



SEPARATION TECHNOLOGY FOR THE MEAT INDUSTRY

Higher quality, additional yield, reduced disposal costs



Engineered For Your Success



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SLAUGHTER BYPRODUCTS - FROM WASTE TO PROFIT CENTER

In the ever-evolving global meat industry, the application of advanced separation technologies, such as industrial centrifuges, has become essential. This technology plays a key role in overcoming the various challenges facing large slaughterhouses. From regulatory compliance to sustainability considerations, the efficient and effective separation of animal byproducts plays a critical role in economic success.

Our state-of-the-art decanter centrifuges and separators offer a comprehensive solution for all meat processing operations that need to optimize their processes and meet the demands of a rapidly changing industry landscape. Through the efficient separation of liquids, solids and fats, our centrifuges enable sustainable and cost-efficient improvement of their processes. Efficient separation technology means: A higher purity of the byproducts and thus an improved economic yield. Secondary and waste flows are reduced and thus also disposal costs.

Modern procedures for processing slaughter byproducts are characterized by the wide application of centrifugal clarification and separation techniques. As the world's leading manufacturer of industrial centrifuges for solid/liquid separation, Flottweg has been a competent and reliable partner to the meat industry for decades.

Depending on the starting material and end product, Flottweg decanters, Tricanters® and disk stack centrifuges in slaughterhouses are also designed for the hygienic processing of slaughter byproducts intended for human consumption.



Flottweg supports the meat industry in mastering its challenges with these services, among others:

- Efficient separation technology for the disposal and recycling of slaughter byproducts
- Simultaneous extraction of edible fat of high purity and quality
- Recovery and processing of recyclables from flotation sludge
- Application-optimized machines in a wide range of configurations up to a fully hygienic design

Flottweg is certified to DIN EN ISO 9001:2015 and manufactures its products in compliance with the latest technical standards.

Flottweg separation technology is used, among other things, in

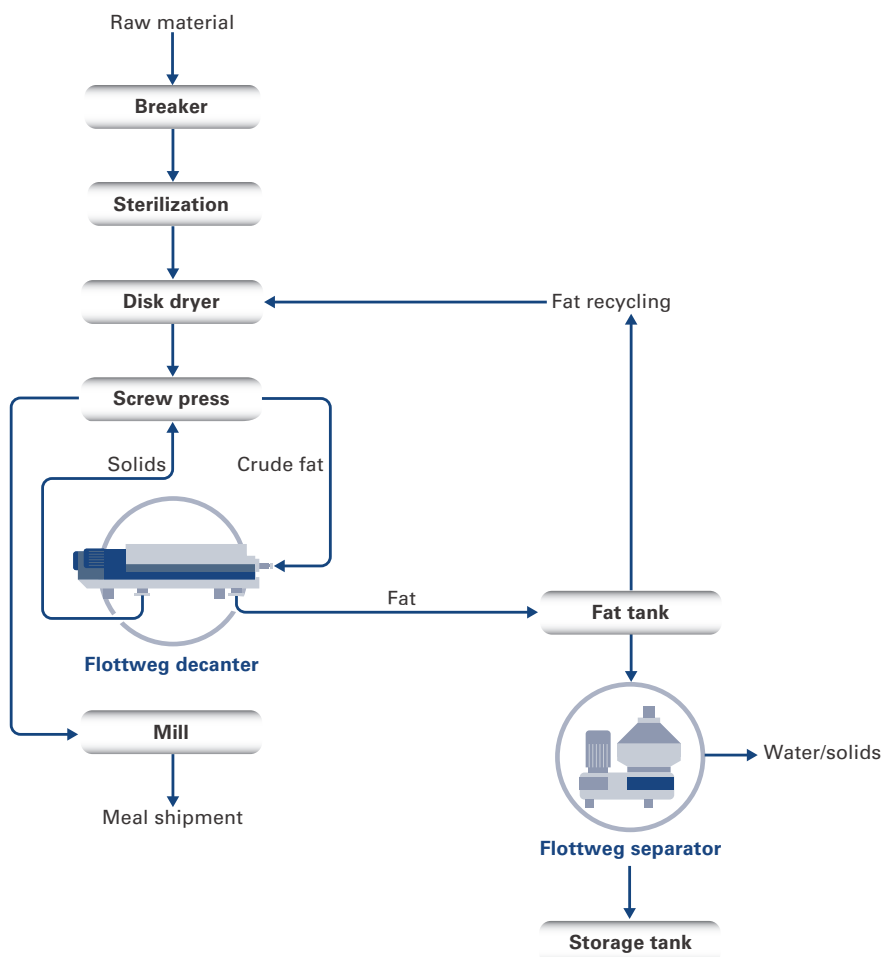
- Fat renderings for processing slaughter byproducts suitable for food use
- Fat separation and clarification plants
- Wastewater treatment plants for dewatering sewage slurries
- Three-phase separation of flotation sludges

We invite you to explore our applications for the processing and monetization of slaughter byproducts: Learn what “Engineered for Your Success” can mean for you and your company!

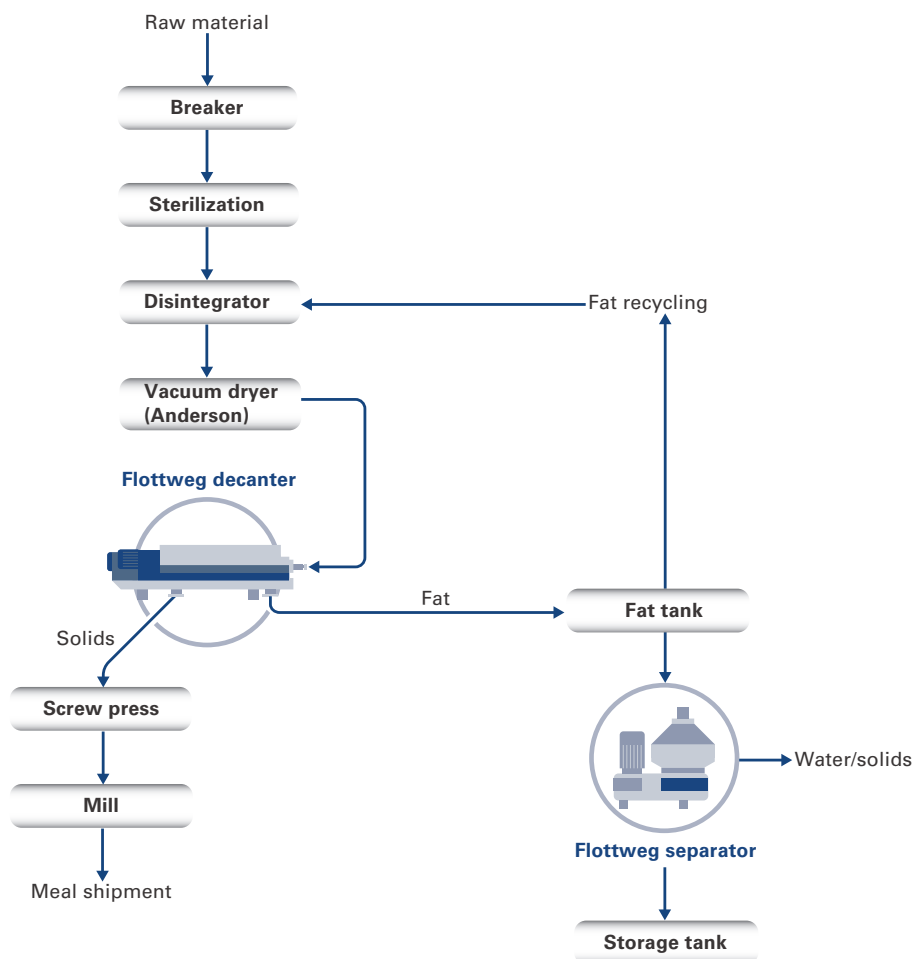
SUCCESS IS ... MAKING THE BEST OUT OF EVERY PROCESS

Flottweg centrifuges are used in various processes for processing offal. Depending on the process, throughputs between 0.5 and 25 t/h (decanter) or 0.5 and 12 t/h (separator) can be processed.

Flottweg decanters are used in 2-phase processes, Flottweg Tricanter® in 3-phase processes.



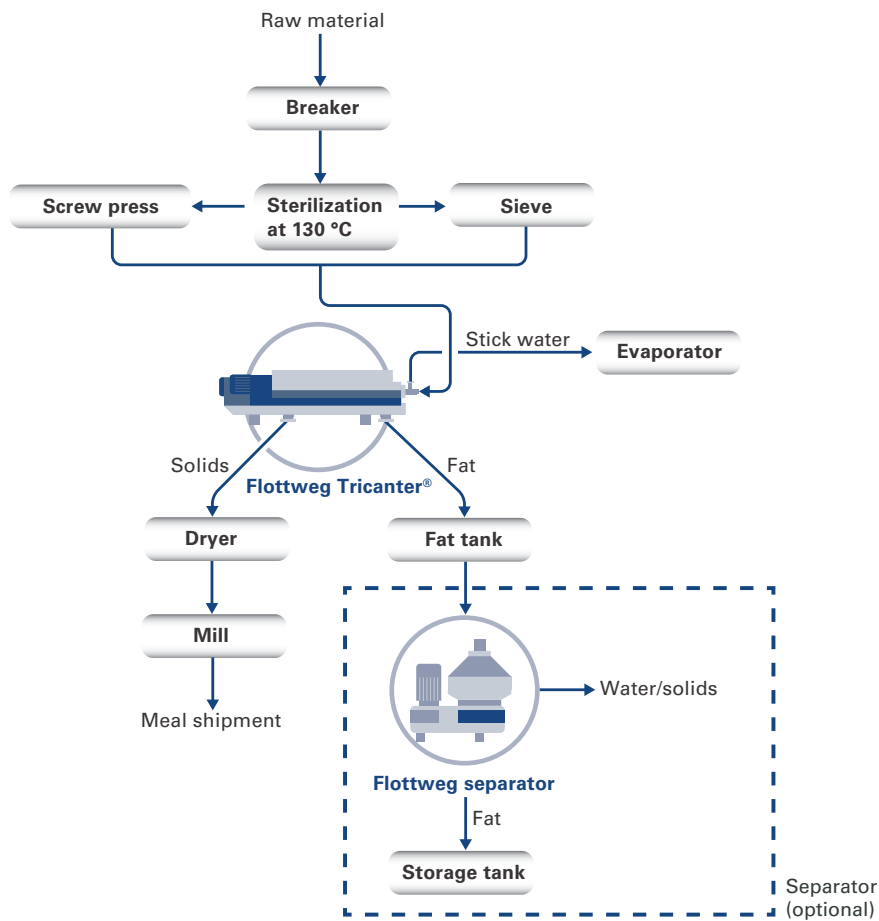
There are basically two different processes: Either a disk dryer (see previous page) or a vacuum dryer (see below) is used.



PROCESSING OF ANIMAL BYPRODUCTS

01 In the 3-phase process at high temperature

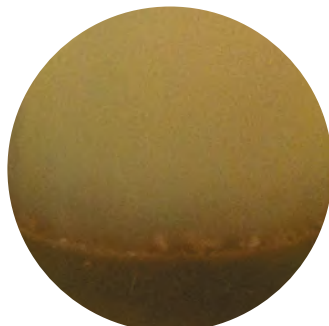
In contrast to the 2-phase process, the product is separated in the first step before the individual streams are dried or evaporated.



GREAVES



STICK WATER



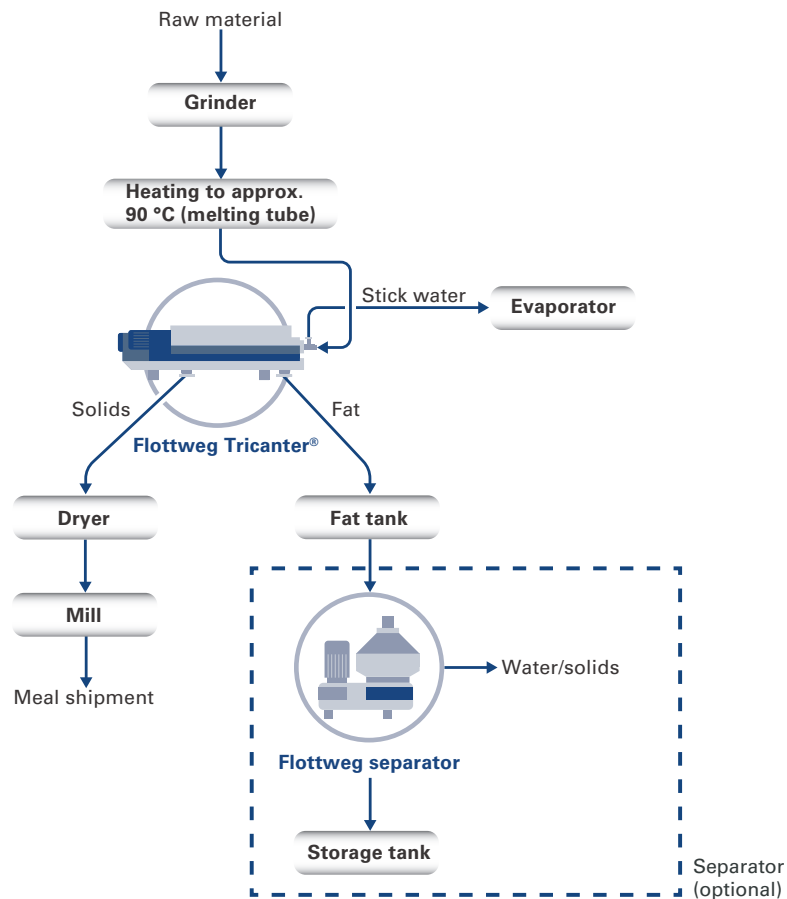
FAT





02 In the 3-phase process at low temperature

The low-temperature process is mainly used in the processing of category 3 material (poultry offal), but also in smaller fat rendering applications. The process engineering schematic is almost identical in all cases.



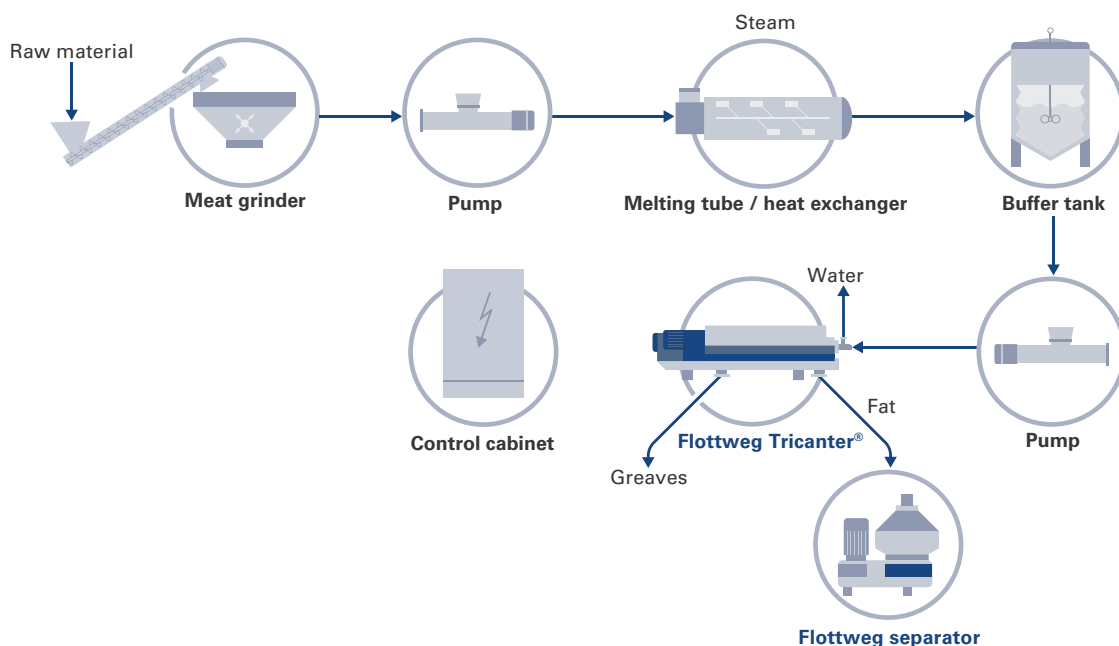
PROCESSING OF ANIMAL BYPRODUCTS

In fat rendering, the byproducts of slaughter that are suitable for further use as food, such as rinds, are processed. There are basically two options for process control when processing these byproducts. Traditionally, after comminuting and heating the product, decanters are used in the first separation step to separate the greaves. In the second work step, the liquid phase is separated from the decanter into the constituents fat, stick water and solids by means of disk stack separators. Usually, the fat phase is clarified with another separator.

As an alternative to this process, it is possible to use a Tricanter® instead of the Flottweg decanter in the

first separation step. Here, fat and stick water are removed separately from the machine — the fat phase via a free overflow, the water phase under pressure using the impeller. This prevents backmixing of the fat and water phases. The formation of emulsions that need to be separated again afterwards is thus minimized.

With an adjustable impeller, the Tricanter® can be adapted to changing feed concentrations at any time, ensuring optimum separation results. For fat clarification in the second stage, a smaller disk stack centrifuge than in the traditional process is sufficient.



Results

- When using the Flottweg Tricanter®, simultaneous separation of the oil and water phase from the solids is possible in one work step
- Further processing of the stick water is usually no longer necessary
- High quality of the fat obtained
- Outstanding separation efficiency and accuracy
- Low temperature loss and energy consumption when using the Flottweg Tricanter®

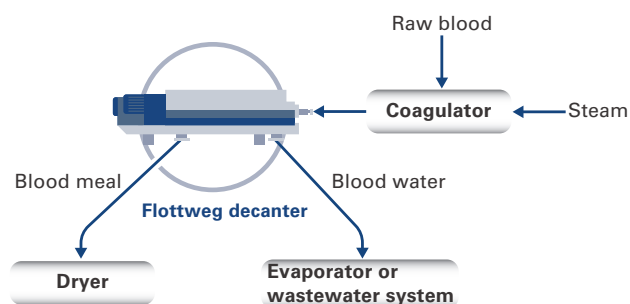
Flottweg combines the highest purity standards with optimum product quality.



DEWATERING COAGULATED ANIMAL BLOOD

Animal blood is an important product for the feed industry. In addition, the processing of animal blood into blood meal offers a possibility for further increasing the profitability of slaughterhouses.

Flottweg decanters with free overflow are used for dewatering coagulated animal blood. Thanks to the adapted scroll geometry, high cake dryness in the solids discharge can be achieved with excellent separation performance.



Results

- High-quality meal for resale to e.g. animal feed producers or fertilizer manufacturers
- Higher profit yield by using a byproduct that is already produced

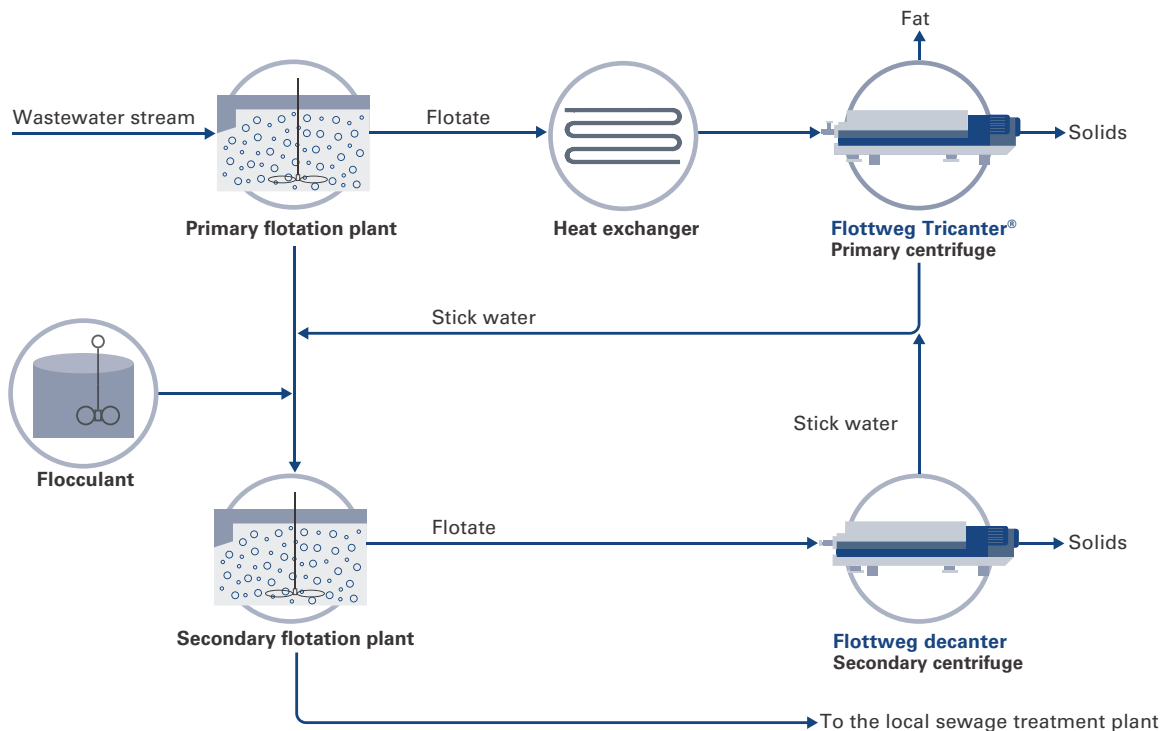
Flottweg maximizes the recycling rate through additional process steps.

CREATING VALUE FROM FLOTATION SLUDGE

Flotation is a separation technology that separates particles from the water during wastewater treatment and separates them at the surface by means of gas bubbles — as flotation sludge. Meat/poultry processing companies also use flotation to purify their process water. However, the resulting flotation froth is both difficult-to-dispose residual waste and a potentially valuable mixture of fat and proteins. It is therefore important to combine disposal and value creation.

The post-treatment of flotation sludge with a Flottweg Tricanter® results in three phases:

- Clarified water
- Recovered animal fat
- Low-moisture solid cakes



Results

- The separation of the flotation sludge reduces the COD value of the wastewater:
This lowers the wastewater costs
- The recovered fat can be sold for animal feed production, for example
- The process water / wastewater is not only cleaned: The recovery of the valuable fat phase increases the overall yield

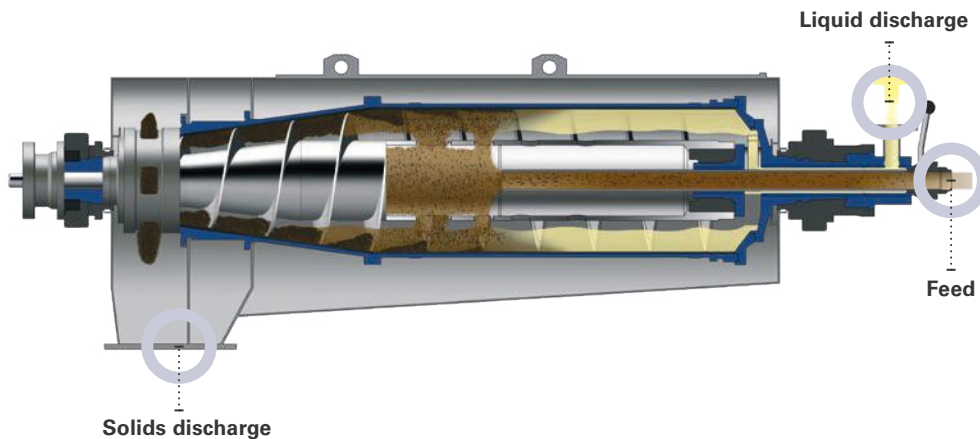
Flottweg turns the cleaning of process water into a profitable business.

SPECIAL FEATURES OF THE FLOTTWEG DECANTERS AND TRICANTERS®

Flottweg decanter

Flottweg decanters are e.g. installed upstream of thermal processes in order to separate liquids from solids (2-phase process). Due to the special design of the Flottweg decanter, the separated solids reach high dry substance levels. This has several positive effects on the overall energy balance of the

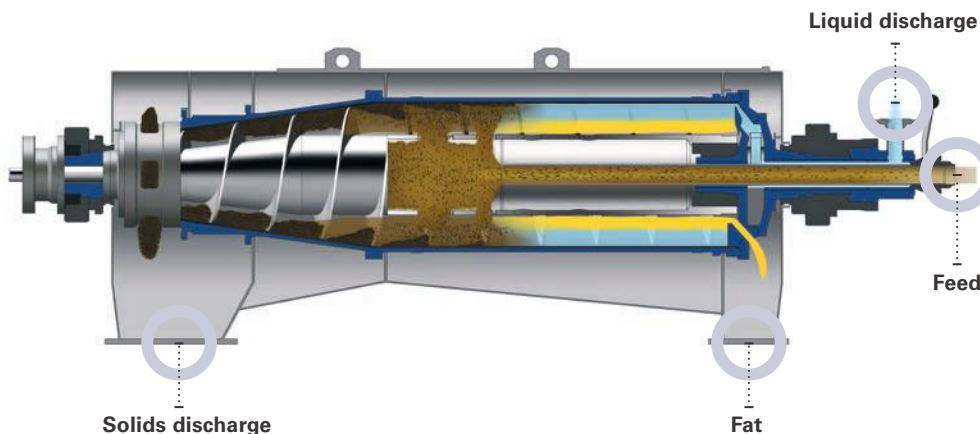
plant, as centrifugal (mechanical) separation requires less energy for water removal than thermal separation. The steam requirement in downstream drying processes is significantly reduced.



Flottweg Tricanter®

Flottweg Tricanter® are used for the simultaneous separation of liquid, fat and solids (3-phase process). Due to the special design of the impeller and the rotor, the re-mixing of water and fat phase after separation (e.g. due to swirling) is practically excluded. As a result, the Tricanter® achieves a very high purity

in the separated fat phase. Often, the Tricanter® is preferred in 3-phase processes because the investment and operating costs are significantly lower than in comparable processes with decanter and separator.





Flottweg Simp Drive®

The Flottweg Simp Drive® regulates the differential speed based on the scroll torque. As a result, the Flottweg decanter/Tricanter® automatically adapts to varying load conditions and dewateres the supplied product to the respective maximum dry solids content.

- Lowest energy requirements due to high efficiency
- Pure motorized operation, therefore no oversizing of the drive motors



Hygienic design

On request, our machines are designed to meet the high requirements of the food industry and their stringent hygiene standards.

- Welding seams in contact with product hygienically ground (optional). All surfaces treated accordingly
- Spray nozzles in the housing and scroll cavity
- Adjustable impeller (option) for rinsing the centrifuge bowl
- Simple integration into (existing) CIP processes
- FDA-compliant seals possible



Flottweg impeller (standard for Tricanter®, optional for decanter)

The adjustable impeller allows infinite adjustment of the pond depth during operation and thus fast, precise adaptation to changing feed conditions — without interrupting operation.

- Highest separation efficiency, even with fluctuating feed mixture composition
- Optionally available with automatic remote adjustment
- Discharge of the liquid phase under pressure. This may eliminate the need for an additional conveying pump
- Optional: fully automatic control through turbidity measurement in the oil or liquid phase



Wear protection

Depending on the application of the centrifuges, numerous wear protection measures extend the service life of the machine. Flottweg offers a variety of options to meet the various challenges of abrasive materials or corrosive media (e.g. alkalis, acids in CIP cleaning):

- Welded hard facing or spray coating
- High wear resistance of the decanter centrifuge
- Longer service life of the decanter
- Costs are reduced because only wear parts are replaced

Flottweg decanter – applications

- Fat cleaning after screw press
- Solids separation after vacuum dryer
- Fat clarification (decanter, separator, each with addition of water)
- Dewatering of coagulated blood
- Dewatering of sludges from in-house wastewater treatment plants

Flottweg Tricanter® – applications

- 3-phase separation after the screw press and/or screening
- Processing of poultry offal
- Processing of other offal (category 3)
- Processing of flotation sludge
- Processing of bone fat and bone meal

Technical data

Type	Decanter	Tricanter®
Bowl diameter [mm]	230 - 620	230 - 620
Max. speeds [rpm]	5500	5500
Differential speed [rpm] ¹	1.5 - 30	1.5 - 30
Materials	All product-wetted parts are made of high-grade stainless steel.	
Max. drive motor [kW]	45	45
Max. scroll motor [kW]	22	22
Throughflow [t/h] ²	2 - 25	2 - 20

1) Adapted to the prevailing conditions, automatic control dependent on torque

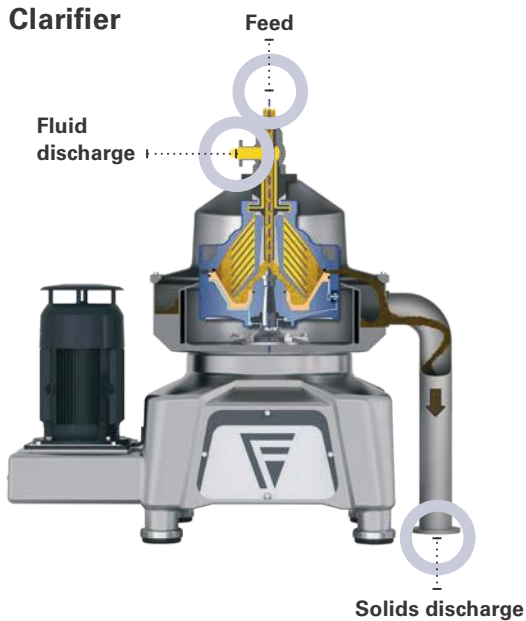
2) To be regarded as a guideline; actual throughflow depends on process and raw material



FLOTTWEG SEPARATORS

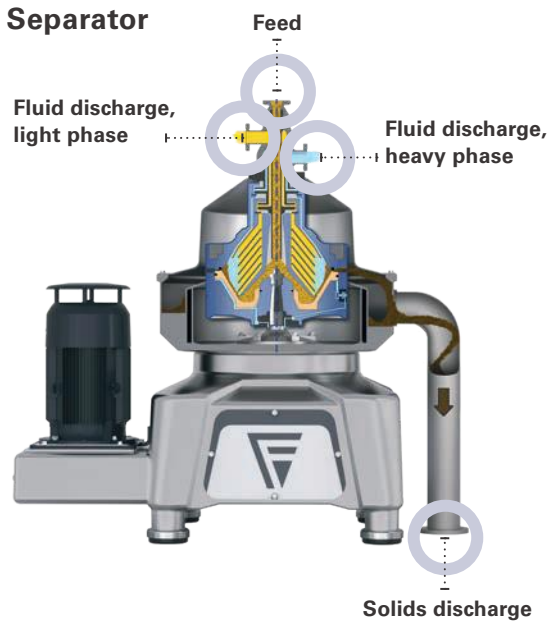
Flottweg separators of the AC series are used in the processing of animal fats both as clarifiers and as separators. Clarifiers clean fat by removing the finest solid contamination such as protein, etc. from the fat. Purifier separators break down 3-phase mixtures into individual components such as fat, stick water and solid contamination. In order to save fresh water, the stick water can optionally also be post-cleaned with the separator. The purified stick water can be used to mash suspensions. Which series or size is best suited depends on the respective process.

Clarifier



FLOTTWEG CLARIFIER FOR THE SEPARATION OF SOLIDS

Separator



FLOTTWEG PURIFIER FOR SEPARATING TWO IMMISCIBLE LIQUIDS WITH SIMULTANEOUS SEPARATION OF SOLIDS

Applications in the meat processing industry

- Separation of fat and stick water
- Cleaning of fat
- Fine clarification of fat
- Post-treatment of stick water

Technical data

Type	Disk stack separator
Bowl volume [liters]	4 - 58
Max. drive motor [kW]	55
Max. throughflow [t/h] ¹⁾	12

1) To be regarded as a guideline; actual throughflow depends on process and raw material





SUCCESS IS WHEN VALUE CREATION IS COMPLETELY AUTOMATED

Flottweg is a global technology driver in the centrifugal processing of slaughter byproducts. We have decades of experience in industrial separation, and we have developed applications that focus on process optimization and so on maximizing our customers' profit margins.

Comprehensive systems – for smooth operation and higher yields

When extracting fat, animal meal or blood meal from byproducts of slaughter, the quality and the yield are paramount. So that we can optimize both factors in line with our customers' business objectives, we offer our customers pre-assembled, turnkey systems. These combine all the individual steps of an efficient value chain in an automated application. Our customized solutions mean that each system is integrated into the company's processes in the most efficient way possible.

Global references are the best evidence

Both individual Flottweg centrifuges and complete process lines are in use worldwide. Our products are known for their reliability and high-quality engineering, and the name Flottweg stands for customized solutions and uncompromising customer-centered service. This means that we stand out as a beacon in the industrial separation technology market.

Flottweg applications for the further use of slaughter byproducts ...

- ... all come from a single source, ranging from engineering and machine production to automation.
- ... are custom-made to suit every customer company and its own challenges.
- ... extract valuable raw materials with the yield and quality that our customers demand.

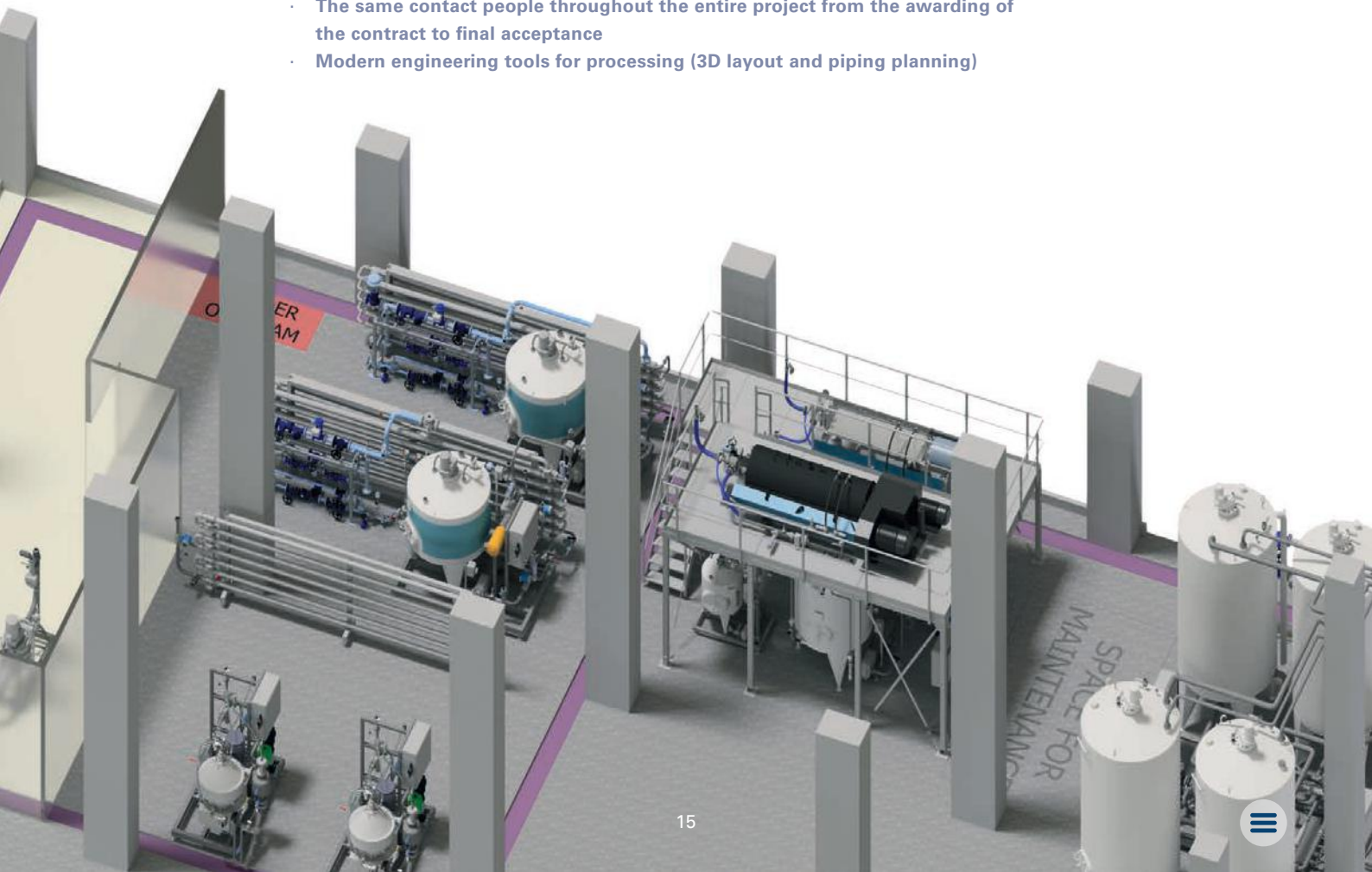
This will give you the significant advantages for achieving success in a competitive growth market!





The following key points are what characterizes our engineering processes:

- Flexibility in selecting the optimal equipment, taking into account the highest possible product yield and product quality
- Complete automation based on Siemens PLC
- Component selection and systems design, as well as installation monitoring and on-site commissioning
- Collaboration with renowned suppliers (Siemens, Danfos, ABB, etc.)
- The same contact people throughout the entire project from the awarding of the contract to final acceptance
- Modern engineering tools for processing (3D layout and piping planning)



FLOTTWEG QUALITY AND SERVICE



Guaranteed Flottweg quality

Made in Germany: We have a clear vision of quality and make no compromises. Our customers often have to deal with aggressive materials. Components of Flottweg centrifuges that come into direct contact with the medium that will be processed (including the bowl, scroll, and inlet), are exclusively made from high-quality, rust and acid resistant stainless steel. This means higher strength and improved resistance.

Our machines are well-equipped, and can withstand your requirements in the long term — in extreme cases, that can mean 24 hours a day, 7 days a week. Additionally, our strict quality controls (DIN ISO 9001:2015) and the traceability of all critical components ensure product safety.



Our service—we are always there for you!

Our 1,100 employees around the world and a network of more than 60 sales and service centers are here to serve you. We are not only striving to provide first-class advice about selecting and designing our systems. We are available for you whenever you need us—in more than 100 countries around the world, 24 hours a day, 7 days a week.



You can plan success. In just three steps.

Are you planning your own success story for your products?
Then get in touch with Flottweg and benefit from our 3-step roadmap:

01

We will discuss the separation task with you and the desired business objectives.

02

In pre-engineering, we examine your raw materials in our laboratory and carry out customer-specific tests in the Flottweg technical center or on your premises. In this context, existing product samples can already be made available.

03

After design and detailed development, you will receive a concrete offer including all relevant key performance indicators for the realization of your individual Flottweg application.

**Make Flottweg the key player in your success:
Our sales partners are looking forward to hearing about your ideas and challenges!**





Flottweg worldwide

11
international
subsidiaries

Projects in over
100
countries

Over
50
service centers

- - Headquarters
- - Subsidiary
- - Representative





Flottweg SE

Industriestraße 6-8

84137 Vilsbiburg

Germany

Tel.: + 49 8741 301-0

Fax: + 49 8741 301-300

[Contact form](#)

mail@flottweg.com

www.flottweg.com

