



# SEPARATION TECHNOLOGY FOR ANIMAL BY-PRODUCTS

Maximum value from animal by-products

 **Flottweg**

Engineered For Your Success



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# **NUTRIENTS AND WASTE, EFFICIENT RECOVERED AND UTILIZED**

The safe and proper disposal of dead animals and waste of animal origin is a matter, of course, for modern rendering plants. However, it is often overlooked that this natural resource can be a valuable source of raw materials.

In recent years, raw material and nutrient management has become increasingly important in the field of rendering. Depending on the category of the source material, recyclable materials are generally separated and forwarded for subsequent utilization.

**Systems from Flottweg, the world's leading manufacturer of industrial centrifuges, have played a key role in solid/liquid separation for many years. This makes it possible to establish sensible rendering processes that offer the operator both economic and ecological advantages.**



**Flottweg supports the animal processing industry in meeting its challenges by providing the following services, and others:**

- Efficient separation technology for the disposal and recycling of animal by-products
- Simultaneous extraction of fat, e.g. for thermal recycling
- Application-optimized machines in a wide range of designs, including fully hygienic designs

Flottweg is certified according to DIN EN ISO 9001:2015 and builds its products according to the latest technical standards and norms.

**Flottweg separation technology is used, among other things, in**

- Animal processing plants
- Supply chains for the chemical industry, feed, and fertilizer producers
- Fat melting, bone fat recovery, glue leather processing

**Find out how our applications support your process in the preparation and economic exploitation of animal by-products: Learn what 'Engineered for Your Success' can mean for you and for your company!**



# SUCCESS IS THE PROFITABLE USE OF TECHNOLOGY

Flottweg Tricanter<sup>®</sup>, decanter, and separators are specially configured for the industrial processing of animal by-products. These industrial centrifuges are easy to operate and are characterized by their high separation efficiency, robustness, and ease of maintenance. This reduces the amortization period and the total cost of ownership.

Flottweg centrifuges may be purchased as individual units - e.g. to optimize or modernize individual process steps. On request, we also offer individually configured plug-and-play systems that can be integrated into your existing plant with minimal effort.

Depending on the process and the source material, throughputs of between 0.5 - 25 t/h (with decanter, Tricanter<sup>®</sup>) or 0.5 - 12 t/h (with separator) are possible. (Guideline values; actual values depend on the process and the raw material)





## Procedures for animal by-products of each category

### **CATEGORY 1**

#### **Animal by-products with highest risk**

- Animal carcasses, parts of animal carcasses, and other high-risk animal material

#### **Flottweg solution**

- Decanter and separators for fat separation and clarification

#### **Extracted raw materials**

- Fat as a raw material for the chemical industry or for the production of eFuels (HVO)
- Solids as a fertilizer
- Alternative: direct thermal recycling of the fat

### **CATEGORY 2**

#### **Animal by-products with medium risk**

- Animal carcasses, parts of animal carcasses, and other animal material containing foreign materials or contaminants

#### **Flottweg solution**

- Decanter and separators for processing carcasses and animal by-products

#### **Extracted raw materials**

- Lubricants and oils
- Feed (depending on the raw material)

### **CATEGORY 3**

#### **Low-risk animal by-products**

- Carcass parts and materials of animals suitable for human consumption

#### **Flottweg solution**

- Decaners and separators for processing category 3 carcasses and animal by-products, to create high-quality end products

#### **Extracted raw materials**

- Proteins, fats, oils for the pet food and food industry

#### **Expansion options for all categories**

- Wastewater treatment plants for dewatering and thickening of sewage sludge
- Three-phase separation of flotation sludges

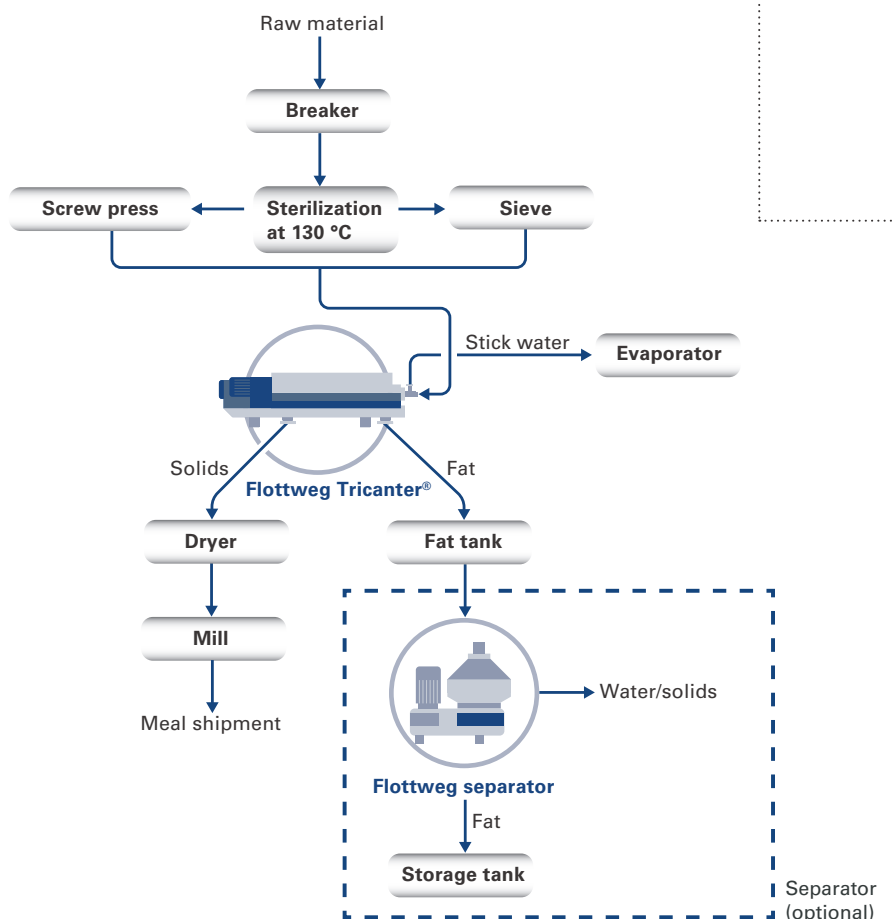
# PROCESSING OF ANIMAL BY-PRODUCTS

## 01 Using the 3-phase process at high temperature - a requirement for processing category 1 and 2 material

There are essentially two different processes downstream of centrifuges: A disk dryer or a vacuum dryer is usually used for heating.

- Disc dryers are generally used when processing low throughputs.
- Vacuum dryers are used to process high throughputs.

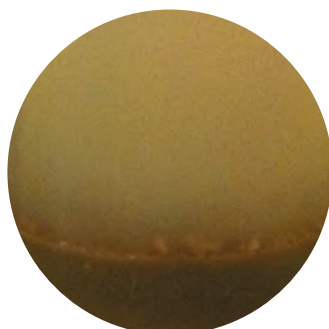
Accordingly, Flottweg centrifuges are optimally designed for your application.



GREAVES



STICK WATER



FAT





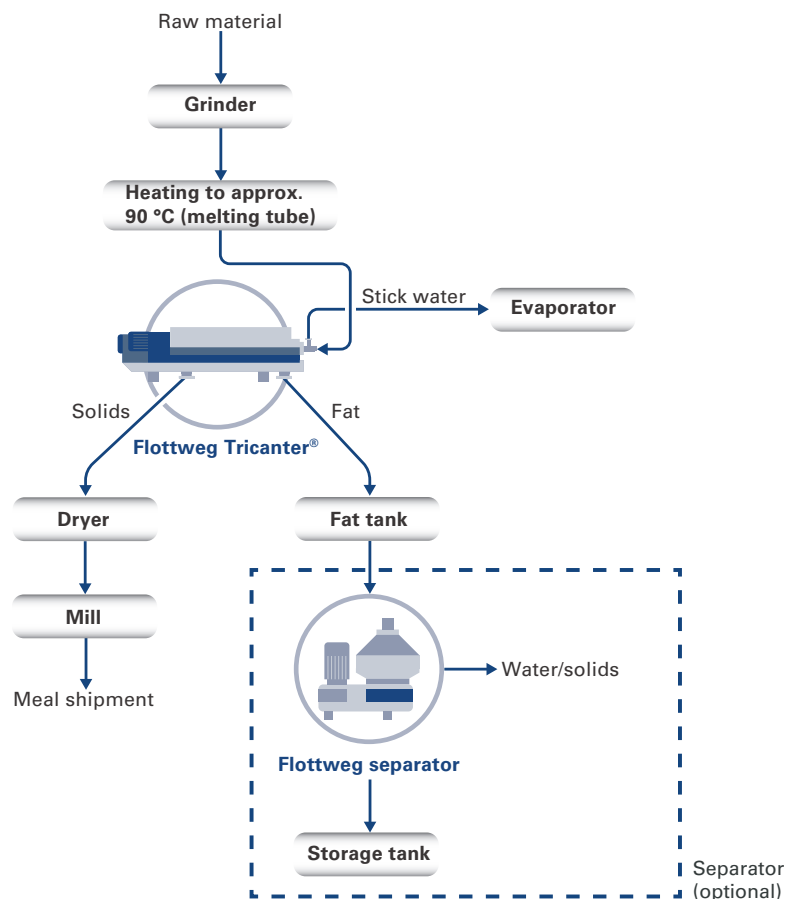
## 02 The 3-phase, low temperature process for category 3 materials

The low temperature method is mainly used

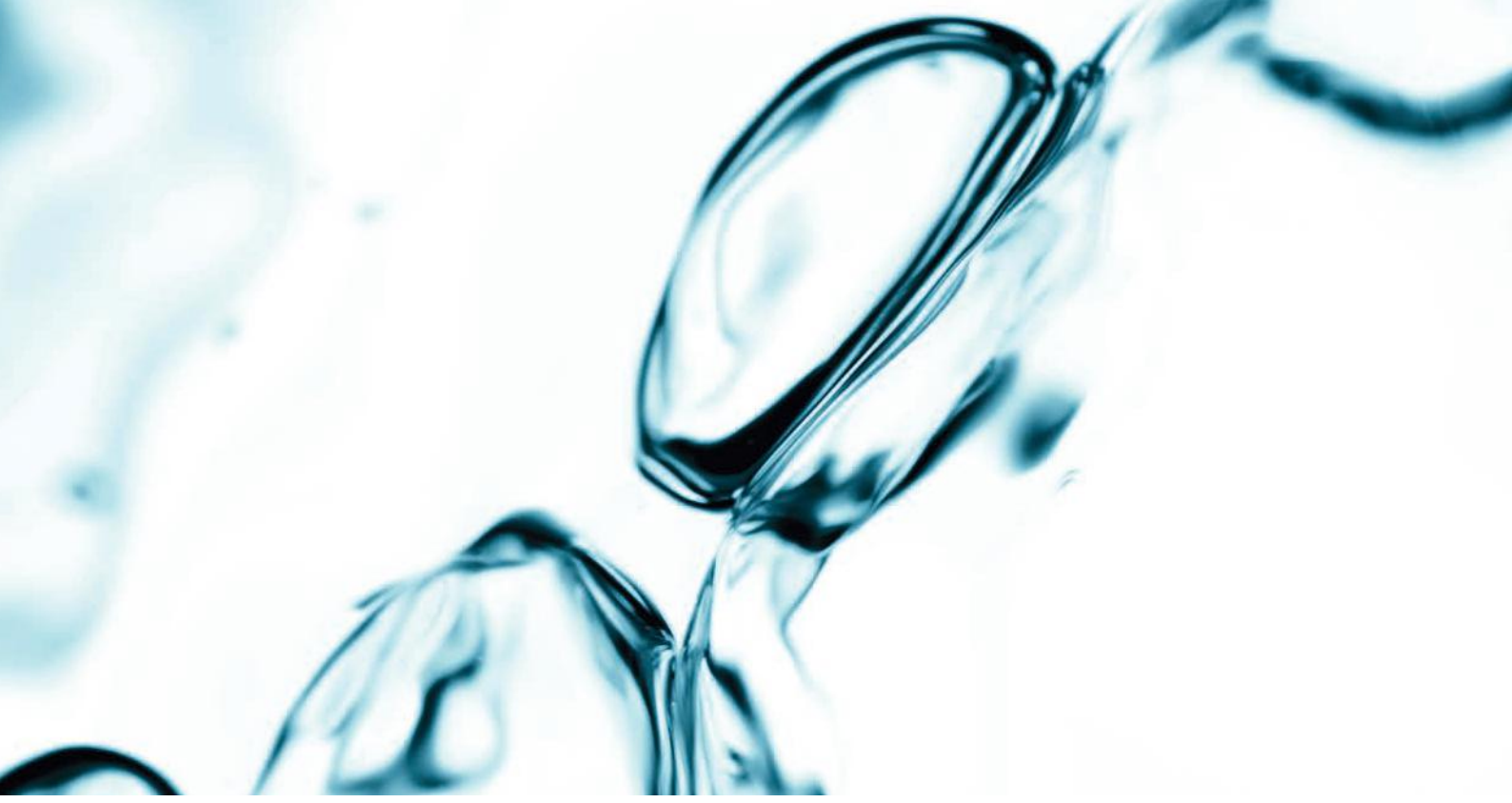
- in the processing of category 3 material
- in glued leather processing
- in bone fat recovery
- but also in smaller fat melts

The process engineering schematic is almost identical in all cases. In one process step, the Flottweg Tricanter® separates the valuable fat from water and solids.

Depending on the starting material and the overall process, a separator can be optionally installed downstream.







# CREATING VALUE FROM FLOTATION SLUDGE

Flotation is a separation technique that separates particles from water during wastewater treatment and separates them on the surface by means of gas bubbles - the so-called flotation sludge. Many fat-processing companies use flotation for process water treatment. However, the resulting flotation froth is both difficult-to-dispose residual waste and at the same time 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

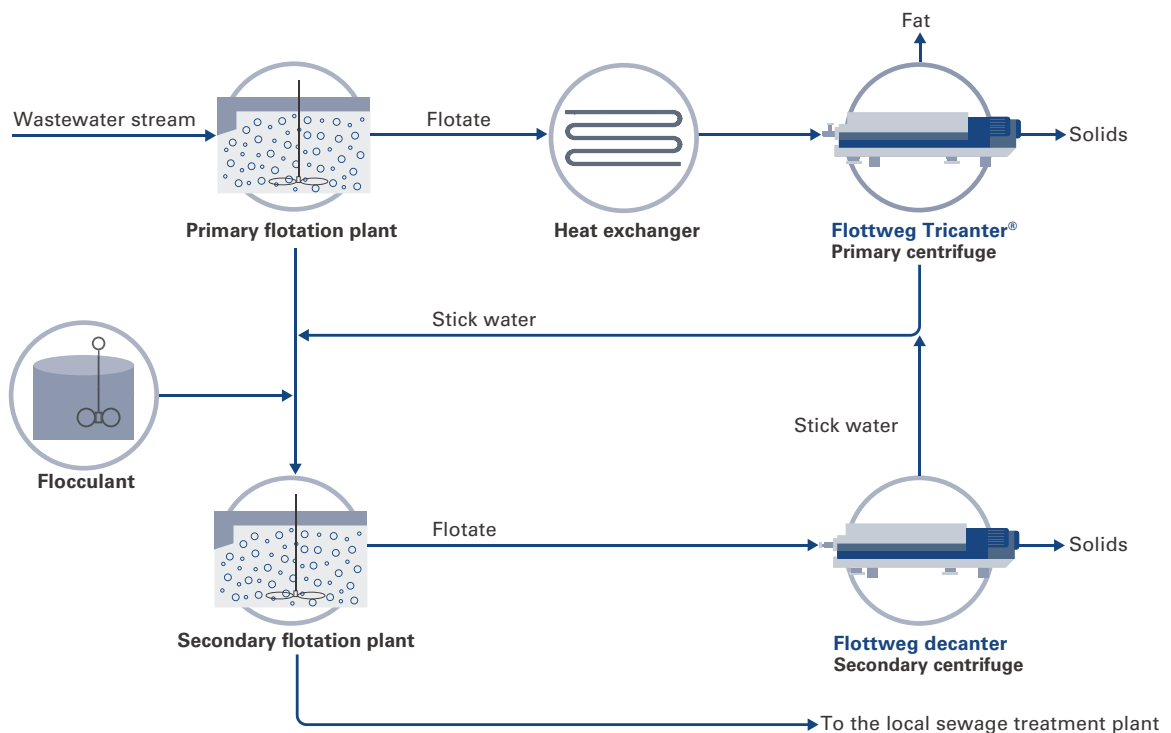
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## Results

- **The separation of the flotation sludge reduces the COD value of the wastewater:**  
This lowers the cost of wastewater
- **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.**



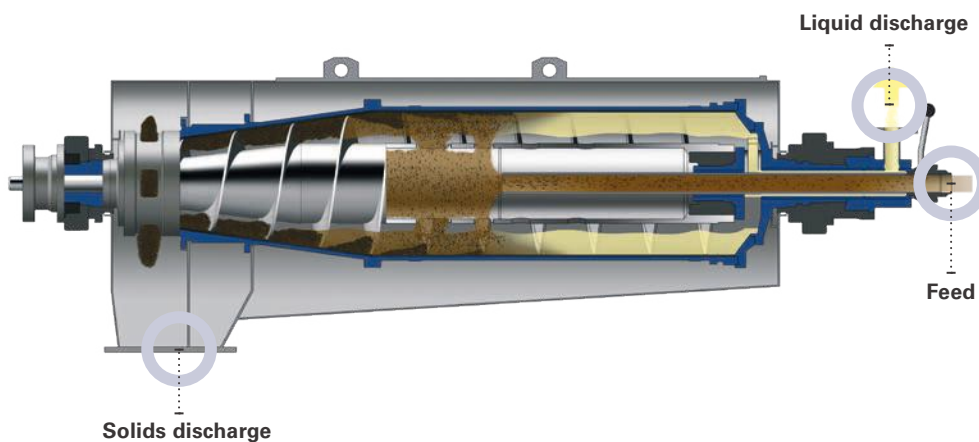


# SPECIAL FEATURES OF THE FLOTTWEG DECANTERS AND TRICANTERS®

## 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

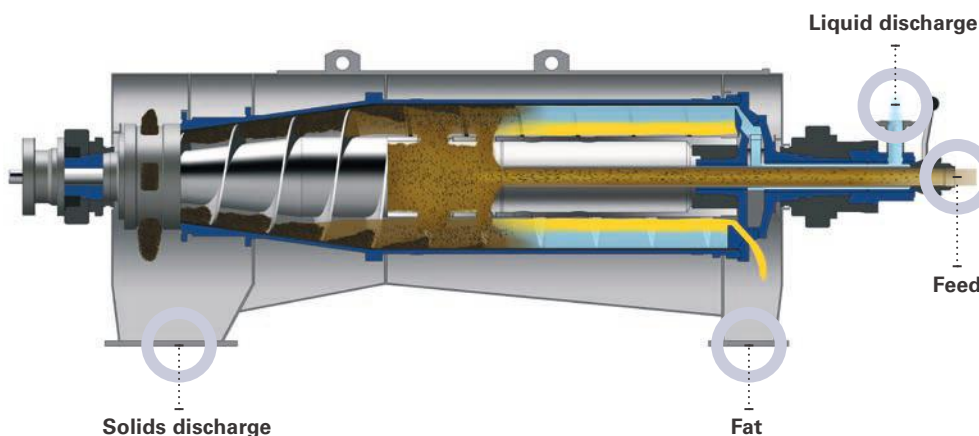
plant, as centrifugal (mechanical) separation requires less energy for water removal than thermal separation. The steam requirement in downstream drying processes is significantly reduced.



## 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

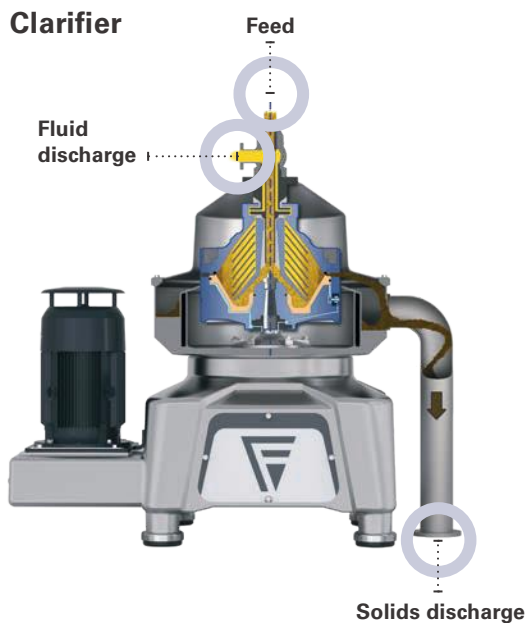
- Fat cleaning after screw press
- Solids separation after vacuum dryer
- Fat clarification (with decanter, separator, each of which use additional water)
- Dewatering of coagulated blood
- Dewatering of sludges from in-house wastewater treatment plants

## Flottweg Tricanter® – applications

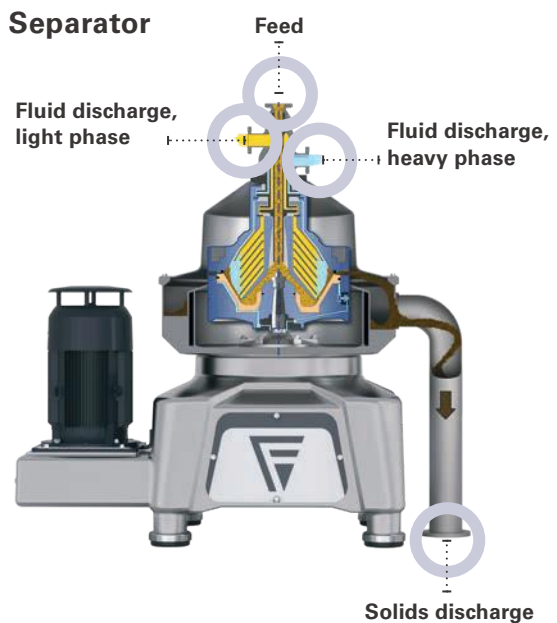
- 3-phase separation after the screw press and/or screening
- Processing and nutrient management of animal by-products (CAT 1, 2 and 3)
- Processing of flotation sludge

# 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.



FLOTTWEG CLARIFIER FOR THE SEPARATION OF SOLIDS



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





# SUCCESS IS WHEN VALUE CREATION IS COMPLETELY AUTOMATED

Flottweg is a global technology driver when it comes to the centrifugal processing of animal by-products. We have decades of experience in industrial separation, and we have developed applications that focus on process optimization and thus on maximizing our customers' profit margins.

#### **Comprehensive systems – for smooth operation and higher yields**

During the recovery of fat, meat and bone meal, oil or proteins from rendering, the focus is on quality and yield. 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 gives us a leading position in the industrial separation technology market.

#### **Flottweg applications for the further use of animal carcasses ...**

- ... from engineering to machine production and automation from a single source.
- ... are tailored to each customer company and its challenges.
- ... extract valuable raw materials with the yield and quality that our customers demand.

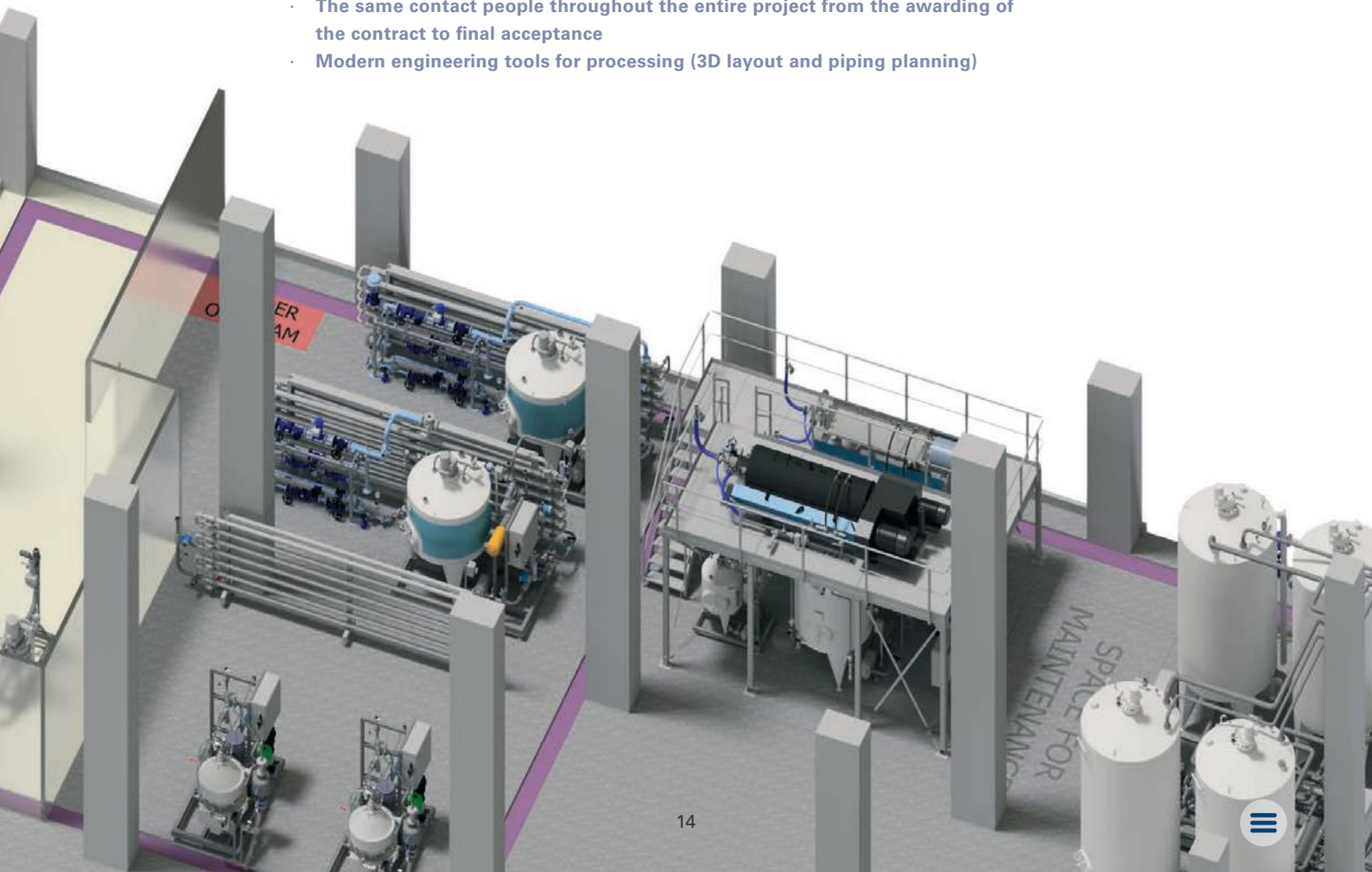
This will give you a decisive competitive edge!





**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





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