



KMS Crossflow Membrane Filtration Pilot System for Lees



KMS crossflow membrane filtration systems for recovery of wine from lees have been used successfully by producers of both red and white wines and continue to gain in popularity. Crossflow membrane filtration maintains the wine's important qualities, including acidity, aroma, color, flavor and clarity, with little or no oxygen pickup or temperature rise.

The economics of the crossflow membrane filtration system are very favorable when compared to diatomaceous earth filtration. Recovery of high quality wine with the membrane-based lees filter gives an enhanced return-on-investment mainly due to the increased value of the wine recovered using CMF.

Application of Crossflow Membrane Filtration to Lees Treatment

Overview

Treatment and product recovery from wine lees, the sludge-like sediment left behind when wine or juice is transferred from one tank to another, is one of the biggest challenges facing the wine industry.

During the winemaking process, insoluble solids are generated that have to be removed before bottling. These solids include fine fruit particles, tartrate salts, spent yeast, bacteria and soil, debris, and fining agents.

All of these solids eventually settle into what is called lees. Wine producers generally classify lees into "sweet lees," or "must lees" and "fermented lees," or "wine clarifier lees." Sweet lees are the settled solids typically found in white grape juice and often are further processed to gain higher yields, while fermentation lees consists of all sediment remaining after fermentation and fining. On average, about 10 percent of the initial volume is removed as lees, which still contain a high percentage of recoverable wine.

Wine recovered from lees using traditional techniques—rotary vacuum or plate filters—often is of low quality and may require further processing before being blended into a usable product. Lees are often accumulated from several batches of wine before being clarified in order to maximize the efficiency of traditional recovery. These older processes can result in oxidation of wine, yield loss and higher operating costs.

The Challenge

To minimize winery waste volume, comply with legislation that limits the disposal of unwanted by-products, and recover quality wine from the lees.

The Solution

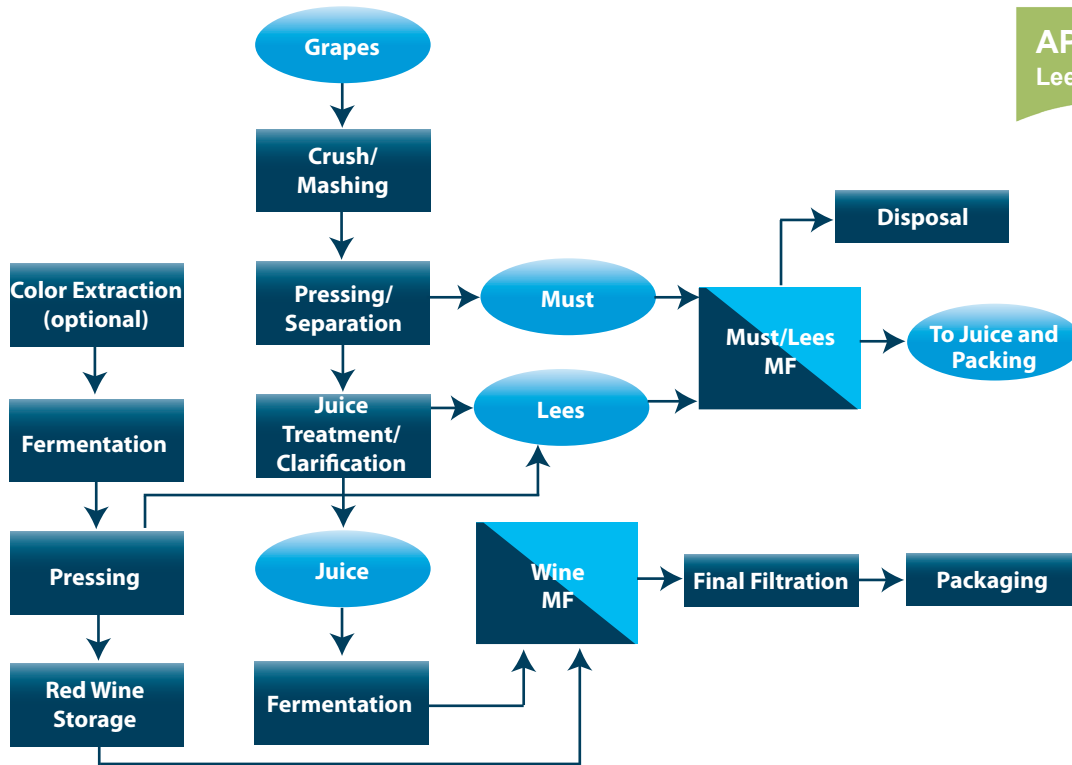
Koch Membrane Systems' (KMS) crossflow membrane filtration (CMF) technology has led to a superior method for recovering valuable wine and juice from lees. This novel process entirely eliminates the need for diatomaceous earth (DE) and other filter aids currently used with traditional recovery techniques.

Crossflow microfiltration membranes configured in a multi-tube modular geometry are ideal for clarifying lees. The tubular design is well-suited for processing streams that contain high levels of suspended solids such as juice and wine lees.

Wineries using CMF systems are recovering wine of higher quality and therefore higher value when compared to traditional systems. Higher value wine plus significant annual operating cost savings are providing wineries with an attractive return on their investment.

Customer Benefits

- Higher Yields with Improved Quality and Value
- Reduced Operating Costs
- Reduced Waste Disposal
- Enhanced Return on Investment



Typical Crossflow Membrane Filtration Process for Wine, Lees, and Must Filtration

Crossflow Membrane Filtration Technology Increases Yield and Maintains Quality

Crossflow membrane filtration technology uses highly-engineered, semi-permeable physical barriers that permit the passage of desired constituents based on size, shape or character. Membranes are available in a variety of configurations, materials and sizes. With crossflow membrane technology, a feed stream is introduced into the membrane module under pressure and flows over the membrane surface in a controlled operating mode. The selective barrier of the membrane separates the feed into a permeate and a retentate stream, both of which may be of value. While used for numerous purposes in many industries, membrane filtration in wine production is most commonly used to

remove suspended solids and turbidity while allowing the passage of color, ethanol, flavor and aroma components. Other membrane applications for wine and juice include sugar concentration in must, volatile acid and alcohol adjustment, and color concentration and standardization.

Polymeric crossflow membranes, the type most often used in wine applications, vary depending upon the separation requirement and are provided in a number of different configurations including hollow fiber, spiral wound and tubular. Membrane porosity also varies with the application; the tightest is reverse osmosis (RO), through nanofiltration (NF), then ultrafiltration (UF) and finally, the most open, microfiltration (MF).

CMF is an industry-accepted technology for wine filtration. However, until recently, the only method for wine and juice recovery from lees has been the use of traditional DE filtration techniques. Polymeric tubular membranes are often used for fluids with very high concentrations of particulate matter and, when constructed in a sanitary geometry, are ideal for lees processing. When CMF for wine clarification and recovery of wine and juice from lees are used together in a winery, the result is higher quality wine and higher yields.



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