



**FLOTTWEG CENTRIFUGE TECHNOLOGY  
FOR USE IN STEELWORKS**  
Maximize Profit and Recovery!



# MECHANICAL SEPARATION IN STEELWORKS

## Enhance your success with Flottweg Centrifuge Technology

Over past decades, steelworks with smoking chimneys were a sign of a booming economy and industrial growth. However, due to the importance of reducing exhaust gases all over the world, modern steelworks work more efficiently nowadays. This means steelworks consume less energy and fresh water, which in turn results in reduced emissions of exhaust gases and reduced production of wastewater. Consequently, Flottweg Decanters are used all over the globe for processing and cleaning of exhaust gas wash water as well as industrial wastewater.

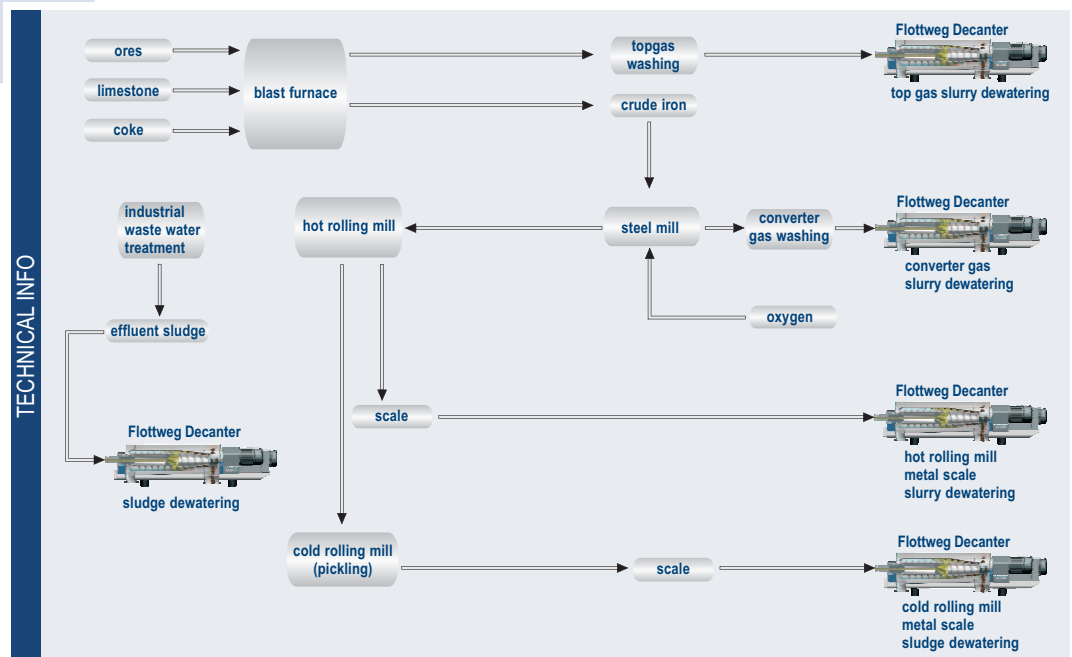
To reduce the emissions of dust, the top gases and exhaust gases are cleaned using gas washing scrubbers whereby waste water is produced. Further waste water is produced in scaling devices of rolling mills where water is used for example for cooling purposes.

Flottweg Decanter Centrifuges purify the produced waste water streams by separating the solid residues. The water cycle is closed by reusing the cleaned water for washing or cooling processes and the production of waste water is minimized. The residual solids consisting

### Flottweg Decanters are used for the following applications in steelworks:

- Furnace gas dedusting and cleaning
- Converter gas dedusting
- Scale slurry processing and separation
- Pickling slurry processing
- Sewage slurry processing
- Water circuit cleaning

mainly of carbon, ash or iron oxide can be either reused in the process for sintering or be land-filled. For more information about the use of a Flottweg Decanter in steelworks, please have a look at the process scheme below



# FLOTTWEG EXPERT KNOWLEDGE IN STEELWORKS

## Flottweg Decanters for Cleaning of Exhaust Gases and Wastewater



Flottweg has been developing and producing centrifuges for more than 60 years, and is one of the world's leading decanter manufacturers. No other manufacturer of decanter centrifuges has so much experience in cleaning wastewater and exhaust gases in steelworks as Flottweg does.





# OPERATING PRINCIPLE 2-PHASE

## The Flottweg Decanter

### FEED

The product is fed through a stationary pipe into the feed zone located in the center of the rotating assembly. The product is then accelerated circumferentially and delivered through ports in the scroll into the bowl.



### SCROLL

The scroll rotates with a slightly different speed than the bowl and conveys the separated solids toward the conical end of the bowl. This differential speed determines the time the solids spend in the bowl. This time is a critical factor for cake dryness. It can be automatically adjusted by changing the differential speed of the scroll thus providing optimal separation. Depending on the physical properties of the product, Flottweg Decaners can be supplied with a different scroll design or by modifying an existing scroll. Scroll pitch and single or multiple lead configurations are important design variables.



### BOWL

The bowl has a cylindrical and conical section. The rotational speed is pre-set optimally to the application and requirements. The slurry rotates with the bowl at the operating speed and forms a concentric layer on the bowl wall. The solids contained in the product are packed against the bowl wall by centrifugal force. The length of the cylindrical bowl section and the cone angle are selected to meet the specific requirements of an application.

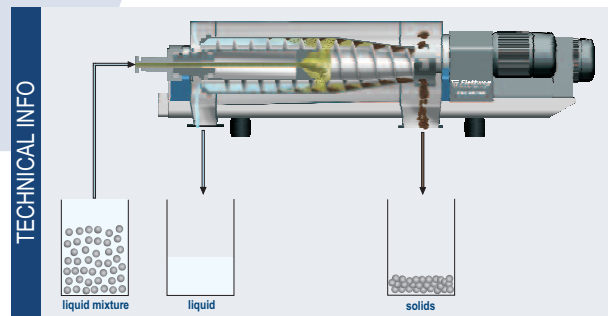
### SOLIDS DISCHARGE

Settled solids are ejected through ports at the conical end of the bowl into the solids housing and fall vertically through the discharge chute.

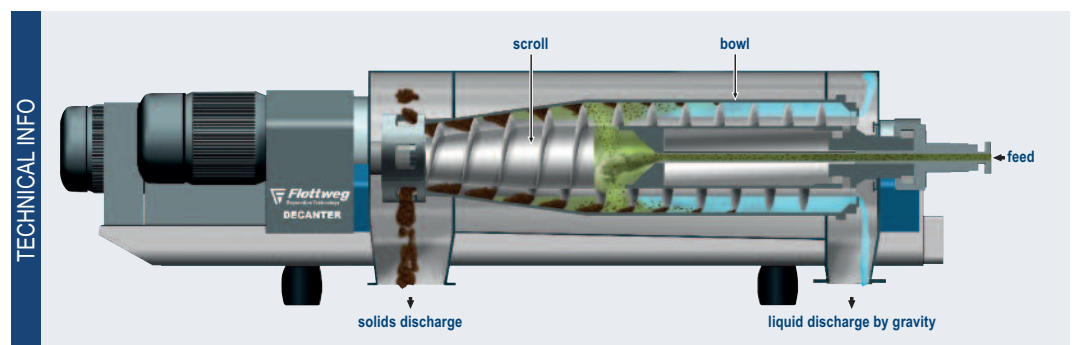


### OVERFLOW WEIRS

The clarified liquids flow to the cylindrical end of the bowl where they exit over weir plates. Easily adjustable weir plates allow for precise adjustment of the pond depth in the bowl. The liquid overflow is then collected in a centrate chamber and discharged by gravity.



Flow of liquids and solids in a Flottweg Decanter



Flottweg Decanter for the separation of solids from liquids with discharge of the liquid phase (centrate) by gravity

The picture shows a decanter scroll

# TAKE ADVANTAGE OF OUR EXPERTISE ... ... and Many Years of Experience in Steelworks!



Flottweg Containers have been designed and manufactured specifically for use in steelworks.



Flottweg Decanters are used world-wide in the steel industry. They are an important component in cleaning exhaust gases and wastewater in steelworks.



Flottweg Technology and a best-practice example for use in steelworks

Ask our sales agents for more references!



# FLOTTWEG DECANTER CENTRIFUGES FOR CLEANING WASTEWATER AND EXHAUST GASES IN STEELWORKS

## SAVING COSTS

Using Flottweg Technology cuts costs because decanters reduce fresh water consumption, which is a crucial argument for an operator of steelworks. Moreover, fully automatic operation enables reduction in operating requirements. Last but not least, a reduction in maintenance work by almost 90 % and less space requirements compared to filter systems are two additional arguments for Flottweg Technology.

## EXPERIENCED AND FIELD-PROVEN

Overall, Flottweg Decanters represent a solution for steelworks that is as elegant as it is efficient. After all, what can be returned to the material cycle does not have to be expensively disposed of. This increases the efficiency of the system and reduces environmental pollution. Moreover, the fact that Flottweg has been developing and producing centrifuges for more than 60 years, and is one of the world's leading decanter manufacturers, is an important argument for operators of steelworks. These facts set us apart from our competitors.

## HIGH G-FORCES

Flottweg Decanters not only feature intelligent drives but also unique wear protection as well as outstanding g-forces. Moreover, the higher the g-force, the better is the result of separation. Flottweg Decanters are attractive for operators of cleaning wastewater and exhaust gases in steelworks because of their high level of versatility in terms of the available g-forces which can be adjusted to the optimal value. For hard separation tasks like cleaning wastewater and exhaust gases in steelworks, this delivers a world-wide leading processing advantage.

## Key success factors for use in steelworks

- Plant and system construction for satisfying individual customer requirements as well as perfectly adjusted processes.
- Flottweg Simp Drive® enables high throughput performance due to high bowl speed and precisely adjusted differential speed.
- Unique wear protection is a key success factor because it enables an optimum process even under difficult conditions.
- Flottweg Machines are designed and manufactured to fulfill the aforementioned success factors, so as to ensure and provide the best possible results for an operator.

# FLOTTWEG PRODUCT FEATURES FOR SEPARATING AND PROCESSING OF EXHAUST GASES IN STEELWORKS

## Benefits of using a Flottweg Decanter

### Customer benefits of Flottweg Simp Drive®

- High flexibility in selection of the operating speed (high g-forces do not matter)
- High throughput performance due to high bowl speed and precisely adjusted differential speed
- Simp Drive® for a broad range of applications in which continuous adaptation of the operating parameters is required.
- Lower energy requirements than conventional gear units due to higher efficiency (cost saving)
- Machine can be cleared out even at a standstill, because the scroll can still be turned nevertheless (no need to dismantle system components).



### SIMP DRIVE®: SIMPLE, INTELLIGENT, MODULAR AND POWERFUL

The Simp Drive® regulates the differential speed between the decanter bowl and scroll depending on the prevailing scroll torque. The differential speed determines the length of time the solid remains in the bowl, and thus has a significant influence on the separation process. The bowl speed and differential speed can be adjusted independently of one another during ongoing operation. This is guaranteed by a special transmission mechanism of the Simp Drive® (special planetary epicyclical gear unit).



### WEAR PROTECTION

Optimum wear protection is crucial for decanters used in steelworks. Our centrifuges are protected against wear by means of carbide plating, tungsten carbide and ceramic paste as well as bushes made from silicon carbide ceramics for special applications. The service life of the wear protection in our centrifuges for dewatering residues from steel manufacture is generally in excess of 15,000 operating hours.

### Customer benefits of Flottweg Wear Protection

- Increased temperature resistance
- Improved corrosion resistance
- High hardness and armoring
- Enhanced surface characteristics
- Improved durability of the decanter
- Increased consistency and reliability of the process

### Customer benefits of plant and system construction

- Perfectly adjusted processes for operators
- Flottweg Experience in steelworks for a fast implementation into practice
- Experienced and excellently trained Flottweg Staff guarantee highest possible quality and success.

### PLANT AND SYSTEM CONSTRUCTION

Specifically for applications in steelworks, we supply complete centrifuge systems comprising Flottweg Decanters, pumps, intermediate tanks including suspension preparation, density regulation, flocculant dosing and control. We offer you an all-round peace of mind package and look after delivery, pipework, cabling and start-up.



# QUALITY MADE IN GERMANY

Features of our Machines – Rugged, Robust, Reliable!



## MATERIALS OF CONSTRUCTION

Flottweg exclusively uses high-quality duplex stainless steels for all parts that come into contact with the product. On request, Flottweg Cen-

trifuges are also available in more corrosion resistant materials such as super duplex steels or high nickel alloys e.g. Hastelloy.

## LUBRICATION

Flottweg Centrifuges can be provided with different lubrication systems according to customer requirements. The lubrication system depends on the type of operation, for example, batch or continuous operation and the degree of automation of the entire system. Flottweg Lubrication Systems allow for the re-lubrication of rotor bearings during operation. The availability of the different lubrication systems depends on the centrifuge model. Scroll bearings are lubricated for the entire service life or can be re-greased manually.

## MANUAL LUBRICATION

Direct lubrication at both rotor bearing blocks via a manual grease pump.

## CENTRAL LUBRICATION SYSTEM

Lubrication from a central manually operated pump. The lubricant is accurately dispensed through a piston distributor to the designated greasing points.

## AUTOMATIC GREASE LUBRICATION

In contrast to the manual central lubrication system, the greasing system can be operated automatically. This ensures uniform and reliable lubrication of the centrifuge. It prevents bearings from being under- or over-lubricated and eliminates short-term spikes in bearing temperatures and excessive grease consumption. The function of the grease pump is controlled by the control system. For the most stringent requirements, an oil-air lubrication system can be provided.

## AUTOMATIC OIL DROPLET LUBRICATION SYSTEM

The fully automatic oil-air lubrication system ensures for minimal quantity lubrication with oil droplets transported via a stream of air to the bearings. Optimal lubrication is achieved at high speeds, with low oil consumption and no loss in performance. Monitoring of the oil and air pressure guarantees high operational safety. Pneumatic designs are available for utilization in explosion-hazardous areas.



Central lubrication system (manually)



Automatic grease lubrication



Oil-air lubrication system



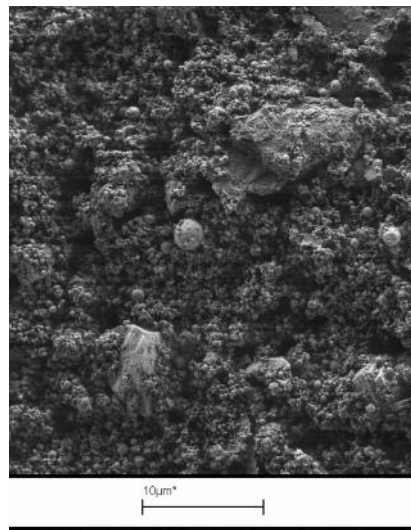
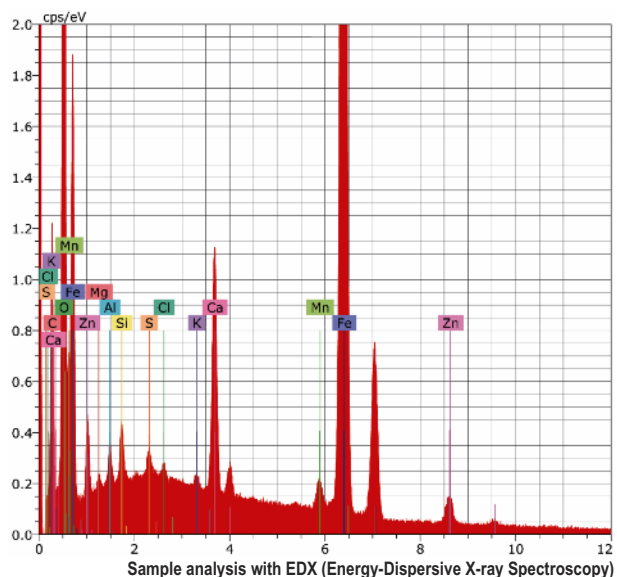
Every process is different. The various parameters have a significant influence on the separation efficiency. Knowing these parameters means increasing the efficiency and yield of your separation process.

We support our customers along the entire process chain from R&D raw material analyses to approval tests. Flottweg offers all necessary methods for analyzing your products and evaluating new potential.

Our worldwide locations and networks guarantee support and service for our customers. With the help of our experience and testing capability we develop made-to-measure solutions to meet your individual requirements.

### Our services

- Laboratory analysis – discover new options and performance parameters.
- Processing department – performance optimization of our separation solutions
- Project planning department – customized systems and solutions



Keep a close eye on your product quality –  
SEM – Analysis (Scanning Electron Microscope)  
of a typical top gas



# 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 all the latest technical standards.



## Flottweg Services include

- Experienced advice 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

## FLOTTWEG 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 localized 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, Canada, China, France, Italy, Mexico, Peru, Poland, Russia and the United States plus representatives in nearly all countries worldwide.

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



# TECHNICAL DATA

## Decanter Z-Series and Tricanter®

### Decanter



Z3E-4 4500 x g\*



Z4E-4 4140 x g\*



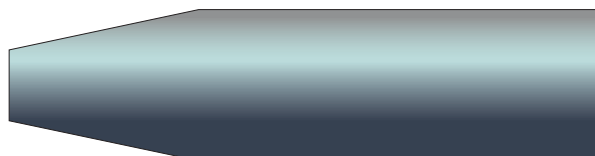
Z5E-4 3620 x g\*



Z6E-4 3550 x g\*



Z8E-4 3000 x g\*



Z92-4 2600 x g\*

### Tricanter®



Z3E-4 4500 x g\*



Z4E-4 4140 x g\*



Z5E-4 3620 x g\*



Z6E-4 3550 x g\*



Z8E-4 3000 x g\*

\*Acceleration in g, depending on the temperature and the density of the product

TECHNICAL DATA OF FLOTTWEG DECANTERS AND TRICANTERS®						
Model	Z3E	Z4E	Z5E	Z6E	Z8E	Z92
<b>Dimensions* (L x W x H)</b>	2950 x 840 x 800 mm 116 x 33 x 32 inch	3500 x 1000 x 1200 mm 138 x 39 x 47 inch	4200 x 1300 x 1150 mm 165 x 51 x 45 inch	4800 x 1800 x 1250 mm 189 x 70 x 49 inch	6200 x 2000 x 1500 mm 244 x 78 x 59 inch	5900 x 2800 x 1750 mm 232 x 110 x 69 inch
<b>Gross weight*</b>	1760 kg / 3880 lb	3000 kg / 6600 lb	6200 kg / 13600 lb	9750 kg / 21500 lb	14150 kg / 31200 lb	18000 kg / 39700 lb
<b>Motor for bowl drive</b>	18,5 kW	45 kW	90 kW	132 kW	160 kW	250 kW
<b>Motor for scroll drive</b> Flottweg Simp Drive®	7,5 kW	15 kW	55 kW	110 kW	110 kW	110 kW
<b>Max. hydraulic capacity**</b>	15 m³/h	35 m³/h	60 m³/h	80 m³/h	160 m³/h	180 m³/h

\* The listed figures are to be understood as guidelines. Actual capacity will depend on the individual characteristics of the feed product.

\*\* Data based on water, g-force depending on temperature, special material and product density. Data to be understood as guidelines.



# 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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