



# Krüger

# FLUENT LINES



Keeping You Updated on Kruger's Pioneering Solutions

## Innovative Biosolids Energy Recovery System For Alternative Fuel

Kruger Inc introduces an advanced biosolids Energy Recovery System (ERS), which captures the energy value from dried biosolids. The BIOCON® ERS will be used as a renewable energy source for the established BIOCON® Thermal Drying System.

The Kruger BIOCON ERS offers wastewater treatment plants the opportunity to reduce energy costs by feeding the dried biosolids into a Biosolids Furnace equipped with a special heat recovery system. The recovered heat is then returned to the drying process. At this point the drying process becomes completely energy self-sufficient.

An added benefit of the BIOCON ERS is that total material reduction is achieved, reaching greater than 95% solids reduction.



*Easy Add-on Energy Recovery System*

According to Finn Nielsen, CEO of Veolia Water Solutions & Technologies North America, "It is remarkable that what used to be thought of as a waste material can now represent a valuable energy resource to municipalities. The present worth of using biosolids material as fuel is often times in the multi-million dollar range."

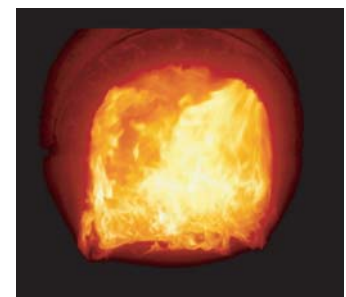


*Drying Air Condenser Enables a Closed Environment*

### I. Kruger Inc. Background

I. Kruger Inc. is a water and wastewater solutions provider specializing in advanced and differentiating technologies. Kruger provides complete processes and systems ranging from biological nutrient removal to mobile surface water treatment. The ACTIFLO® Microsand Ballasted Clarifier, BIOCON® Dryer, BIOSTYR® Denitrification System and HYDROTECH Discfilters are just a few of the innovative technologies offered by Kruger. Kruger is a Veolia Water Solutions & Technologies company.

For More Information about Kruger Visit: [www.krugerusa.com](http://www.krugerusa.com)



*View into Energy Recovery System*

### In This Letter:

Focal Point: Biosolids & Energy Free Energy for Thermal Drying Carmel, IN Recieves Award



Solutions & Technologies

# CREATIVE SOLUTIONS

## BioCon® - Safe, Simple & Efficient Thermal Drying

BioCon® uses indirect heating and low temperatures (<350°F) to create one of the safest dryers on the market today; demonstrated by over 10 years of full-scale operations without incident. The innovative biosolids depositors eliminating back-mixing requirements and gentle material handling minimizes dust and fines production. The BioCon dryer can also be expanded with the addition of an Energy Recovery System. Kruger uses a slow-moving grate type furnace that reduces the output of the plant to 5% of its original quantity.



## ATHOS® - Biosolids Minimization



ATHOS® is a hydrothermal oxidation process that minimizes biosolids volumes by as much as 98%. To accomplish this reduction while remaining odor free, the process operates in a completely closed environment and uses pure oxygen to mineralize organic carbon content.

The products generated by ATHOS are:

- Clean odor free gas
- An easily biodegradable organic liquid
- A mineral-based solid (Technosand)

## BioPasteur - Pre-Pasteurization

Kruger's patented BioPasteur process uses innovative heat exchanger design to create a pre-pasteurization system that is both energy efficient and easy to maintain. The use of sludge/water/sludge heat transfer allows easy operation and maintenance.



Kruger is committed to providing innovative solutions with proven value-added performance. Our biosolids treatment technologies focus on performance enhancement, renewable energy, beneficial reuse, and minimization. We offer safe and environmentally friendly solutions to help overcome challenges faced by municipalities and industries around the world.

## BioTherm - Anaerobic Digestion

BioTherm digestion gives small treatment plants an energy efficient treatment alternative. By operating thermophilically, the digestion rate is increased which allows secondary sludge to be treated with or without the presence of primary sludge. The process uses small stainless steel digesters that have integrated heat exchangers and a simple mixing system. Additionally, the process produces Biogas that is harnessed for heat or power production, further increasing energy efficiency and reducing costs.



## BioThelys® - Thermal Hydrolysis

BioThelys® is a thermal hydrolysis process used to treat dewatered municipal or industrial sludge. The hydrolyzed sludge is then digested by anaerobic digestion. The BioThelys step optimizes the digestion process by increasing the amount of biodegradable organic material.



BioThelys Performance:

- Reduction of 50-60% in biosolid volume
- Enhanced digester capacity
- Increased biogas production
- Class A end product

## SOLIA - Solar Drying

Kruger's Solia process combines two tried and true methods of sludge treatment, air drying and aerobic digestion, to enhance sludge drying efficiency. Sludge is stored in a greenhouse environment, where solar radiation is used for drying. The sludge is maintained in an aerobic environment and turned regularly. The energy released by the oxidation of the biomass increases the drying efficiency. The Solia process provides a cost-effective and environmentally-friendly method of treating waste biosolids.



For more information on how Kruger can help solve your biosolid needs please contact:  
Brian Frewerd or Tom Dodd at (919) 677-8310

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Tom.Dodd@veoliawater.com

## Leading The Way, Carmel Receives Award

The City of Carmel, IN recently received an Honor Award from the Indiana chapter of the American Council of Engineering Companies for its BioPasteur system, which started up in March 2005. Carmel is the first city in the United States to install this innovative process.

The BioPasteur process at Carmel involves heating 45 to 80 gallons per minute of thickened sludge to a minimum temperature of 155°F.

The sludge is held at high temperatures for a period of thirty minutes to one hour. A simple to maintain sludge/water/sludge heat exchanger provides a simple

means for heat to be recovered and transferred, maximizing efficiency. The process is followed by anaerobic digestion to produce Class A biosolids.

The BioPasteur is simple to operate because the process is automatically controlled by a PLC system.

The program is customized for site-specific conditions to provide optimum treatment.

The installation continues to be a successful one for the City of Carmel. They have future plans to dewater the Class A product produced by the BioPasteur system and use it as a source of revenue by marketing it to customers.



*Carmel's Insulated Pasteurization Tanks*

# Municipalities Save Money Utilizing BioCon® Drying System

When municipalities evaluate potential treatment options for their biosolids, thermal drying tends to make the list. Thermal drying offers the benefits of a Class A end product and minimizes the amount of material to ultimately be hauled away. However, fuel for the heat source typically represents over half of the operating costs required for a drying system. With fuel costs on the rise and the national drive to find alternative energy sources, the Kruger BioCon dryer offers a solution.

Unlike other drying technologies that use high temperatures to obtain operating conditions, the BioCon dryer runs at lower temperatures with two distinct temperature zones. As a result, untapped waste heat sources once thought of as unusable in a solids drying function are now ready to be used. A major free heat source is where many least expect: a municipal landfill.

Over the past 10-15 years, more and more landfills have been tapping into the gas they produce and using it to generate electricity.

These operations generate a positive cash flow and pay back the investment in short order. Whether gas engines, micro-turbines, or turbines are used, Kruger can capture the heat produced by the electrical generation equipment and use it to heat the BioCon dryer. Quite often the end result is a drying system that produces a Class A end product usable for cap material and for less cost than what would be charged if the biosolids were land-filled untreated. Imagine a thermal sludge dryer that pays for itself with savings!

I am interested in receiving more information on:

- |   |  |
|---|--|
| <input type="checkbox"/> Energy Recovery System | <input type="checkbox"/> SOLIA               |
| <input type="checkbox"/> BioCon                 | <input type="checkbox"/> BioThelys           |
| <input type="checkbox"/> BioTherm               | <input type="checkbox"/> BioPasteur          |
| <input type="checkbox"/> ATHOS                  | <input type="checkbox"/> Waste Heat Recovery |

Name \_\_\_\_\_ Title \_\_\_\_\_  
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Address \_\_\_\_\_ City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_ Telephone ( ) \_\_\_\_\_  
Please tell us about your special needs and/or challenges  
for biosolids



1.0- MW Gas Engine Supplying Heat for BioCon Dryer



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