

Case Study

Crossflow Microfiltration Helps Wineries Reduce Costs

Overview

Wineries using crossflow microfiltration (CMF) systems are recovering wine of higher quality and value when compared to traditional systems. The economics of the CMF system are very favorable compared to diatomaceous earth filtration, which raises serious safety and environmental concerns and carries high disposal costs.

The latest generation of crossflow filters delivers consistent results on all wine varieties. New membrane technology and equipment designs use lower pressures and do not require cooling, provide a more natural filtration process. Improvements in techniques such as 'reverse flow' have helped increase filtering run times and prolonged membrane life. Larger membrane cartridges that process more wine in less space have helped reduce system cost.

"Koch Membrane Systems (KMS) has installed KMS WINEFILTER™ crossflow cartridges in hundreds of wineries during the last twenty years. The latest version of our microfiltration

membrane is a significant advancement over previous models because it provides the ability to process all wines—including the most difficult reds—thereby delivering a one-step solution for any size winery. We have also streamlined the system design making crossflow microfiltration easier to use and more affordable," said Brad Milnes, process technology leader for the Food, Dairy and Beverage Group at KMS.

Challenge: Woodbridge Winery

Woodbridge Winery needed an economical alternative to conventional wine filtration methods without sacrificing wine quality. Using conventional methods, wine has to be filtered in multiple steps. The excessive filtration often strips the red wines of flavor and color. Conventional methods also involve high labor, material, storage and disposal costs when compared to CMF technology.

The Solution

For Woodbridge, the answer is the KMS WINEFILTER 3-stage continuous crossflow microfiltration system.

"Our KMS WINEFILTER system means we can eliminate almost all diatomaceous earth filtration and its associated costs and disposal issues,"

said Dan Hansen, Director of Cellar Operations at Woodbridge Winery. "Not only have we reduced our biggest cost, but we also spend less on bottling final filters, the wine is cleaner so the filters last longer. Of course the greatest benefit is that quality of the wine, particularly the difficult reds, has improved because with crossflow filtration the reds hold their filterability much longer than with diatomaceous earth or cellulose pad filters, so we don't have to refilter the wine."

Woodbridge expanded their first WINEFILTER system in 2006 and added a second system in 2008. "Upgrading to a second system has doubled our capacity. Filtration time for our 216,000 gallon tanks has been cut in half," said Hansen.

The winery now clarifies wine in two steps, using centrifugation followed by two automated three-stage crossflow microfiltration systems from KMS. The two systems produce 50-100 gallons per minute in 36-hour continuous runs, and run up to 100 hours in a typical week and even longer during harvest season. This continuous design converts a minimum of 99 percent of the feed to filtered wine with less than one percent of high solids lees left for further processing downstream. The first system filtered 18 million gallons





Woodbridge 3-stage Continuous WINEFILTER™ System

before the cartridges needed to be replaced; the newer system filtered nearly 27 million gallons before cartridge replacement.

“The KMS single-pass system is definitely a better way to go; it runs almost trouble-free,” says Hansen. “Another great feature of the WINEFILTER system is the ability to isolate cartridges. This is really important because if one cartridge needs to be removed, you can easily isolate and bypass it without shutting down the entire system.”

Challenge: Llano Estacado Winery

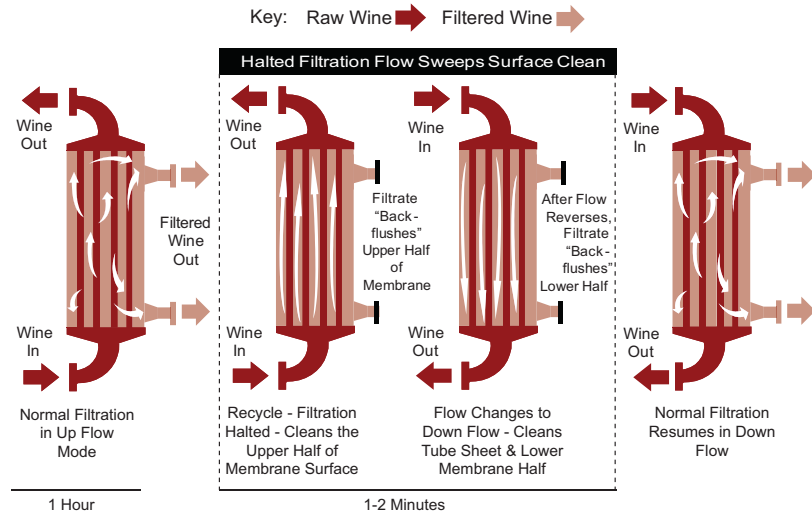
Llano Estacado Winery, a premium winery in Texas, has produced a number of award-winning wines over its 35 year history. When Llano needed a new wine filtration system, the company sought a solution able to handle the different levels of processing required by their many varieties of wine.

The Solution

After a thorough evaluation of competing systems, Llano Estacado determined that the KMS WINEFILTER would meet their needs in terms of price and features. Llano started operations with their new WINEFILTER in July 2011.

In its first five months, Llano Estacado's system processed approximately

KMS WINEFILTER™ Reverse Flow Feature



140,000 gallons of red and white wine varieties. It can easily handle 12-18 hour runs, can run overnight unattended, and is extremely energy efficient.

A key factor in Llano Estacado's decision to purchase a WINEFILTER is that KMS not only manufactures the system but the membranes as well. “One of the most important features to us is the fact that KMS makes their own polymeric membranes. We find non-organic filters are very expensive and use more power than polymeric filters,” said Greg Bruni, Vice President Executive Winemaker at Llano Estacado Winery.

The winery is satisfied with the system's operational efficiencies, noting that the system is quiet, uses less energy, can stop fermentations much easier, and reduces filtration losses. “We're also impressed with the unique reverse flow feature of the WINEFILTER system, which really seems to be working well for us,” Bruni said.

Bruni also praised KMS' follow-up and service, in particular KMS engineers' experienced help in determining the best operation and cleaning regimens for the membranes.

Product Overview

The KMS WINEFILTER system improves efficiency, increases throughput, and reduces filtration steps and down time. At the same time, WINEFILTER systems are gentle on wine due to minimal oxygen pickup and heating.

WINEFILTER systems are available in various levels of automation. Sizes range from compact, low cost systems in the 5 to 10 gpm (10 to 20 hl/hr) filtrate flow range to larger systems capable of flows exceeding 100 gpm (230 hl/hr). One system can be used for all styles of wine, keeping overall capital investment low. KMS systems incorporate techniques such as reverse flow and back-pulse, which stabilize the flow of filtered wine and minimize membrane fouling.

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