



SEPARATION TECHNOLOGY FOR FOOD WASTE, USED FAT AND OILS

From waste to valuable raw materials – with lower disposal costs



Engineered For Your Success



CONTENTS

Recycling food waste, used fats, and oils	Page 02
Profitable use of Flottweg separation technology	Page 04
Flottweg processes for food waste, used fats and oils	Page 05
Kitchen and food waste as a source of raw materials	Page 06
Used fats and oils in secondary recycling	Page 07
Wastewater removal from fat and oil	Page 08
Flottweg decanter and Tricanter[®]	Page 10
Flottweg separators	Page 12
Fully automated value creation	Page 13
Flottweg quality and service	Page 15





WASTE RECYCLING AT AN INDUSTRIAL LEVEL

Not only for environmental reasons but also because of the potential for the creation of value, the recovery of valuable resources from so-called waste is becoming more and more important. In particular, waste containing fats and oils from commercial kitchens, food businesses, slaughterhouses, and private households must be professionally disposed of in many countries around the world. Thus, they become an economic factor that can be recycled.

This is where Flottweg technology comes into play: The future of recovering recyclable materials lies with Flottweg industrial centrifuges. These provide efficient solutions for the large-scale separation of kitchen and food waste and the cleaning of used fats and oils. These technologies are not only environmentally sound but are also economically attractive because they maximize purity and efficiency during the separation process. This significantly increases the value of the nutrients and raw materials recovered.

For many years, systems from Flottweg, the world's leading manufacturer of industrial centrifuges, have played a decisive role in the recovery of valuable components from organic waste. Our industrial centrifuges can be integrated into both new and existing plants: We establish meaningful processes that offer you both economic and environmental benefits.



Flottweg supports you in meeting your challenges and value creation with the following added values, among others:

- New market opportunities are derived from the extraction of recyclable materials such as fat and protein as a basis for animal feed or for the production of eFuels (HVO) or biodiesel
- Increased value creation through the recovery of higher-purity fat
- Reduction of disposal costs through efficient dewatering and thus volume reduction of sludge and residues

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

- Food industry and slaughterhouses
- Large canteens
- System gastronomy
- Wholesale and retail chains
- Companies that dispose of used edible oils and fats

Find out how our applications support the economical use of food waste/used oils and fats and reduce disposal costs: Learn what 'Engineered for Your Success' can mean for you and for your company!



SUCCESS IS IN CONVERTING WASTE INTO PROFITABLE RAW MATERIALS

Flottweg offers various separation processes for obtaining purified used fats and oils and for recovering nutrients from food leftovers.

For this purpose, Flottweg Tricanter®, decanters, and separators are specially configured for the industrial recovery of valuable nutrients and purified used fats/oils. 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.

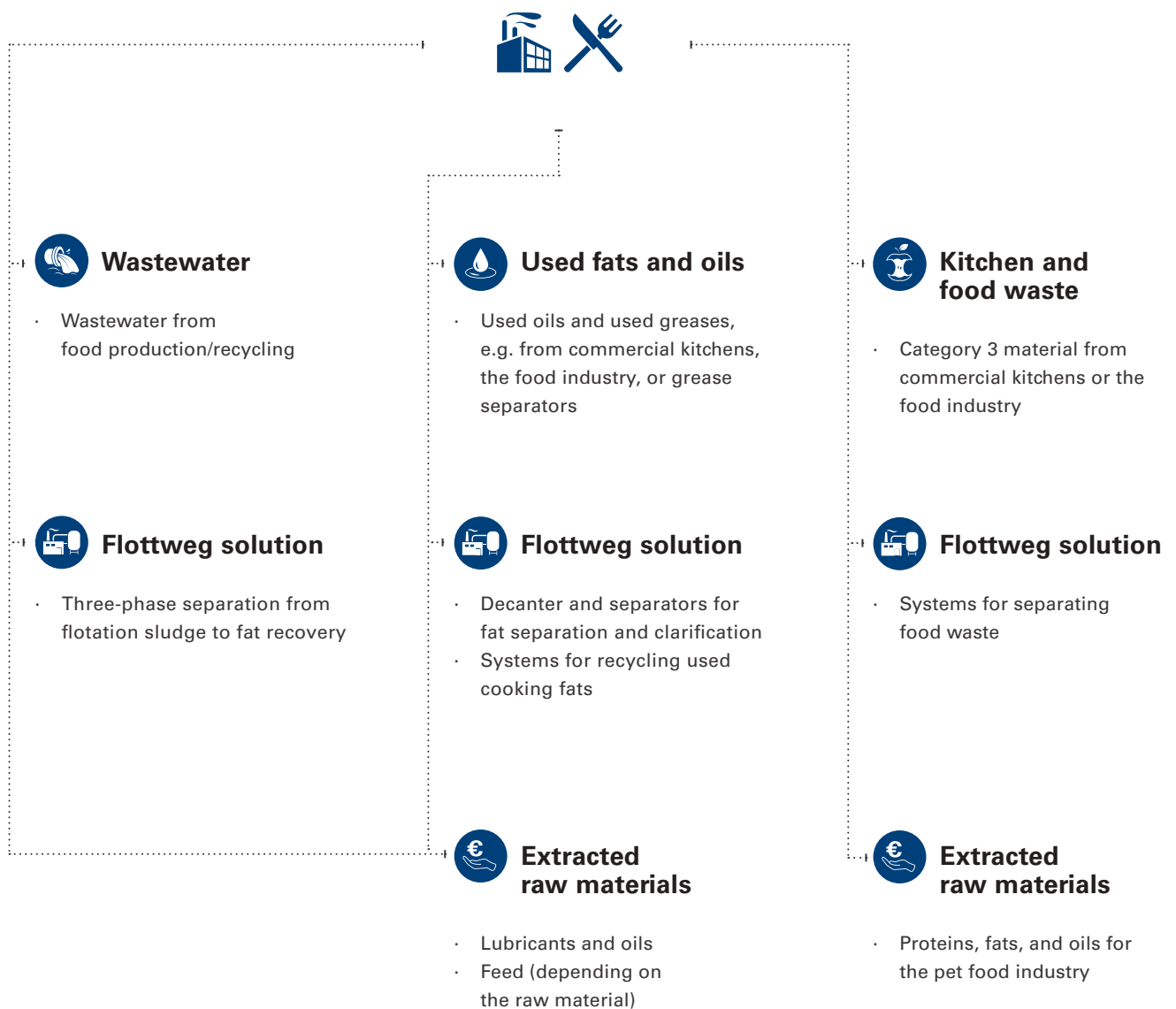
Flottweg centrifuges may be purchased as individual units - e.g. to optimize or modernize individual process steps. On request, we also offer individually configured plug-and-play systems that can be integrated into your existing plant with minimal effort.

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





Process overview: Flottweg processes for food waste, used fats, and oils



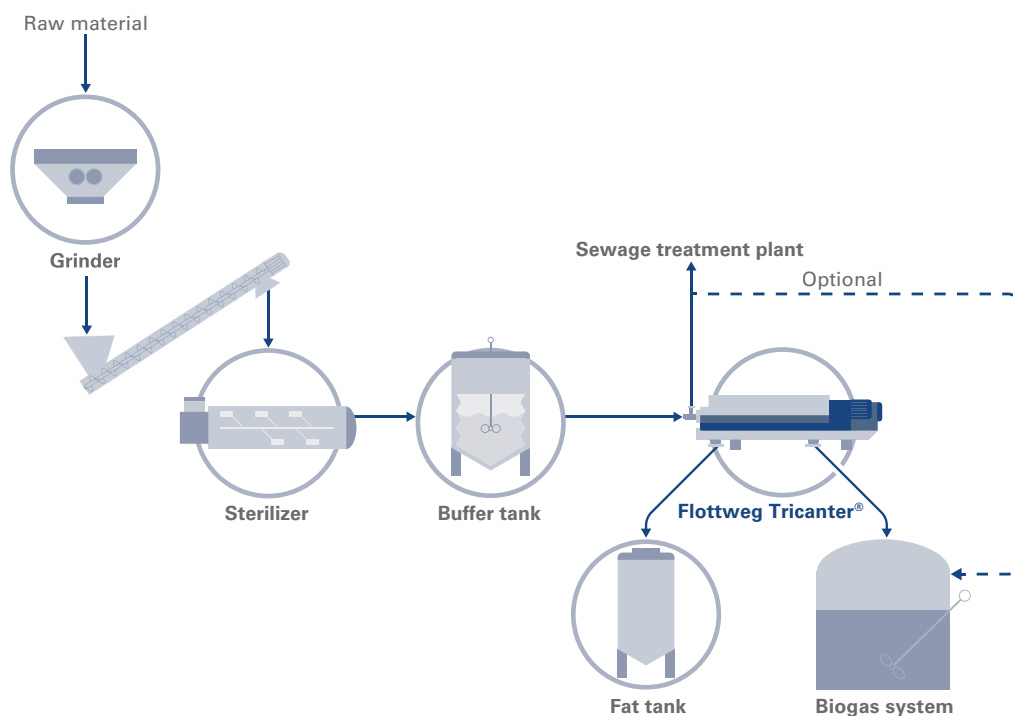


KITCHEN AND FOOD WASTE AS A SOURCE OF RAW MATERIALS

Gastronomy companies and the food industry generate a wide range of waste material: Food waste from food preparation or food production, as well as past-best food or raw materials. This perishable waste must be disposed of quickly in accordance with the relevant legislation.

Many waste disposal companies recover valuable raw materials from these animal by-products and food waste, thus opening up an additional source of revenue.

For this, the food waste is shredded and hygienized. As a minimum, the finely ground food waste must be heated to 90 °C for 60 minutes. Subsequently, a Flottweg Tricanter® is used to separate high-purity oil. Depending on the starting material, it may also be possible to further recycle the solids.



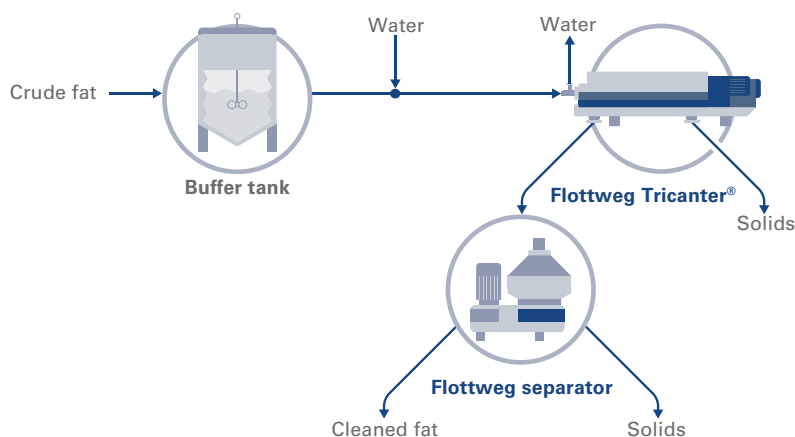


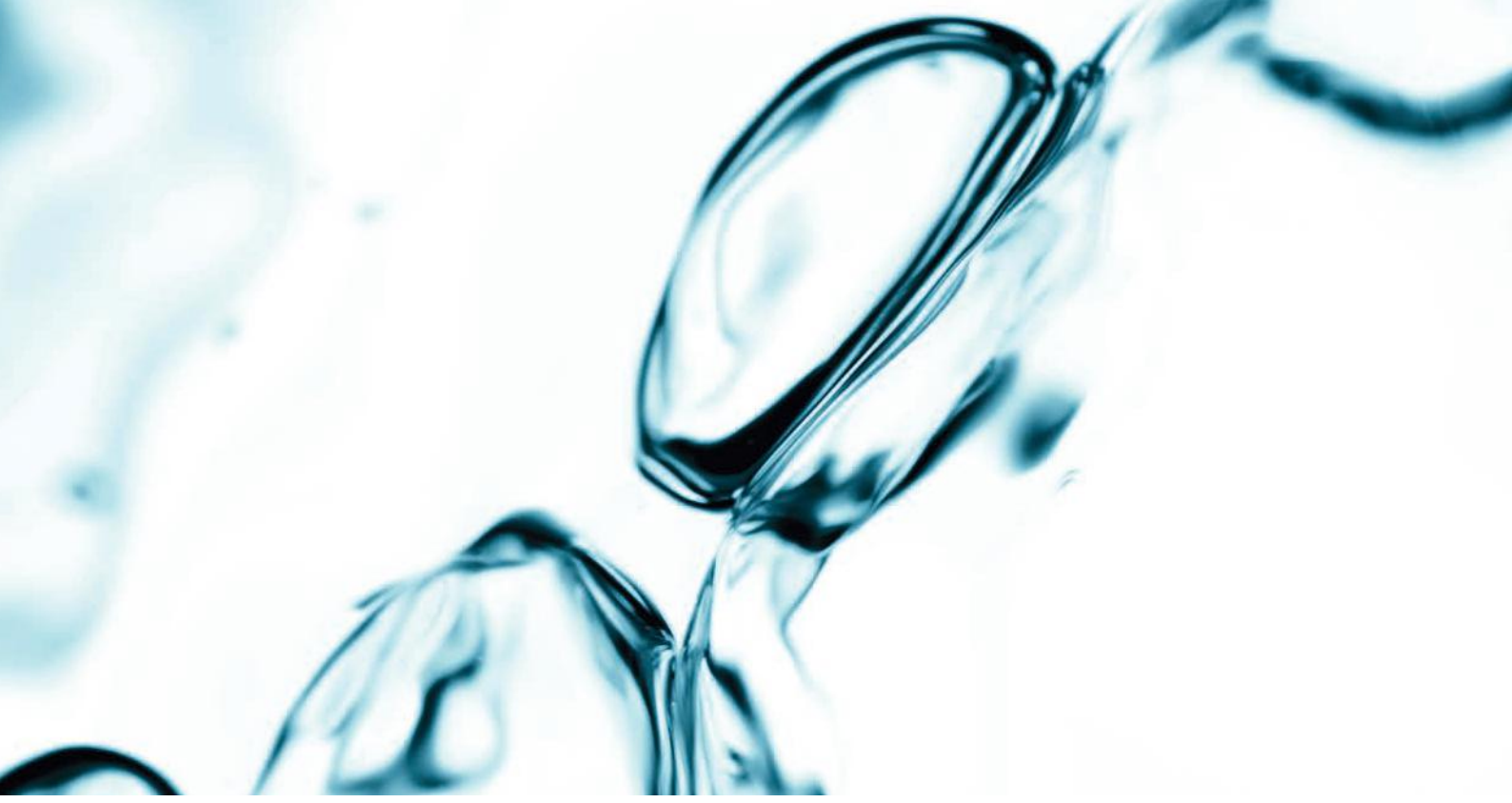
RECYCLING USED FAT AND OILS

In the food industry and in gastronomy, a considerable amount of used edible oils are discarded as waste. These edible oils may be utilized profitably: The recycled and processed used cooking oils are utilized as raw materials in the production of biodiesel, hydrogenated vegetable oils (HVO), and technical fats.

The used oils and used fats that accumulate sometimes contain significant amounts of unwelcome foreign substances. These foreign materials must be separated before further industrial processing in refineries. Plant and animal fats, used cooking oils, or the contents of grease traps are heated to the required processing temperature and fed to the 3-phase centrifuge. The Flottweg Tricanter® separates water, oil, and solid particles in just one step. Due to its robust design, the centrifuge easily manages the separation of solid particles of even different sizes and quantities.

Depending on the desired purity of the used fat, a separator can be installed downstream. This cleans the processed fat again and separates even the finest solid particles.





PROCESSING OF FATTY WASTEWATER

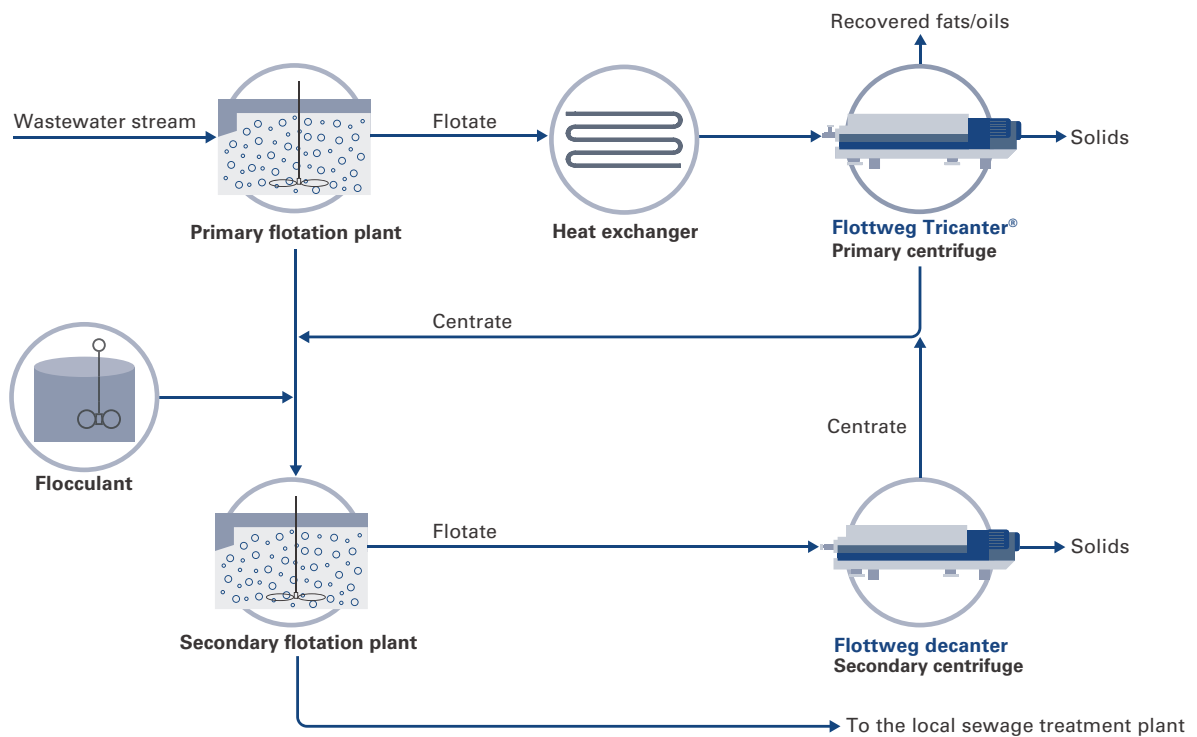
Numerous fatty side streams can arise during the manufacture and processing of food. These fats and oils are a harmful and expensive contaminant in wastewater.

In addition to fat separators in the gastronomy sector, flotation plants are used in industrial operations to treat such wastewater. The resulting flotation froth contains a potentially valuable mixture of fat and protein.

It is therefore important to combine disposal and value creation. The post-treatment of flotation sludge with a Flottweg Tricanter® results in three material phases: clarified water, reclaimed fat, and a low-moisture solids cake.

Results

- The separation of the flotation sludge reduces the COD value of the wastewater: This lowers the cost of wastewater.
- Depending on the process and the raw material, the recovered fat can be sold to the animal feed industry, for example, or processed into biodiesel or eFuels (HVO).

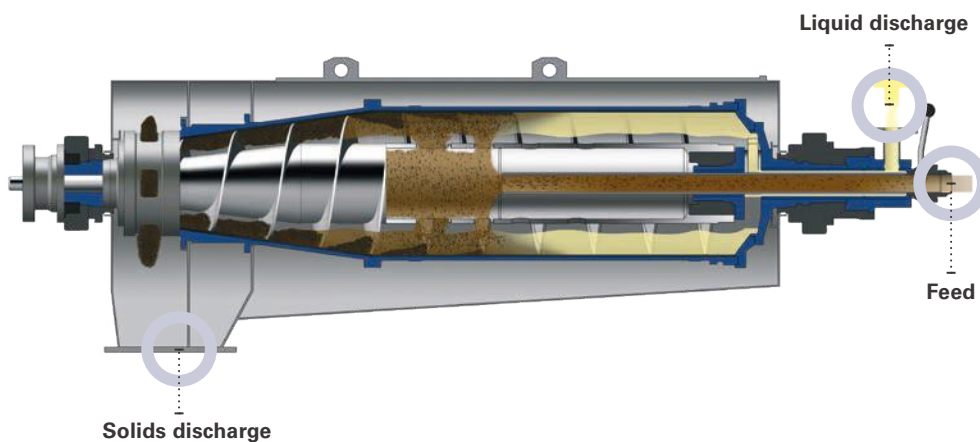


SPECIAL FEATURES OF THE FLOTTWEG DECANTERS AND TRICANTERS®

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

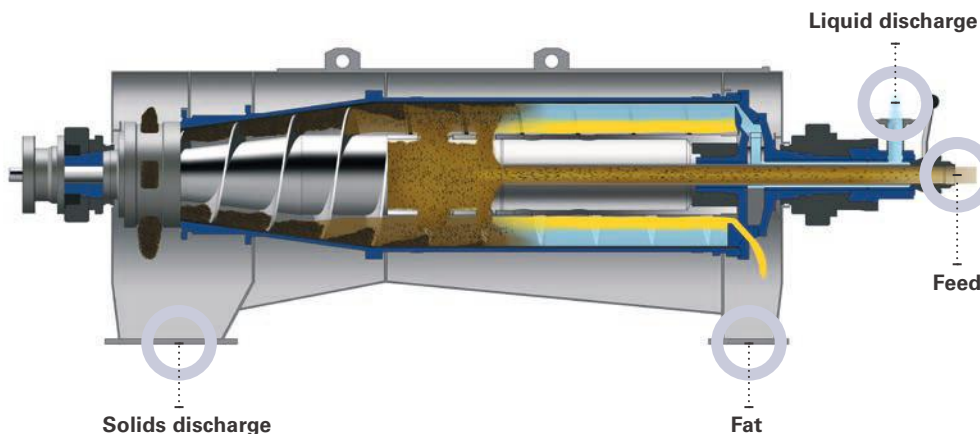
plant, as centrifugal (mechanical) separation requires less energy for water removal than thermal separation. The steam requirement in downstream drying processes is significantly reduced.



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

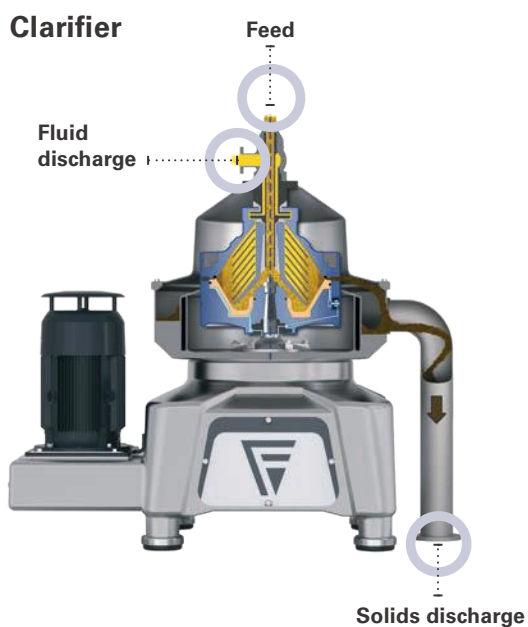
- **Fat clarification (with decanter, separator, each of which use additional water)**
- **Dewatering of sludges from in-house wastewater treatment plants**

Flottweg Tricanter® – applications

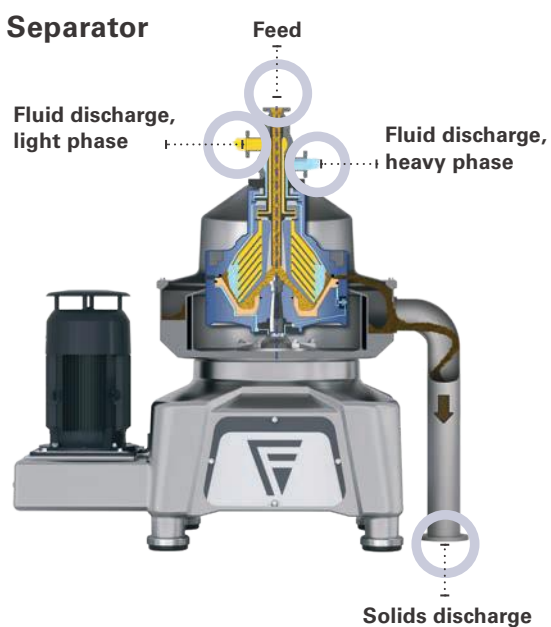
- **3-phase separation of kitchen and food waste for the recovery of nutrients**
- **Cleaning of vegetable or animal fats, old cooking fats, or contents of fat separator**
- **Processing of flotation sludge**

FLOTTWEG SEPARATORS

In the recycling of used fats and used oils, Flottweg AC series separators are used both as clarifiers and as separators. Clarifying separators clean grease by separating the finest solid contaminants such as proteins, etc. from the grease. Separators break down 3-phase mixtures into their constituent parts, e.g. grease, water, and solid impurities. 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 fat recycling

- Separation of fat and water
- Cleaning of fat
- Fine clarification of fat
- Post-treatment of side streams containing oil





SUCCESS IS WHEN VALUE CREATION IS COMPLETELY AUTOMATED

Flottweg is a global technology leader in the centrifugal processing of food, food waste, used oils, and fats. With decades of experience in industrial separation, we have developed applications that focus on process optimization and product quality, thus allowing our customers to maximize profits.

Comprehensive systems – for smooth operation and higher yields

When considering the recovery of fat, oil, or raw materials from food waste, the focus is on quality and yield. We offer our customers pre-assembled, turnkey systems, to make it possible to optimize both quality and yield in line with our customers' business objectives. 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 recovery of oil, fat, and food raw materials ...

- ... 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.

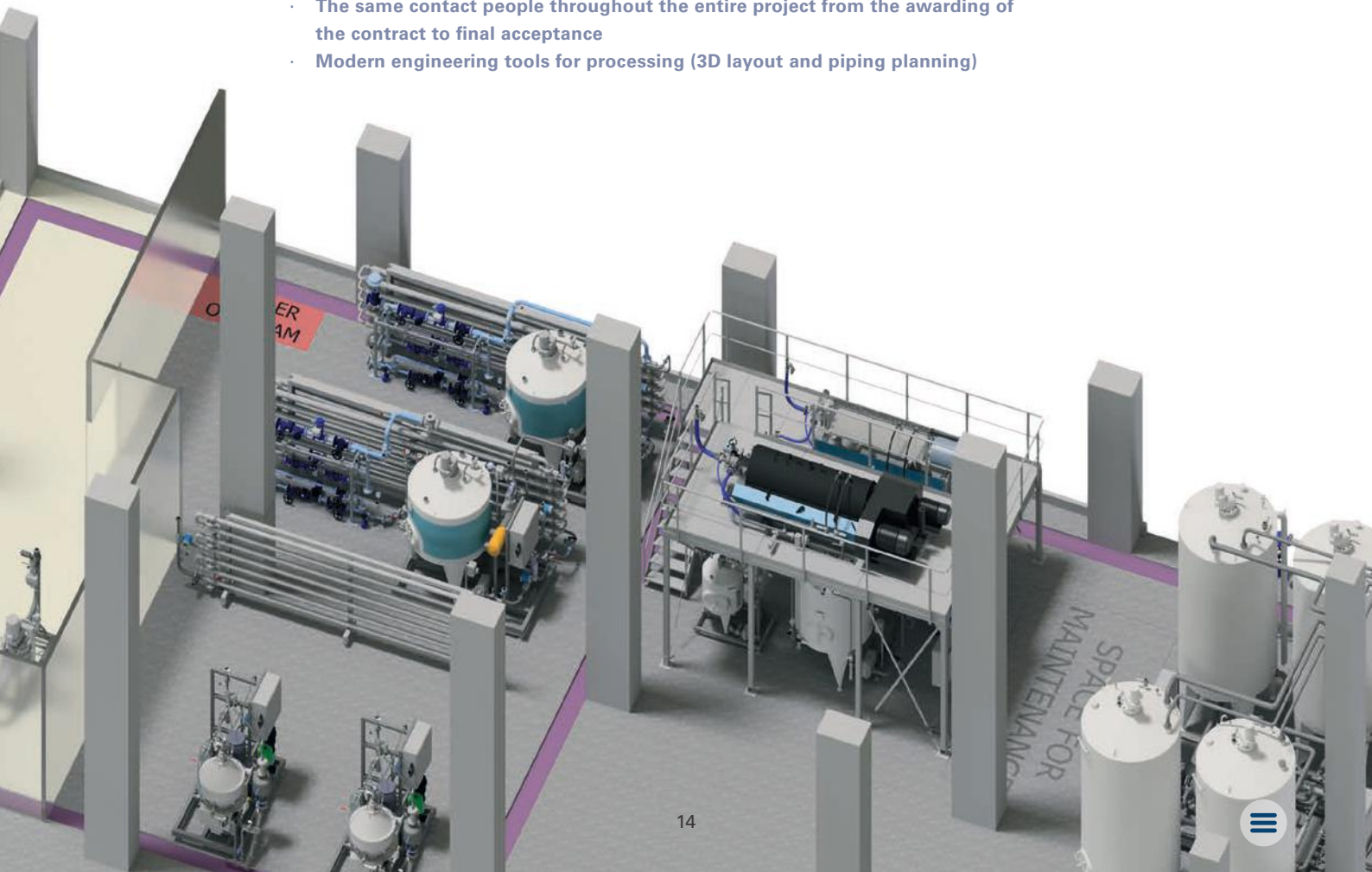
This will give you a decisive competitive edge!





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 resilience.

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