

Combining 3M™ High Flow Series Filters and 3M™ LifeASSURE™ BBA Series Filters increase filter life at natural spring site



The problem

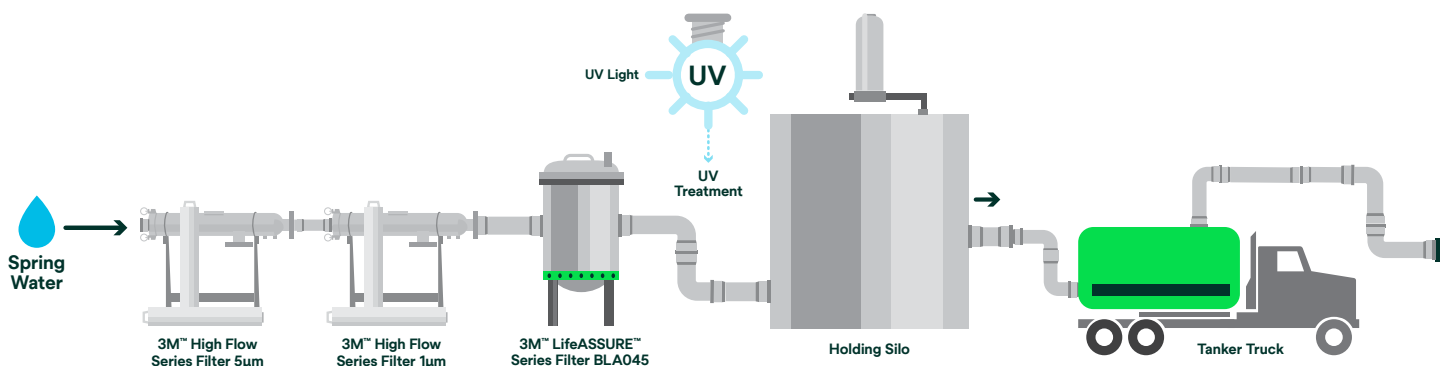
Bottled water continues to enjoy widespread popularity due to many factors such as convenience, taste and health awareness. Bottled water is portable and easy to consume on-the-go, making it a preferred choice for busy lifestyles. Consumers expect bottled water to be free from impurities that could impact flavor, aroma or pose health risks. With growing health consciousness, consumers see bottled water as a healthier alternative to sugary beverages, contributing to hydration without added calories.¹

Natural springs are a significant source of bottled water and contribute to the industry's appeal in many ways. The bottling process of spring water presents unique challenges as the water quality at each site can vary greatly. Typical contaminants such as microorganisms, sediment, and heavy metals are required to be removed during the filtration and treatment processes.

A bottled water company, an existing customer in the eastern United States, partnered with Solventum to optimize performance at their spring water site – to increase throughput while reducing the number of filters in their production line. Two product trials were conducted to optimize the customer's filtration life and efficiency. At this spring site, water is pumped through a series of filters and then stored until it is transported to a bottling plant. Initially the customer was using the 3M™ High Flow Series 5µm filter, a 3M™ High Flow Series 1µm filter and a 3M™ LifeASSURE™ BLA045 nylon filter in series.

The process

This process map outlines the bottled water company's filter path, typical for natural spring sites.



The solution

The Solventum Application Engineering team collaborated with the customer to identify a two-pronged approach to improve their operational performance. First, it was agreed upon to replace their 3M™ High Flow Series Filter 1µm with a 3M™ High Flow Series Filter Cartridge 0.5µm. With a 99.9% (Beta 1000) efficiency, the 3M high flow series filter cartridge 0.5µm can provide water bottlers with the labor saving and ergonomic benefits of a high flow, large format filter coupled with a lower total cost of filtration for their sub-micron applications by extending the life of existing, more expensive 3M™ LifeASSURE™ Series Membrane Filters.

In a second trial the customer replaced the 3M™ High Flow 5µm filter with a tighter 3M high flow filter 1µm and agreed to evaluate the recently launched 3M™ LifeASSURE™ BBA Polyethersulfone (PES) Membrane Filter 0.45µm as the final filter. The LifeASSURE BBA series filter cartridge design combines asymmetric PES membrane and melt blown polypropylene microfiber media to provide durable long-lasting performance for food and beverage applications. The filters were monitored in service during the months long trials and collected upon being spent.

The result

Trial 1: By switching the downstream 3M high flow series filter cartridge from a 1µm to a 0.5µm, the customer improved the service life of the (22) 3M™ LifeASSURE™ BLA045 membrane filters by **increasing final filter throughput 180%**. This equated to an increase from 2.5 million gallons to 7 million gallons filtered. The 3M high flow series filters lasted 45 days in service and the LifeASSURE series filters did not achieve terminal pressure during the 4-month trial. The switch from the 1µm to 0.5µm 3M high flow filter helped achieve a **20x reduction in cost**, a substantial cost of filtration savings that directly supported the customers bottom-line.

Trial 2: In this trial, the customer replaced the upstream 3M high flow filter 5µm with a 3M high flow filter 1µm and installed the newly released LifeASSURE BBA045 series filter cartridge as the final filter. Using the upgraded filtration process, one set of (22) LifeASSURE BBA045 series filter cartridges **increased the final filter throughput by 64%**, as compared to the LifeASSURE BLA045 filter cartridges. This equated to an increase from 7 million gallons to over 11.5 million gallons of filtered spring water. This extended lifespan reduced the frequency of replacements, maintained specific quality standards and lowered overall operation costs by utilizing the more efficient 3M high flow series filters to protect the high value LifeASSURE series final filters.

In these trials, by optimizing the upstream 3M high flow series filter rating and utilizing the robust LifeASSURE BBA series filter cartridges, the customer saw a **10x reduction in expensive downstream membrane filtration cost**.

1. Bottled Water Market Size, Share & Trends Analysis Report By Product (Still Water, Sparkling Water, Functional Water), By Distribution Channel (On-trade, Off-trade), By Packaging, By Packaging Size, By Price Range, By Region, And Segment Forecasts, 2025–2030, Horizon Databook, Report ID: GVR-2-68038-411-6.

Application engineering

The cornerstone for Solventum's philosophy is service to customers, not only in product quality and prompt delivery, but also in validation, application support, and the sharing of scientific information.

By using Solventum products, customers have access to Solventum Application Engineering support, a global team of market-focused scientists and engineers who excel in supporting collaborative efforts between customers and Solventum.

Our Application Engineers can work with you from start to finish to suggest the most effective and economical filters to achieve the clearest results.

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3M Purification is now part of Solventum

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