

**BIO-ORGANIC CATALYST**  
THE POWER IN NATURE®

**BIO-ORGANIC CATALYSTS IMPROVING  
BIOLOGICAL STABILITY AND EFFICIENCY OF  
BIOGAS PRODUCTION**

# BIOORGANIC CATALYSTS (BOC)



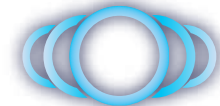
- Bio-Organic Catalyst Inc. produces a line of proprietary product compositions, based upon its unique patented broad spectrum catalytic biochemistry.
- Bio-Organic Catalysts (BOCs) are built upon the bio-catalytic capabilities of a fermentation supernatant, derived from yeast and a balanced composition of other active ingredients.
- The functional mechanism of BOCs is attributed to molecules consisting of both a hydrophobic and a hydrophilic element.
- BOC Applications:

Agriculture	Composting & Animal Care	Paper & Pulp
Anaerobic Digestion	Wastewater Treatment	Facilities Treatment
Aquaculture	Hydrocarbon Cleani	Water Clarification
Bio-Catalytic Cleaning	Odor Control	

# OPTIMIZING ANAEROBIC DIGESTION SYSTEMS



- BOCs offer substantial improvement in anaerobic digestion
  - BOC has shown, in municipal, industrial and agricultural anaerobic digestion systems, that they act on the total volatile solids and total solids components, providing higher reduction rates over baseline values.
  - BOC lead to a faster increase of Microorganisms important for hydrolysis and Methane production ,
  - Sludge quality is enhanced due to more complete digestion and sludge odors will be greatly reduced.
- ➔ BOCs improve the economics of biogas production.



**BIO-ORGANIC CATALYST**  
THE POWER IN NATURE®

## CASE STUDY: RICHWOOD WASTE WATER FACILITY

In August 2014, the formation of a mat of grease which was 4-6 Ft thick was observed.

The addition of BioOrganicCatalyst began early September.

This was stopped after 10 days as the FOG cap was drastically reduced.



### BOC Benefits:

1. Allows increased VS Loading while maintaining increased biogas yields.
2. Improves dramatically biogas production in underperforming Anaerobic Digesters.

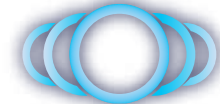
Before



After



Source: Bio-Organic Catalyst Inc.



BIO-ORGANIC CATALYST  
THE POWER IN NATURE®

## BOC APPLICATION IN BIOGAS PLANTS IN GERMANY

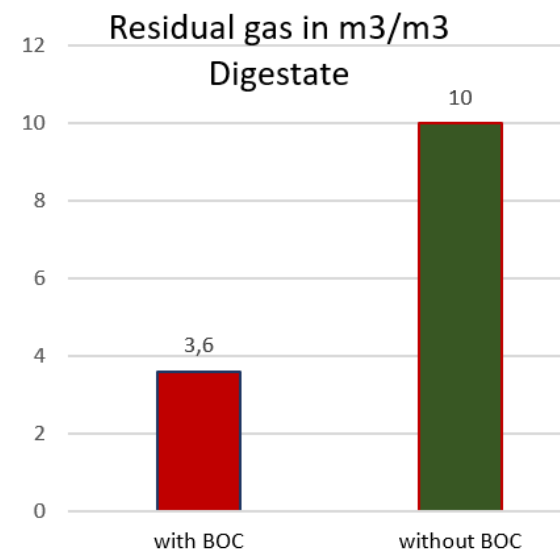
BOC were tested in 10 agricultural biogas plants in Germany:

- The operations are of a size between 250 kw el. and 4 MW el.
- Tests were started in summer 2016.
- The daily dosage is 250 ml/t Organic Dry Matter (ODM) fed.

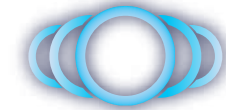


### Key Findings:

- Fast improvement of homogeneous mixing of the fermenter content.
- Better degradation of organic matter.
- Improved viscosity resulting in decreased electricity consumption for mixing,
- Reduction of floating layers.
- Reduction of Residual Gas in Digestate

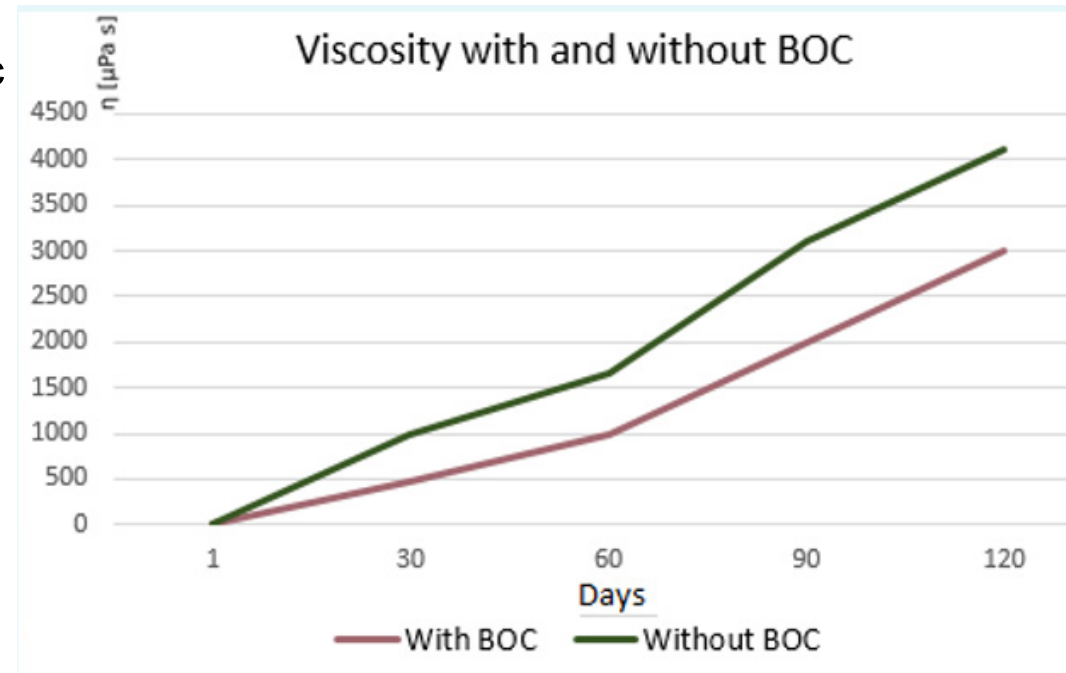


## IMPROVES VISCOSITY



BIO-ORGANIC CATALYST  
THE POWER IN NATURE®

- **EcoSystemPlus®** accelerates and increases the breakdown of organic matter.
- A measurable reduction in **viscosity** helps in the prevention and decomposition of swimming layers.
- A decrease in electricity consumption for stirring is reducing production costs.

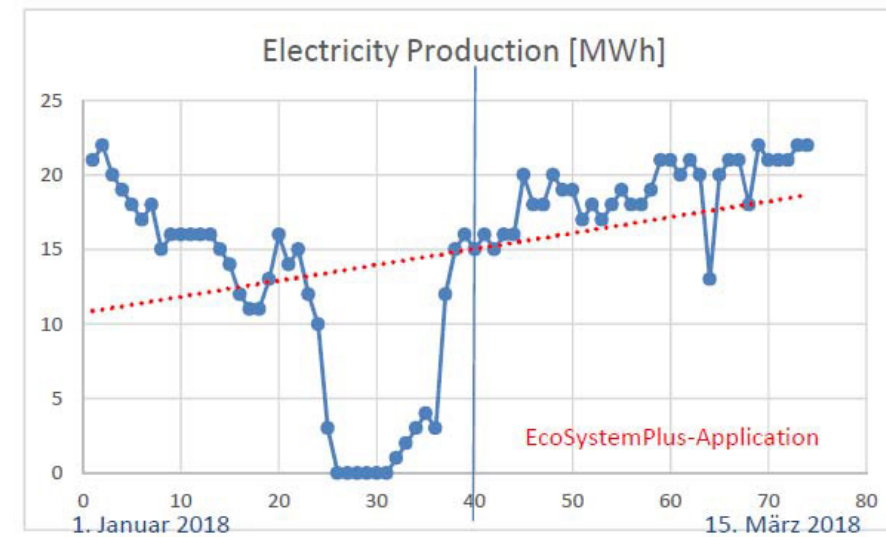
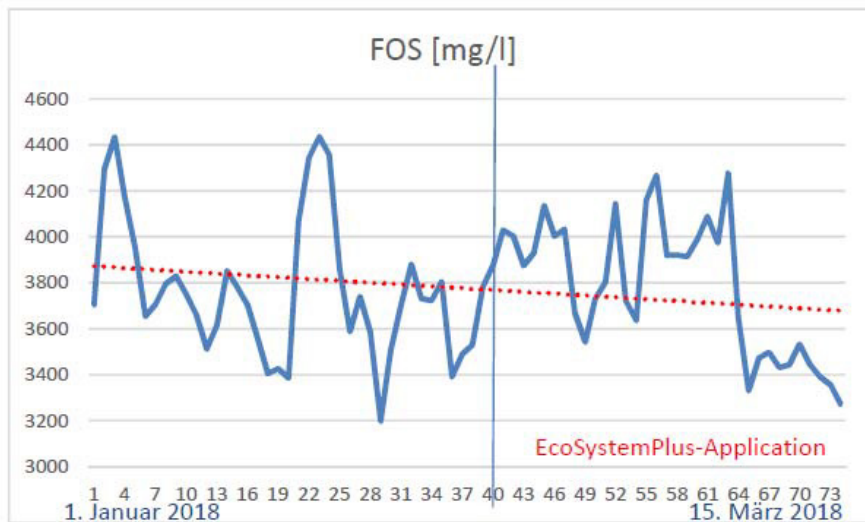
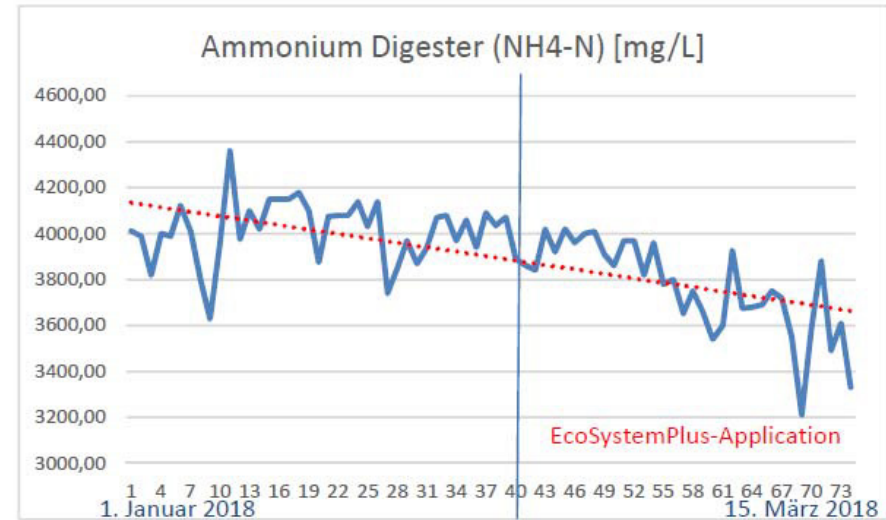
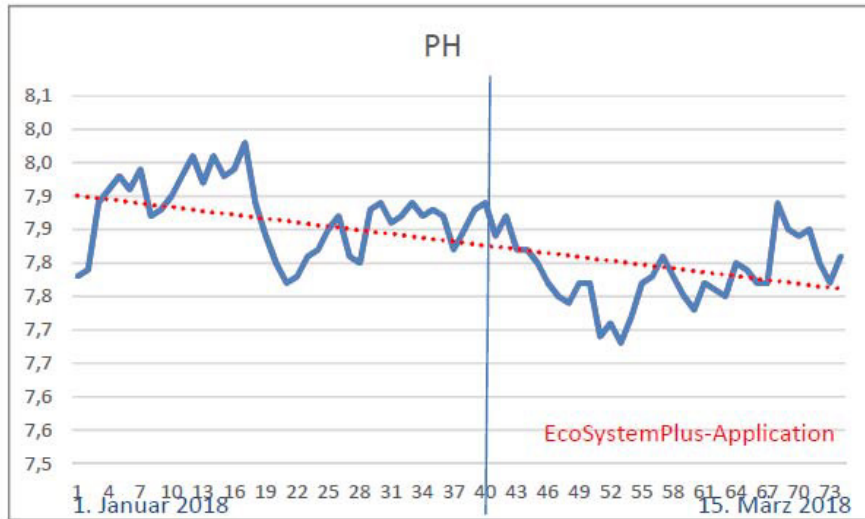


- **EcoSystemPlus®** promotes the hydrolysis and proliferation of methane-forming micro-organisms.
- ESP cleans hydraulic lines and removes sediments.

# APPLICATION OF ESP IN BIOGAS PLANT GEORGSMRIENHUETTE (FOODWASTE)




**BIO-ORGANIC CATALYST**  
THE POWER IN NATURE®



# APPLICATION OF ECOSYSTEM PLUS

## Application:

- EcoSystem Plus® can be fed directly into the biogas fermenter,
- For biogas plants, a daily dose of 250 ml / t ODM (organic dry Matter) has proved its worth.
- Individual dosages are used for the decomposition of floating layers and sewage treatment plants.
- EcoSystem Plus® is non-toxic.



**EcoSystemPlus®**

Optimization of biogas plants, sewage treatment plants, composting

Improves the degradation of organic matter  
Reduces the viscosity  
Prevents swimming pools

Application for:

- Treatment of sewage
- Avoiding film and mucus formation in pipes and process baths.
- Prevention of "biofouling" in heat exchangers and cooling towers
- Improvement of biological degradation

5L 10L 20L

Bezug durch:  
Renew Sources GmbH  
Am Kottengrover Mäse 100  
D-53913 Swisttal  
info@renew-sources.de



## **Bio-Organic Catalyst, Inc.**

711 West 17th Street,  
#E6 Costa Mesa, CA 92627

Phone: 949.515.1301

info@bio-organic.com

**bio-organic.com**

### **Report by:**

Dr. Christian Böse  
Managing Director  
Renew-Sources GmbH