



SEPARATION TECHNOLOGY FOR SEAWATER DESALINATION PLANTS

Efficient sludge treatment for lower transportation and disposal costs



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HIGH-EFFICIENCY DESALINATION

Water scarcity is becoming one of the key challenges of our time: 97% of the world's water supply consists of saltwater, while only a very limited portion is available as usable freshwater. As precipitation levels decline, the demand for fresh water is rising – driven, among other factors, by growing populations, agriculture and industry.

To address growing water scarcity, seawater desalination has established itself as a reliable and sustainable technology capable of meeting rising global water demand. In many regions, it is already the main source of drinking water.

Seawater desalination plants generate sediment sludge and backwash water during the desalination process, which must be treated and disposed of due to their organic contaminants. Flottweg decanter centrifuges offer an efficient solution to this challenge: They reliably separate the sludge into transportable solids and reusable water. Effective dewatering significantly increases the dry matter content of the sludge and substantially reduces its volume. This reduces transportation and disposal costs and contributes to more cost-effective plant operation.

Flottweg offers the perfect solution:

As the world's leading manufacturer of industrial centrifuges, we enable efficient sludge dewatering and the environmentally responsible handling of residual sludge or filter backwash sludge. These processes are key factors for ensuring the sustainable and compliant operation of desalination plants.

The path to higher yields

- **State-of-the-art decanter centrifuges designed specifically to meet the requirements of seawater desalination**
- **Efficient sludge management**
- **Centrifuges with high corrosion resistance, high energy efficiency and worldwide service support**



SUCCESS IS... QUALITY THAT LASTS

In seawater desalination plants, materials are constantly exposed to high salt concentrations and harsh operating conditions (pressure, temperature). That's why Flottweg uses high-alloy materials that have been specifically developed to meet these requirements.

Optimally tailored solutions for every application – both technically and economically

For seawater desalination applications, Flottweg prefers to use superduplex steels, as these offer:

- High corrosion resistance
- Excellent mechanical strength
- Very good resistance to sustained loads

For less aggressive applications – such as those using brackish water – optimized combinations of duplex and superduplex steels can also be used.

Maximum process reliability and a significantly longer component service life

When selecting materials, resistance to pitting and crevice corrosion is crucial. Pitting corrosion is described by the PREN value (Pitting Resistance Equivalent Number): The higher the PREN value, the better the resistance. Crevice corrosion is indicated by the CF value. The same applies here: The higher the CF value, the better the resistance.

Flottweg intelligently employs materials with PREN values of up to 42 – a level that exceeds standard industry requirements – and CF values of 35.

Additional protection in critical areas and minimal downtime

The following factors also contribute to long-term durability:

- High mechanical strength and ductility for cyclical pressures and loads
- Optimized weldability for maximum component strength
- Customized concepts for wear and corrosion protection
- Special corrosion-resistant coatings
- Flottweg-specific protection systems for areas subject to particularly high stress

Sustainability through durability

In addition to providing greater cost-effectiveness, using durable components also means:

- Fewer replacement parts and less material consumption
- Reduced maintenance costs
- Lower carbon footprint over the product life cycle



CENTRIFUGAL SEPARATION TECHNOLOGY IN SEAWATER DESALINATION

Our decisive contribution to sludge dewatering

The desalination process separates saltwater into two streams: one stream of treated freshwater and a second stream with a higher salt concentration, known as brine.

The process begins with the intake of seawater, brackish water or raw water, which is then subjected to a multi-stage pretreatment process. We outline these four stages below – and explain how Flottweg optimizes your desalination processes at each stage.

01 Pretreatment and filtration – The basis for stable processes

During pretreatment, coarse solids are separated out and the first sludge streams are generated. This stage significantly reduces the load on the subsequent filtration and desalination processes. The pretreated water then passes through additional filtration systems before entering the main desalination stage. Depending on the system design, this is achieved by one of the following:

- Reverse osmosis (RO)
- Thermal processes

02 Sludge streams – Unavoidable and crucial to efficiency

During the water treatment process, continuous sludge streams are also generated, which consist of:

- Sediment from the pretreatment process
- Backwash water from filtration processes

The sludge is subjected to further sedimentation or thickening stages and initially has a very low solids content of about 0.5–2% dry matter.

After thickening and the addition of polymers, the solids content increases to 1–4% dry matter. However, the sludge still contains a high proportion of water and is therefore:

- Voluminous
- Expensive to dispose of
- Inefficient to handle

It is at this point that mechanical dewatering using Flottweg decanters becomes a critical step in the process.

GREATER EFFICIENCY THROUGHOUT THE ENTIRE PROCESS

03 Mechanical dewatering using industrial centrifuges

The thickened sludge is fed into a Flottweg decanter, where the solids and liquid are separated. This allows for:

- Separated solids that are as dry as possible (reduction of disposal volume)
- Recovery of process water (centrate), which is returned to the raw water inlet

Mechanical dewatering not only significantly reduces the sludge volume, but also improves the water balance of the entire plant – with direct impacts on operating costs and resource efficiency.

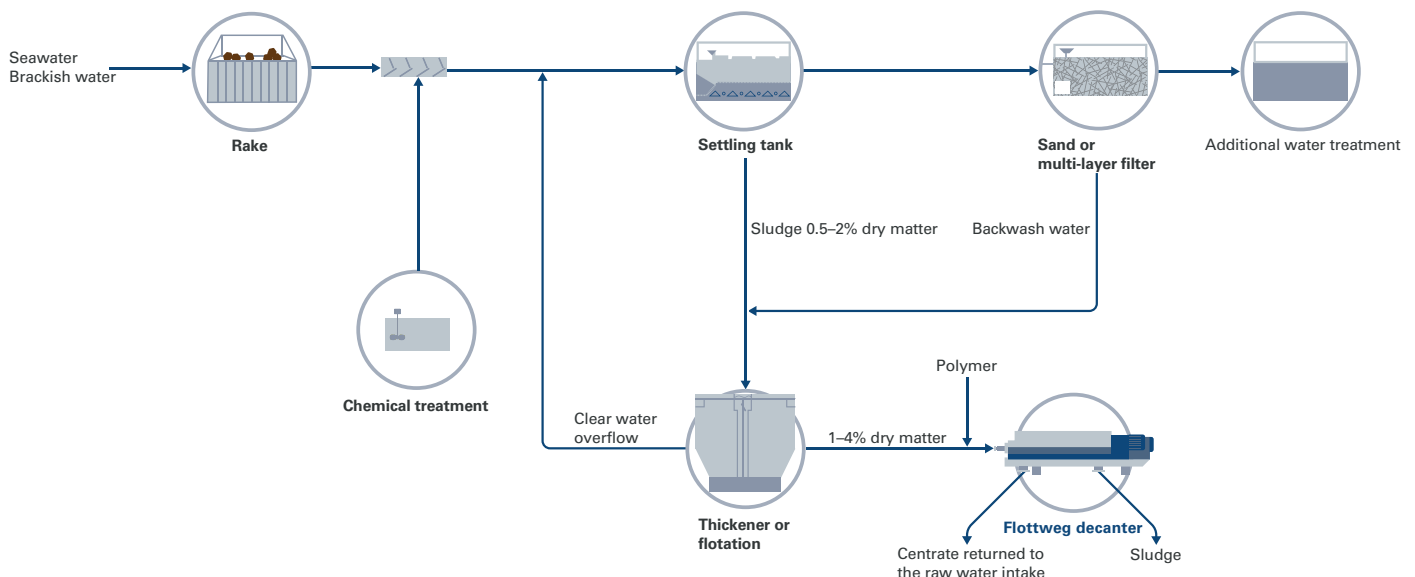
Particularly in large-scale desalination plants with high flow rates, the efficiency of this process step has a direct impact on overall economic performance.

Flottweg decanters play a key role in:

- Reducing disposal and transportation costs
- Stabilizing the overall process
- Reducing the environmental impact

04 Post-treatment

After desalination, the treated water undergoes final post-treatment to meet the quality standards required for drinking water or process water.



YOUR BENEFITS AT A GLANCE



Corrosion resistance

Flottweg decanters are designed to withstand the harsh conditions encountered in seawater desalination. All components that come into contact with the process fluid are designed for maximum corrosion resistance, ensuring a long service life and minimizing unplanned downtime due to material wear.



Materials with high PREN and CF values

We use stainless steel with a corrosion resistance value (PREN) of up to 42 – which is well above industry standards – and a CF value of 35. This ensures exceptional resistance to localized pitting corrosion and crevice corrosion in chloride-rich environments. This is also crucial for the reliability and longevity of desalination plants.



Optimized sludge management

Our decanters offer extremely efficient separation performance, which enables effective sludge dewatering. This improves the plant's overall efficiency, reduces disposal costs and helps ensure compliance with environmental regulations.



Custom-made solutions with global support

Flottweg provides custom-made solutions tailored to the specific requirements of each desalination project. Our global service network ensures expert support, fast response times and long-term operational reliability – for maximum uptime and the highest level of customer satisfaction.



Environmental protection measures

The careful treatment of return streams and wastewater – and the targeted reduction in the use of chemicals – helps to ensure the protection of marine ecosystems. At the same time, waste management is optimized to ensure the safe disposal and, where possible, sustainable recycling of waste.



Sustainable water supply

A stable and sustainable water supply is crucial for the economic development, public health and resilience of water-scarce regions. By converting seawater into drinking water, desalination plants reduce the strain on traditional freshwater sources and promote sustainable water management worldwide.

In short: The high quality of Flottweg decanters combined with our wealth of experience in the areas of cost-effectiveness, environmental protection and process quality enables optimal, cost-effective fresh water production from seawater.





FEATURES OF FLOTTWEG DECANTERS



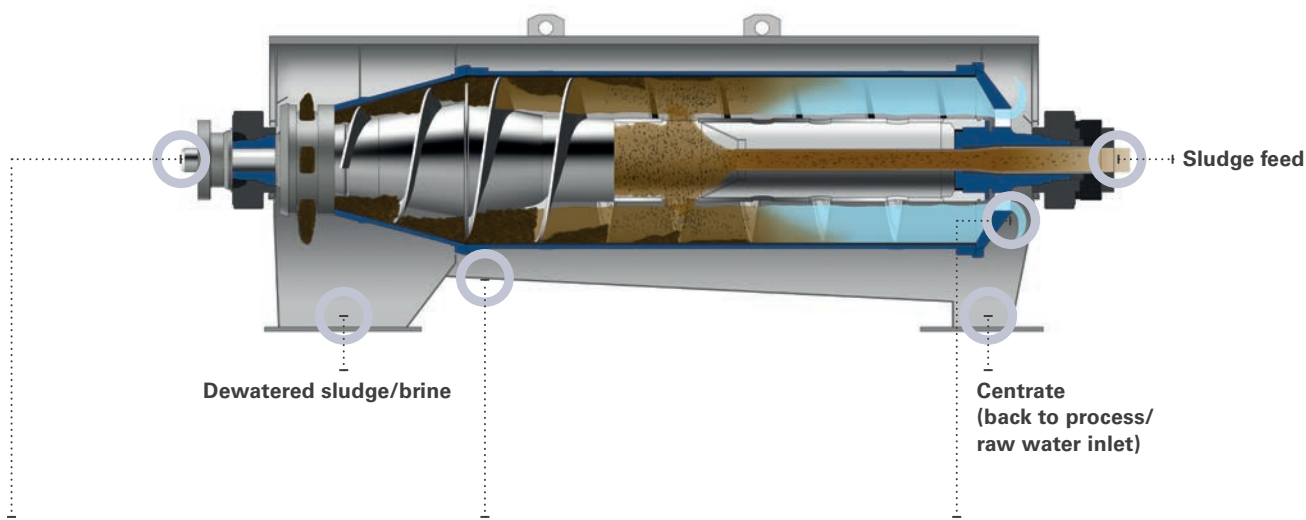
Intelligently designed

- Low space requirements allow you to invest in replacements without the need for structural work
- Maintenance-friendly, easily accessible design promotes maximum availability and minimum downtime during servicing
- Replacement of spare and wear parts, as well as operational safety checks (accident prevention regulations), are generally carried out on site



Fully automatic

- Automatic 24-hour operation, including scheduled switching on/off
- Already 4.0 – all remote monitoring and maintenance options on request
- Individual integration of the centrifuge controller into your overall control system for maximum efficiency and operational reliability of your system



Flottweg Simp Drive®

- Economical thanks to intelligent combination of rotor and scroll drive; conversion losses are reduced
- Automatic regulation of the thickened sludge concentration depending on the current loading of the machine
- Best possible thickening even with changing feed conditions



Sturdy and durable

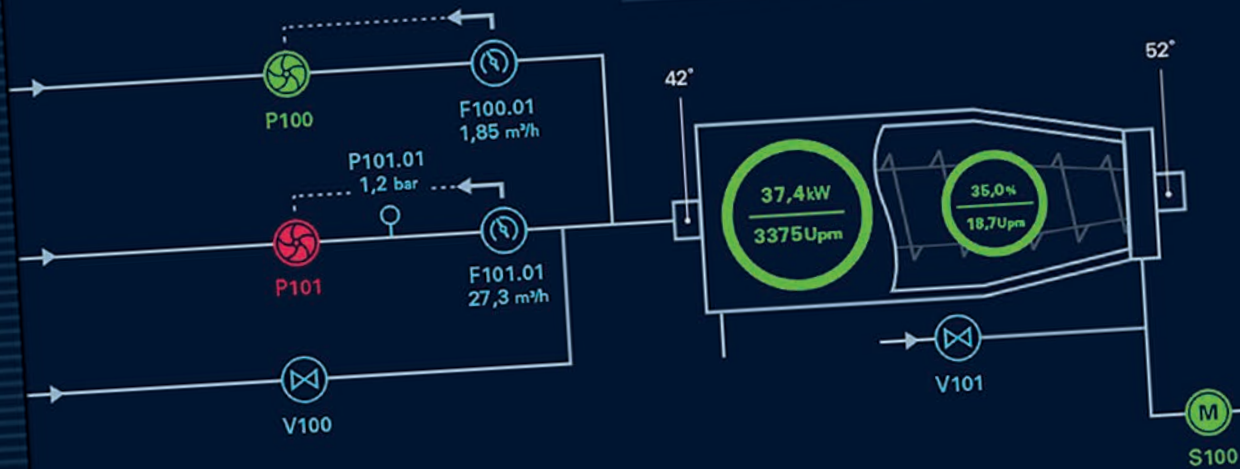
- Materials with high PREN and CF values
- High-performance wear protection for the scroll helixes, rotor and solids discharge
- Additional protection for all inlet and outlet openings



Flottweg Recuvane®

- Additional reduction in operating costs thanks to lower energy consumption
- Reduces the energy consumption of your decanter by up to 30%*
- Easy adjustment of the pond depth
- Can be retrofitted without substantial effort; quick amortization
- Existing separation processes remain unchanged

*Dependent on pond depth and sludge suitability



RELIABLE PROCESSES, LOWER COSTS

INto the system and GO: Flottweg InGo user interface for easy control

Each Flottweg centrifuge is equipped with a pre-installed and factory-tested control package including the InGo operating concept. The Flottweg automation package offers you the following benefits:

- High process reliability combined with low costs thanks to an intuitive operating concept
- High functional reliability thanks to climate-controlled control cabinets for safe operation under extreme conditions such as heat, dust and moisture
- Worldwide support is possible thanks to the integrated remote maintenance system: direct, secure VPN connection to all network participants of the Flottweg control system (PLC, VFD, HMI, etc.)
- Simple data connection of the Flottweg control system to customer PLC or SCADA systems via individual protocols (Profibus, Profinet, Ethernet IP, Modbus, UPC-UA)
- Optional: Control of customer units (pumps, valves, etc.)



The modern machine control combined with the InGo operating system enables a fully automatic interplay between the individual process and system components. Users can see the operating state at a glance – including in poor lighting conditions or outdoors. The control system also meets the highest standards in terms of operational and machine safety. This ensures high process availability, including when FW control components are integrated into the customer's control system.

With InGo ...

- **you always have a complete overview and full control over all process components**
- **you save time and costs when operating the system**
- **you operate the centrifuge intuitively, as InGo is based on the established concepts of smartphones and PCs**
- **user acceptance is guaranteed – without the need for extensive training**
- **you always retain control over all process parameters**

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

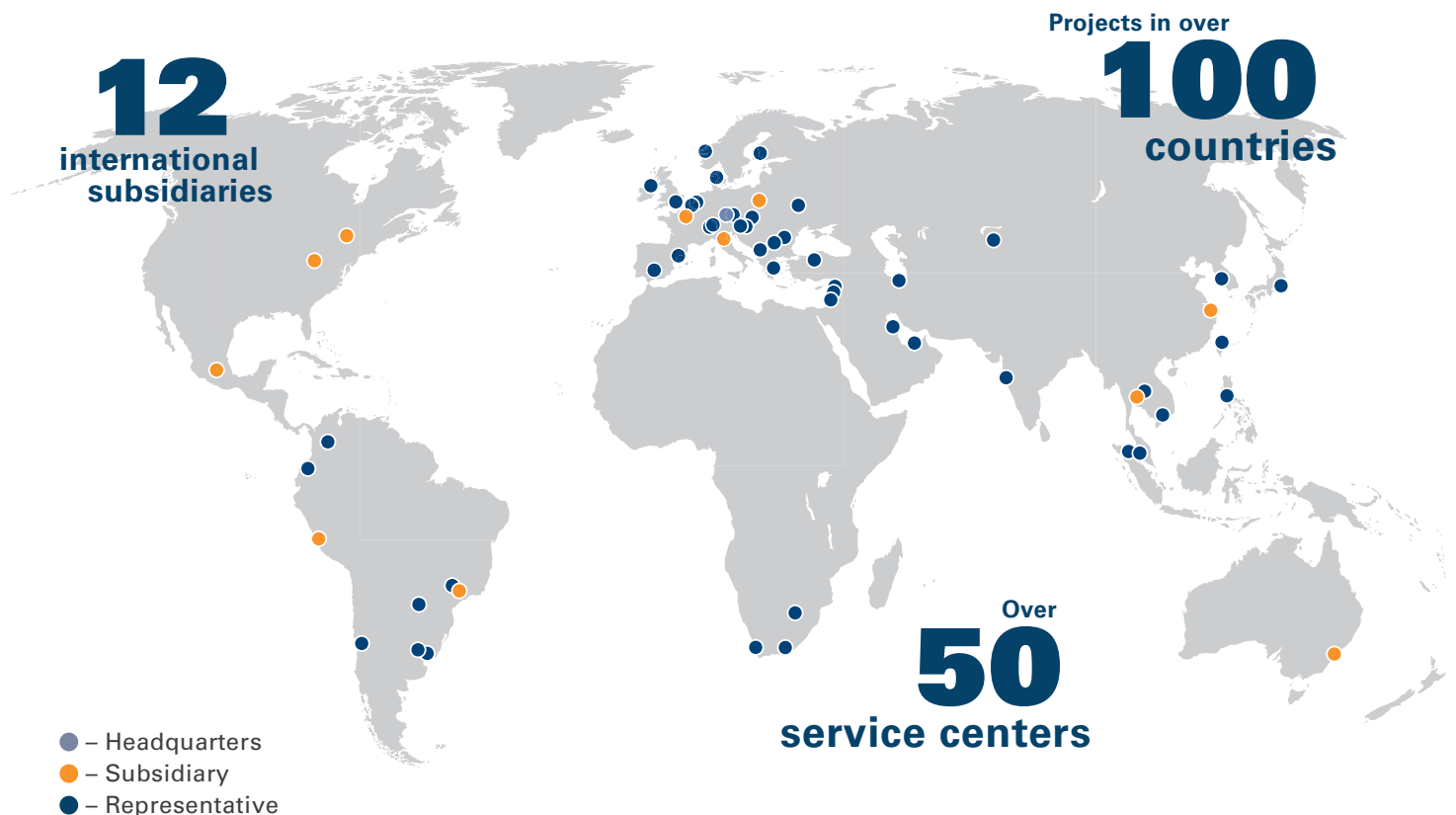
After the design and detailed development process, you will receive a concrete offer including all relevant line figures for your individual Flottweg application.

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.





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