Continuous centrifugation of milk

Gustav de Laval invented the continuous centrifugal separator in Sweden. It was a big improvement on gravity separation for milk. The dairy industry is still one of the biggest users of centrifugal separators.

Wine industry beginnings

Some early centrifuges in the wine industry continuously discharged thick, non-settleable sludge. The process was very oxidative and the lees were quite thin, with manufacturers recommending that the lees be reprocessed through the centrifuge once or twice more.

Self-emptying centrifuges

Self-emptying centrifuges removed the need to manually open and close the centrifuge. The top of the chamber can move up and down, a flow of operating water above the top of the chamber keeps the bowl closed, but when this water is stopped, the top of the bowl lifts and there is a total discharge of the bowl (liquid and sludge), before resealing.

Chamber bowl centrifuges

Chamber bowl centrifuges allowed sludge thicker than was possible with nozzle separators. The wine passed through multiple chambers where solids could be separated and accumulate on the walls. When the solids had built up enough, they could be manually opened and cleaned, which was time-consuming and cumbersome.

Discharge control from flow at the edge of the sludge holding space

Material from the edge of the sludge holding space flows above an extra large disc on the stack. Through a sensor and back into the feed stream. When sludge builds up in the bowl and begins to flow above the disc the flow rate increases and the disc is moved by either a flow switch (Westfalia Self-thinker) or in turn push-down a section covering the lateral openings. In this model, the opening time of the bowl could be reduced, resulting in a partial discharge (mainly sludge evacuates, not the total liquid in the bowl), subject to sludge consistency.

Chamber bowl centrifuges where solids could be separated and holding spaces were full, the centrifuge needed centrifuges. The wine passed through multiple operations and once or twice more. Before the advent of the centrifugal separator, cream was allowed to rise in Gravity separation and skimming of cream. The process was very oxidative and the lees were quite thin, with manufacturers recommending that the lees be reprocessed through the centrifuge once or twice more.

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The biggest markets are dairy and marine applications (removing contaminants from fuel oil that could damage ship engines). In terms of overall sales, wine is a very small market for centrifuges. The biggest users are dairy and food industries.

Gas counter-pressure

In an effort to reduce air contact, bottom-fed centrifuges were introduced. Alternate designs with top-heating and water seals and optimised feed distributors were also released (this is now the most common arrangement in winery centrifuges)

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