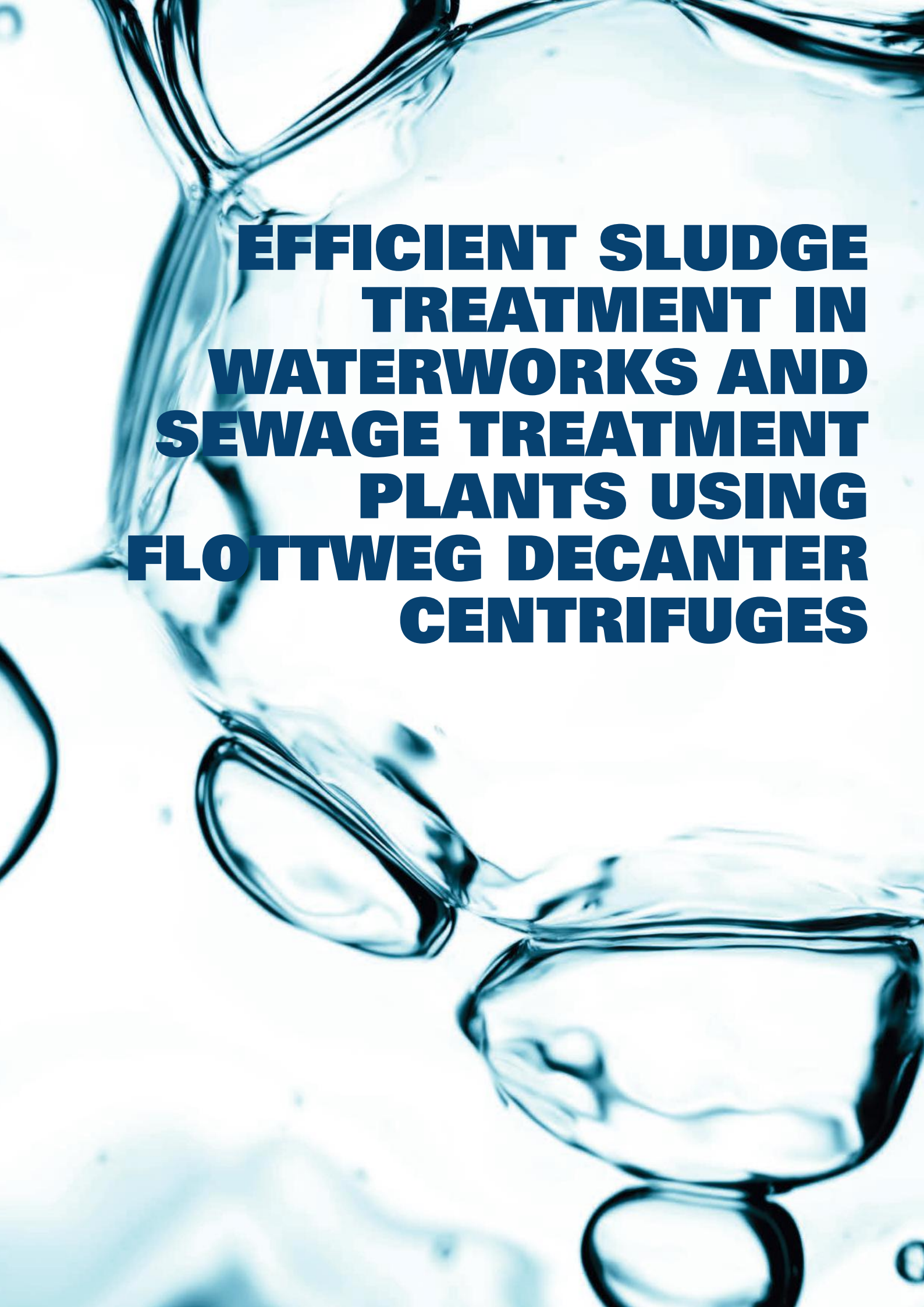


FLOTTWEG
DECANTERS
IN WATERWORKS
AND SEWAGE
TREATMENT
PLANTS

A dynamic background image showing water splashing and creating bubbles, rendered in a monochromatic blue color scheme. The water droplets and splashes are captured in motion, creating a sense of freshness and purity.

**EFFICIENT SLUDGE
TREATMENT IN
WATERWORKS AND
SEWAGE TREATMENT
PLANTS USING
FLOTTWEG DECANter
CENTRIFUGES**

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WHY EFFICIENT SLU IS CRUCIAL

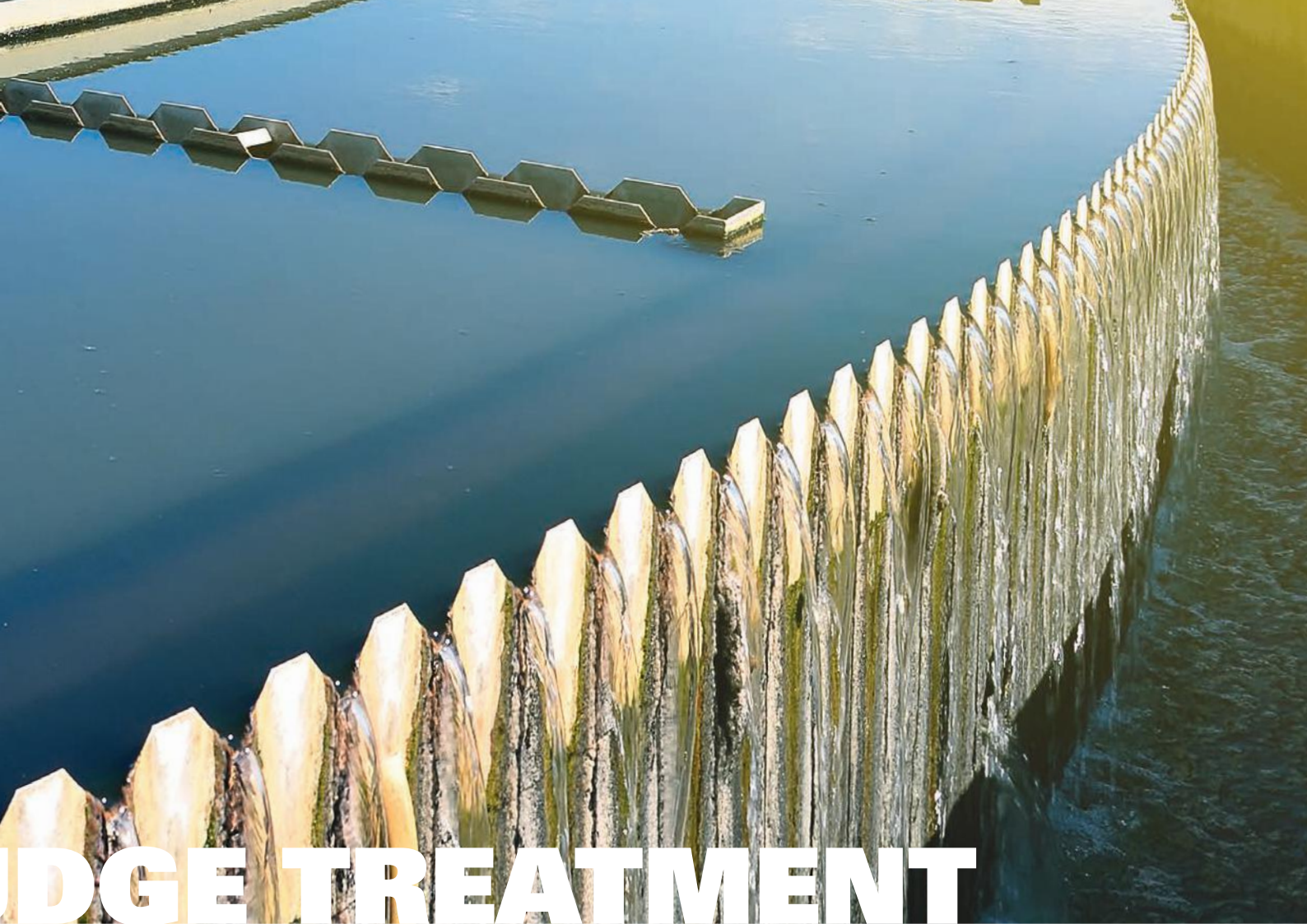
All water on earth circulates in a closed loop. The total quantity of water on earth amounts to 1.4 billion cubic-kilometers, 96.5% of which is sea water in the oceans. Only 3.5% is fresh water. However, more than half of this fresh water is in the form of ice on the poles, glaciers, and permafrost.

Clean water is becoming an increasingly important raw material. That's why municipal and industrial waste water treatment is also becoming increasingly important.

2

A key process in waste water treatment is the efficient separation and, as far as possible, mechanical dewatering of fine-grained sludge. Cost-effective, precise separation of these solids is crucial for keeping soils and waters clean, regardless of whether the solids are disposed of in landfills, reused as fertilizer, or incinerated.

To make this process step more economic and more efficient and to save energy, the use of industrial centrifuges in waterworks and sewage sludge treatment plants has become state-of-the-art technology.



DGE TREATMENT

The Five Most Important Parameters in Sludge Processing

In order to find the optimum, and above all, most economical solution for your dewatering process, you should always consider all the important parameters, when selecting the appropriate separation equipment.

The five most important parameters are as follows:

- Dry-substance content
- Capacity
- Polymer consumption
- Energy consumption
- Back-contamination in the clarified liquid (separation efficiency)

Flottweg is your competent partner for the right selection and dimensioning of your separation equipment. Many satisfied customers all over the world use Flottweg Decaners on a daily basis, with these decaners operating in treatment facilities serving population equivalents from 5,000 to 10,000,000.

Optimize your process! For more information, please visit our website:
www.flottweg.com

EFFICIENT, ECONOMIC

The Advantages of a Decanter Centrifuge for Your Success

Over the past few decades, we have been meticulously collecting and evaluating both our customers' demands and our process experiences. We have learned what is important to you.

Based on this knowledge, we are continuously improving the performance of our centrifuges, while always keeping in mind economic efficiency when optimizing your processes, as well as the price performance ratio of our machines. Furthermore, you will benefit from the typical advantages offered by centrifugal centrifuges.



Watertight Design

- Closed construction
- Excellent shielding of the working environment against odor emissions and sewage sludge aerosols



Simple Intelligent Modular Powerful

- Powerful Flottweg Simp Drive®
- Cost-effective due to its intelligent combination of rotor and scroll drives; conversion losses are reduced
- Machine can be emptied at standstill because the scroll rotates independently from the rotor (no disassembling of system components necessary, e.g. after a power failure)
- Fully developed and manufactured by Flottweg without purchased parts, so components are optimally dimensioned and adjusted to the machine
- High availability in the event of maintenance and service



Extra Dry Substance

- Scroll body consisting of double cone and weir disc
- Additional compression on the solids
- Therefore higher dry substance values in the discharged solids



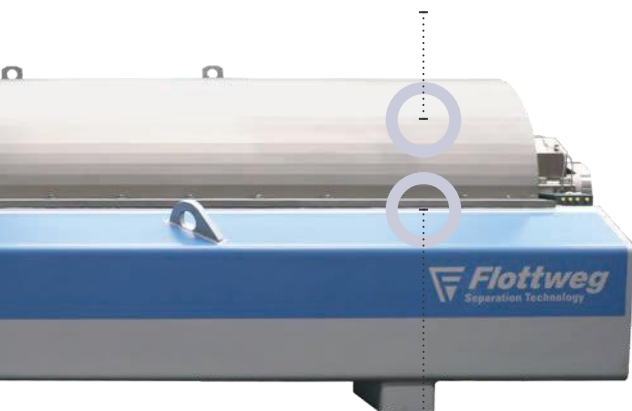
IC, COMFORTABLE



Master Saver

- Additional energy recovery thanks to the Flottweg Recuvane® System
- Reduced energy demand of your decanter of up to 30%*
- Easy retrofitting, quick pay-off
- Existing separation processes remain unchanged

*depending on the pond depth and the characteristics of the sludge



Wear Protection and Materials

- Extensive wear protection
- Protection of scroll with tungsten carbide tiles
- Protection of all feed and discharge openings with chilled hard metal portcastings
- All product wetted parts are made of high quality stainless steel.



Automatic Is Good!

- Fully automatic adjustment of the bowl and the differential speed produces optimum dry substance levels in the dewatered solids at any time, even in case of varying conditions in the feed
- Already 4.0 compliant – all options for remote monitoring and maintenance are available on request.
- Optional – automatic dosage of flocculants with real-time monitoring; polymer consumption is reduced additionally.
- Individual integration of the centrifuge control system into the main control system for maximum efficiency and security of your system



Dosage of Polymer Flocculant Aids

- To some extent, the polymer demand in sludge dewatering and thickening depends on the machine design.
- For maximum efficiency, the flocculants have to be added at the right time and for the right residence time.
- Therefore, the Flottweg OSE and HTS Decaners® and Xelletor Decaners are provided with a special mixing pipe.
- This means that the flocculants are added directly before the sludge enters the separation zone.



Intelligent Design

- Easy maintenance on-site due to simple replacement of wear parts
- Quick assembly and disassembly of the rotor and scroll helps to reduce service and maintenance costs

FLOTTWEG OSE DECANTERS

for Sludge Thickening

In sludge thickening, surplus sludge generated during the biological stages is concentrated from 1% or less dry substance content to 5 – 8% before it is pumped into the digester. As a result, the amount of sludge is reduced by 90 to 95%.

The Flottweg OSE Decanter (OSE = optimal sludge thickening) was created specifically for this purpose and has since then continually been further developed. Today, the Flottweg OSE Decanters stand out with their high performance, reliability, and cost efficiency.

Recent studies taking into account all relevant fixed costs (capital and labor) as well as variable costs (consumption of power, water, and polymer as well as spare parts) show that a thickening decanter has advantages over other thickening equipment. These advantages become increasingly significant in the case of large capacities and long operation time. Flottweg OSE Decanters are available for capacities ranging from 8 to 250 m³/h (90 to 1100 gpm) per unit.

For more information, please see our flyer on OSE decanters, available for download at www.flottweg.com.

Customer Benefits Versus Other Thickening Techniques

Most important point

- Solids concentration in the discharge is adjustable and controllable
- Optimized feed of the digester
- Increased gas yield and degradation rate

Optimized operation costs through

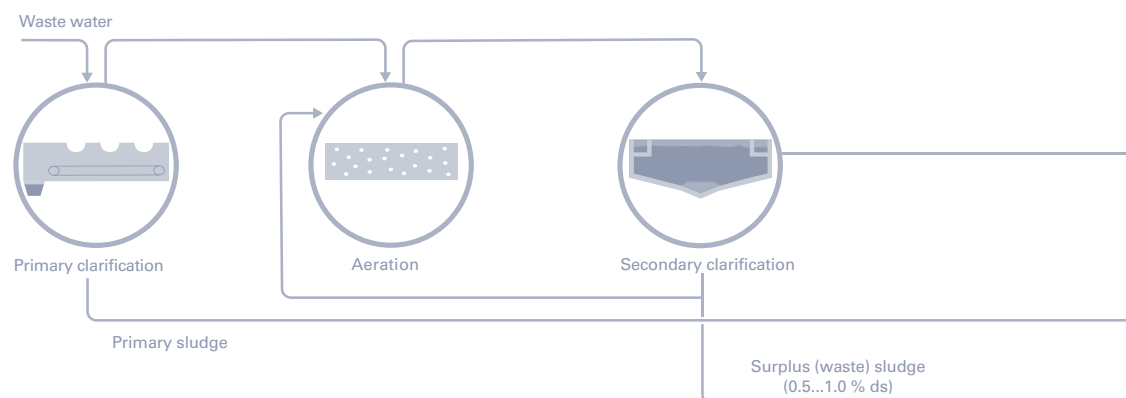
- Continuous and automatic operation
- Low specific energy demand
- Low or no polymer demand
- Easy cleaning by flushing without dismantling
- Highly-efficient wear protection
- On-site replacement of wear parts and safety inspections

Lower procurement costs

- Compact design, small footprint, and high capacities
- Closed design that minimizes odor emissions, no special vent line necessary

Versatility

- Flottweg OSE Decanters are also suitable for processing blended and primary sludge



FLOTTWEG HTS DECANTERS® AND XELLETOR DECANTERS

for Sludge Dewatering

Regardless of whether the sludge is transported after dewatering, reused as fertilizer, disposed of in landfills or incinerated – maximum dryness is the most critical factor.

Other key factors are cost efficiency in terms of polymers, energy, water and spare parts, as well as continuous, automatic operation at minimal costs.

All these critical design features were already taken into account at the beginning of the 1970s. The result of this continuous development is the complete Flottweg HTS Decanter® portfolio for sludge dewatering which includes equipment to handle capacities of 5 to 180 m³h (40 to 88 gpm).

Flottweg has developed a unique centrifuge concept specifically designed for the highly efficient dewatering of sewage sludge: The Flottweg Xellektor Series combines our most recent technologies and know-how from sludge dewatering.

For more information on HTS decanters® and the Xellektor series, please visit our website: www.flottweg.com

Customer Benefits Versus Other Dewatering Techniques

Optimal performance

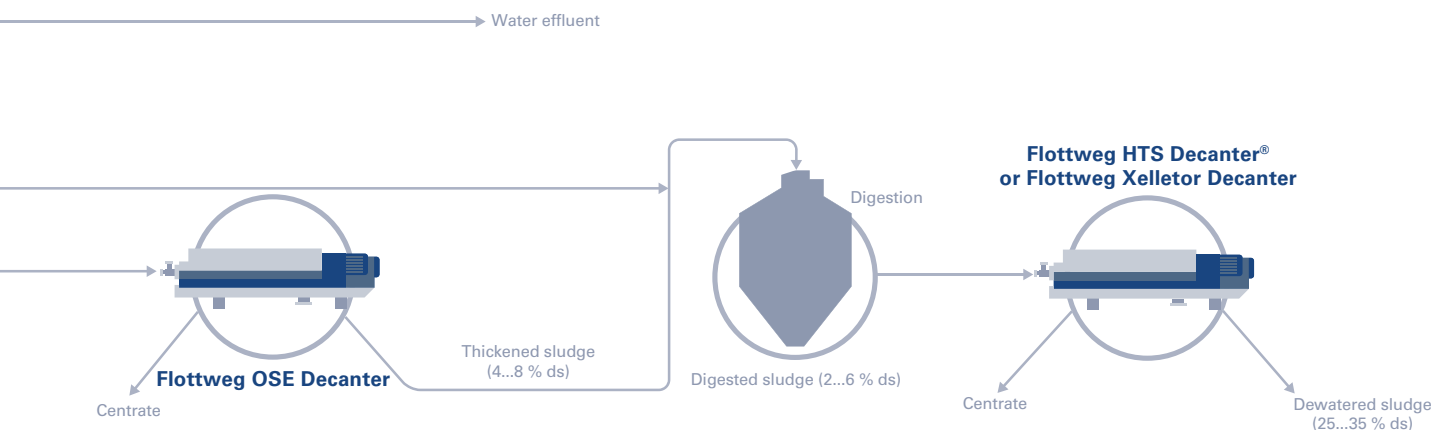
- Maximum cake dryness
- Minimum power consumption
- Minimum polymer demand

Optimized operational costs through:

- Continuous and automatic operation
- Easy cleaning by flushing without dismantling
- Highly efficient wear protection
- On-site replacement of wear parts and safety inspections
- No consumables such as filter aids, filter cloth, etc.

Flexibility

- Flottweg HTS Decanters® and Xellektor Decanters can be adjusted to varying feed and operation conditions during operation automatically via PLC or remote control.



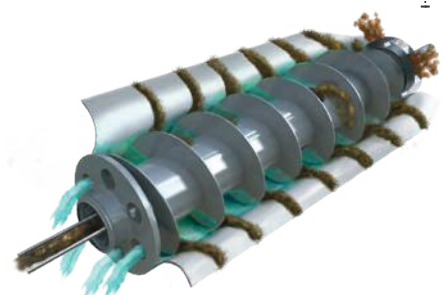
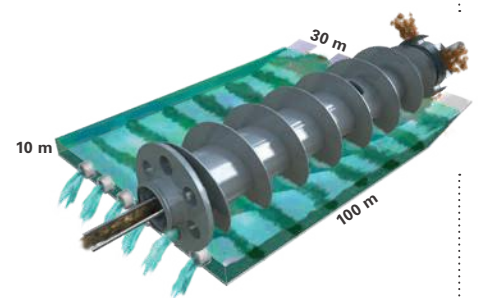
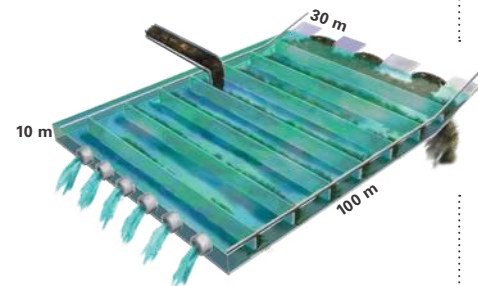
HOW THE FLOTTWEG DECANTER WORKS

A decanter centrifuge can be viewed as a settling pond wrapped around an axis. In the settling pond, solid particles, which are heavier than the liquid, settle to the bottom driven by gravity and build up a sediment layer on the bottom of the pond. In the rotating bowl of the centrifuge, solid particles, which are heavier than the liquid, move to the inner diameter of the bowl driven by centrifugal force and build up another sediment layer on the inner surface of the centrifugal bowl.

Since the centrifugal force in the decanter is approximately 3000 x g instead of 1 x g in the gravitation field, separating solids from a liquid in a centrifuge becomes much faster and more efficient.

From the Settling Pond to the Decanter

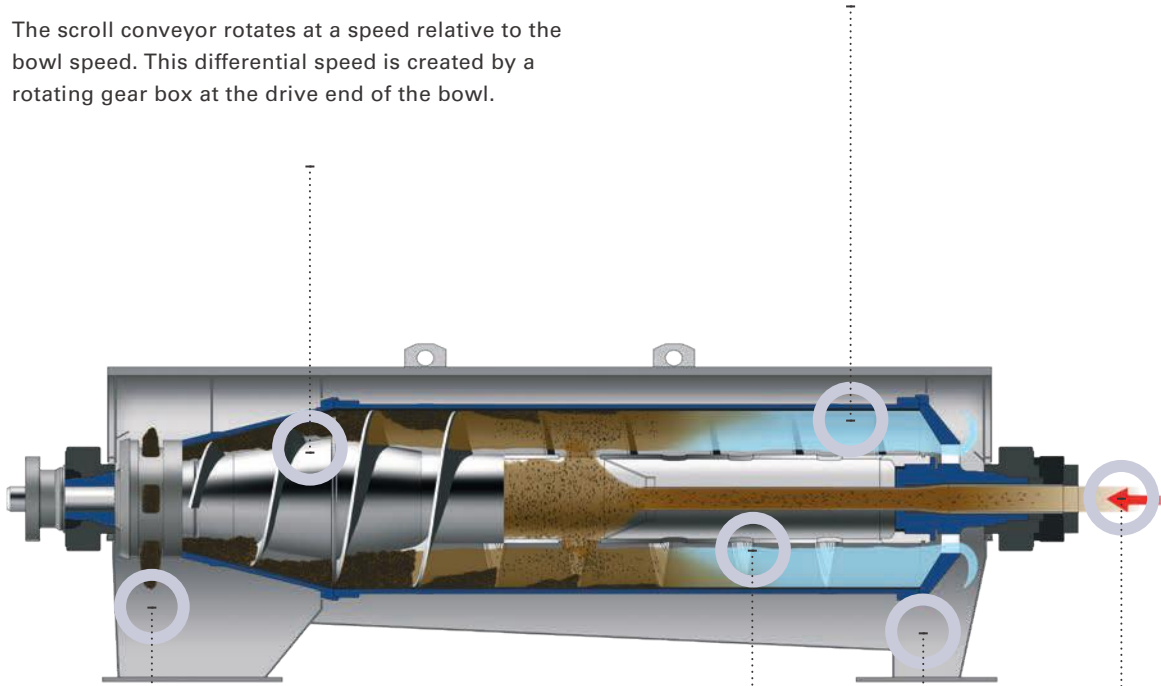
Settling pond with a capacity of 30,000 l/h



Inside the bowl, there is a scroll conveyor for the continuous discharge of the sediment which is packed on the inner surface of the bowl wall.

The bowl of a decanter has a cylindrical-conical shape. It rotates at a high speed creating the centrifugal force needed for the separation.

The scroll conveyor rotates at a speed relative to the bowl speed. This differential speed is created by a rotating gear box at the drive end of the bowl.

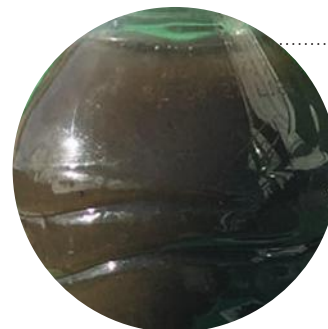
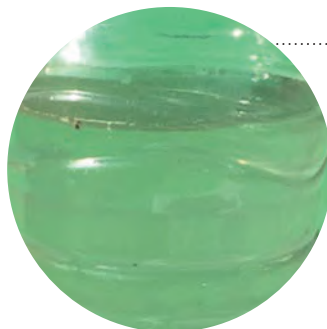


The **sediment** is delivered out of the pond on the conical end of the machine, also called the dry zone, before it leaves via discharge ports on the conical end of the bowl.

In the separation zone, it separates into a sediment layer and a liquid layer.

The **separated liquid** flows to the cylindrical end of the bowl where it is discharged by gravity via an overflow weir.

The **sludge** to be separated enters the bowl via a stationary feed pipe. From the feed pipe it enters the separation zone via feed ports in the scroll body.



OVERVIEW



VIEW OF MODELS



C2E/300 mm



C3E/370 mm



C4E/470 mm



C5E/570 mm



C7E/700 mm



C8E/770 mm



Z92/920 mm

XELLETOR



Flottweg OSE Decanters for Sludge Thickening

Technical Data of Flottweg OSE Decanters*

Type	C2E-4	C3E-4	C4E-4	C5E-4	C7E-4	C8E-4	Z92-4
Materials	All product wetted parts are made of high grade stainless steel such as 1.4463 (Duplex) and 1.4571 (AISI 316T).						
Dimensions (L x W x H)	2700 x 840 x 800 mm 107" x 33" x 32"	2980 x 940 x 890 mm 118" x 37" x 36"	3520 x 1140 x 1030 mm 139" x 45" x 41"	4070 x 1520 x 1210 mm 161" x 60" x 48"	4800 x 1720 x 1390 mm 189" x 67" x 55"	5910 x 2000 x 1470 mm 233" x 79" x 58"	5910 x 2770 x 1730 mm 233" x 110" x 69"
Gross weight	1400 kg / 3100 lb	1765 kg / 3890 lb	2760 kg / 6100 lb	5030 kg / 11100 lb	8200 kg / 18100 lb	13070 kg / 28900 lb	18000 kg / 39700 lb
Motor for bowl drive	5.5 – 7.5 kW 7.5 – 10 hp	7.5 – 15 kW 10 – 20 hp	15 – 30 kW 20 – 40 hp	30 – 55 kW 40 – 75 hp	55 – 110 kW 75 – 150 hp	75 – 132 kW 100 – 180 hp	90 – 200 kW 125 – 270 hp
Motor for scroll drive Flottweg Simp Drive®	2.2 kW 3 hp	4 kW 5 hp	4 kW 5 hp	5.5 kW 7.5 hp	5.5 kW 7.5 hp	5.5 kW 7.5 hp	7.5 kW 10 hp
Capacity	8 – 15 m ³ /h 35 – 65 gpm	15 – 30 m ³ /h 60 – 120 gpm	30 – 60 m ³ /h 125 – 250 gpm	45 – 90 m ³ /h 200 – 400 gpm	70 – 140 m ³ /h 300 – 600 gpm	100 – 200 m ³ /h 440 – 880 gpm	120 – 250 m ³ /h 500 – 1100 gpm

* The listed figures are merely guidelines. Actual capacity depends on the individual characteristics of the product. Subject to technical changes.

TECHNICAL DATA



Flottweg HTS Decanters® and the Flottweg Xelletor Series for Sludge Dewatering

Technical Data of Flottweg HTS Decanters®**

Type	C2E-4	C3E-4	C4E-4	C5E-4	C7E-4	C8E-4	Z92-4
Materials	All product wetted parts are made of high grade stainless steel such as 1.4463 (Duplex) and 1.4571 (AISI 316T).						
Dimensions (L x W x H)	2700 x 840 x 800 mm 107" x 33" x 32"	2980 x 940 x 890 mm 118" x 37" x 36"	3520 x 1140 x 1030 mm 139" x 45" x 41"	4070 x 1520 x 1210 mm 161" x 60" x 48"	4800 x 1720 x 1390 mm 189" x 67" x 55"	5910 x 2000 x 1470 mm 233" x 79" x 58"	5910 x 2770 x 1730 mm 233" x 110" x 69"
Gross weight	1400 kg / 3100 lb	1765 kg / 3890 lb	2760 kg / 6100 lb	5030 kg / 11100 lb	8200 kg / 18100 lb	13070 kg / 28900 lb	18000 kg / 39700 lb
Motor for bowl drive	7.5 – 11 kW 10 – 15 hp	11 – 18.5 kW 15 – 25 hp	22 – 37 kW 20 – 50 hp	45 – 75 kW 55 – 100 hp	75 – 132 kW 100 – 180 hp	90 – 160 kW 120 – 215 hp	160 – 250 kW 215 – 300 hp
Motor for scroll drive Flottweg Simp Drive®	3 kW 4 hp	4 – 5.5 kW 5 – 7.5 hp	7.5 – 11 kW 10 – 15 hp	15 kW 20 hp	30 kW 40 hp	30 – 45 kW 40 – 60 hp	30 – 55 kW 40 – 75 hp
Capacity	5 – 10 m³/h 20 – 45 gpm	10 – 20 m³/h 45 – 90 gpm	20 – 40 m³/h 90 – 180 gpm	30 – 60 m³/h 125 – 250 gpm	60 – 120 m³/h 250 – 500 gpm	80 – 160 m³/h 350 – 700 gpm	90 – 180 m³/h 400 – 800 gpm

* The listed figures are merely guidelines. Actual capacity depends on the individual characteristics of the product. Subject to technical changes.

Technical Data of the Flottweg Xelletor-Series*

Type	X4E-4	X5E-4	X7E-4
Materials	All product wetted parts are made of high grade stainless steel such as 1.4463 (Duplex) and 1.4571 (AISI 316T).		
Dimensions (L x W x H)	3520 x 1140 x 1030 mm 140" x 45" x 40"	4070 x 1550 x 1210 mm 162" x 61" x 48"	4800 x 1720 x 1390 mm 189" x 68" x 58"
Gross weight	2760 kg / 6000 lb	5030 kg / 11100 lb	8200 kg / 18100 lb
Motor for bowl drive	22 – 30 kW / 30 – 40 hp	45 – 75 kW / 60 – 100 hp	75 – 110 kW / 100 – 150 hp
Motor for scroll drive Flottweg Simp Drive®	7.5 – 11 kW / 10 – 15 hp	15 kW / 20 hp	30 kW / 40 hp
Capacity	20 – 50 m³/h / 90 – 220 gpm	30 – 70 m³/h / 130 – 300 gpm	60 – 140 m³/h / 260 – 600 gpm

* The listed figures are merely guidelines. Actual capacity depends on the individual characteristics of the product. Subject to technical changes.

® = registered trademark in various countries





MOBILE SLUDGE DEWATERING

... in a Container – Connect and Dewater

In small sewage treatment plants, the investment costs for dewatering and thickening of incoming sludge frequently play a decisive role. In stationary dewatering systems, for example, the construction of a new building or the expansion of existing space can be significantly costly.

You can avoid those costs with mobile container systems for sludge dewatering. Container-based solutions are therefore a practical alternative to fixed dewatering installations or thickening systems. A container is a true „plug and play“ option – just connect it and start dewatering.

Mobile systems for sludge dewatering or thickening can be installed for long-term use or simply serve as a temporary solution for a few weeks or months. Fully mobile use is also possible at any time.

Optimized for Operation in Tight Spaces

- All the system parts installed are optimized for the limited space available in the mobile container, such as the specially designed polymer system or the intake pump with alternating stator. The pipelines need not be disassembled to remove the alternating stator. No additional space is needed to remove it, either.
- Thanks to the large pivot range of the transport screw, it is quite easy to fill two vats, making interruption-free processing possible.

Sludge Dewatering in One-Man Operation

- In addition to placing and lifting the container, the connection of the intake lines can also be done by a single person without a crane. All lines are fixed plumbing up to the wall of the container. All connections to lines are located outside the container. That means no hoses or loose lines during operation inside the container. And that guarantees a high level of operating comfort and personal safety.
- Due to the use of stainless steel and the drainage openings in the interior cladding and container wall, the system is easy to clean. Drainage valves at the low points of the pipelines also support ease of cleaning.

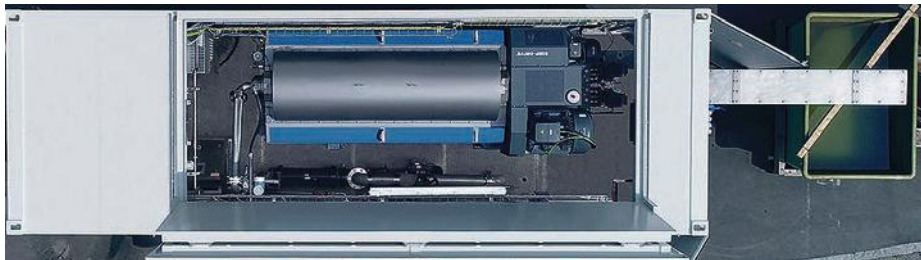


THE FLOTTWEG C2E DECANTER IN A CONTAINER AS PART OF A SYSTEM

WATERING

Year-Round Comfort

- The roof can be opened over the entire width of the container or lifted slightly near the decanter for operation in summer to ensure sufficient fresh air. The roof can be opened simply and safely by a single person using a manual hydraulic lift mechanism.
- Since its walls and roof are insulated, the container is also fine for winter use. An auxiliary heater and a curtain near the transport screw ensure freeze-proof operation and a high degree of comfort.
- Upon request, the feed and discharge lines can be heated as well. This ensures the best possible operational reliability even in winter.



FLOTTWEG C5E DECANTER IN A CONTAINER INCLUDING A SWITCH CABINET

First Test, Then Decide

Our goal is for our mobile systems for sludge dewatering to be convincing under actual conditions. As a result, operators of sewage treatment plants have the option of testing the system thoroughly on-site before making any investment. Our mobile containers are available as rentals for experimental purposes or for short-term projects.

This way you will reduce your amount of sludge and save money for disposal. For more information, please visit our website: www.flottweg.com.



QUALITY ...

Material Certifications

For product-wetted components such as housing, scroll and bowl, we have material certificates in compliance with 3.1 and 2.2 EN 10204, which demonstrate our high-quality standards.



AEO Certification

With this certification based on regulation (EC) No 300/2008 of the European Parliament and of the Council of March 11, 2008, we ensure that we can also in future provide our customers quickly with components and spare parts – anywhere around the globe. In combination with the customs' certification AEO F dating back to July 2011, this important seal of quality assures continuous first-class customer service all over the world.

Quality Management in Compliance with DIN EN ISO 9001:2015

In 2017, Flottweg was for the first time certified according to the most recent international norm in compliance with DIN EN ISO 9001:2015. This quality awareness is the foundation of Flottweg's success, assuring for our customers best product and service quality in the long term.



... AND SERVICE

Customer Service Is Our Strength

Application-based project planning, high-quality manufacturing and efficient maintenance are prerequisites for 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.

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 Worldwide

Flottweg is headquartered in Vilsbiburg, Germany, (near Munich) 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, along with representatives in nearly all countries worldwide. Check out our website at www.flottweg.com to find a competent contact person.

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, spare parts and service worldwide**

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