

# BIOCOS WASTEWATER TREATMENT TECHNOLOGY BIOLOGICAL COMBINED SYSTEM

## **Field of application**

BIOCOS® is generally an advantageous combination of continuous-flow technologies and the SBR system, and represents an advancement compared to them, which makes the technology unique. No mechanical equipment within the aeration tank and the settlers while blower air is utilized for RAS-recycle and mixing (rough bubble mixing) resulting in low maintenance requirements and significantly lower risk of any malfunction compared to other conventional activated sludge technologies. Using the technology lower investment costs can be reached due to lack of mechanical equipment (only blowers and in-tank piping, no scrapers, mixers and recycle-pumps) and common wall construction between the AIR and ALT Reactors. Due to its advanced working mechanism the technology is flexible: it can be adopted to changing load conditions and can handle high hydraulic loads for example in case of heavy stormwater appearance. Mechanical pre-treatment (screening, sand and oil, fett removal), sludge treatment, disinfection (UV, chemical dosing...etc) also can be adjusted to this technology.

- COMPACT CONFIGURATION
- SPACE-SAVING SYSTEM
- LOW ENERGY CONSUMPTION
- HIGH EFFICIENCY
- FLEXIBLE TECHNOLOGY



### Description of the technology

Each BIOCOS®-module consists of one so-called aeration-reactor (AIR) and two alternation-reactors (ALT). The raw wastewater is continuously fed to the AIR-reactor (1a), but the ALT-reactors (1b-1c) operate cyclically. Intermittent aeration is required for this technology via fine bubble diffusors. The air-blowers' operation can be controlled via on-line oxygen probes, optimizing aeration for lowest energy consumption. The nitrification and partial denitrification processes take place in the aeration basin (AIR tank), while the liquid-solid phase separation (secondary clarification) and the post-anoxic endogenous denitrification happen in the sedimentation and circulation basins (ALTreactors).



Component of the technology

Each aeration zone (1.a. -AIR) is connected with two alternating sludge recycling and settling tanks (1b, 1c- ALT 1-2)

1. basins

- 1a the aeration basin (AIR)1b alternating sludge recycling
- and settling tanks (ALT 1-2)
- 2 blowers to aeration (1a) and air-driven RAS-recycle
  - and reactor mixing
- 3 chemical dosing system (if neccessary)
- 4 sludge removal
- 4a recirculated aerobic sludge (RAS)
- 4b wasted aerobic sludge (WAS)

#### **Advantages**

- continuous feed, continuous purified water discharge
- compact: no need for multiple pump lifting among treatment steps (no separate anoxic tank, no separate secondary clarifier)
- flexible: it can adapt to changing load conditions and can handle high hydraulic peek-loads without additional equalization tank

#### **Benefits of the technology**

- high treatment efficiency: low effluent concentrations
- less mechanical equipment: air-dirven RAS-recycle and reactor mixing (motoric valve provided to switch and regulate the air supply) resulting lower investment costs
- unique but simple operation
- lower maintenance and electric energy cost compared to other activated sludge technologies
- easy to maintain

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