



BioCon™
Biosolids Drying & Energy Recovery

WATER TECHNOLOGIES

The BioCon™ Dryer

Safe, Simple, and Efficient

BioCon™ is a dual-belt dryer designed to be one of the safest dryers on the market while maintaining easy and efficient operations. In much the same way a convection oven speeds up the baking process in the kitchen, BioCon uses hot air circulation to evaporate the water from the biosolids.

The air drying temperatures in the BioCon range from 350°F to 175°F as the biosolids complete the drying process. Additionally, the BioCon meets EPA 503 Class A requirements.



Biosolids Depositors and Stainless Steel Belt



Top view of cells

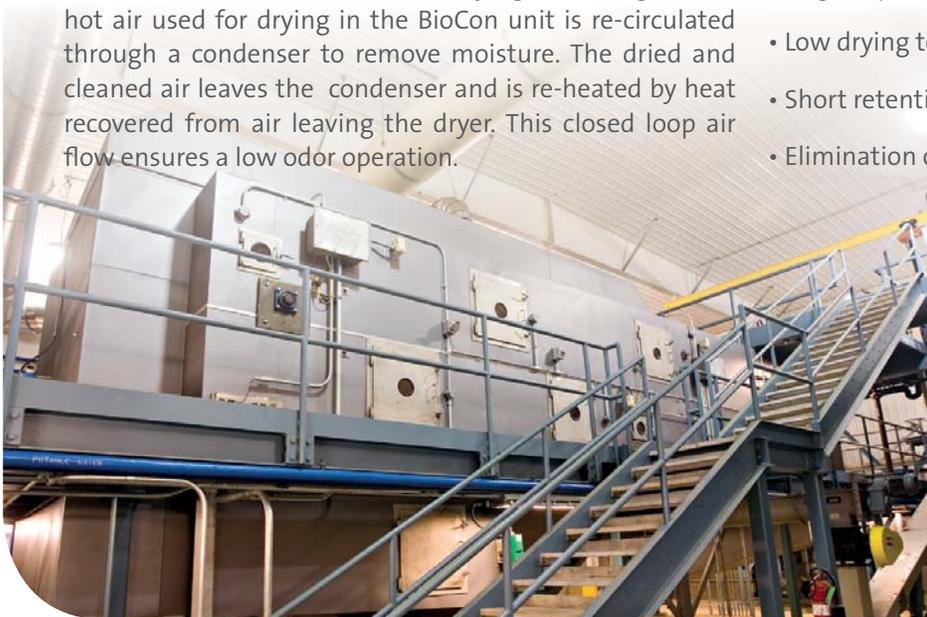
Efficient Evaporation Without Odor

Energy is supplied indirectly by heat exchangers to heat the drying air. Circulation fans provide the necessary air velocity around the biosolids, thus increasing the drying efficiency and the water evaporation from the biosolids. Also, the entire dryer is kept at a low negative pressure to avoid the odor associated with most other drying technologies. The hot air used for drying in the BioCon unit is re-circulated through a condenser to remove moisture. The dried and cleaned air leaves the condenser and is re-heated by heat recovered from air leaving the dryer. This closed loop air flow ensures a low odor operation.

Solids Into the Dryer

The system accepts dewatered cake from 10% to 30% dry solids. Primary, secondary or digested biosolids are pumped from a storage tank through the sludge depositors in thin strings in order to create a large available surface area for drying. This large evaporative surface area created by the sludge depositing step allows:

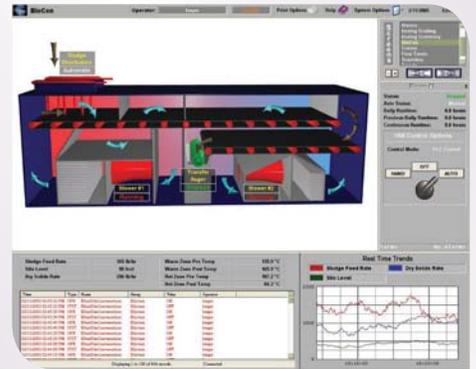
- Low drying temperature
- Short retention time
- Elimination of back-mixing



Buffalo WWTP BioCon™ Dryer

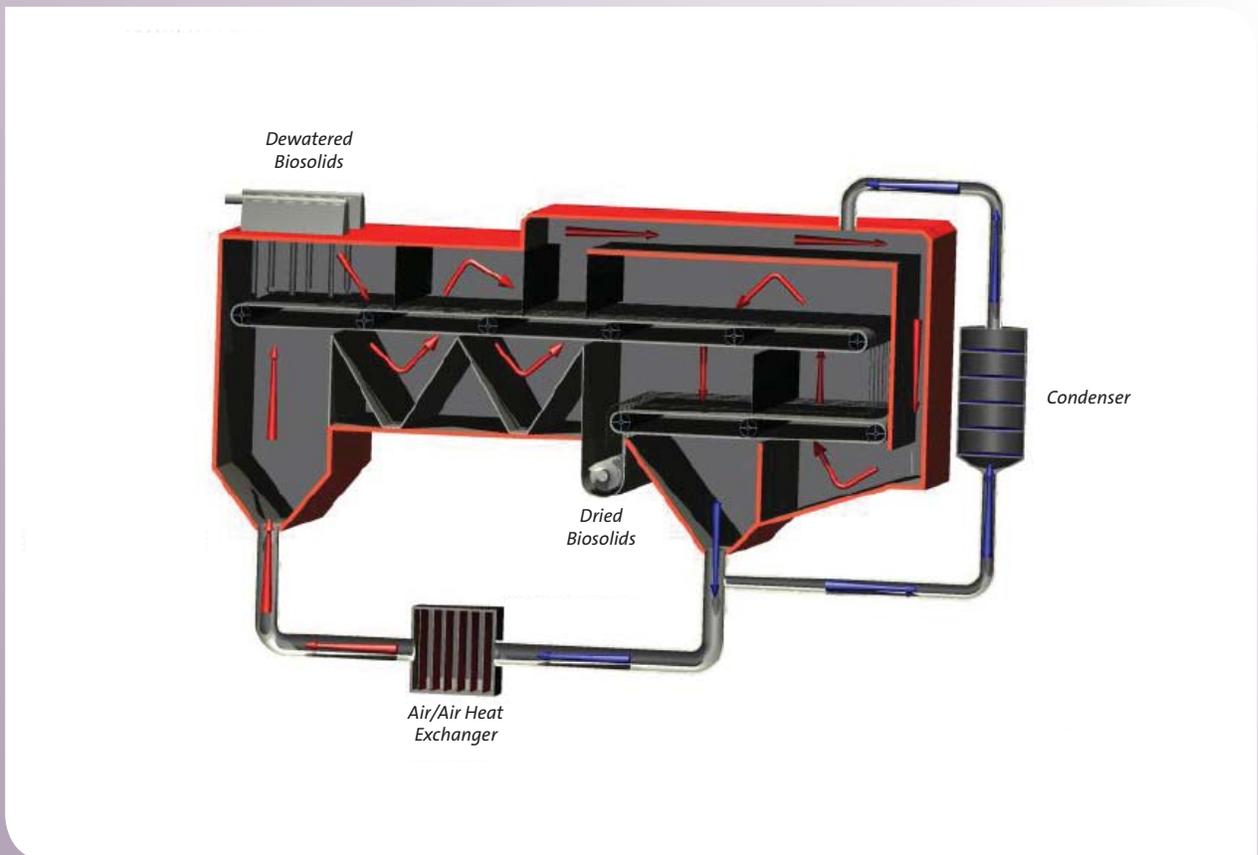
Automation and Controls

BioCon is furnished with Veolia's SCADA and controls system which allows unmanned operations for extended periods of time. Veolia offers the availability of remote monitoring for occasions when no operator is on site.



Waste Heat Utilization

The BioCon dryer operates at lower temperatures. As a result, waste heat sources can now be used for solids drying. Over the past 10-15 years, more and more waste energy sources have been utilizing the gas they produce to generate electricity. Whether gas engines, micro-turbines, or turbines are used, Veolia can capture the heat produced by the electrical generation equipment and use it to heat the BioCon dryer.



The End Product

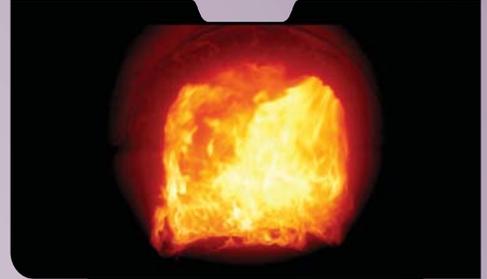
Processed biosolids are dried to a minimum dry solids content of 90%. The desirable end product is easily handled and spread. The end product meets Class A requirements for vector attraction and pathogen reduction. Beneficial reuse of the end product is preferred application because of the high organic content which improves soil quality.



BioCon™ Energy Recovery System

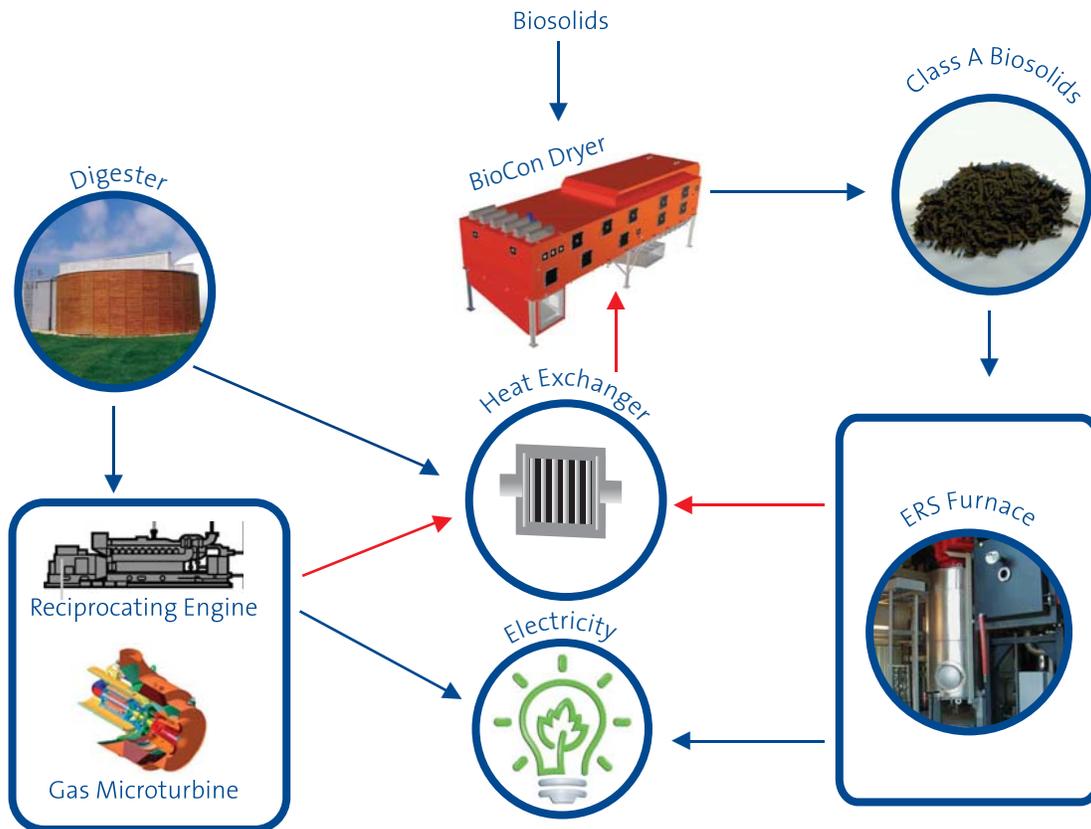
The BioCon drying system can be expanded with the addition of an Energy Recovery System (ERS). Veolia uses a furnace that reduces the output of the plant to 5% of its original quantity. The compact design, which also includes flue gas treatment, may provide all necessary energy for the BioCon dryer. This makes the BioCon system a totally self-sufficient energy process.

Easy Add-on Energy Recovery System



View into Biosolids Furnace

BioEnergy & Biosolids Options



Advantages of the BioCon™

Safe

- BioCon operates at low drying temperatures $\leq 350^{\circ}\text{F}$
- No drying air or dust is released into the surroundings
- The air is recycled, making it a contained process
- The drying vessel operates at a negative pressure
- Low agitation of biosolids during drying process due to minimal noise and dust
- End product meets EPA Class A quality requirements

Simple

- Automatic start, stop and operation, requiring minimal operator attention
- Reliable machinery consisting of few moving parts and many years of full-scale operational experience
- Designed for intermittent or continuous
- Easy to upgrade for an Energy Recovery System

Efficient

- System designed with energy savings in mind resulting in significant heat recovery
- Large evaporation surface area for biosolids are dried in thin strings, enabling low drying temperature
- A supplemental odor control system is not necessary
- Significant mass reduction with reduced storage, transportation and disposal costs



Select Installations

• Buffalo WWTP

Start Up: 2008
Plant Size: 4.4 MGD
Biosolids Capacity: 3,300 lbs/hr

• SMSC, MN WWTP

Start Up: 2007
Plant Size: 1.0 MGD
Biosolids Capacity: 1,100 lbs/hr

• Randers WWTP

Start Up: 1999
Plant Size: 7.5 MGD
Biosolids Capacity: 3,900 lbs/hr



Gas Engine

Flexible Energy Sources

BioCon has the flexibility to use any of the following energy sources:

- Oil, Natural Gas, or Biogas
- Gas Engines or Microturbines
- Steam
- Flue Gases
- BioCon Energy Recovery System

Additionally, given its low operation temperature, BioCon can make use of waste energy sources in a practical manner.

Resourcing the world

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