



FLOTTWEG CENTRIFUGES AND BELT PRESSES FOR BREWERIES

Get More out of Your Beer!



YOU WILL MAKE MORE MONEY

Our Separation Technology Can Improve Your Profitability

Every beer is unique. Each process is individual. We will find a customized solution for your application. Optimize your brewing process where it makes sense with the help of our systems. Get more out of your process using our machines, and discover additional saving potentials.

Profit from the flexibility of our medium-sized company and the advantages of our **Made in Germany** centrifuges and belt presses. We will support you – from the initial planning of your system until you attain your objectives – and beyond!

Flottweg is ISO 9001 certified and manufactures its products in compliance with all current technical standards.

- Long experience in the manufacturing of centrifuges
- Competent, individual advice
- Customized solutions for separation technology
- First class service at fair prices



Because we are a Bavarian company, the quality of beer is particularly close to our hearts. We understand the brewer's responsibilities and we are always striving to meet the specific requirements of breweries as best as possible with our Flottweg Decanters, Sedicanters®, Disc Stack Centrifuges, and Belt Presses. Thus not only do we make our contribution to the quality of breweries' products, but our state-of-the-art technology can also increase your profitability.

We offer customized separation technology solutions for small, medium-sized and large breweries. When designing our machines, we already consider the process as a whole, with a view to maximizing work efficiency and conserving resources.

Typical applications

Our centrifuges and belt presses offer a variety of possible applications in your brewery:

Flottweg Decanters

- for wort recovery from hot trub
- for processing co-currents (e.g. kieselgur or waste water dewatering)

Flottweg Sedicanters®

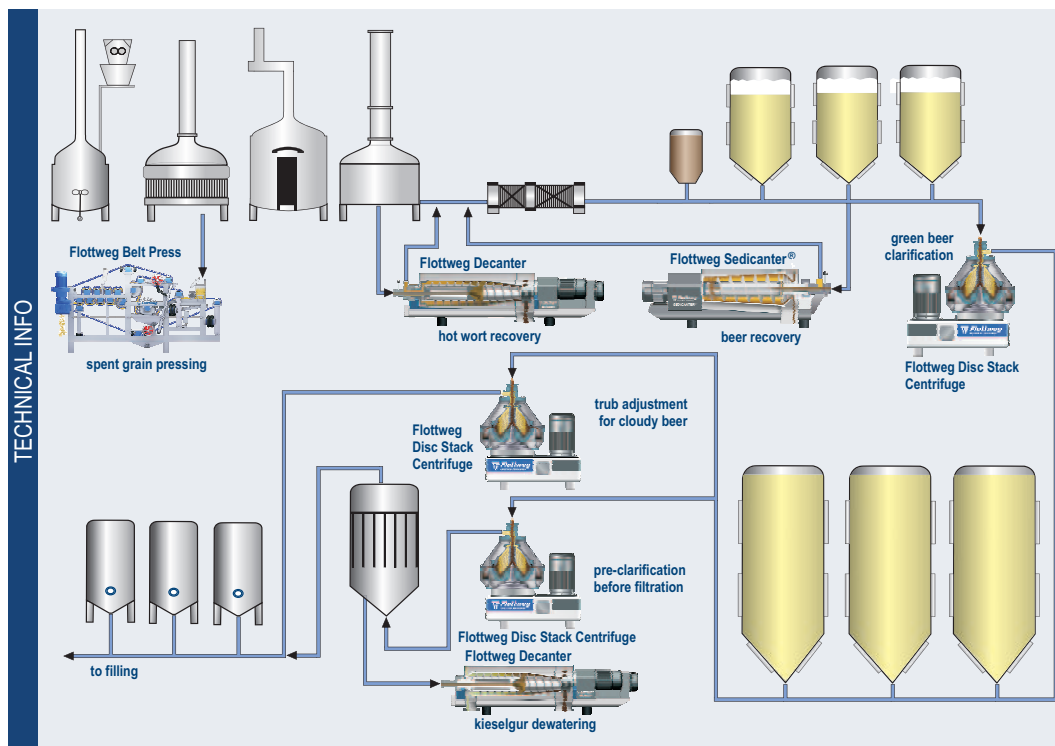
- for beer recovery from surplus yeast

Flottweg Disc Stack Centrifuges

- for wort separation
- for beer clarification before filtration
- for green beer clarification
- for pre-defined trub adjustment of cloudy beers
- for separation of hop components

Flottweg Belt Presses

- for spent grains dewatering (as a pre-stage for thermal spent grains recycling)



The brewing process using Flottweg Separation Technology

HIGHER YIELDS IN THE BREWHOUSE

Wort Recovery from Hot Trub

The hot trub separated during wort clarification in the whirlpool still contains up to 75 % liquid wort, which may be recovered. Our decanter in the brewery supplements the trub separation from hot wort.



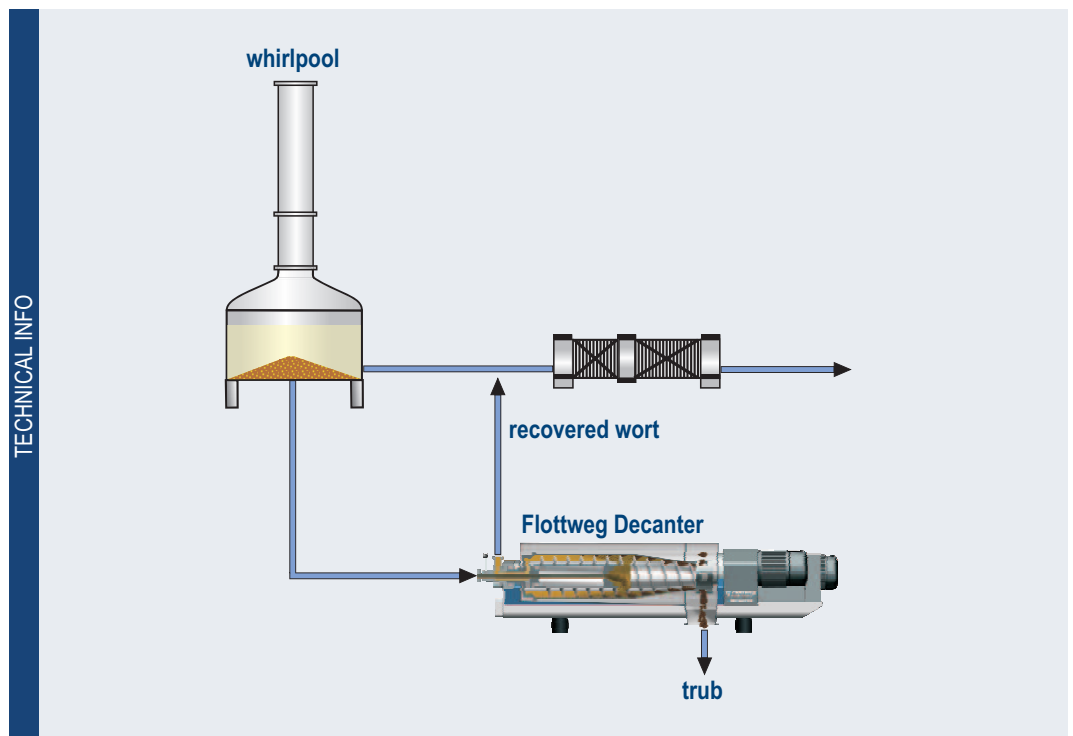
The hot trub coming from the brewhouse is separated using the Flottweg Decanter

The unbeatable advantage of the decanter is that even high feed trub content can be processed without problems. The separated hot trub is optimally concentrated. The recovered hot wort can be added directly

The advantages of the Flottweg Decanter for wort recovery

- High cake dryness, thus considerably reduced wort losses
- Reduced production costs per hectoliter of beer
- Return of the recovered wort to the ongoing process
- Optimized process management through continuous automatic operation

to the clarified hot wort stream coming from the whirlpool. Therefore this is a very efficient way to minimize the loss of wort.



Separation of hot trub

THE FLOTTWEG DECANter

Dependable and Efficient



ADJUSTABLE IMPELLER

- Optimum adjustment to the requirements of different recipes and hot trubs
- Adjustable from outside during operation
- Clarified wort is discharged under pressure in a closed system
- On request: automatic adjustment
- Additionally: optimized cleaning effect during CIP



MATERIAL

- Hygienic design for highest product quality
- Food hygiene certificate for lubricants and sealings (in compliance with NSF H1)
- On request: Sealings with FDA certificate or conformity
- Optimum adjustment to high product temperatures and aggressive media (e.g. CIP, cleaning media in food processing companies)
- Spray nozzles for cleaning the cover, rotor, solids discharge system and other liquid wetted parts



SIMP DRIVE®

- Automatic adjustment of the differential speed depending on the torque
- Automatic adjustment to different loads (hot trub quantity)
- Maximum hot trub yield



FLOTTWEG DECANTERS FOR WORT RECOVERY				
Type	Z2E	Z3E	Z4E	Z5E
Construction materials	All product wetted parts are made of high quality stainless steel.			
Capacity*	20 hl/h	75 hl/h	up to 150 hl/h	up to 230 hl/h

* The listed figures are guidelines for information only. The actual capacity depends on the characteristics of the feed.

Picture shows the scroll in the decanter bowl

DOWN TO THE LAST DROP

Beer Recovery from Surplus Yeast

Depending on the size of your brewery, beer recovery from surplus yeast after fermentation and/or storage represents an ideal opportunity to reduce your beer losses.

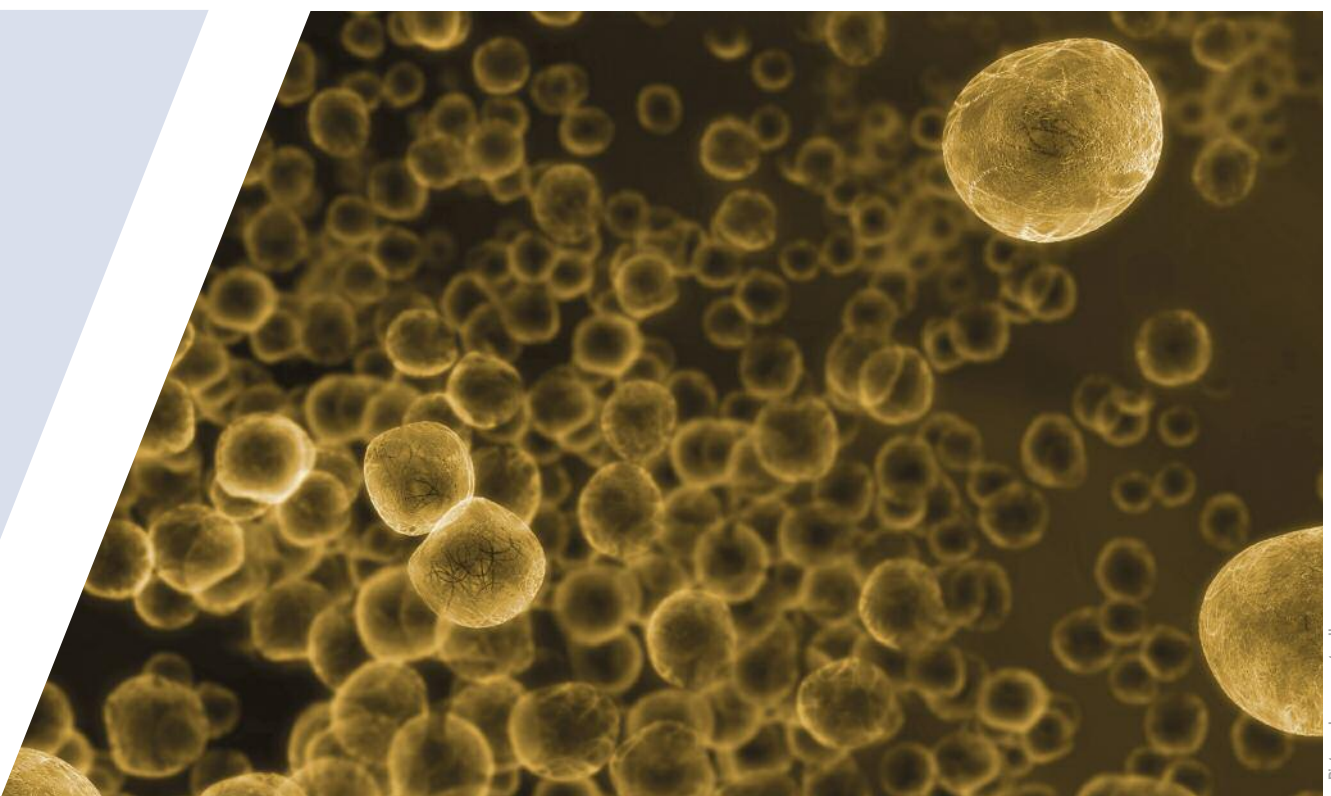
Recovering beer from surplus yeast not only helps to reduce waste water, it also allows you to recover two resources: beer which can be returned into your process, and yeast which can be sold, for instance, for further processing in the food industry, as a vitamin rich dietary supplement or as animal feed.

Other systems for beer recovery such as disc stack centrifuges, membrane filtration or yeast presses exhibit big differences regarding beer quality, process ease, handling, as well as operation and maintenance costs. The Flottweg Sedicanter® represents an extremely interesting alternative, both technologically and economically.

Besides easy and gentle processing of the beer, it is also possible to process fluctuating quantities of yeast in the feed without problems. As well as producing higher yields, the system also has substantially lower investment and operating costs.

The benefits of the Flottweg Sedicanter® for beer recovery

- The recovered beer is virtually free of yeast
- Prevention of oxygen pickup via CO₂ purge
- Gentle treatment of the beer
- Compact yeast cake, high dry substance content (between 25 and 28 % by weight)
- Higher dry substance content means higher beer yields
- Easy to integrate into existing production and CIP processes
- No dilution of the yeast suspension in the feed necessary
 - Saves process water
 - Increases the effective capacity of the machine
 - Reduced energy consumption



Picture shows yeast cells

THE FLOTTWEG SEDICANTER®

Unique Construction, High Clarification Efficiency

Features

- High clarification efficiency due to a powerful centrifugal field (up to 10000 x g)
- Fine adjustment during operation - the impeller is also remotely adjustable
- High yields, even when the product to be processed varies in consistency
- High separation efficiency with continuous operation (high purity of beer and yeast)
- Machine design specifically adapted to meet the high hygienic requirements of the brewery

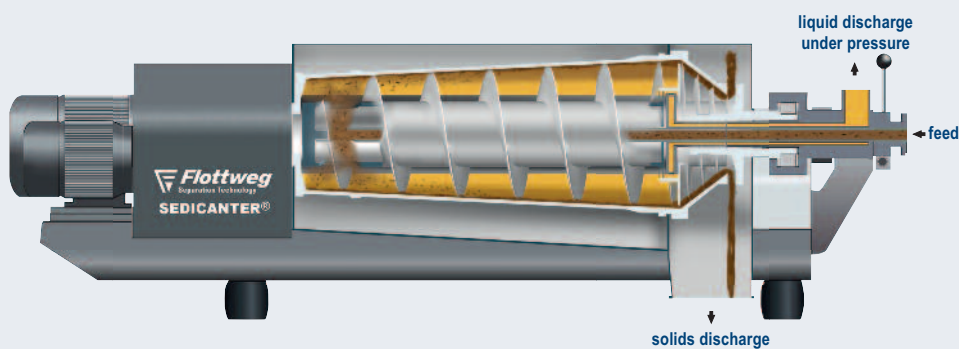
Suspension in the feed of the Flottweg Sedicanter®



Suspension after being processed using the Flottweg Sedicanter®



TECHNICAL INFO



Cross section of a Flottweg Sedicanter®

FLOTTWEG SEDICANTERS® FOR BEER RECOVERY			
Type	S3E	S4E	S6E
Construction materials	All product wetted parts are made of high grade stainless steel.		
Capacity*	up to 10 hl/h	up to 40 hl/h	up to 100 hl/h

* The listed figures are guidelines for information only. The actual capacity depends on the characteristics of the feed.

LONGER FILTER SERVICE LIFE

Flottweg Disc Stack Centrifuges for Extended Filter Service Life

Optimize your filtration process! Filtration often presents challenges to the brewer. Besides the varying quality of the raw material, the quality and the concentration of the yeast affect the filterability of the beer. These factors determine the length of the filter service life as well as the amount of filter additives consumed.

With the use of disc stack centrifuges, most of the yeast can be separated continuously before filtration. Thus, the related processes in the filter cellar can be considerably optimized. Filter service life is extended by up to 100%. At the same time, the necessary quantity of kieselgur and thus the costs for its procurement, handling, and disposal are reduced. Additionally, beer losses as well as cleaning and waste water costs are reduced.

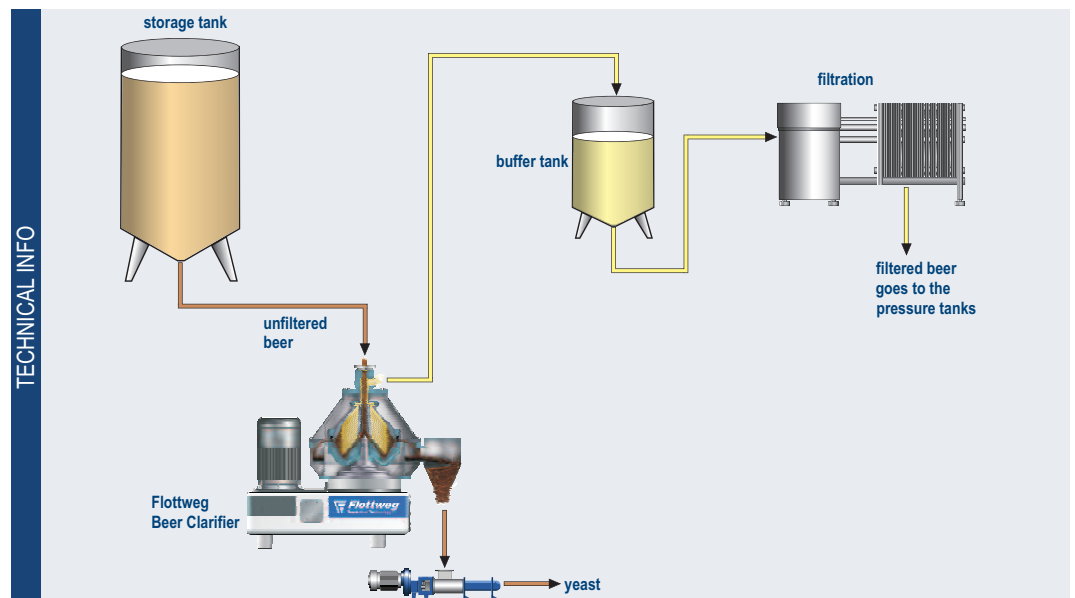
In order to operate kieselgur-free filtration systems (membrane technology, deep bed filtration) economically, the use of disc stack centrifuges is essential. Any filter system can be upgraded quickly and simply with the disc stack centrifuge for pre-clarification.

Advantages of the Flottweg Disc Stack Centrifuge for beer pre-clarification

- Longer filter service life
- Reduced beer losses
- Reduced cleaning costs and reduced costs for waste water disposal
- Gentle treatment of beer and yeast
- Easy to integrate into existing production and CIP processes

Additional advantages in craft beer production

- Separation of hop components in strongly hopped beers
- Trub adjustment if there is no filtration



The Flottweg Disc Stack Centrifuge optimizes the filtration process

THE FLOTTWEG DISC STACK CENTRIFUGE

Sturdy and Easy to Maintain



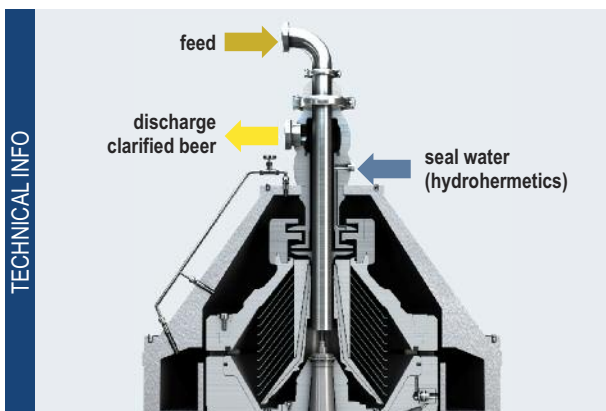
FLOTTWEG SOFT SHOT® SYSTEM

- Accurate partial and total discharges in any combination for high yield
- High solids concentration in the discharged yeast
- Excellent processing of strongly hopped beers
- Capacity adjustment depending on the solids load
- Reduced noise thanks to the Soft Shot® discharge system, no additional noise protection required
- Reduced amount of bowl seals, thus easy and economic in maintenance and operation



BELT DRIVE

- Energy efficient due to the low-wear and silent belt drive
- Economic in maintenance and servicing
- Power transfer controlled by a frequency inverter via belt drive
- Easy and sturdy design
- Reduced vibrations as well as smooth and silent operation
- Standard drive motors, thus high availability



Bowl of the beer separator including hydrohermetics



HYDROHERMETICS

- Seal water ring including de-gassed water
- Prevents oxygen pick-up
- No additional CO₂ gassing required
- No mechanic wear (in contrast to shaft seals)

Advantages of our platform solution

- All components and monitoring devices (valves, sensors, etc.) are pre-installed for easy commissioning and implementation in existing production and CIP processes
- Completely automatic operation with turbidity measuring and additional monitoring devices (pressure, temperature, flow rate, oxygen sensor)
- Maximum flexibility including recipe pre-selection (depending on the beer types to be processed)
- Reliable and safe signal exchange for implementation in central control systems

The Flottweg AC series has been specifically adapted to the requirements of breweries. For easy implementation and commissioning we deliver the machine and the switch cabinet as well as the panel as a compact stainless platform. On request, these modules can be adapted to your individual requirements.



AC 1200-420 as skid solution

FLOTTWEG DISC STACK CENTRIFUGES FOR THE BREWING INDUSTRY

Type	AC 1200-420	AC 1500-420	AC 2000-420	AC 2500-420
Capacity*	15 to 70 hl/l	70 to 150 hl/h	100 to 300 hl/h	200 to 600 hl/h

* The listed figures are guidelines to be used for information only. The actual capacities depend on the feed (number of cells/ml), the desired separation efficiency and the discharge pressure which, in turn, are influenced by the peripherals of the system after the disc stack centrifuge.

PRECISE ADJUSTMENT

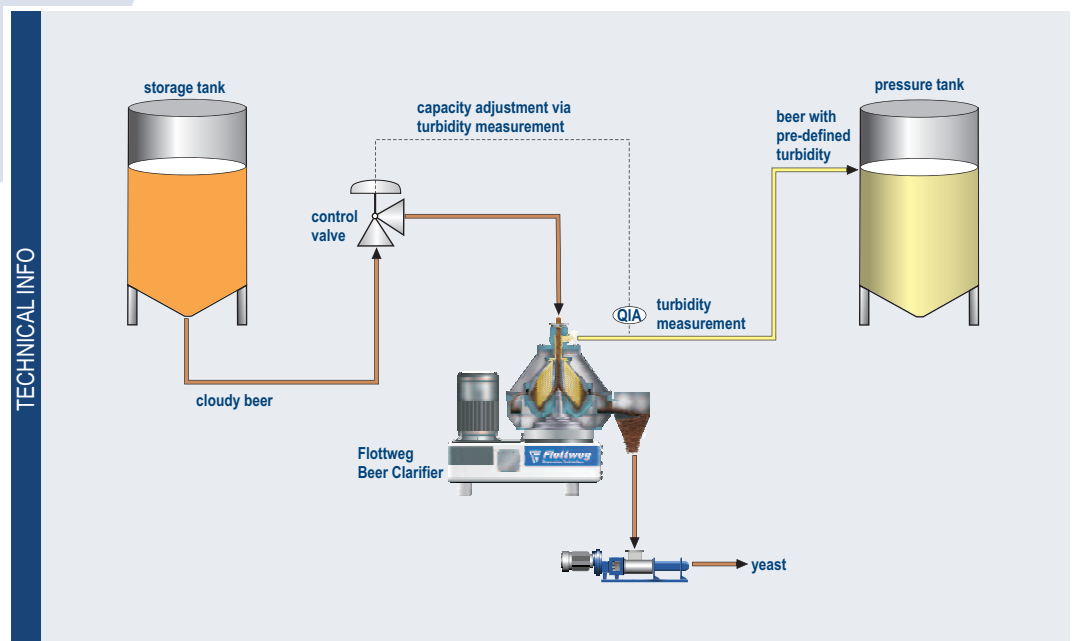
Turbidity Adjustment Using the Flottweg Disc Stack Centrifuge

Especially during the storage of wheat beer or cloudy beers, the yeast content is irregular due to sedimentation in the tank. In this case, the disc stack centrifuge considerably facilitates the brewer's job and ensures consistent product quality.

Thanks to the continuous operation of the disc stack centrifuge, it is possible to elegantly balance undesired yeast fluctuations. The brewer determines the required turbidity value in the wheat beer. The rest is done automatically. The control system monitors the yeast concentration by measuring the turbidity in the feed and in the discharge. With automatic adjustment of the flow rate, the required separation efficiency can be maintained. Thus, after the disc stack centrifuge, the beer always shows the same turbidity.

Advantages of the Flottweg Disc Stack Centrifuge for turbidity adjustment

- Easy handling
- Consistent predetermined turbidity in the wheat beer
- Continuous, fully automatic operation
- Easy integration into existing production and CIP processes
- Flexibility: clarification and turbidity adjustment are possible with just one machine



Completely automatic turbidity adjustment



GREEN BEER UNDER CONTROL

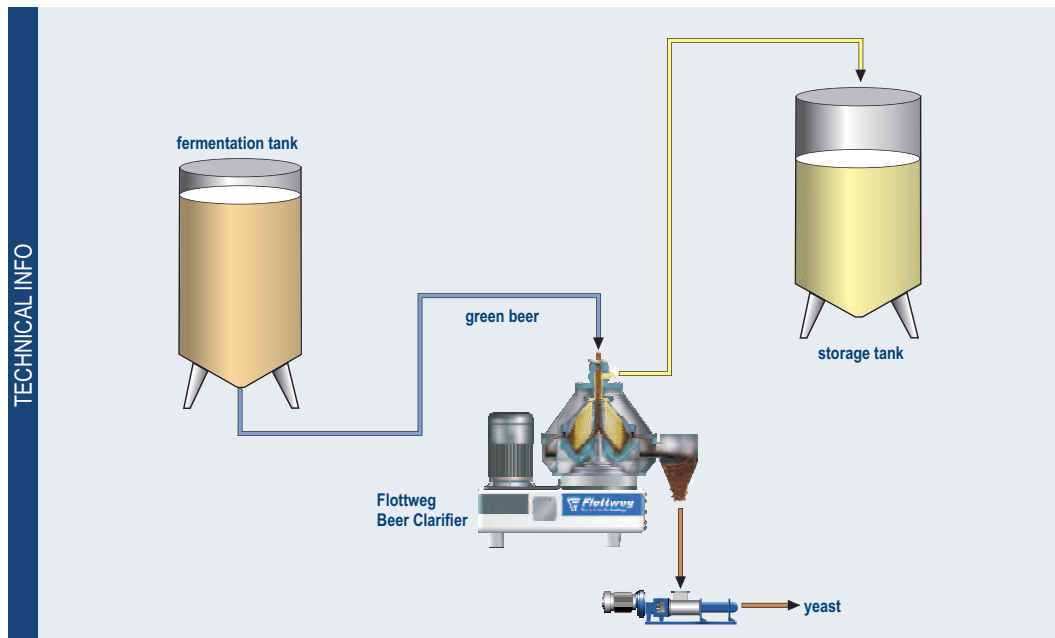
Adjustment of the Yeast Cells in the Green Beer Using the Flottweg Disc Stack Centrifuge

Ensure constant conditions in green beer before secondary fermentation and maturation by using the disc stack centrifuge.

By adjusting the desired number of yeast cells in the green beer (by means of the disc stack centrifuge) process conditions of maturation and secondary fermentation are standardized.

Advantages of the Flottweg Disc Stack Centrifuge during green beer clarification

- Defined secondary fermentation (consistent beer quality)
- Less yeast autolysis during storage
- Reduced filter impingement (after maturation) thanks to reduced yeast loads



The process conditions are standardized, using the Flottweg Disc Stack Centrifuge

Flottweg Separator System in a large brewery



WASTE MATERIALS BECOME RESOURCES

Thermal Recycling of Spent Grains – an Environmentally Friendly Energy Source

Not all breweries have the possibility to recycle spent grains in a biogas plant. The fermentation process is time-consuming, and an acceleration of the process is only possible to a limited extent. Also the sale of spent grains as animal food is not always possible.

To combat increasing energy prices, a mechanical dewatering process has been developed which enables optimal thermal recycling of the spent grains within the brewery. The spent grains are dewatered directly from the silo using a Flottweg Belt Press, and can then be incinerated in a biomass furnace.

One metric ton of wet spent grains can produce approximately 1000 kWh of thermal energy. Depending on the combustion technology, 70 – 75 % of this energy can be used.

The Flottweg Belt Press has been specially adapted to the specific requirements of spent grains. Thanks to its high efficiency, the spent grains are dewatered to a dry substance content of 42 %. The separated press water does not have to be evaporated during the subsequent combustion process. Therefore the total profitability of the process increases considerably. The more water can be extracted, the more energy is available for the brewery. Using a Flottweg Belt Press, it is possible to produce energy in an environmentally friendly and economical way.

Advantages of the Flottweg Belt Press for mechanical dewatering of spent grains

- CO₂ neutral energy recovery by recycling renewable materials
- High yields of thermal energy from the spent grains
- Assured utilization of spent grains – independent of external recipients
- Less energy consumption from external sources
- Potential reutilization of press water



The spent grains: from the straining vat directly onto the belt press



Energy production via thermal recycling of spent grains

Illustration shows wet spent grains after the brewing process



THE FLOTTWEG BELT PRESS

Quality that Pays off

Features

- Automatic, pneumatic belt control
- Reliable operation thanks to optimum tension and regulation of the belts
- Easy operation, simple cleaning
- Continuous operation
- Consistent use of high grade stainless steel



FLOTTWEG BELT PRESSES FOR THE DEWATERING OF SPENT GRAINS

Type	BP 800 TR	BP 1200 TR	BP 1500 TR	BP 1750 TR	BP 2500 TR
Capacity*	up to 1 t/h	up to 2 t/h	up to 3 t/h	up to 4,5 t/h	up to 7 t/h

* The listed figures are guidelines to be used for information only. The actual capacity depends on the characteristics of the feed.



BREWERIES PRODUCE MORE THAN JUST BEER

The Flottweg C-Series for Kieselgur Dewatering

Waste management is not the core business of breweries. But due to increasing disposal costs, stricter limit values and increasing cost pressure, this subject is becoming more and more important. It becomes clear using the example of kieselgur sludge. Especially in large breweries the amount of kieselgur to be disposed of may become a waste and cost problem.

Centrifuges help reduce these waste disposal costs considerably through sludge dewatering. Dewatering means to considerably increase the dry substance content of the sludge, thus reducing the amount of sludge to be disposed of and therefore also disposal costs. Due to these numerous advantages, centrifugal dewatering in other industrial sectors has become a long-established method for economic sludge processing.

Kieselgur has a strongly abrasive impact. Therefore, Flottweg Machines are protected against wear through special hard facings at the scroll and at the discharge system, thus assuring long service lifetime and easy maintenance.

Advantages of kieselgur dewatering using the Flottweg C-Series

- Continuous and automatic operation, thus easy handling
- Small footprint, easy integration into existing processes
- No cleaning cycle during operation
- Highly efficient wear protection, long service lifetime and easy maintenance
- No consumables such as filter aids, filter cloths etc. required



THE FLOTTWEG C-SERIES

for Use in Wastewater Facilities of Breweries

The C-series for use in wastewater facilities of breweries

The advantages:

- 24 hour operation without supervision
- Easy handling and monitoring due to continuous and automatic operation
- Addition of lime is not required
- Virtually constant high solids content in the dewatered sludge, even with varying feed conditions
- Sealed construction avoids odor emissions

Optimized operating costs

- Easy cleaning through flushing, machine doesn't have to be disassembled
- Extensive wear protection
- Spare parts can be exchanged on site
- No consumables such as filter aids, filter cloths etc. required

Many breweries already profit from the advantages of biological wastewater treatment. The dewatered sludge can be used in agriculture, incinerated, or taken to a landfill.

The costs of sludge disposal are reduced with the increasing dryness of the sludge; regardless of the type of disposal. As in municipal sewage plants, decanters offer many advantages for wastewater treatment plants in breweries.



Flottweg C2E:
Small footprint also in case of high capacity

FLOTTWEG C-SERIES FOR THE DEWATERING OF SEWAGE SLUDGE						
Type	C1E	C2E	C3E	C4E	C5E	C7E
Capacity*	1 to 4 m ³ /h	2 to 10 m ³ /h	10 to 20 m ³ /h	20 to 40 m ³ /h	30 to 60 m ³ /h	60 to 120 m ³ /h

* The listed figures are guidelines to be used for information only. The actual capacity depends on the characteristics of the feed.



Flottweg Separation Technology – Engineered For Your Success



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