

## THE FLOTTWEG ISP PROCESS

Innovation in Soy Protein Extraction



# SOY PROTEIN EXTRACTION

## SOY PROTEIN

Soy protein has become one of the primary sources of vegetable protein for human and livestock consumption. The growing demand for soy products such as isolate and milk requires highly efficient production lines in terms of product quality and yield.

## PROTEIN ISOLATE

The basic stages of the protein isolate extraction process have been known for a long time. They consist of slurry preparation using defatted soy flakes or flour and water, separation of non-protein solids and fibers, and finally precipitation, separation and drying of the protein.

**Up-to-date equipment and accurate engineering are the key requirements for the process in order to achieve:**

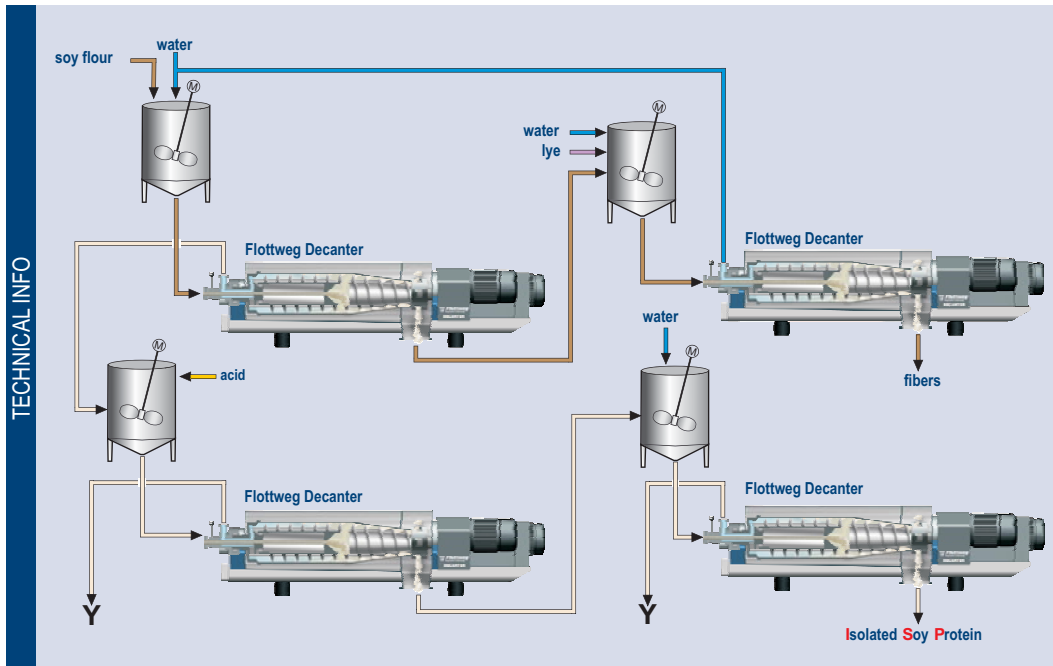
- Optimum yield in protein
- High efficiency of the process
- Process line without bottleneck
- Product purity and quality
- Standardization of products
- Flexibility and stability of the process





# PROCESS DETAILS

Complete Customized Systems Solutions



Flottweg Isolated Soy Protein Process

## PROTEIN EXTRACTION

A slurry of soy flour and water is produced and the protein is brought into the solution. Then the low-protein fibers are separated from the protein-enriched solution by centrifugal force.

## CURD WASHING

The precipitated and separated protein still contains some impurities of the mother liquor. Thus the protein is re-slurried using water and separated again.

## PROTEIN PRECIPITATION

The pH of the protein-enriched solution is adjusted to the isoelectrical point to precipitate protein particles, which then are separated from the mother liquor using centrifuges.



# BENEFITS OF THE FLOTTWEG ISP PROCESS

Characteristic for the **Flottweg Isolated Soy Protein Process** is the use of Flottweg Decanters in the extraction stage and in the precipitation and washing stages. The use of up-to-date Flottweg Centrifuge Technology makes the ISP process highly flexible and available.

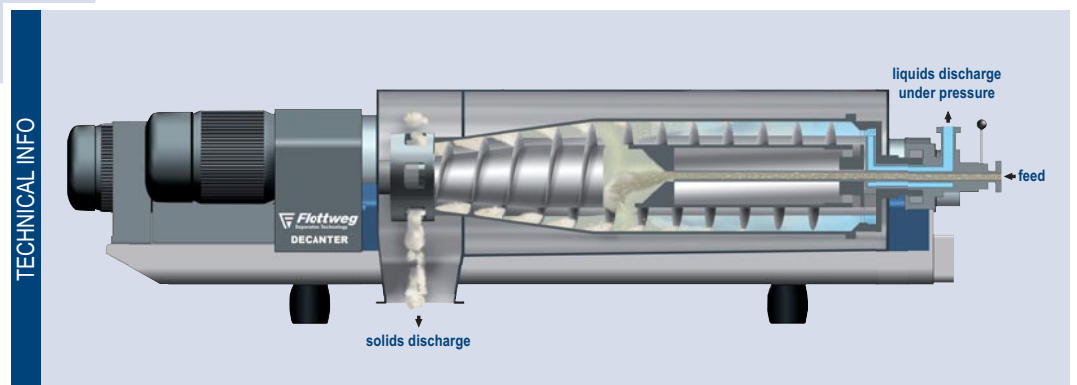
Flottweg Centrifuges can be easily adapted to varying feed conditions and are CIP-capable.

All components of the Flottweg ISP Process are closed systems with minimum air intake, which results in reduced foam formation, low oxygen pick-up, and reduced off-flavor.

Flottweg Decanters provide high centrate clarity and decent cake dryness resulting in a high yield in protein without the need for the use of disc stack centrifuges and their related costs of investment and maintenance.

**The Flottweg ISP Process is suitable for new installations as well as for revamping and debottlenecking existing process lines**

- Reduced foam formation
- Reduced off-flavor
- Low oxygen pick-up
- Increased yield
- Cost efficiency



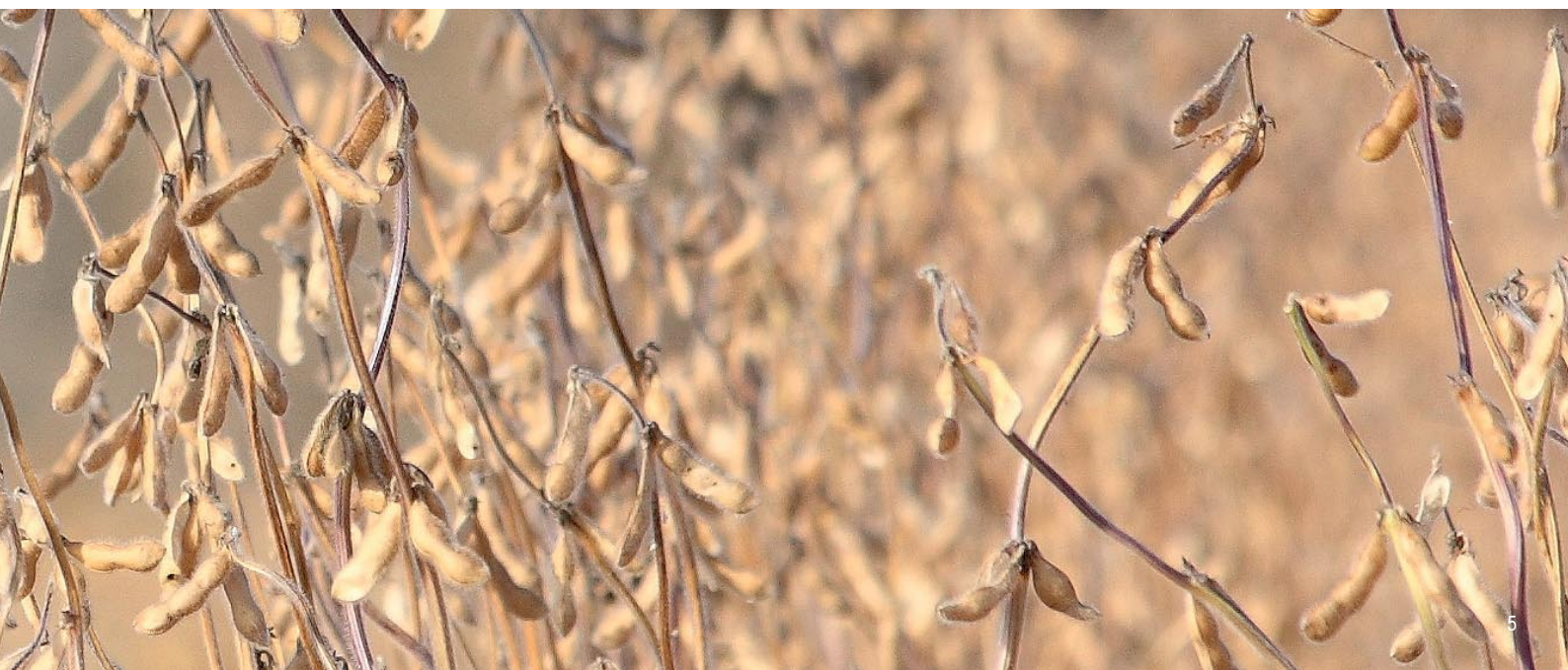


Flottweg Decanters applied in the ISP process are in compliance with the requirements of hygienic design and are fully CIP-capable. All product wetted parts are made of stainless steel with appropriate surface finish. Flottweg Centrifuges applied in the ISP process are equipped with both a servo-driven adjustable impeller for automatic adjustment of the liquid level inside the bowl, and with the patented Flottweg Simp Drive® for the automatic control of the differential speed.

The servo-driven adjustable impeller and the Flottweg Simp Drive® are self-thinking systems for an automatic adaptation to varying feed conditions.

## Reasons why the use of Flottweg Centrifuges makes the ISP process so effective

- Fit-for-purpose lay-out to meet different requirements in different separation stages
- Hygienic design and CIP-capability for effective cleaning and minimum downtime
- Variable frequency drive (VFD) and control system – flexibility for easy adaptation to varying process conditions



# SPECIAL DESIGN FEATURES

## of Flottweg Centrifuges in Food Applications



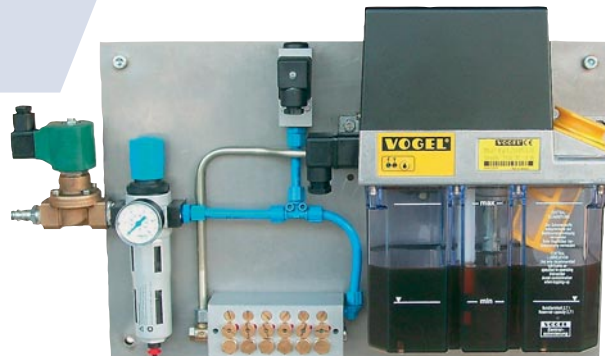
### FLOTTWEG SIMP DRIVE® – ENERGY EFFICIENCY

The Flottweg Simp Drive® automatically controls the scroll differential speed according to the torque load that the feed stream generates. Thus, the Flottweg Decanter adapts itself to varying operating conditions, such as solids load and feed rate, resulting in optimum cake dryness. The Simp Drive® enables Flottweg to use standard “off-the-shelf” frequency converters and smaller motors, which will save the end user money during installation and on operation power over the lifetime of the equipment.



### AIR/OIL LUBRICATION SYSTEM – INCREASED BEARING LIFETIME

Flottweg’s simple, compact, and effective air/oil (droplet) lubrication system guarantees that the bearings are continuously provided with the optimal amount of fresh, non-recycled oil, thereby minimizing bearing temperature and maximizing bearing life while reducing energy consumption and requiring virtually no maintenance.



Oil-air lubrication system



### SERVO-DRIVEN ADJUSTABLE IMPELLER – HIGH FLEXIBILITY

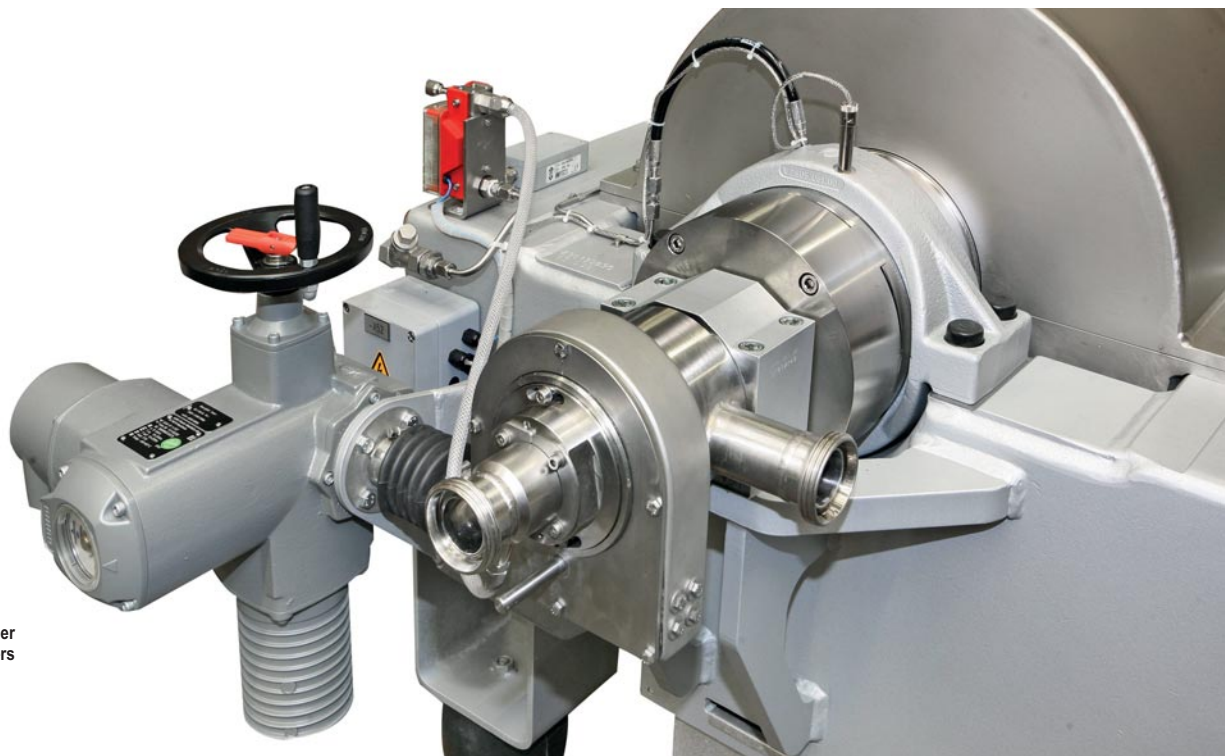
Quick and accurate adaptation to varying operating conditions: Flottweg’s Adjustable Impeller allows for continuous variation of the pond depth during machine operation.

### COMPACT CONSTRUCTION – EFFECTIVE MAINTENANCE

Flottweg Decanters have the most compact machine and required machine maintenance footprints allowing the end user to maximize plant space utilization. In conjunction with the compact layout, Flottweg Machines have design features that make them the most ergonomic, maintenance friendly, and accessible centrifuges available.

### HYGIENIC DESIGN – INCREASED AVAILABILITY

Flottweg Decanters are laid out in hygienic design as closed systems to avoid air intake and to enable CIP-capability.



Automatic adjustable impeller  
of Flottweg Decanters



# FLOTTWEG ENGINEERING

We Provide Support to Our Customers



## PROCESS ENGINEERING

Layout of components and package units for all process stages.

## PROCESS OPTIMIZATION

Our specialists are qualified for process analysis and debottlenecking, as well as for modernization and expansion of existing installations.

## PRODUCT DEVELOPMENT

In cooperation with our customers, we provide our capability for the development of soy products with different functional properties, hydrolizates, and lecithination.

## PILOT TESTS

Our experienced and well-trained test engineers carry out pilot tests at the Flottweg Test Bay or field tests at the customer's facility.



# DECANTER CONTROL

## VIBRATION MONITORING (STANDARD)

Vibration sensors transmit acceleration signals to an analyzer that sounds an alarm or shuts the centrifuge down upon reaching the maximum permissible level.

## SPEED MONITORING (STANDARD)

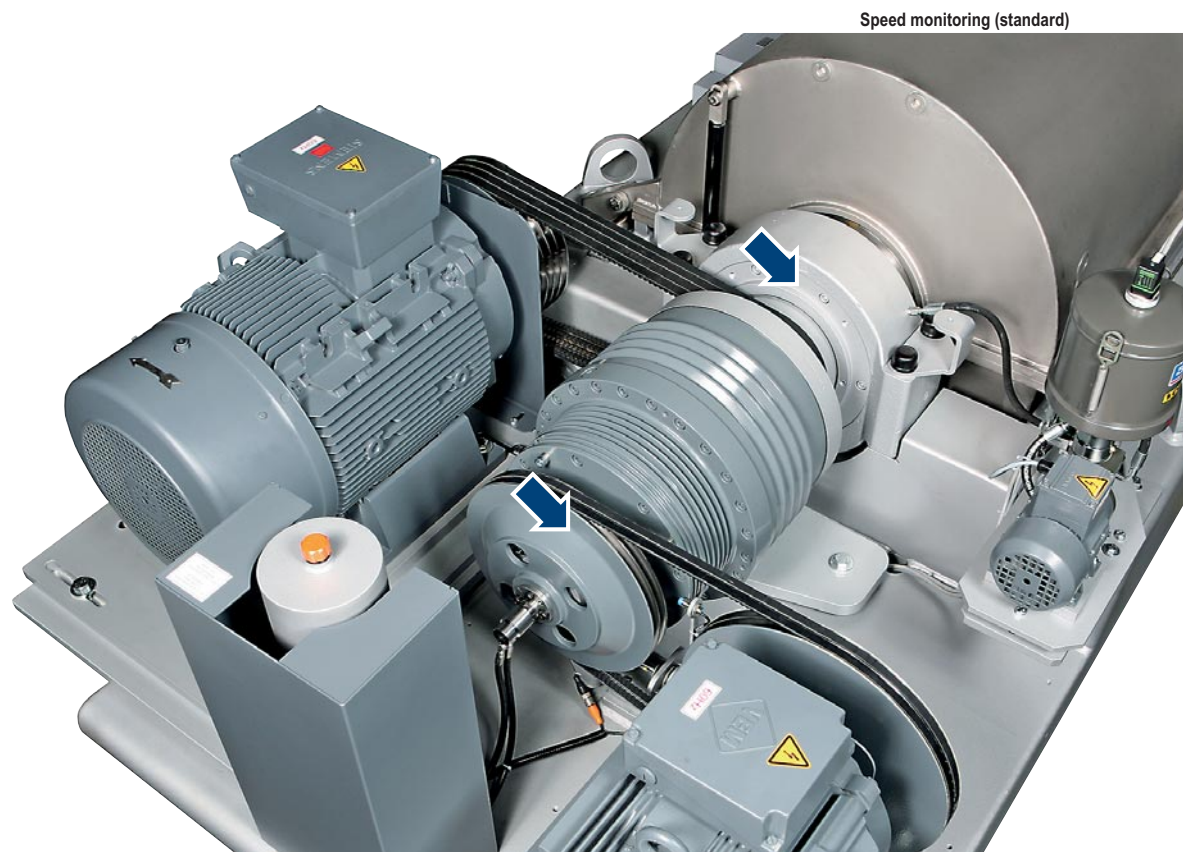
Bowl speed and scroll differential speed are each measured by an inductive proximity switch and shown on a digital display. Continuous monitoring of maximum and minimum values during operation helps to minimize preventable failures and maintain acceptable safety standards.

## TEMPERATURE MONITORING (OPTIONAL)

Bearing temperatures are continuously monitored on Flottweg Centrifuges by means of resistance thermometers. Upon exceeding pre-set temperature limits – between 100°C and 130°C depending on the individual application – , the centrifuge gives an alarm or shuts down. This preventive measure safeguards against bearing failure or machine damage.



Vibration monitoring (standard)



Speed monitoring (standard)



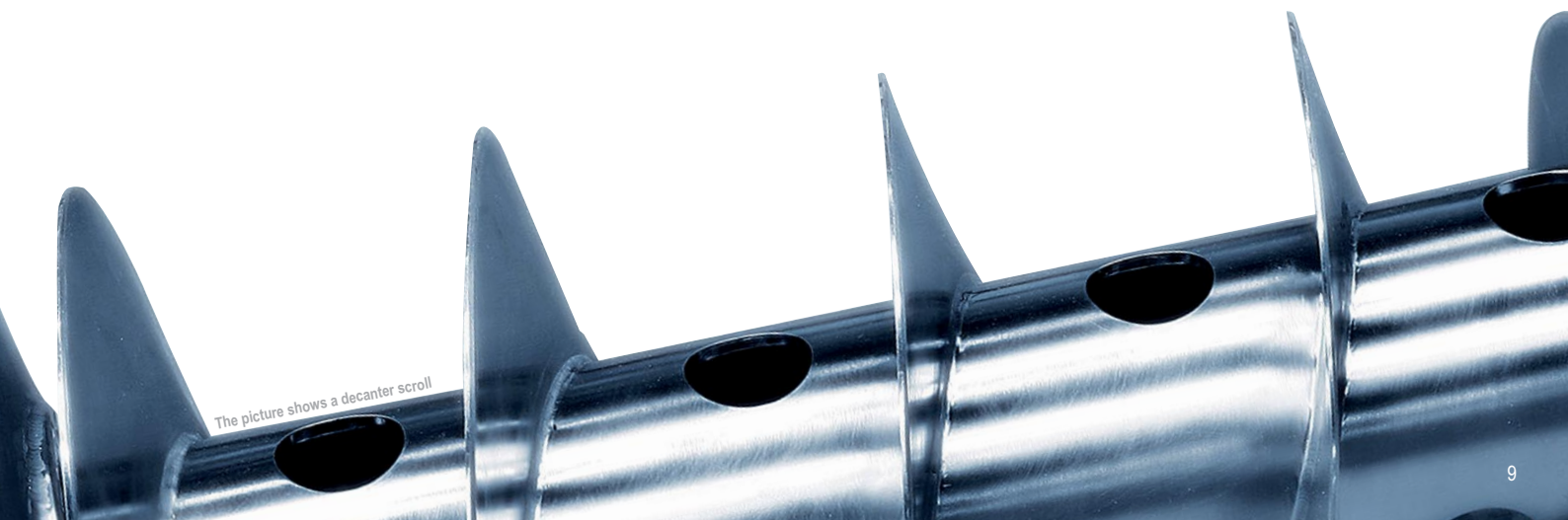
# TECHNICAL DATA

## of the Flottweg Decanter



TECHNICAL DATA – FLOTTWEG DECANTERS FOR THE ISP PROZESS			
Model	Z5E	Z6E	Z8E
Bowl diameter	530 mm (21")	620 mm (24")	770 mm (30")
Rotation speed of the bowl	3625 / min	3500 / min	3000 / min
Materials	All parts in contact with product are made of high-grade stainless steel, e.g. 1.4463 (Duplex), 1.4571 (AISI 316 Ti), etc.		
Dimensions (L x W x H)*	4500 x 1600 x 1200 mm	5150 x 1700 x 1500 mm	6400 x 2000 x 1500 mm
Gross weight*	6800 kg	8300 kg	14400 kg
Motor sizes	55 + 15 kW	90 + 30 kW	130 + 55 kW
Options	Electropolished surfaces, frame in stainless steel, hydraulic and drive motors		

\* The figures listed are guidelines only. Actual capacity will depend on the individual characteristics of the feed product.



The picture shows a decanter scroll

# GLOBAL AFTERMARKET SUPPORT NETWORK

No Matter Where You Are in the World



## CUSTOMER SERVICE IS OUR STRENGTH

Application-based project planning, high-quality manufacturing and professional after-sales service are prerequisites for a trouble-free operation. Experienced and reliable service engineers from our customer service department are ready to respond quickly if needed. The Flottweg Service Group is also available to perform preventive maintenance in order to avoid interruptions in production.

## QUALITY “MADE IN GERMANY”

Flottweg is ISO 9001 certified and manufactures its products in compliance with the latest technical standards.



## Flottweg Services include:

- Experienced advise on separation processes
- Pilot tests on-site or at the Flottweg Laboratory and Test Center
- Selection and sizing of appropriate equipment
- Customer-specific automation/control systems and process integration
- Design and construction of complete process systems
- Installation, commissioning, maintenance, repair, and spare parts service worldwide





## AFTER-SALES CUSTOMER SERVICE

Even the best machinery needs to be maintained and serviced. Flottweg has established a worldwide service network consisting of its own subsidiaries, branch offices, and representatives to provide our customers with local service and spare parts.

Our service engineers and technicians are qualified for any kind of installation, commissioning, repair, and maintenance.



Flottweg Service Technicians are always available for you

## FLOTTWEG WORLDWIDE

Flottweg is headquartered in Vilsbiburg (near Munich), Germany, and has branch offices in Cologne and Leipzig as well as subsidiaries in Australia, Brazil, China, France, Italy, Mexico, Poland, Russia, and the United States, along with representatives in nearly all countries worldwide.

Check out our website at [www.flottweg.com](http://www.flottweg.com) to find a competent contact person.



# Flottweg Separation Technology – Engineered For Your Success



Flottweg SE  
Industriestraße 6-8  
84137 Vilsbiburg  
Deutschland (Germany)

Tel.: +49 8741 301-0  
Fax: +49 8741 301-300

mail@flottweg.com  
www.flottweg.com

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