



KRÜGER

BioCon™

Sludge Drying Solutions

 **VEOLIA**
WATER

Solutions & Technologies



A BioCon sludge drying plant is especially designed for drying of dewatered sludge from municipal and industrial wastewater treatment plants.

BioCon sludge drying plants are furthermore CE marked and comply with current EU and national rules, regulations and directives.

The BioCon Dryer

BioCon is a dual-belt low temperature dryer designed to be one of the safest dryers on the market while maintaining easy and efficient operations.

BioCon uses innovative depositors within the dryer to deposit thin strings of dewatered sludge on the first drying belt. The depositor system ensures a large evaporation surface area while the circulated drying air evaporates the water from the sludge.

BioCon operates with a drying air temperature range from 180 °C on the first belt to 80-100 °C on the end belt. The sludge residence time in the dryer is more than 60 minutes and the dried sludge meets the US EPA requirements for Class A pathogen reduction.

Features and benefits

- ▶ Safe operation due to low drying temperature and minimal dust emission.
- ▶ Flexible in regards to energy and heat source
- ▶ No odour release to surroundings due to negative pressure drying air system
- ▶ Designed for intermittent as well as non-stop operation
- ▶ Low operation and maintenance costs
- ▶ Delivers disinfected and granulated dried biosolids. The end product meets the US EPA Class A requirements
- ▶ Easily expanded with BioCon Energy Recovery System (BERS)
- ▶ Easily expanded with BioCon Energy Exchange System (BEES)



The BioCon drying plant is designed for intermittent as well as non-stop operation. The BioCon drying plant is fully monitored and controlled by the state of the art Siemens PCS7 SCADA system which allows unattended operation also outside normal working hours.

Efficient Drying Without Odour

Energy is supplied indirectly by a heat exchanger to heat the drying air. A circulation fan provides the necessary air velocity around the sludge strings to ensure the water evaporation from the sludge.

To remove the moisture and particulate matter from the wet drying air a certain amount of the drying air is taken into the condensing air loop and sent through the condenser before returning to the drier.

As the entire dryer unit is kept at a low negative pressure by the vacuum air fan and the drying air as well as the condensing air loops are enclosed cycles the system ensures an odourless operation.

Sludge into the Dryer

From the sludge cake buffer silo any combination of primary, secondary or digested sludge is pumped into the BioCon dryer.

To ensure effective depositing on the belt the dried solids content in the dewatered sludge should be between 10% and 30% DS.

The BioCon depositor system creates a large evaporation surface in the sludge strings which allows the drying process to operate at:

- ▶ Low drying temperature
- ▶ Short retention time
- ▶ Elimination of back-mixing

Flexible Energy Sources

The flexible BioCon dryer uses several energy sources to provide the needed heating fluid for the drying air heat exchanger.

Heating fluids

The simple BioCon dryer enables flexibility in choice of heating fluids as:

- ▶ Hot air
- ▶ Steam
- ▶ Hot oil
- ▶ Hot oil / hot water

Combinations

The simple and flexible BioCon dryer operates in easy combination with:

- ▶ Gas Engine
- ▶ Boiler
- ▶ Steam Generator
- ▶ Air Heater
- ▶ BioCon Energy Recovery System (BERS)
- ▶ BioCon Energy Exchange System (BEES)

BioCon Energy Recovery System (BERS)

The BioCon Energy Recovery System (BERS) reduces the total output of the plant to 5-10% of the original sludge cake quantity.

BERS provides thermal energy for the drying process. BERS will be self-sufficient regarding thermal energy at 20-25% DS content in sludge cake.

The BioCon Energy Recovery System includes a movable grate furnace for burning of the dried sludge, a heat exchanger for flue gas/drying air and a compact dry flue gas treatment system.

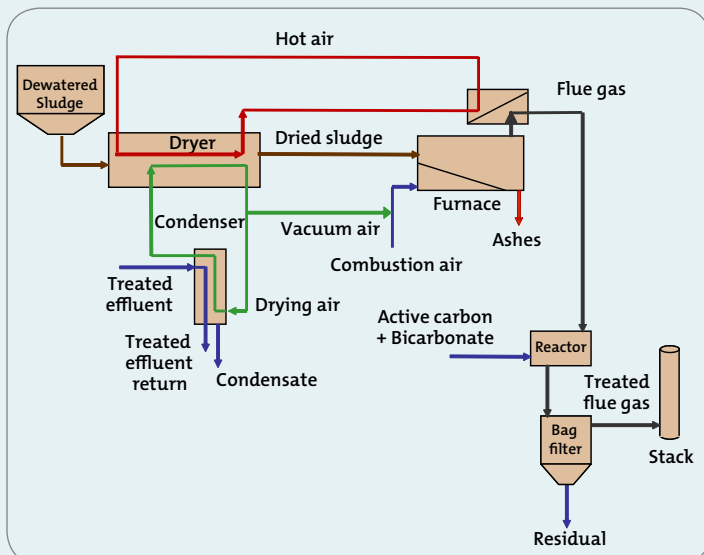
The installation for flue gas treatment consists of equipment for dosing of bicarbonate and activated carbon and a bag filter for residuals.

BioCon Energy Exchange System (BEES)

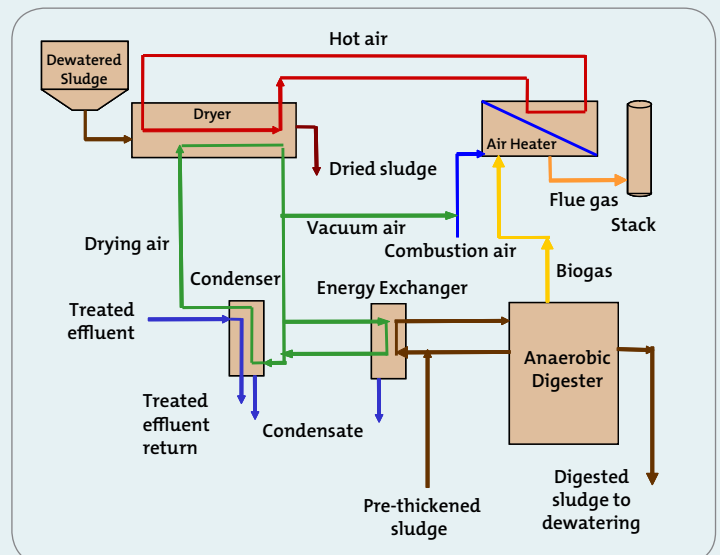
Sludge digestion combined with the BioCon Energy Exchange System (BEES) provides an essential reduction in the need for external energy supply.

BEES utilizes the opportunity for energy transfer between the dryer condensing air and the sludge digestion heat system. Frequently sludge digestion and BEES will turn out autothermic.

BioCon Energy Recovery System (BERS)



BioCon Energy Exchange System (BEES)





BioCon™ Sludge Drying Solutions

Selected Reference Plants



1999: Randers Wastewater Treatment Plant, Denmark
1,600 tons dry solids per year



2003: Mora Wastewater Treatment Plant, Sweden
840 tons dry solids per year



2006: Haapavesi Wastewater Treatment Plant, Finland
1,500 tons dry solids per year



2006: Draguignan Wastewater Treatment Plant, France
1,638 tons dry solids per year



2006: Mystic Lake Wastewater Treatment Plant, USA
333 tons dry solids per year



2001: Bjergmarken Wastewater Treatment Plant, Roskilde, Denmark
1,675 tons dry solids per year

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