

Food & beverage

Filter cartridges help wine to achieve stability

A leading producer of sparkling wines and a variety of other wines and spirits exports its products to more than 100 countries around the world. The company relies on sound filtration solutions to achieve the microbiological stability of the end products with good cost efficiency.

In 1825, in Bratislava, colonial goods and wine merchant Johann Fischer and physician Michael Schonbauer, launched the first company in Europe outside of France to produce sparkling wine, based on the original French formula from the Champagne region. In 1877, the company was taken over and successfully managed by the Hubert family. Today, Hubert Sekt is



Eaton's filtration cartridges ensure that all wine and sparkling wine produced by Hubert Sekt achieve microbiological stability.

the market leader in Slovakia, producing sparkling wines, plus a variety of other wines and spirits. Filtration solutions from Eaton have been a permanent part of the company's processes, which involve a filtration volume of approximately 16 million liters of wines annually. Different filter media are used on the three bottling lines. The lines for all sparkling and wine varieties are equipped with filter cartridges, while the spirits line is fitted with depth filter sheets. The beverage company had been testing cheaper options from competitors on the sparkling wine and other wine lines in the last two years, but found that the cheaper cartridges caused problems in terms of microbiological stability, filtration capacity and the service life of the cartridges.

The challenge

An essential factor in bottling filtration is the microbiological safety of the filtrates. If yeast and bacteria end up in the wine, the product may continue to ferment in the closed bottle, leading to changes in taste and secondary hazing, and possibly causing enormous pressure to build up in the bottle due to the accumulated CO₂ inside. The microbiological safety of the filtrates must be ensured to avoid having to recall the finished product due

to quality issues and to avoid potential injuries to employees and consumers due to exploding bottles. Collecting the bottles, filtering the product again and then refilling the bottles is also time- and cost-intensive and impacts the entire efficiency of the operation.

Another aspect to consider is that the filtration process must be adapted to optimize the service life of expensive membrane filter cartridges. Blockages that occur early in the filtration process lead to bottling downtimes, reducing filter capacity and increasing process and material costs for filter cartridges.

The high colloidal and microbiological burden makes filtering the products more difficult. Accordingly, it is essential to use membrane filter cartridges with high levels of bacterial retention (LRV >7 per cm²) and a good service life despite the tight filter material. Suitable pre-filter cartridges must be identified with the aim of optimizing filterability and protecting the membrane filter cartridges. These pre-filter cartridges predominately catch particles and colloids that could otherwise block the membranes prematurely. The membrane filter cartridges themselves act as final "police filters," separating out only



Beco Protect KM are sintered stainless steel filter cartridges and are predominately used in steam filtration to filter rust and abrasive particles.

the remaining microorganisms before bottling.

The solution

After a complete process analysis conducted by Eaton, an optimized filtration concept was developed and implemented. The analysis investigated the filterability of the wines, the flow speed, the pre-filtration stages of sparkling wines, other wines and service media, such as water and steam, and the cleaning process of the filter cartridges (regeneration).

The new process solution is composed of an integrated approach of pre-filter and membrane filter cartridges, as well as water filter cartridges for the rinsing process and a steam filter cartridge for sterilization.

Beco depth filter cartridges with a nominal retention rate of 0.6 μm are used as pre-filters. The layered wrapping of these cartridges allows for a wide spectrum of particles to be caught and improves the cleaning result during the regeneration phase. They feature a large filter area of fine filter material that results in a long service life, high flow rate with low differential pressure and excellent filterability.

With an absolute retention rate of 0.45 μm , the membrane filter cartridges reliably filter out yeast and bacteria. They can frequently be rinsed and sterilized thanks to their high mechanical and thermal stability, which maximizes their life span and extends their service life. One of the main benefits of membrane filter cartridges is integrity

testing capability. This feature means that they can be used as 'police filters' before bottling.

Different filter cartridges are used for the filtration of the service media (water and steam). It is essential to filter this media because particles and contaminants can significantly impact the regeneration result and damage the filter cartridges. The rinsing water for the regeneration of the pre-filter and end filter cartridges is filtered in two stages. In the first stage, Beco pre-filter cartridges with a nominal retention rate of 0.6 μm are used. In the second stage, Beco Membran PS membrane filter cartridges with an absolute retention rate of 0.2 μm ensure that the rinsing water is free of bacteria. Beco Protect KM stainless steel filter cartridges with a nominal retention rate of 10 μm are used to ensure particle-free steam for sterilizing the pre-filter and end filter cartridges and the housing.

The new filtration solution is tailored to Hubert Sekt's requirements and provides

cost efficiency and high product quality. Process costs decrease thanks to increased safety and reliability. In addition, material costs are lower thanks to the optimized service life of Eaton's membrane filter cartridges which are protected through harmonized pre-filtration and service media filtration.

Eaton recommends wrapped depth filter cartridges because they are more robust and can be rinsed and reused. Furthermore, they have a higher particle retention capacity than pleated depth filter cartridges thanks to fractioned depth filtration. As a consequence, blockage substances are easier to remove and filter service life is longer.

By using this combination of pre-filter cartridges and downstream membrane filter cartridges, Hubert Sekt can achieve microbiological stability in its sparkling and other wines, and triple their filter capacity. ●

www.eaton.com/filtration



Beco membran PFplus and PS are pleated membrane filter cartridges made of polyvinylidene fluoride (PVDF) or polyethersulfone (PES) that can be tested for integrity.