



SEPARATION TECHNOLOGY FOR THE OIL AND GAS INDUSTRY

Materials management for extraction, processing and the recycling
of mineral oil, sludges containing oil and product water



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SUSTAINABLE MORE EFFICIENCY

Flottweg centrifuge technology for mineral oil processing

The global oil and gas industry faces three key challenges: rising demand, volatile prices for raw materials, and increasingly stringent environmental regulations. To meet these requirements, solutions that combine efficiency, cost-effectiveness and environmental responsibility are needed.

Flottweg offers solutions that can be applied at several value-added points in mineral oil processing:

In the oilfield

The quality of the crude oil can be significantly improved by separating solids and water. This protects downstream plant technology and increases the efficiency of further processing.

In the refinery process

Wastewater produced during the processing of crude oil is reliably separated into oil, water and solids. The recovered oil increases the yield, while purified wastewater ensures compliance with legal environmental standards.

In lagoons and ponds

Residues containing oil from refineries can be efficiently processed. In addition to the recovery of valuable raw materials, this makes an active contribution to environmental protection.

In the recycling process

Flottweg centrifuges reduce residual volume, reduce disposal costs and enable the recovery of valuable resources when processing used oils.

Centrifuge technology from Flottweg, one of the world's leading manufacturers of industrial centrifuges, proven for decades as a key technology for optimizing industrial processes along the entire value chain in the mineral oil industry – from the oilfield to recovery.



Improve your overall balance sheet. Reliable.

Centrifugal separation technology solutions from Flottweg support the sustainable extraction and processing of mineral oil.

With Flottweg ...

- increase the quality of oils.
- turn the processing of sludges containing oil and the recovery of mineral oil into your own profit center.
- simultaneously reduce disposal costs by reducing solids and unusable sludges.
- improve your ecological footprint through wastewater processing or the recovery of product water.

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

Successful and reliable worldwide for decades: Flottweg systems optimize your processes and make further added value possible. Greater success, as evidenced by numerous testimonials: This is what we mean by “Engineered For Your Success!”



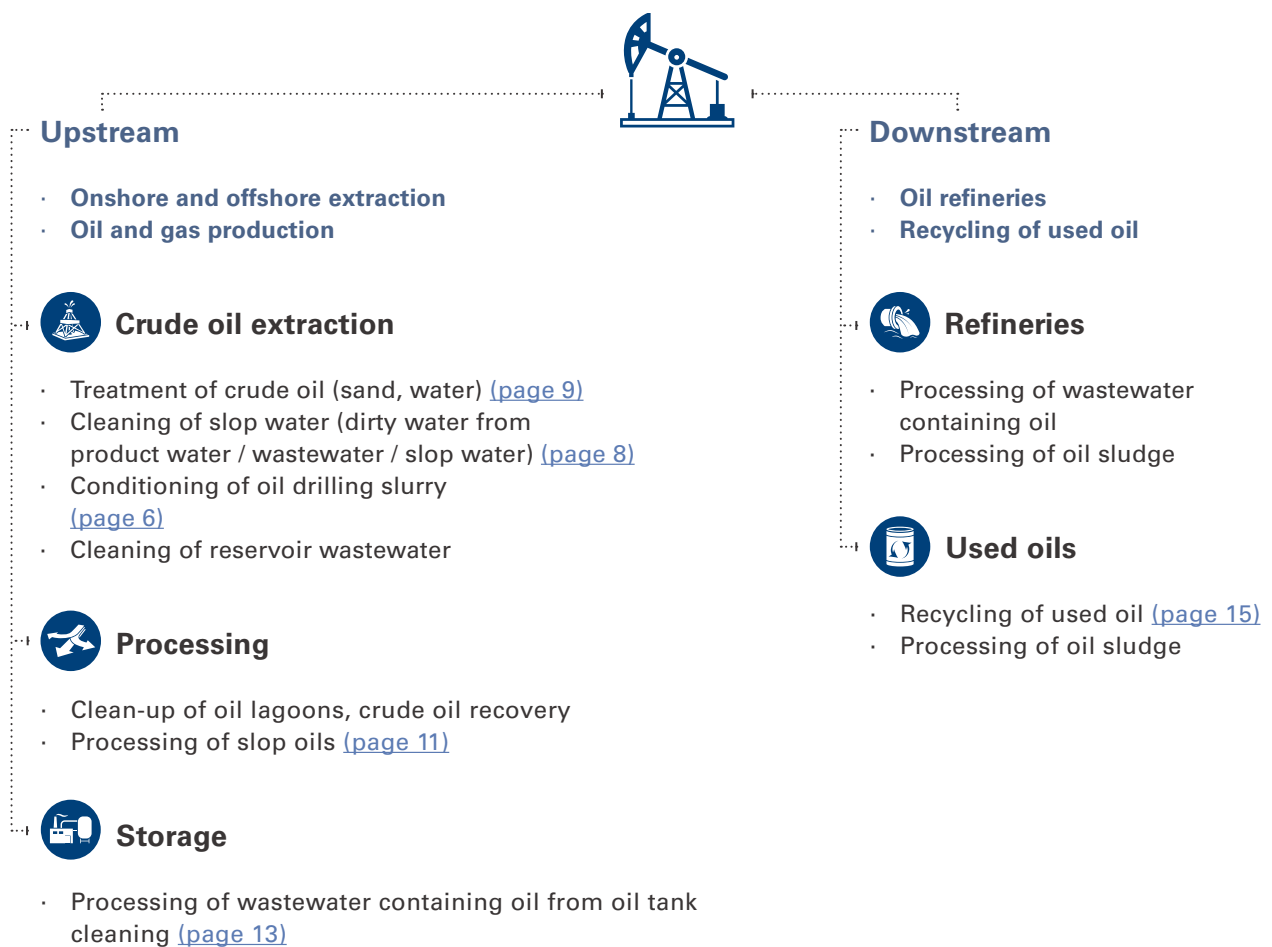
A large offshore oil rig stands in the middle of a blue sea under a cloudy sky. The rig has a tall derrick on the left and various platforms and cranes. The text "SUCCESS IS..." is overlaid in white on the right side of the image.

SUCCESS IS...



PERFECTING MINERAL OIL SEPARATION

Processing of sludges and wastewater containing oil





EFFICIENT PROCESSING OF DRILLING SLURRY

Whether on oil platforms or in other industrial applications, the continuous cleaning of drilling liquids such as drilling slurry, flushing fluids and drilling mud is crucial for the trouble-free operation of modern drilling systems. At the same time, environmental protection requirements are increasing, especially with regard to the prevention of groundwater and marine pollution.

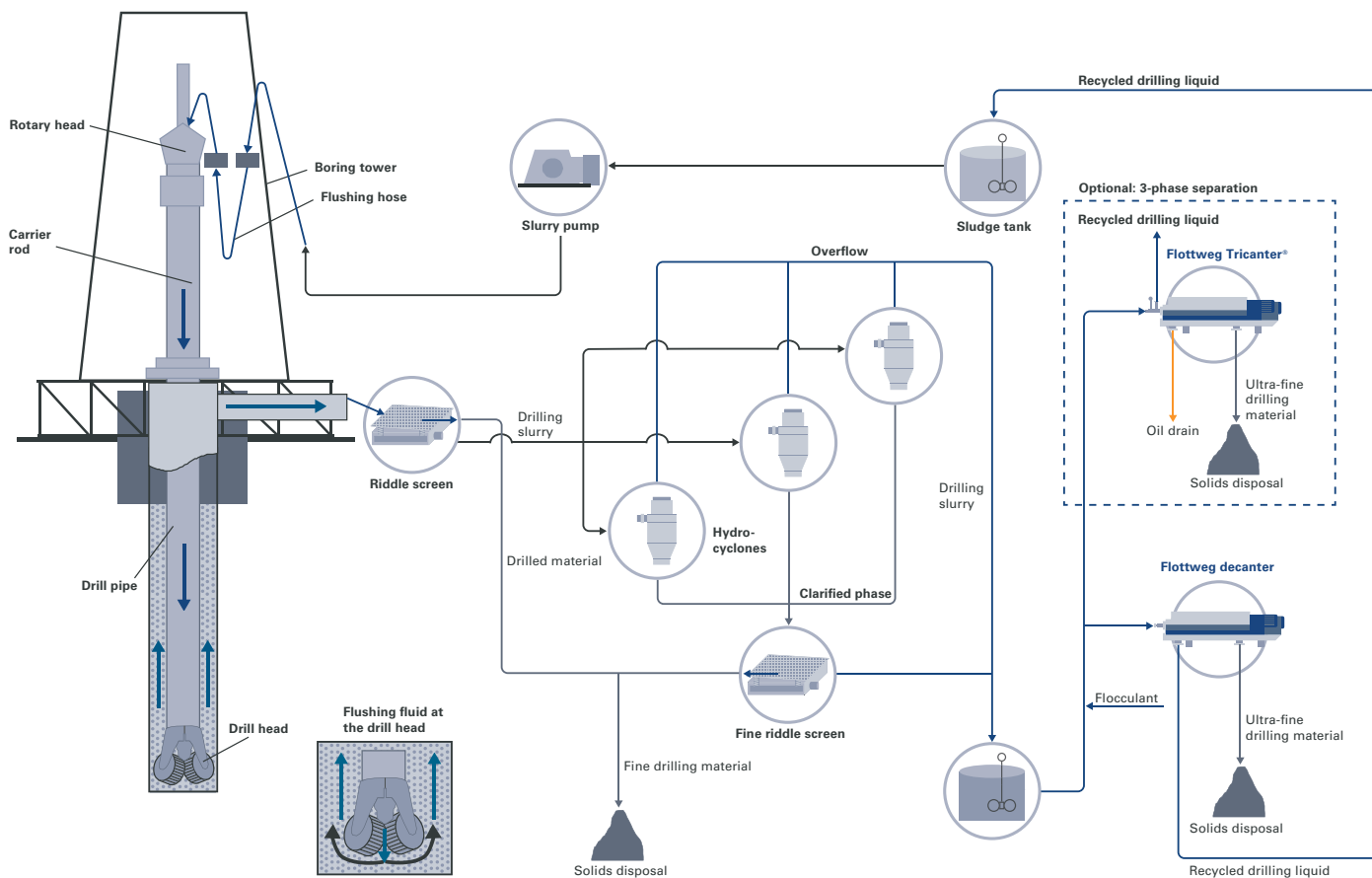
Flushing fluids perform a variety of tasks: they cool and lubricate the drilling tool and reliably transport cuttings. The composition is complex – they are made up of water, oil or polymers, with stabilizers, flocculants, corrosion inhibitors, defoaming agents, tensides and other additives.

Modern drilling systems operate in closed circuits. To ensure process reliability, all solids introduced must be efficiently removed. While coarse particles are separated by vibrating sieves and hydrocyclones, the Flottweg decanter takes over the separation of the fine solid components – reliably, continuously and with the highest separation quality.





Drilling slurry process with Flottweg centrifuge technology



SLOP WATER PROCESSING

When offshore oil and gas platforms are operated, slop water – a complex mixture of hydrocarbons, chemicals, drilling muds, salts, sand, solids and water – is produced during cleaning work on the pipe and drilling deck. These highly contaminated liquids often contain erosive and corrosive components that prevent direct discharge into the sea according to environmental regulations.

Flottweg offers an efficient and on-site solution for the treatment of slop water. By mechanically separating the phases, the water is purified to the extent that it meets the legal requirements – while transport and disposal costs are significantly reduced.

If the solids content in the drainage water is particularly high, which is often the case, for example, on drilling vessels, we offer a two-stage system with an upstream decanter. In addition to our centrifuges, we also fit our plants with other components such as preheaters and pumps.

Your benefits at a glance

- Reduction of residual oil content to a minimum
- Integrated oil-in-water measurement system for continuous monitoring of water quality
- On-site processing directly on the platform – without return transport on land
- Minimizing environmental impact through immediate treatment on the source
- Cost-effective solution due to elimination of external disposal logistics





QUALITY-OPTIMIZED CRUDE OIL PROCESSING

In addition to the actual product, large amounts of gas, water and solids are also produced during the extraction of crude oil. Before the crude oil can be transported and further processed, it must meet defined quality standards – especially with regard to the content of water and sediment (BS&W – Basic Sediment & Water).

Flottweg offers custom-made centrifuge solutions for the dewatering and purification of crude oil, which reliably separate water, dissolved salts and fine particles.

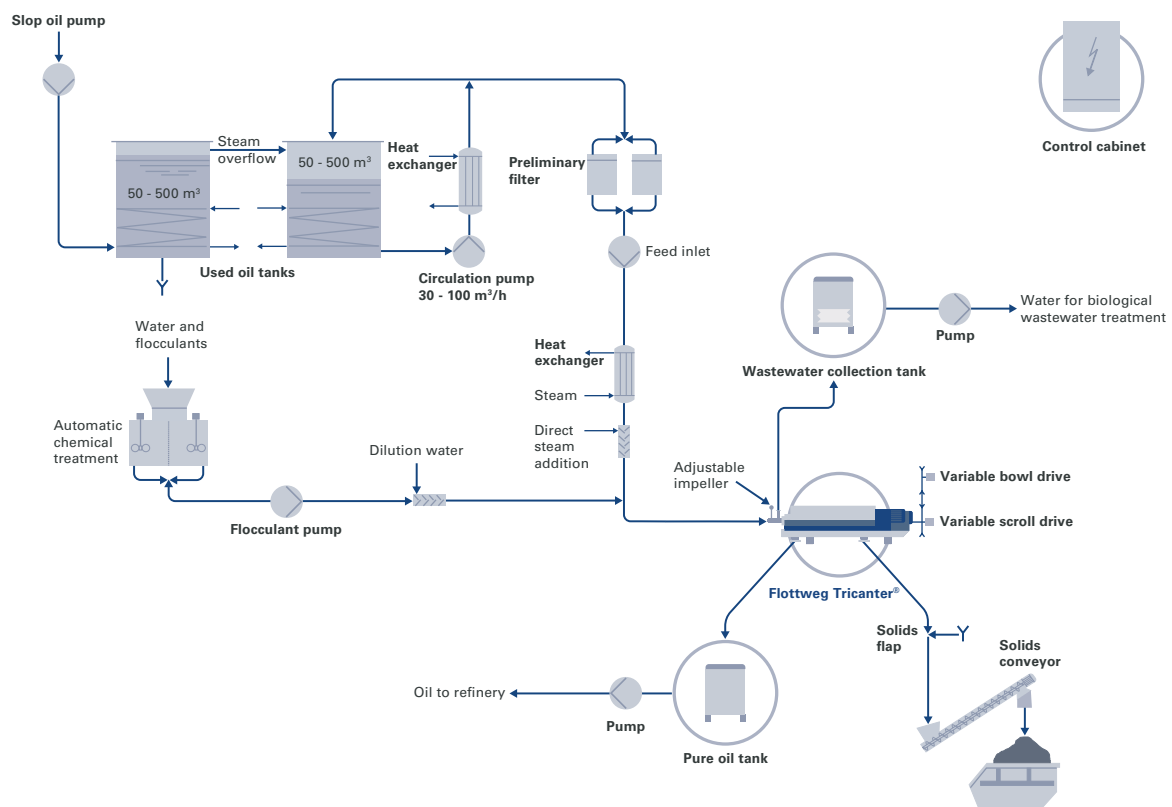
The separation technology used optimizes the overall process and reduces the demand for energy (thermal pretreatment), dilution, rinsing water and chemical additives. As a result, our separation technology significantly reduces operating costs.

Operators benefit from the following advantages, both onshore and offshore:

- **Efficient and reliable Simp Drive®**
- **High centrifugal forces and large clarification surfaces for maximum separation performance**
- **High throughput capacities in a compact design**
- **Robust, energy-efficient design for demanding operating conditions**
- **Easy installation and operation for user-friendly processes**
- **Comprehensive process monitoring of all relevant parameters**
- **Flexible adaptation to fluctuating feed concentrations thanks to adjustable impeller**



Crude oil process with Flottweg centrifuge technology



COMPLETE SLOP OIL PROCESSING

From waste to valuable material

Slop oil is produced during the cleaning of oil tanks, in filter recovery processes or as a by-product in refineries – for example, through leaks or overflows. It is a complex mixture of oil, water, chemicals and coarse and fine particles, the composition of which can vary greatly.

Efficient pretreatment for stable processes

In the first step, the slop oil is heated to process temperature and is mixed with suitable chemicals (e.g. demulsifiers) to break down emulsions. In special mixers, the medium is homogenized – an important prerequisite for a stable and efficient separation process.

Three-phase separation with the Flottweg Tricanter®

Regardless of viscosity or solids content, the Flottweg Tricanter® separates oil, water and solids in a single step. The Simp Drive® automatically adjusts the differential speed to the composition of the slop oil – for consistently optimal separation results. The recovered oil meets the requirements for further processing in refineries.

After-treatment of the water phase

Optionally, the water phase can be further purified with a Flottweg separator. The disk centrifuge removes the finest sediments and reduces the residual oil content to a minimum – reliably and continuously 24/7.

Safety through ATEX-compliant design

Flottweg offers centrifuges in explosion-proof design according to ATEX Zone 1 or 2 for use in potentially explosive atmospheres. Thanks to inert gas superposition, critical media can also be processed safely beyond their flash point.

Complete systems and mobile solutions

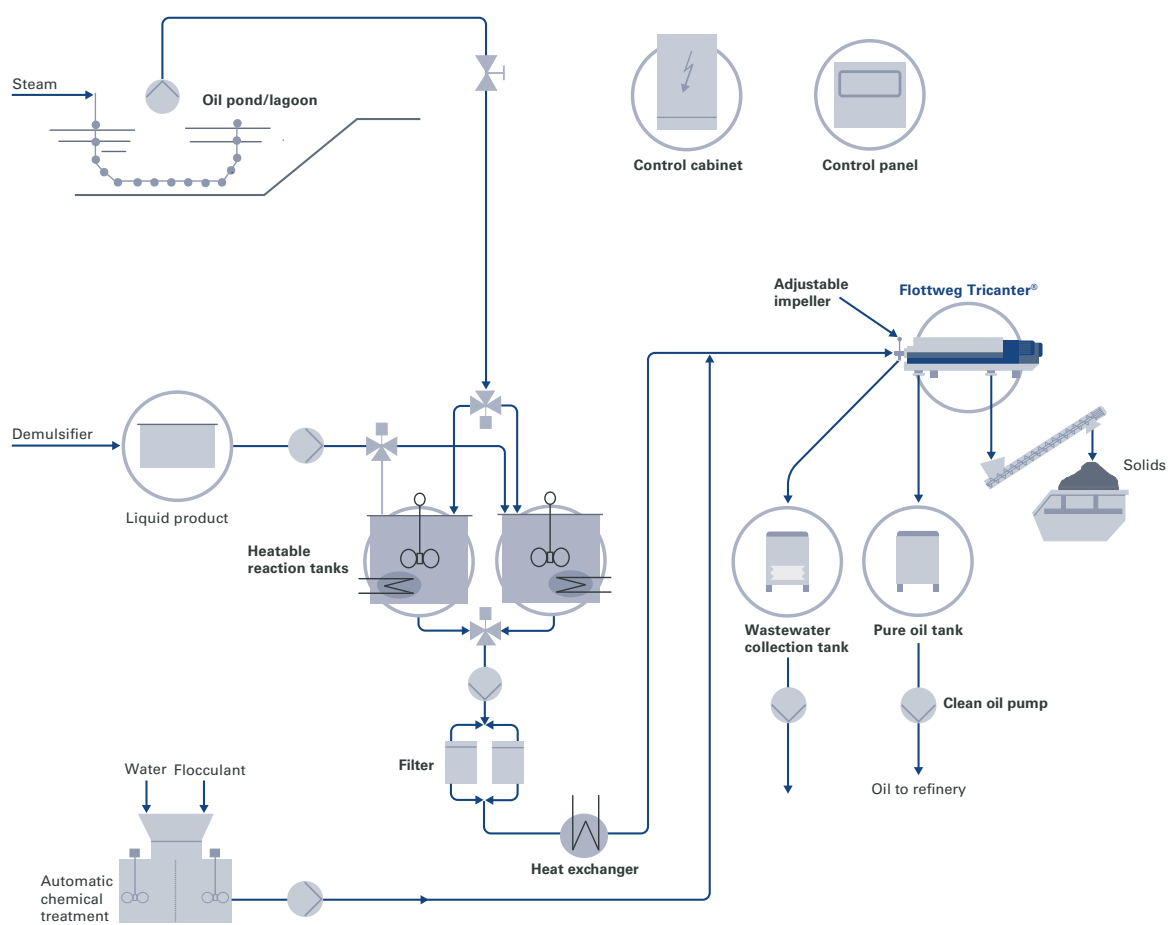
Flottweg supplies turnkey plants for oil and water treatment – including control, individually configured and available in various sizes. For flexible use, all components can also be provided container-based as a mobile unit.

Your advantages in slop oil processing with Flottweg

- High efficiency in oil recovery
- Optimum separation performance even with varying composition
- Robust, continuous systems
- Reduction of waste volume
- Environmentally friendly on-site treatment
- Minimal downtime



Slop oil process with Flottweg centrifuge technology





RECYCLABLE MATERIALS FROM TANK BOTTOM RESIDUES

Tank bottom residues are formed by the deposition of sludges and sediments at the bottom of storage tanks in the oil and gas industry. These residues contain a high proportion of recoverable oil – but are difficult to process due to their high viscosity, emulsion content and solids concentration. Proper treatment is essential to recover valuable hydrocarbons, minimize environmental impact and reduce disposal costs. Untreated residues – up to 70% water, 10-70% oil and 5-20% solids – will otherwise have to be burned or transported in specialized facilities, which can be expensive.

Efficient oil recovery with Flottweg industrial centrifuges

Flottweg offers a powerful portfolio of separation technologies for the treatment of tank bottom residues. The Tricanter® and separator are specifically designed to process complex suspensions – even at low pH, high chloride, abrasive particles, organic solids and asphaltenes.

Maximum hydrocarbon recovery

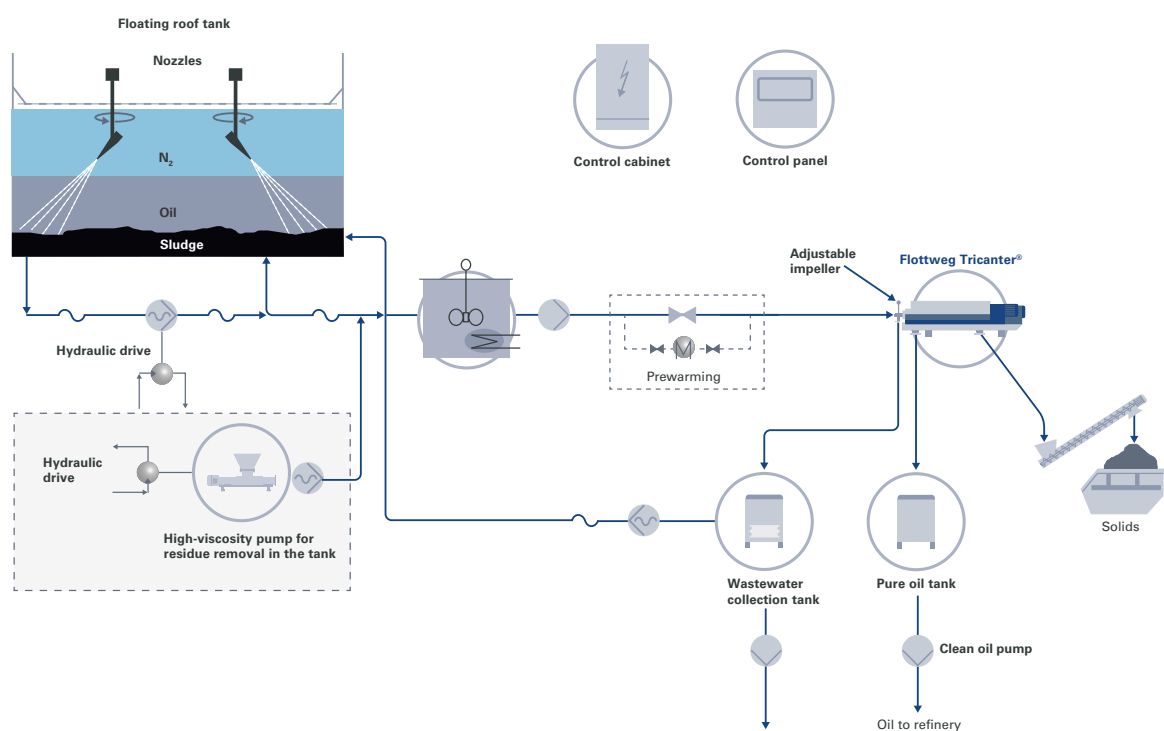
The combined use of mechanical separation technology, chemical pretreatment and temperature control allows 80-95% of the recoverable hydrocarbons to be recovered. This not only reduces the volume of waste, but also increases the economic benefits.

Regardless of the location of the oil tanks

Flottweg systems for the processing of tank bottom residues can also be designed for mobile use. They can be integrated into the cleaning process regardless of location to utilize the residues in the best possible way. The integration of Flottweg Tricanter® systems enables efficient on-site treatment: a problematic waste product becomes a valuable raw material.



Flottweg separation technology in oil tank cleaning





RESPONSIBLE USED OIL DISPOSAL

Recycling used oil, conserving resources

Used oils are a significant environmental burden if they are not disposed of properly. Even the smallest quantities can contaminate soils and bodies of water. Flottweg offers a powerful solution for recovering valuable resources at the source.

With the Flottweg Tricanter®, used oil can be separated efficiently in three phases: oil, water and solids. The combination of mechanical separation technology, temperature control and chemical pretreatment ensures that the oil is reliably recovered, while the water phase is purified and the solids are safely separated.

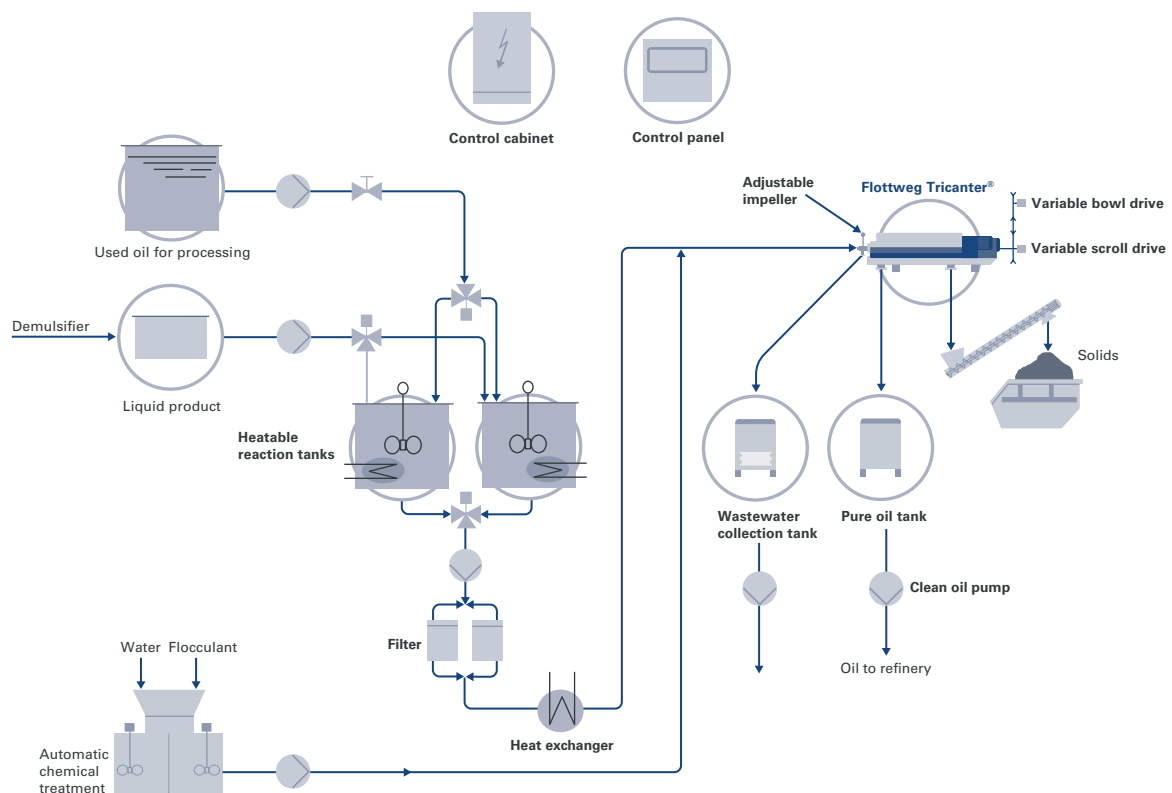
Your benefits

- Recovery of up to 95% recoverable oil
- Reduction of residual oil content in water
- On-site treatment – no costly disposal required
- ATEX-compliant design for maximum safety
- Skid-mounted or container-mounted plug & play systems for mobile applications available

Flottweg Tricanter® systems enable economical and environmentally friendly used oil processing – flexible, robust and proven worldwide.



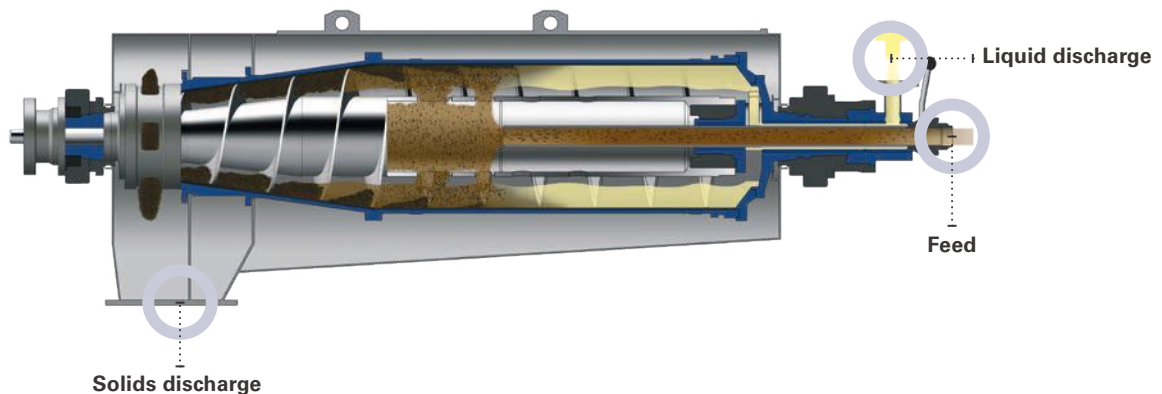
Flottweg separation technology in used oil disposal



SPECIAL FEATURES OF THE FLOTTWEG DECANTER AND TRICANTER®

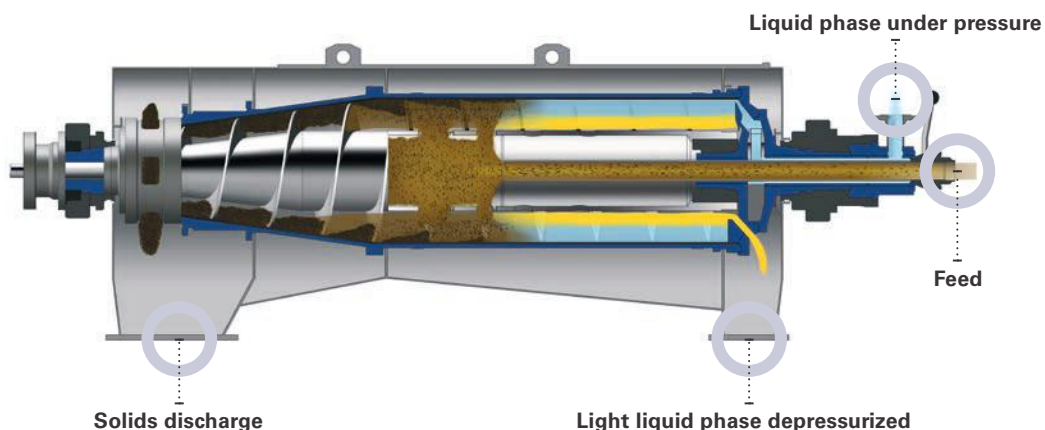
Flottweg decanter 2-phase separation

Flottweg decanters are often connected upstream of further separation stages to separate high solids loads from liquids (2-phase process). Due to the special design of the Flottweg decanter, the separated solids reach high levels of dry substances. This results in a maximum yield of reusable drilling emulsion in the course of the processing of drilling slurry.



Flottweg Tricanter® 3-phase separation

The Flottweg Tricanter® enables three-phase separation, i.e. the simultaneous separation of two immiscible liquids with different densities and a solid phase. The prerequisite is that the solid phase is present as the specifically heaviest phase. The function is like that of a decanter. The decisive difference lies in the separate discharge of the two liquid phases.





Flottweg Simp Drive®

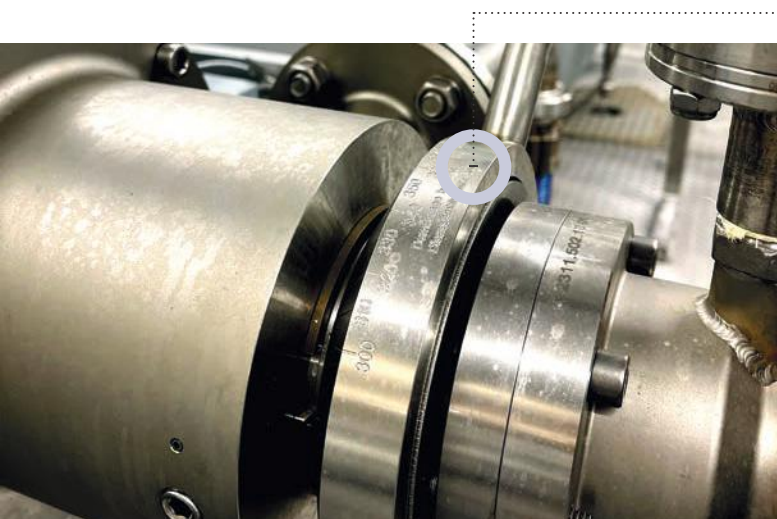
The Flottweg Simp Drive® regulates the differential speed according to the scroll torque. The Flottweg decanter/Tricanter® automatically adapts to different load conditions and drains/dewaters the product to the maximum total dry solids.

- Lowest energy demand due to high efficiency
- Purely motorized operation, therefore no oversizing of the drive motors
- Scroll rotates independently of the rotor, so it is also possible to clean out the machine when it is at a standstill – even after a power failure without dismantling system equipment



Wear protection and material

- When using a Flottweg decanter or a Tricanter®, optimum wear protection is crucial for the respective application.
- All wear parts are protected by special, hard surfaces made of tungsten carbide or SIC and replaceable wear bushings.
- Under operating conditions, the Flottweg wear protection system lasts more than 24,000 operating hours.



Flottweg impeller (series with Tricanter®, optional for the decanter)

The adjustable impeller can vary the pond depth continuously during operation, allowing for quick and precise adaptation to changing feed concentrations.

- Highest separation efficiency, even with varying feed mixture composition
- Optionally available with automatic remote adjustment
- Discharge of the liquid phase under pressure. An additional conveying pump can be omitted, if necessary
- On request: fully automatic control by turbidity measurement in the oil or liquid phase

FLOTTWEG SEPARATORS

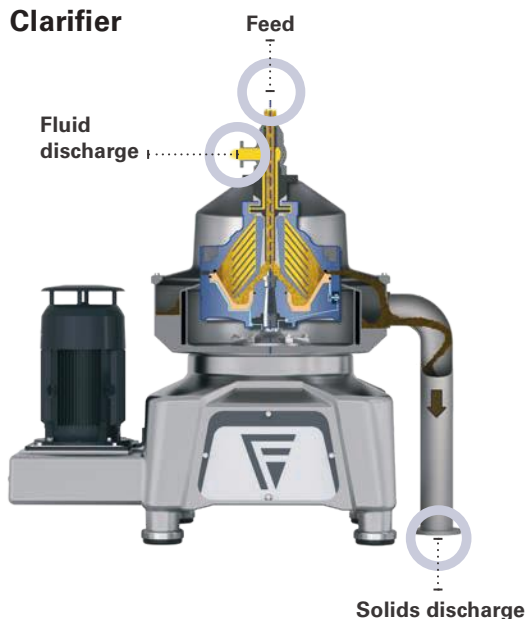
Highest separation performance for oil slurry treatment

Flottweg separators are used when a high purity of the recovered oil is required. This is because they are capable of freeing liquids from the finest solids or separating liquid mixtures with different densities.

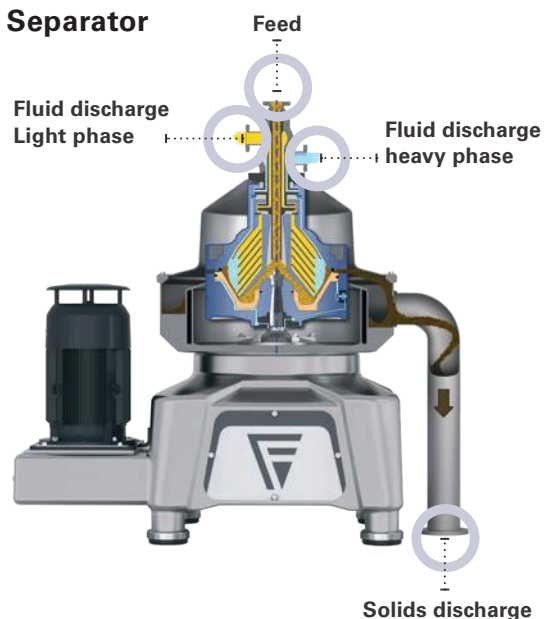
The pre-purified oil from the Flottweg Tricanter® is heated and then further processed in the separator. With significantly higher rotational speeds than decanter centrifuges, Flottweg separators generate an extremely high centrifugal acceleration (g-force). Residual water and the finest solids are removed.

Our powerful, self-cleaning separators of the AC series (Automatic Cleaning) are particularly suitable for the mineral oil industry.

Clarifier



Separator



Use in oil slurry processing

- **Clarification separator:**
Removal of ultrafine solids from liquids
- **Density separator:**
Separation of liquid mixtures with different densities and simultaneous solids separation





The Flottweg Soft Shot® FLEX system

- Soft Shot® FLEX discharge system for fully automatic discharge of separated solids from the bowl
- High flexibility thanks to variable speeds and any combination of partial and full discharge operations
- High clarification efficiency and high concentration of solids
- Quiet operation, the discharge is almost inaudible



Sturdy design

- Due to the Soft Shot® discharge system, highly stressed components are less stressed, which significantly reduces wear
- Special wear protection in the bowl and the solids discharge
- Optional: super duplex stainless steels for higher resistance to chlorides
- This results in lower maintenance costs and longer machine life



Drive

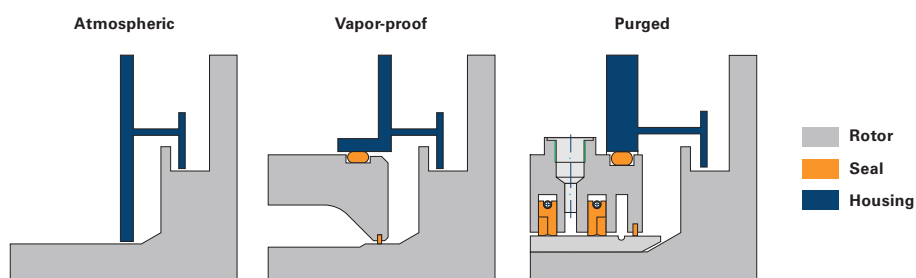
- Quiet and energy efficient belt drive
- Reduced starting current, working speed reached rapidly
- Easy maintenance, low-wear drive concept
- Fast, smooth reacceleration after solids discharge
- This reduces power consumption and reduces mechanical stress on the system
- Standard drive motors, resulting in high availability
- Compact spindle: easy maintenance, thanks to good accessibility and pre-assembled main components

EXPLOSION PROTECTION ACCORDING TO ATEX

Safety for demanding mineral oil processes

Explosive atmospheres can occur during the processing of mineral oil and mixtures containing oil. For these applications, Flottweg offers explosion-proof centrifuge solutions according to ATEX Zone 1 and 2, which guarantee maximum safety in all process stages.

Thanks to special housing seals and inert gas superposition (e.g. with nitrogen), combustible media can be processed safely beyond their flash point – without compromising efficiency or process stability.



Due to reinforced housings around the rotor and various seals, it is possible to operate Flottweg centrifuges even in closed systems.



Flottweg sealing systems advantages

- No risk from release of undesirable product emissions to the environment
- No formation of a flammable mixture, since an ingress of ambient air (oxygen) to the medium being processed
- Improved sealing effect through additional seals on shaft penetrations and housings
- A high number of sealing elements ensures low consumption of inert gas
- Standard components such as solenoid valves and sensors ensure high availability



PURGING: CONTROLLED ATMOSPHERE

When processing flammable or potentially explosive media, protection against ignition sources is essential. Flottweg centrifuges offer a well designed purging concept that ensures maximum safety while operating efficiently.

Flushing with inert gas

Prior to commissioning, the entire plant – including centrifuge – is purged with inert gas. The oxygen content in the plant is reduced to a non-critical level to reliably prevent the formation of ignitable mixtures.

Blanketing with inert gas during operation

During operation, inert gas is continuously supplied to maintain a slight overpressure in the system. This prevents the ingress of air as well as the escape of product vapors.

Automated pressure monitoring

The blanketing is regulated by a pressure-monitored sealing system. The differential pressure is automatically kept constant and visualized via the Flottweg control system – for maximum process reliability without manual intervention.

The Flottweg sealing principle

The specially developed sealing system ensures a separation between the product and the environment. It reliably protects against emissions and ensures safe operation – even with demanding media.







SUCCESS IS... WHEN ADDED VALUE IS COMPLETELY ORGANIZED

Proven complete solutions for the mineral oil industry: for the efficient treatment of oil sludges and process wastewater containing oil, Flottweg offers custom-made plug & play systems that are individually tailored to the respective requirements. Depending on the nature of the starting material, upstream treatment stages can be integrated to achieve an optimum separation result.

At the center of the systems are the proven and powerful mechanical separation stages with Flottweg decanter and separator systems. These are supplemented by:

- Control cabinet and explosion-shielded control panel
- Automatic inlet control
- Flow measurement and other process-relevant components

Optionally, additional assemblies such as screen technology, pumps or heating systems can be integrated into the plant to further optimize the overall process.

On request, Flottweg supplies the systems completely piped, wired and tested. Commissioning is performed by factory-trained and experienced service personnel directly on site. For maximum flexibility, the plants are also available as skid-mounted systems.





Our complete solutions feature a flexible and scalable process and module system

Whether pumping, processing, separating ... or even administrative tasks:
For all work within the mineral oil value chain, we offer optionally available process stages and modules for the best possible work result:

- **Product separation**
- **Centralized control and monitoring**
- **Product feed**
- **Chemical and mechanical product processing**
- **Product prewarming**
- **Steam generation**
- **Energy production**
- **Nitrogen production**
- **Temporary storage**
- **Tank cleaning accessories (nozzles, cleaning robots, etc.)**



FLOTTWEG QUALITY AND SERVICE



Guaranteed Flottweg quality

Typical “Made in Germany”: we have a clear understanding of what quality is and do not compromise on it. Therefore, the Flottweg centrifuge components that come into direct contact with the medium to be processed (e.g. bowl, scroll, and feed) are made exclusively of high-grade, rust and acid-resistant stainless steels. This also makes it possible to increase the strength and improve the resistance.

Our machines are equipped to meet your requirements permanently – in extreme cases 24 hours a day, 7 days a week. Our strict quality controls (ISO 9001:2015) and the traceability of all critical components ensure additional product safety.



Our service – always there for you!

Over 1,100 employees worldwide in a network of more than 60 sales and service locations are available to assist you. We not only strive for first-class advice on the selection and design of our systems, but we are also there for you afterward, whenever you need us – in more than 100 countries around the world.



Success can be planned. 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 discuss your separation task and business goals with you.

02

In the pre-engineering stage, we analyze your raw materials in our laboratory and carry out customized tests at the Flottweg Technical Center or on site at your business premises. The first product samples can also be provided at this point.

03

After the design and detailed development process, you will receive a concrete offer including all relevant line figures for your individual Flottweg application.

Make Flottweg the engineer of your success:
Our sales partners are looking forward to hearing about your ideas and challenges!



Flottweg worldwide

To be able to serve our customers worldwide, we maintain an international sales and service network: we are represented in over 100 countries. All branches and representatives have specially trained service technicians, some of whom we train in our in-house Flottweg Academy.

11
international
subsidiaries

Projects in over
100
countries

Over
50
service centers

- – Headquarters
- – Subsidiary
- – Representative



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