

FLOTTWEG SEDICANTER®

The art of centrifugal
separation technology

Centrifugal solid-liquid separation

By the end of the 19th century, centrifuges were already used for different separation tasks. Depending upon the application and the separation process, many different models of centrifuges have been developed since then. In order to select the appropriate centrifuge for each application a number of criteria have to be taken into consideration.

Here are some basic rules to follow:

In order to separate materials with good filtration qualities such as crystals and coarse-grained materials, filtrating centrifuges, i.e. machines with screen bowl, are preferred. Solid wall bowl centrifuges such as decanters, disc stack centrifuges, and tubular cen-

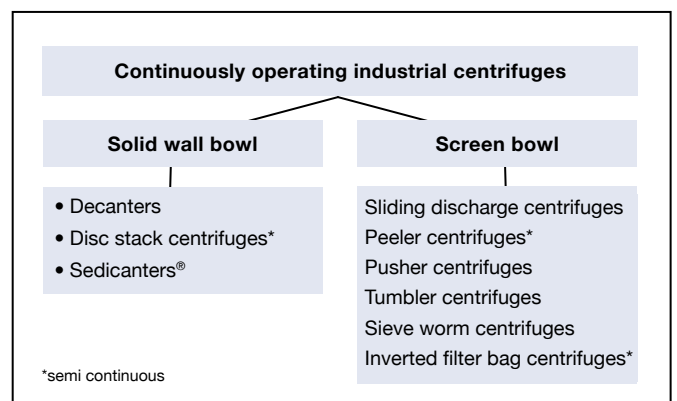
trifuges, however, are used for separating materials which are difficult to filtrate, i.e. suspensions with fine and soft solids which form a paste-like and compressible sediment.

Among the solid bowl centrifuges are models such as decanters which are more solids-oriented and those such as disc stack centrifuges which



FLOTTWEG SEDICANTER® for beer recovery

are rather liquids-oriented. In this context solids-oriented means that the machine can handle a large quantity of solids in the feed and that the separated solids are relatively dry. Liquids-oriented centrifuges such as the disc stack centrifuges are used particularly if the centrate has to be as clear as possible and if the separated solids can be accepted in the form of a liquid concentrate.



® = registered trademark in various countries

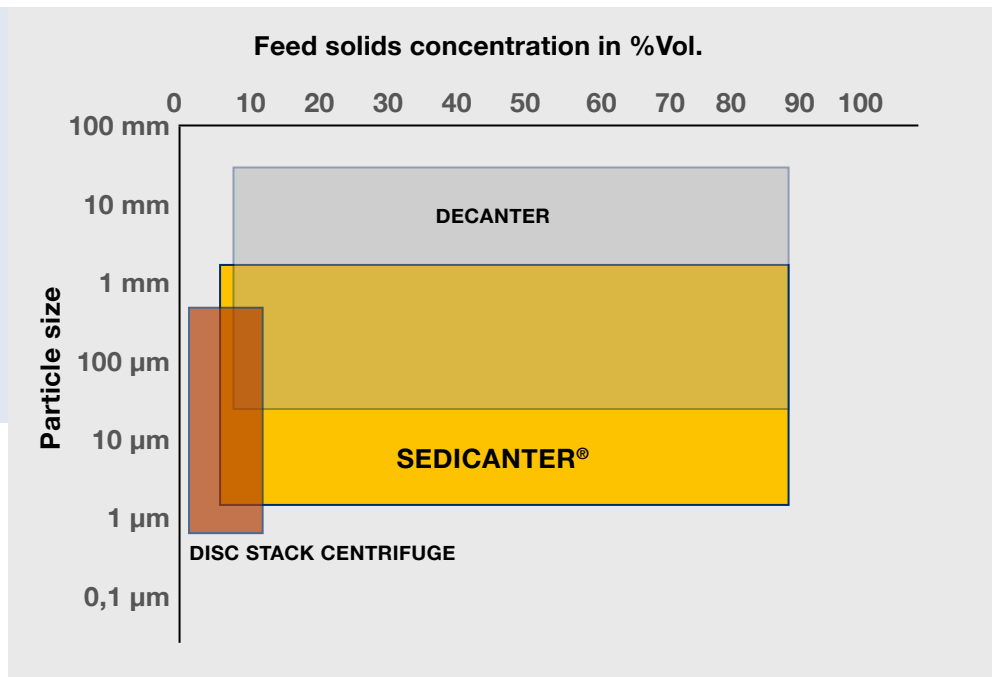
Application areas of the FLOTTWEG SEDICANTER®

There are always separation tasks in which the solids content in the feed is relatively high, but the centrate must be as clear as possible, and the solids as dry as possible. In these cases the user either has to make a compromise concerning the quality of the centrate or the dryness of the solids. Or he chooses a two-stage process, which means

that he uses a solids-oriented and then a liquids-oriented centrifuge.

The FLOTTWEG SEDICANTER® has been developed especially for these separation tasks. The FLOTTWEG SEDICANTER® offers a centrifugal field comparable to the one of a disc stack centrifuge, which means that it also clarifies like

a disc stack centrifuge. It can, however, also handle relatively large quantities of solids in the feed, at the same time the separated solids are as dry as those separated using a decanter.



Application areas of decanters, SEDICANTERS®, and disc stack centrifuges as the function of particle size and solids concentration in the feed



How the FLOTTWEG SEDICANTER® works

The FLOTTWEG SEDICANTER® is a solid bowl centrifuge, just like a decanter. Distinctive features of this kind of centrifuge are a solid wall bowl in which the centrifugal field is generated and a conveyer scroll located within the bowl. The scroll rotates at a slightly different speed than the bowl and thus conveys the separated solids. The entire centrifuge rotor con-

sists of a bowl shell, a scroll, and a rotating gear box which generates the differential speed.

In contrast to the decanter, the FLOTTWEG SEDICANTER® has been developed for the separation of suspensions with fine and soft solids. Separating fine solids requires a long clarification zone, a smooth flow, a

large clarification volume, and a powerful centrifugal field within the centrifuge rotor.

Dewatering of the sediment is done by mechanical compression.



FLOTTWEG SEDICANTER® S6E

These requirements were consequently taken into consideration when the FLOTTWEG SEDICANTER® was designed:

The bowl consists of a long flat cone which forms the clarification zone, and of a very short steep cone from which the separated solids are discharged. The suspension is fed via a pipe which extends to the

end of the long cone. Thus the whole length of this cone can be used as the clarification zone. Liquids and solids go through the clarification zone in the same direction (co-current principle) avoiding turbulence and back-mixing. The shell of the bowl allows the liquid level to be as close to the rotational axis as possible thus generating a large clarifi-

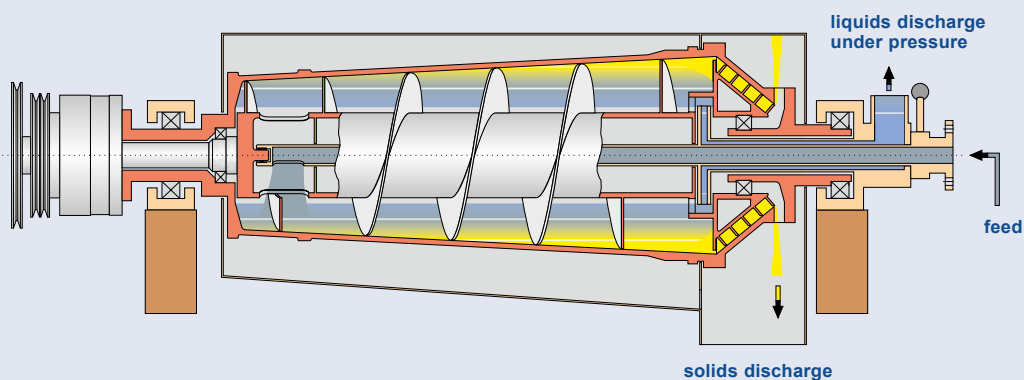
cation volume. The high-speed rotor allows for a maximum centrifugal acceleration of 10,000 x g. For comparison: conventional decanters only allow for 6,000 x g.

With the help of the conveyor scroll, the separated solids are conveyed over the long flat cone to the junction of the two cones. There, at the largest radius of the bowl, is the greatest centrifugal acceleration and thus maximum compression on the solids. This compression is increased by another feature at this junction: a ring-like disc. The outer edge of this

disc dips into the separated sediment. The solids in the gap between the external diameter of the disc and the internal diameter of the bowl form a seal; thus the solids are piled up against the disc. As a consequence the liquid level in the clarification zone of the bowl moves to the center generating increased hydro-static pressure on the solids which

results in the solids being pressed through the gap between disc and bowl. Finally the solids arrive at the short and steep cone where they are discharged from the rotor with the help of the conveyor scroll. Via an excentrically shaped impeller disc the clarified liquid is discharged under pressure from the machine at the end of the clarification zone. By

adjusting the impeller, the liquid level in the bowl can be changed which in turn changes the hydro-static pressure on the solids as well. This means that the compression and thus the cake dryness of the discharged solids can be adjusted during operation from outside using the adjustable impeller.



The special characteristics of the FLOTTWEG SEDICANTER®

High separation efficiency due to:

- High centrifugal field up to 10,000 x g
- High clarification volume, optimal utilization of the bowl volume
- Long clarification section and co-current principle

Flexibility to handle changing feed conditions due to:

- Impeller which can be adjusted during operation from outside
- Adjustment of the differential speed independently from the bowl speed due to the FLOTTWEG SIMP-DRIVE®
- Automatic control via regulator circuits

High cake dryness in the solids due to:

- Strong compression in the centrifugal field
- Hydrostatic pressure on the solids

Appropriate for hygienic applications:

- Hygienic design
- Electro-polishing for all product wetted parts

Technical data



Type	S3E-3	S4E-3	S6E-3
Bowl diameter	12" (300 mm)	19" (470 mm)	26" (670 mm)
Bowl speed	7750 rpm	5000 rpm	3650 rpm
Differential speed	1.5 – 30 rpm	1.5 – 30 rpm	1.5 – 30 rpm
Material of construction	All product-wetted parts are made of high quality stainless steel (1.4571 and superior)		
Overall dimensions*	2304 x 700 x 752 mm	3222 x 1000 x 1200 mm	4527 x 1705 x 1270 mm
Gross weight*	1210 kg	3100 kg	10530 kg
Motor size (main drive)	15 kW	37 kW	75 – 132 kW
Motor size (gear drive)	4 kW	5.5 kW	15 kW
Capacity*	1 t/h	4 – 15 t/h	25 – 40 t/h
Design	Hinged cover, flushing device for housing and scroll, optionally: electropolished finish/gastight version		

* The listed figures are guidelines to be used for information only, real capacity depends on the composition of the raw material

The FLOTTWEG SEDICANTER® is available in the following versions

- Sanitary version capable of CIP (Cleaning in place) appropriate for processing of food as well as pharmaceutical, fine-chemical, and biotechnological products
- Explosion proof versions with or without inert gas purging unit in compliance with the ATEX standards for zone 1 and 2 to be used in explosion hazardous areas and for the treatment of media whose vapors together with oxygen form an explosive mixture.

Applications for the FLOTTWEG SEDICANTER®

The first FLOTTWEG SEDICANTER® was launched in 1994. Since then the machine has been improved continuously. In the meantime the FLOTTWEG SEDICANTER® is available in three different sizes. A large number of FLOTTWEG SEDICANTERS® work successfully in the following applications:

- **Soy milk clarification**
Increased yields in milk and protein clarification, especially in combination with fine grinding
- **Sugar syrup**
Efficient pre-clarification by separating interfering proteins and fibers
- **Industrial biotechnology**
Efficient separation of biomass from fermentation broth; Recovery of vitamins and enzymes
- **Wheat starch**
Process optimization by clarification of the pentosan phase and recovery of fine starch
- **Algae**
Optimized energy efficiency for the process, since the algae come out as a compact cake
- **Animal and vegetable proteins**
Increased product yields by separating coagulated proteins



FLOTTWEG SEDICANTER® S3E

- **Alcohol stillage**
Selective protein separation from thin stillage
- **Vegetable raw material**
Increased extraction yield for aqueous and solvent-based systems
- **Fat fractionation**
Increased separation efficiency during the recovery of olein/stearin
- **Beer recovery**
of surplus yeast for increased beer yields

In all these applications the task is to separate fine and soft solids in a relatively high concentration from a suspension, while the solids are forming a flowable sediment. In these cases the FLOTTWEG SEDICANTER® proved itself to be the optimal solution compared to other industrial centrifuges.



FLOTTWEG SEPARATION – WORLDWIDE REPUTATION



Experience

FLOTTWEG AG, headquartered in Vilsbiburg / Germany, has been a worldwide leading manufacturer of high performance centrifuges for solid-liquid separation for more than 50 years. FLOTTWEG has a worldwide sales and service network with its own subsidiaries, branch offices, and representations.

Competence

FLOTTWEG provides highest engineering expertise for optimal integration of our centrifuges into your process.

Quality “Made in Germany”

FLOTTWEG centrifuges are designed and manufactured in Germany. All individual parts and components and each complete centrifuge are certified according to our strict test criteria. FLOTTWEG is ISO 9001 certified and manufactures its products in compliance with all the latest technical standards.



Flexibility

FLOTTWEG offers you customized solutions for your long term success.

Strong Partner

FLOTTWEG is a financially strong and healthy company and can assure you first class aftermarket service for the lifetime of your FLOTTWEG machine.

**Use our know-how for
your success – contact us!**



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