



EXTENDED FILTER SERVICE LIFE

The Apolda Brewery uses Flottweg separators for beer clarification

The new Flottweg beer separator AC 1500-420 constitutes an ideal solution in several steps of the brewing process, especially for medium-sized breweries. During beer clarification the separator enables a longer filter service life and therefore work flows are optimised, less kieselguhr is consumed, and less beer is lost. The Apolda brewery in Thuringia, Germany, and Flottweg AG succeeded in a joint project to improve the existing filtration process.

The Apolda brewery which produces ten different varieties of beer, uses in its filtration line a candle filter system with a filter area of 30 m². Basically the

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brewery staff has been satisfied with the results of kieselguhr filtration, but they have always enquired about the possibility of extending filter service life and reducing kieselguhr consumption. Throughout the peak time of four or five days of filtration, the company was time and again pushing its capacity limits in regards to organisation, human resources, and the following process steps. It was the objective of this medium-sized brewery to improve filtration in regards to profitability and to simplify production processes, while at the same time producing beer in continuously high quality.

a company which has been manufacturing decanters for the beverage industry for more than 50 years. Flottweg Decanters for wort recovery from hot trub, Sedicanters[®] for beer recovery from surplus yeast, and belt presses for the dewatering of spent grains have been in use in the brewing industry for decades.

Thus, it was self-evident to use this separation technology know-how to further develop the separator, fulfilling the requirements for use in breweries and thus enlarge the Flottweg product range.

After a successful development and test phase at the Flottweg headquarters in Vilsbiburg, the separator was assembled in the Apolda brewery and commissioned within two days. It was possible to quickly begin trials in production scale with the option of turning the machine on or off during filtration bypass.



Stefan Bichlmeier

Master Brewer and Production Manager for Brewery and Beverage Technology; Process Engineer, Flottweg AG, Vilsbiburg

Implementation of the test machine

The Apolda brewery found the right partner in Flottweg –



Test installation: Disc stack centrifuge with connection frame.

Due to the excellent results in the tests the disc stack centrifuge was already during the second week completely integrated into the filtration process. Besides the experienced technicians, there was always a process engineer at their disposal during the whole test period.

The disc stack centrifuge

The AC 1500-420 clarifier, with a bowl volume of 14 litres and a maximum bowl speed of 6800 rpm, can process a quantity of 50 to 130 hl/h. A low maintenance belt drive efficiently transfers the power to the clarifying bowl.



The new Flottweg beer separator AC 1500-420 provides longer filter service life for the Apolda brewery.

Additionally the disc stack centrifuge is equipped with the Soft-Shot® discharge system which helps to discharge the separated yeast without a loud bang.

Using the disc stack centrifuge before the filter allowed the continuous discharge of a large portion of yeast, reaching a separation efficiency of 99.9 per cent. Also the yeast peaks, which appear during emptying the tanks, were evened out while using the separator. On average 1.5 to 2 million yeast cells/ml of feed had to be processed.

Depending on the application and on customer demands, it is possible to vary the separation efficiency by adjusting the flow rate and rotational speed (see diagram). Thus a flexible operation is possible. This adjustment was made together with the Apolda brewery and so the ideal number of yeast cells to obtain the best filtration result was determined.

Moreover, the machine was adjusted according to the desired capacity. The results of this measure become evident in regards to several parameters such as filterability and filter service life. Filterability increased by 30 per cent compared to the values obtained before the implementation of the disc stack centrifuge, and filter service life increased by a 100 per cent thus reducing the consumption of filter additives (kieselguhr) by 50 per cent.

Reduced consumption of kieselguhr also means reduced expenses for its purchase and disposal. The anticipated legislation regarding the disposal of kieselguhr is also an important factor for the investment in the disc stack centrifuge.

Longer filter service life results in a reduction of the filtration days and as a consequence also in less alluvial deposits as well as in a reduction of losses during the start and the end of the filtration.

Turbidity adjustment

Wheat beer has become a growing portion of the annual beer production of the Apolda brewery. The use of the disc stack centrifuge offers decisive advantages during turbidity adjustment, especially in the case of wheat beer: Fluctuating turbidity values in the feed,

caused by the settling of yeast cells in the storage tank, are equalised by using the integrated turbidity measurement. The brewer defines the required turbidity value in the finished wheat beer.

The control system controls the yeast concentration by measuring the turbidity in the feed and in the discharge system. By automatically regulating the varying flow rate, the desired separation efficiency is adjusted. There is also the option of the traditional bypass control for turbidity adjustment. The result of both alternatives are constant turbidity values in the final product.

High quality demands

The high quality of the beer is assured with the integration of several control steps in the brewery itself and additional analyses at independent institutes. For this purpose, regular samples were taken to check important parameters for product quality which were forwarded as agreed upon with the customer. The analysis always compared samples between feed and the discharge.

In addition to froth stabilisation, confirming the existence of life/dead yeast cells, and the calcium-oxalate-ration, the protein fractions were also determined. It could be shown to the brewery that there was no undefined separation of protein and that stabilisation was possible by doing as usual. (The definition of the number of cells in the feed and in the discharge is done using a cell counter device. Samples with less than 100 000 cells/ml were analysed).

Oxygen pick-up is prevented due to the hydro-hermetic sealing of the machine. When using degassed water as a sealing medium, no oxygen pickup by the separator was detected.

Kieselguhr free filtration

Due to these results as well as continuous discussions concerning the future disposal problems for kieselguhr the responsible persons at the Apolda brewery agreed on a series of tests for kieselguhr free filtration.

The Flottweg Beer Separator

Features

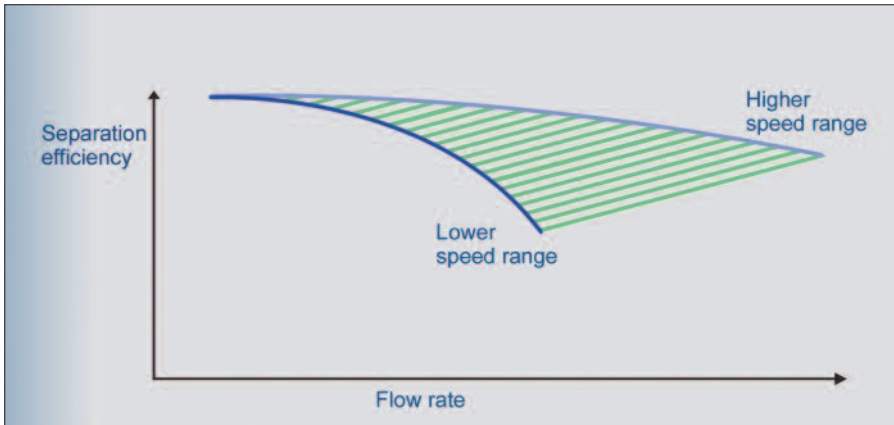
- Gentle product treatment
- High solids concentration due to the precise working discharge system
- Hygienic design
- Hydro-hermetic sealing in order to avoid oxygen pick-up
- Flow rate adjustment dependent on the solids load
- Simple integration into the existing CIP system
- Low noise due to the “Soft-Shot®” system, additional sound protection is not necessary
- Energy efficient due to the low-wear and low-noise belt drive

Benefits

- Longer filter service life
- Reduced consumption of kieselguhr
- Optimised work flows
- Reduced beer loss
- Turbidity adjustment
- Green beer clarification
- First step in kieselguhr free beer filtration



A successful joint project: The Flottweg employees Stefan Bichlmeier (left) and Jan-Martin Glöckner (right) together with Andreas Kunze (2nd from left) and master brewer, Gunter Herrmann, both from the Apolda brewery



Variation of efficiency depending on throughput by means of a simple speed adjustment

The Greenomic-System from the Begerow Company with the cooperation of Flottweg AG is depth filtration based on cellulose. Here, pre-clarification of the beer using a disc stack centrifuge is essential.

The tests, which subsequent to the ones at the Apolda brewery, showed that that procedure was a real alternative to kieselguhr filtration. Using the depth filtration medium, Becopad, is ecologically

friendly since it is a renewable resource, free of minerals, and ecologically harmless because it can be composted. It can also be integrated into existing filter machines.

Conclusion

Because of the positive results in regard to longer filter service life, reduced consumption of kieselguhr and CIP media for the filter as well as significant ease in work; the responsible people at the Apolda brewery decided after only a short period of time to buy the separator. The above-mentioned results clearly indicate that the filtration process was significantly improved using the disc stack centrifuge. Thus, due to the aforementioned possible savings, the investment pays off especially for medium-sized breweries. □



FLOTTWEG BEER SEPARATORS

for consistently high beer quality

- Longer filter service life
 - reduced consumption of kieselguhr
 - optimized operation processes
- reduced beer loss
- Turbidity adjustment
- Green beer clarification
- First step in kieselguhr-free beer filtration

