Filtration: past and present

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Asymmetric membrane filtration had mainly been a laboratory technique until the development of pleated membrane cartridges, by Gallipoli in the 1970s. These made industrial applications feasible as the pleats maximise the surface area in each cartridge and the cartridge format is easy to manage. Membrane cartridges are mainly used as a safety filtration, rather than for removing many solids. Before WW1, cellulose-asbestos filter pads were used in wineries. These were perfected and sold for juice and wine filtration from the 1930s. Paste filters allowed different levels of filtration depending on the asbestos level in the cellulose-asbestos pads. Some CE grade asbestos filter pads allowed for sterile filtration. Additional frames were available for diatomaceous earth filters. The technology was widely adopted from the 1950s. Air was added to a filter (e.g. cellulose or asbestos) before filtration. The adoption of continuous flowing of a body of diatomaceous earth extended the filtration cycle length by continually providing a fresh filter medium. The technique was widely adopted from the 1950s.

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Loose asbestos

The Seitz brothers developed Asbestos as a filter aid in the 1850s. It was used for fine wine due to its adsorption that were not removed by other filter aids. Despite having been added as a loose material (pellets or dust) in combination with cellulose, it could easily be peeled off after filtration.

Loose asbestos pads

Before AWRI, cellulose-asbestos filter pads were developed that allowed sterile filtration of drinking water. These were perfected and sold for juice and wine filtration from the 1930s. Paste filters allowed different levels of filtration. Membrane cross-flow filters had been used in other industries since the early 20th century. Other industries often used a design with a continuous cloth belt to support the filter aid rather than the fine stainless mesh on modern wine filters. Atkin Ltd developed a 10% open area cross-flow filter press that gave high flow rates.

Cross-flow action

Cross-flow filters have gradually replaced pressure leaf filters for wine filtration and are now widely replacing rotary drum vacuum filters for lees filtration. Cross-flow is seen as one of the most important options available in wine production following lees filtration stages. More automation, improved wine quality and reduced consumption of filter aids have associated health and safety issues.

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