

## WHY CHOOSE COMPACT WWTP BC biocleaner®?



- Proven technology with a strong track record** – decades of experiences across Europe.
- In-house development and innovation** – ensuring stable and efficient operation.
- Treating wastewater for over 1 000 000 PE** – a reliable and widely used solution.
- More than 250 installed compact WWTPs and over 25 000 BC biocleaner® installations.**
- Compact design** – space-saving thanks to an integrated settling tank.
- Optional full enclosure** – minimizing protective zones and ensuring stable winter operation.
- Low investment costs** – reducing construction requirements.
- Tailor-made technological solutions** – customized to your specific needs.
- Comprehensive technical support and service** all over Europe.
- Effluent quality meeting the strictest EU regulations** and individual client requirements.

## FROM IDEA TO REALITY – WWTP PROJECT STEP BY STEP



Our team is fully equipped to manage every aspect of your project. From the preparation of detailed project documentation through the comprehensive support throughout the entire process to the final implementation. Thanks to our experts in technology, engineering and financing, we offer you a complete turnkey solution – efficiently, professionally and worry-free.

## SUITABLE FOR INDUSTRIAL APPLICATIONS

Our compact WWTPs **BC biocleaner®** are also an ideal solution for organically polluted industrial waters, particularly from the **food industry**.

For industrial applications, we provide a complete service including:

- sampling and chemical analysis** – we will provide wastewater sampling and detailed analysis in our in-house chemical laboratory,
- water audit** – we will map the water flows and identify opportunities for efficient water use, minimizing losses and recycling,
- pilot testing** – we will test the technology on a pilot unit directly on-site and verify its effectiveness.

We also specialize in challenging industrial processes, where standard solutions may not be sufficient.

## CONTACT US!

Stay ahead and invest in the future of your municipality. Contact us to learn how compact WWTPs **BC biocleaner®** can improve water quality and the environment in your area.

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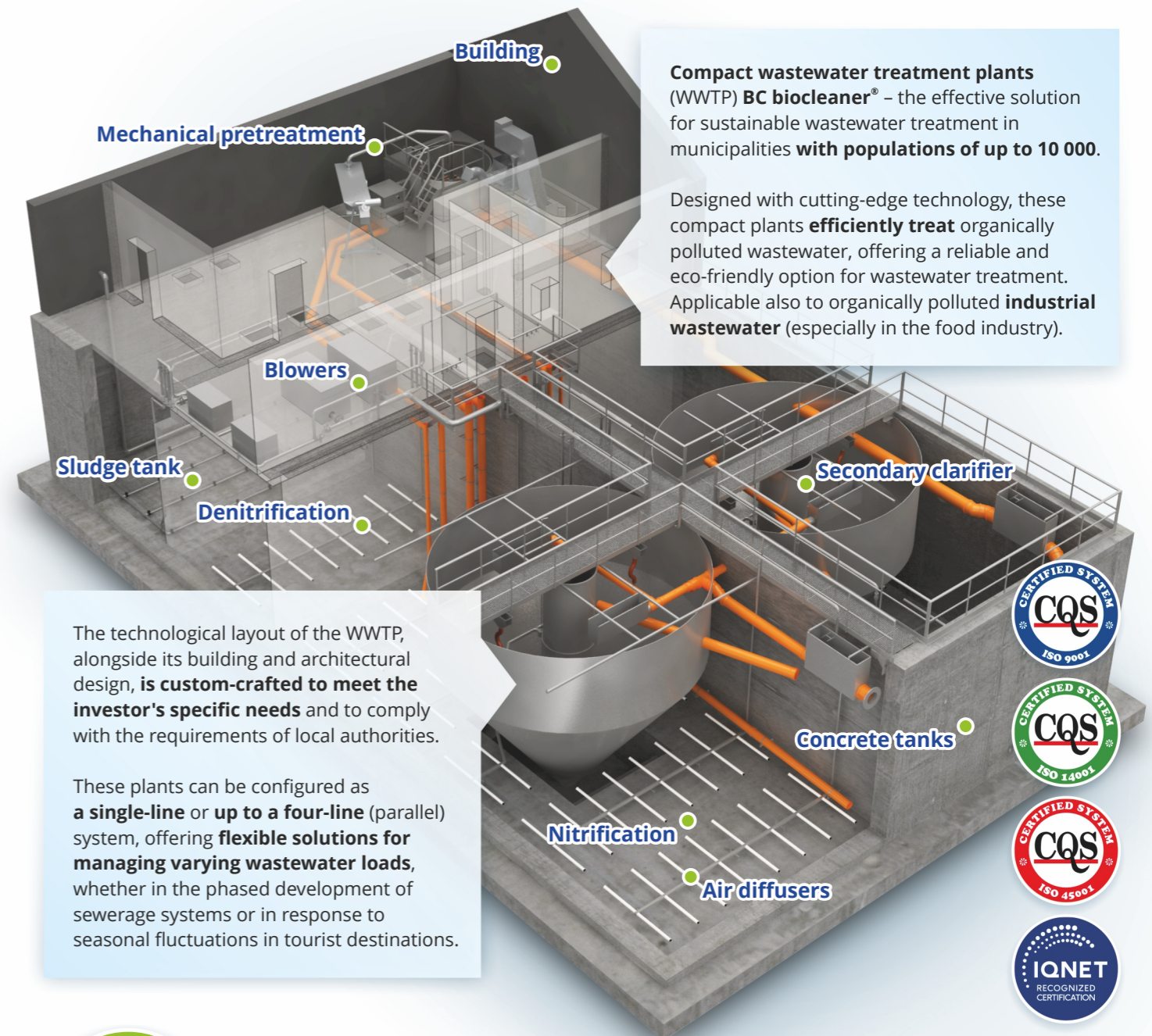
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# COMPACT WASTEWATER TREATMENT PLANTS



- PROVEN TECHNOLOGY**
- OPERATING EXPERIENCES**
- POSSIBILITY OF COVERING**
- COMPACT DESIGN**
- LOW INVESTMENT**
- HIGH EFFICIENCY**

# BC biocleaner® TECHNOLOGY

## Mechanical Pretreatment

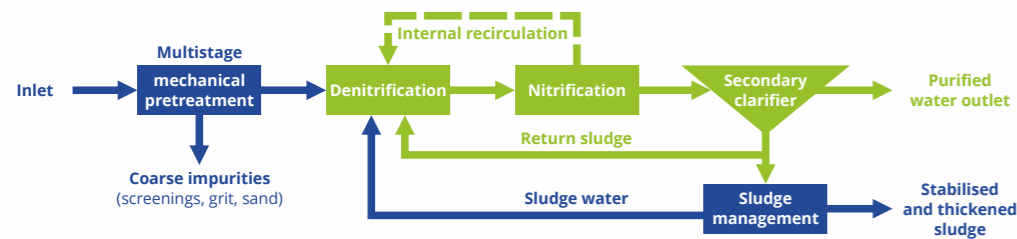
The mechanical pretreatment is included to protect the main biological reactor. The choice of technical solution depends on the type and condition of the sewer system, as well as on the characteristics of the wastewater. The following equipment is used for removing mechanical impurities:

- **coarse screens**,
- **fine screens** (manual or mechanically cleaned), which, depending on the capacity (size) of the WWTP, are suitably complemented by dewatering devices and conveyors,
- **grit traps** and **sand separator**.

## Biological Treatment

In the main part of the treatment plant, organic pollution and nutrients (nitrogen and phosphorus compounds) are primarily removed by the activity of activated sludge microorganisms. This phase includes:

- **efficient biological treatment** due to mixing activation under aerobic conditions,
- **D-N system** – modern technology with pre-denitrification and nitrification,
- **flexible design** – single-line or multi-line configuration according to requirements.



### Denitrification

Denitrification is a biological process in which nitrate nitrogen ( $\text{NO}_3\text{-N}$ ) is converted into nitrogen gas ( $\text{N}_2$ ), which is then released into the atmosphere. This process occurs under anoxic conditions (in the absence of dissolved oxygen) with the participation of denitrifying bacteria. The homogenization of the activated sludge mixture in the tank is provided by the submersible mixer.

### Nitrification

In the process of nitrification, ammoniacal nitrogen ( $\text{NH}_3\text{-N}$ ) is oxidized to nitrite nitrogen ( $\text{NO}_2\text{-N}$ ) and subsequently to nitrate nitrogen ( $\text{NO}_3\text{-N}$ ) by nitrifying bacteria. This process occurs in aerobic conditions (in the presence of dissolved oxygen). The nitrates produced during nitrification are subsequently returned to the denitrification process through internal recycling. The tank is aerated by a fine-bubble aeration system located at the bottom of the tank. The processes of nitrification and denitrification play a crucial role in removing nitrogen from wastewater. Excess amounts of nitrogen compounds, especially nitrates, contribute to the eutrophication of aquatic ecosystems, leading to uncontrolled algal growth and a decline in water quality.

### Phosphorus removal

Phosphorus removal is carried out by chemical precipitation through dosing an iron salt, e.g. ferric sulfate into the biological treatment stage.

### Secondary Clarifier

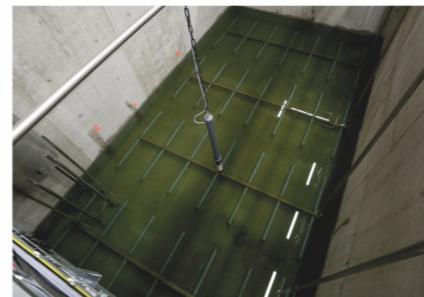
The separation of treated water and activated sludge is achieved using a circular settling tank integrated into the nitrification tank. The advantage of placing the settling tank within the nitrification process is space saving and a short distance for sludge pumping. This system allows the removal of both, return and excess sludge (settled sludge from the bottom of the settling tank), using hydro-pneumatic pumps (air-lift pump). The use of air-lift pumps instead of conventional pumps leads to reduced operational costs and improved operational reliability.



Mechanically cleaned screens



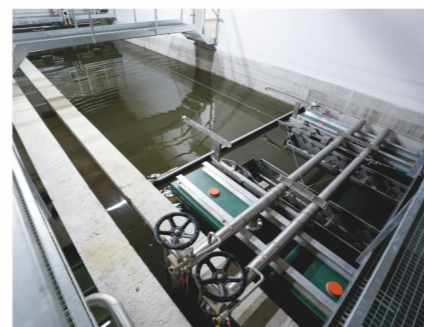
Sand separator



Air supply system



Inserted settling tanks



Secondary clarifier – Clarivac®

## Machine Room

### Air Supply System

Blowers are used to supply pressurized air for aeration in the nitrification process, stabilization, and excess sludge storage tanks, as well as for sand separator, and also for air-lift pumps for return and excess sludge.

### Sludge Management

Sludge management includes aerobic stabilization, gravity thickening and storage of excess sludge. Depending on the capacity of the WWTP, it is supplemented with mechanical dewatering of the sludge, reducing its volume and preparing it for further processing or disposal.

### Chemical Management

For effective phosphorus removal from treated wastewater, a chemical precipitation system using inorganic salts, such as ferric sulfate, can be implemented.

### Septage Storage Tank

If wastewater collection from the treatment plants or septic tanks is required, a septage receiving tank can be installed. The tank is typically equipped with a screen basket to capture coarse solids. Wastewater from this tank is pumped into the wastewater treatment plant inlet as needed using a submersible sludge pump.

### Tertiary Treatment

Tertiary treatment is used for additional wastewater purification in cases where stricter discharge quality requirements apply. It is implemented through:

- filtration methods (gravity and sand filters, micro-sieve drum filters and membrane filters),
- hygienic disinfection processes (including UV disinfection and chlorination).

## CONSTRUCTION DESIGN

Thanks to its compact design, the WWTP BC biocleaner® can be fully installed inside a brick building, keeping all the technology within an enclosed space. Alternatively, a partial roofing option is available, where larger technological components, such as nitrification and settling tanks or parts of the mechanical pre-treatment, are located outside the building. The choice of the optimal solution depends on the treatment plant's parameters, site location, construction costs and aesthetic integration into the surroundings.

## TREATED WATER QUALITY

Our wastewater treatment plants utilize the best available technologies (BAT) ensuring that treated water meets strict emission limits – both in concentration (mg/l) and treatment efficiency (%). The required level of treatment depends on the plant's capacity:

- **WWTP up to 500 PE**  
The removal of organic pollution is required. The plant operates on a low-load activated sludge process.
- **WWTP up to 2 000<sup>1)</sup> PE (resp. up to 1 000<sup>2)</sup> PE)**  
In addition to organic pollution removal, the elimination of ammoniacal nitrogen is also required by regulations. The plant features a low-load activated sludge process with stable nitrification.
- **WWTP up to 10,000 PE**  
The removal of organic pollution, ammoniacal nitrogen and phosphorus is required.

Each treatment plant can be customized to meet specific customer requirements.

### Indicative Parameters of Compact WWTPs

Number of PE (Population Equivalent)	500	1 000	2 000	5 000	10 000
Dimensions for the built-up area (m)	11.5 × 7.5	12.5 × 10	20 × 15	75 × 50	100 × 60
Quantity of wastewater $Q_{24}$ (m <sup>3</sup> /day)	75	150	300	750	1 500
Energy demands (kWh/day) <sup>3)</sup>	45	90	175	400	775
Number of lines	1 to 2	2	2	2 to 4	4

1) In accordance with Council Directive 91/271/EEC of 21 May 1991 concerning urban wastewater treatment.  
2) In accordance with the new Directive (EU) 2024/3019 of the European Parliament and of the Council.  
3) Approximate value / quality at full load of the WWTP, real parameters result from used technology.



Sludge dewatering



Blowers for aeration



Closed construction solution



Opened construction solution



Opened construction solution



PROVEN TECHNOLOGY



OPERATING EXPERIENCES



POSSIBILITY OF COVERING



COMPACT DESIGN



LOW INVESTMENT



HIGH EFFICIENCY