



Optimizing processes with the right filters

Location:
Krems, Austria

Segment:
Food & Beverage,
wine processing

Challenge:
Increasing processing efficiency through longer service life, lower drip loss, flexibility in changing types of wine and protection of cartridge filtration while maintaining high hygiene and quality standards

Solution:
Eaton's BECOPAD® 115C pure cellulose sterile depth filter sheets

Results:
Tripling of filter sheet service life, drip loss reduction of up to 99%, high flexibility in changing types of wine and optimized protection of membrane filter cartridges

"Sheet drip loss was practically eliminated and change intervals tripled with BECOPAD 115C depth filter sheets. The depth filter sheet also increases the service life of the downstream membrane filter cartridges, by significantly reducing fine colloids beforehand."

*Andreas Zang,
Eaton's Area Sales Manager, wines and sparkling wines for Franconia, Wurttemberg and Austria*

Background
For the city of Krems at the river Danube in Lower Austria, the largest quality wine growing area in the country, wine growing has a very special meaning. Wine has been cultivated in the 1,000-year-old city since earliest times, a testimony to the tradition of viticulture in Austria. The quality of the wine stems from the soil structure, the prehistoric rock terraces, and the conglomerate soil, as well as the favorable Pannonia climate with dry, hot days and cool nights. Accordingly, viticulture is still a major industry in the region today.

And so, one of the most modern, state-of-the-art wineries in Austria with an annual revenue of EUR 14 million (2015) and 13 hectares under cultivation, is located here as well. This IFS-certified winery focuses on bottling quality wines in cooperation with vintners, associations and international wine trading companies.

The winery already uses various Eaton beverage products throughout its operation. Now, they also rely on Eaton to help meet the new filtration challenges associated with increased bottling productivity.

Challenges
Sheet filtration combined with a fully automated filter cartridge system is used to filter during bottling. 23.6 x 24.2 in (60 units with a flow of 145 gal/sqm/h)/ 600 x 615 mm (60 units with a flow of 550 l/m²/h) sterile depth filter sheets are connected in series with two pre-filter cartridges and a membrane filter cartridge (0.45 microns). This filter combination keeps bottled wine microbiologically stable and meets the winery's high-quality demands.

To attain cost-effective filtration results, especially in light of the frequent changes between wine types, ensuring flexibility of the production process, as well as preventing a blockage of the membrane filter cartridge is of utmost importance.



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An interruption usually occurs when the sterile filter sheets have to be replaced after five days of filling in the two-shift operation because the sheet filter drips heavily after five days. This short period not only limits productivity but also causes wine loss and hygiene problems.

Another aspect which poses a challenge is that the winery only has a small capacity for switching from red wine to white wine during a bottling day, further reducing bottling productivity and flexibility.

“To augment productivity and attain flexibility, we have studied the overall process and examined where we can best position ourselves in an efficient and cost-conscious manner”, says Andreas Zang, Eaton’s area sales manager for wines and sparkling wines in the regions of Franconia, Wurttemberg and Austria. “As the winery relies on our expertise in this field, we naturally found a corresponding solution to satisfy our customer’s high demands.”

Solution

Currently, the wine is first clarified using a sheet filtration system then sent through a pre-filter and membrane filter cartridge combination. The filter sheets in the pre-filter stage do not work efficiently, which leads to premature blocking of the filter cartridges and particularly the downstream membrane cartridge caused by particles and fine colloids. The membrane filter cartridges are the most expensive filter component in this process and must be protected for a cost-efficient result. Only then will the best results for a microbiological safe wine be filled into the bottle.

Eaton’s BECOPAD 115C sterile depth filter sheets are used to protect membrane filter cartridges in multistage filtration systems. They have a nominal retention range of 0.1 to 0.2 microns and are especially designed to retain fine colloids, extending the operating life of membrane filter cartridges and increasing productivity. Filtration of white wine after red wine is also possible due to their cellulose fiber characteristics. Depth filter sheets with mineral components do not allow white wine after red wine filtration, as these have an adsorbent effect and bind anthocyanins to them, which are difficult to remove from the sheets even in the rinsing process.

“Sheet drip loss was practically eliminated and change intervals tripled with BECOPAD 115C depth filter sheets. The depth filter sheet also increases the service life of the downstream membrane filter cartridges, by significantly reducing the fine colloids beforehand”, says Andreas Zang. “We have solved all our customer needs efficiently and cost-effectively, and we have also demonstrated that we are a highly reliable and competent partner in both areas involving beverage treatment and filtration.”

Results

Using these depth filter sheets, the winery can now extend the service life of depth filter sheets to 15 days (filtration volume: 84,535 gallons/1,000,500 liters) instead of five working days (filtration volume: 264,304 gallons/320,000 liters). Furthermore, drip loss using BECOPAD depth filter sheets has been sharply reduced compared with standard depth filter sheets.

The edge compression in the sheet filter improved from 0.059 to 0.045 in (1.5 to 1.16 mm). The greater compression results from the composition of the pure cellulose sheet. As no mineral components permeate the homogeneous cellulose fiber structure, the flexible cellulose fiber can be compressed more efficiently, reducing drip loss by up to 99%.

Another and more important benefit from using BECOPAD 115C sterile depth filter sheets is the possibility to filter white wine after red wine, when the proper rinsing and cleaning steps are taken. The BECOPAD cellulose fibers have almost no adsorbent capacity and can be nearly completely rinsed of anthocyanins. Due to the simplification of changing types of wine, bottling schedules can now be optimized and makes a more flexible operation possible.

The Krems winery can continue to meet the same high standards of modern oenology with durability, high hygienic standards and flexibility. These are challenges other large wineries and contract bottling companies face in their processes.

Familiarity with these processes and the ability to see things as a whole in order to develop targeted solutions once again illustrate Eaton’s expertise to understand and meet customer and market demands.



BECOPAD depth filter sheets combine microbiological safety with virtually full preservation of aroma and color and are available in nine degrees of clarification with coarse to sterile filtration. The special grade BECOPAD 115C reliably retain fine colloids and effectively protect downstream membrane filter cartridges.



The **BECO COMPACT PLATE A600 sheet filtration system** is a high-quality, multi-layer filter with a variety of options. The filter surface can be adapted to the respective application, and drip loss reduced to a minimum through the hydraulic tightening unit with automatic subsequent pressing.

North America
44 Apple Street
Tinton Falls, NJ 07724
Toll Free: 800 656-3344
(North America only)
Tel: +1 732 212-4700

Europe/Africa/Middle East
Auf der Heide 2
53947 Nettersheim, Germany
Tel: +49 2486 809-0

Friedensstraße 41
68804 Altlußheim, Germany
Tel: +49 6205 2094-0

An den Nahewiesen 24
55450 Langenlonsheim, Germany
Tel: +49 6704 204-0

China
No. 3, Lane 280,
Linhong Road
Changning District, 200335
Shanghai, P.R. China
Tel: +86 21 5200-0099

Singapore
4 Loyang Lane #04-01/02
Singapore 508914
Tel: +65 6825-1668

Brazil
Av. Julia Gaioli, 474 – Bonsucesso
07251-500 – Guarulhos, Brazil
Tel: +55 11 2465-8822

**For more information, please
email us at filtration@eaton.com
or visit www.eaton.com/filtration**

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08-2016