



**BIOLAK® Technology GmbH**  
COMPETENCE IN WATER AND RENEWABLE ENERGY



# BIOLAK® GAS Liquid System

Energy recovery from highly polluted wastewater



BIOLAK® GAS Liquid plant for a brewery of approx. 1.5 Mio. hl/a



# What is BIOLAK®GAS Liquid

A BIOLAK®GAS Liquid plant combines wastewater precleaning with energy production.

The anaerobic degradation process converts the organic residues of the wastewater into methane (biogas). The resulting biogas can be used for energy production in the wastewater-generating plant or for the production of electricity.

Simultaneously, the anaerobic process evokes a significant reduction of pollution in the wastewater.



BIOLAK®GAS Liquid plant for a distillery approx. 61 t COD/d and 1,600 m<sup>3</sup>/d

## BIOLAK®GAS Liquid fields of application

Typical applications for BIOLAK®GAS Liquid are process wastewaters from:

Breweries

Dairies

Distilleries

Fruit processing

Potato starch processing

Slaughter houses and similar

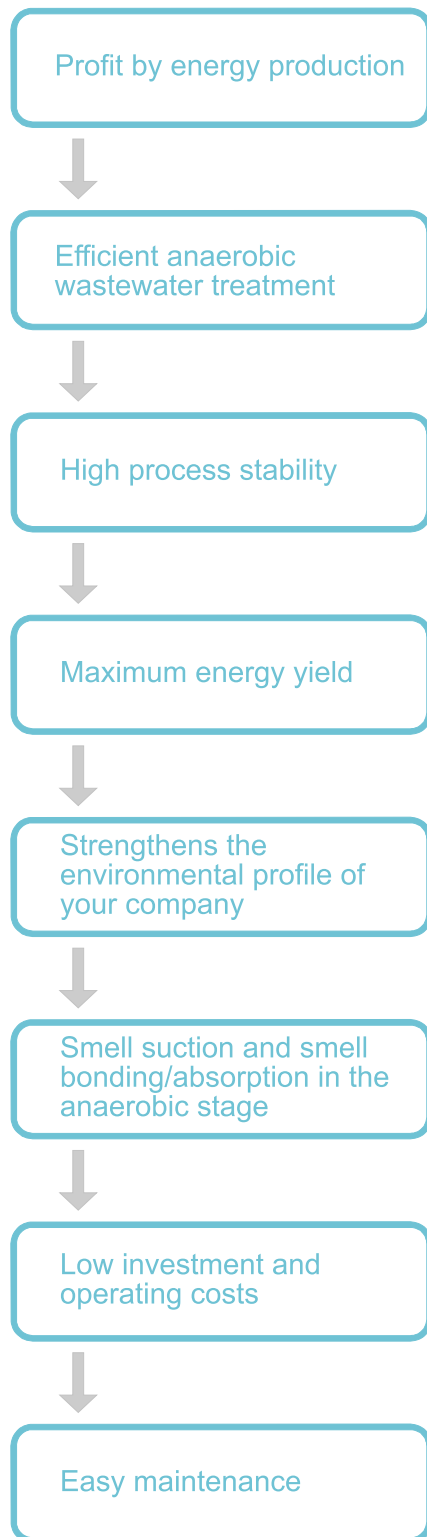
BIOLAK®GAS Liquid may be applied for COD values from 3,000 mg/l.

A particularly high energy yield is achieved by the low volume load and the double-stage configuration.



BIOLAK®GAS Liquid plant for a brewery of approx. 2 Mio. Hl/a

# Advantages of BIOLAK<sup>®</sup>GAS Liquid



A BIOLAK<sup>®</sup>GAS Liquid plant may offer all enterprises that produce highly polluted wastewater, significant cost savings and more energy value.

By extensive anaerobic cleaning of wastewater, energy in the form of gas, electricity and heat is produced. This energy can be used either in the own company or fed into the national grid at subsidized rates. The simultaneous treatment of water and energy provided by the BIOLAK<sup>®</sup>GAS Liquid plant makes a significant contribution to the profit of your company.

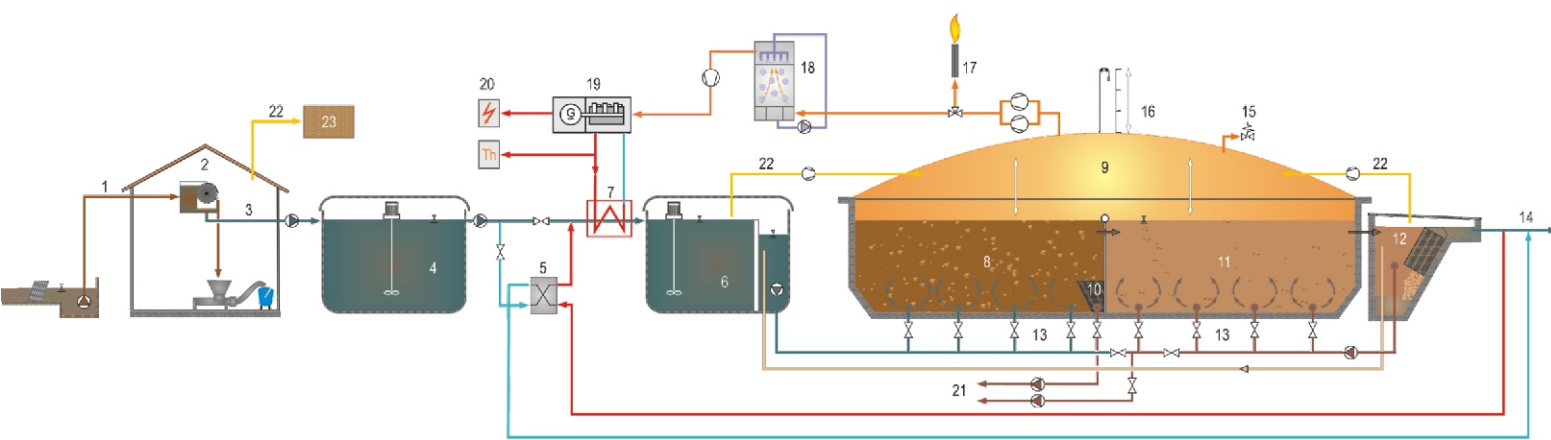
- Low volume loads (3 - 5 kg COD/m<sup>3</sup>d) and double-stage configuration with "adapted" anaerobic sludge leading to:
    - High process stability
    - A maximum of energy production
  - Simple construction with HDPE lined earth basins, as well as integrated acidification, gas storage and final clarification resulting in:
    - Low investment and operating costs
    - After amortization of the investment your plant will earn more than the invested money
  - A modern wastewater treatment with energy production strengthens the environmental profile of your company.
- This will be appreciated by your customers and will give them the opportunity to reposition their profile on the market.
- Low maintenance expenditure.
  - Compensation of the waste gas during the week by the generously sized gas storage.
  - All odors in the inlet and outlet are sucked off and fed to the activated sludge, whose millions of bacteria absorb the smell completely.
  - Optimal use of compensation for electricity fed into the grid (feed-in tariffs) and investment subsidies for alternative energy production in many European countries.



BIOLAK<sup>®</sup>GAS Liquid plant for soft drinks production of approx. 1,200 m<sup>3</sup>/d, 2,450 kg COD/d



# BIOLAK<sup>®</sup> GAS Liquid concept



## Stage I

The process starts with the so-called hydrolysis resp. Preacidification at temperatures from 20 °C to 35°C.

## Stage II

The next step is the anaerobic double-stage at 35°C (high load and low load stage).

Here several types of microorganisms are growing and ensure an optimal conversion of organic substances into biogas and a stable process.

This process guarantees maximum energy production because of a decomposition rate of upto 90% and a high methane content (mesophile process).

## Stage III

Downstream of the gas production after the fermenter is a generously sized lamella separator, which ensures a high degree of retention of biomass and its return to the plant.

- 1 Inlet
- 2 Mechanical pretreatment
- 3 Industrial wastewater
- 4 Buffer basin
- 5 Heat recovery
- 6 Preacidification
- 7 Heating
- 8 Anaerobic stage I (high load)

- 9 Gas storage
- 10 Intermediate clarification
- 11 Anaerobic stage II (low load)
- 12 Final clarification (lamello separator)
- 13 Circulation system
- 14 Outlet
- 15 Safety valve
- 16 Level indication

- 17 Gas flare
- 18 Desulphurisation
- 19 Cogeneration unit
- 20 Energy utilization (electrical + thermal)
- 21 Excess sludge removal
- 22 Smell suction
- 23 Biofilter

## The BIOLAK<sup>®</sup> GAS Liquid FFF - Alternative

Only advanced digestion and high preacidification rates are leading to a good decomposition and high gas production. Since the basic suitability of liquids and solids are differing in the aforementioned process stages, we have developed an appropriate system named FFF (in English: Solids, Fluids, Fermentation).

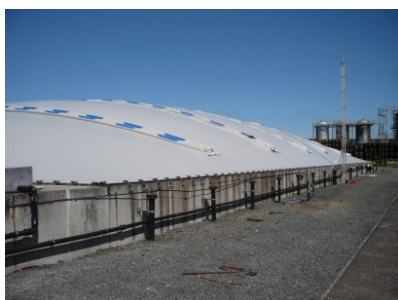
During the FFF process, the different characteristics of the substances are being compensated and all organic substances can be treated in one and the same reactor simultaneously at a high efficiency degree.

# Technical details



## Preacidification

By a controllable retention time of the wastewater in the preacidification, the different characteristics of substances are balanced and all organic materials can be decomposed simultaneously with a high degree of efficiency.



## The two-stage anaerobic reactor and gas storage

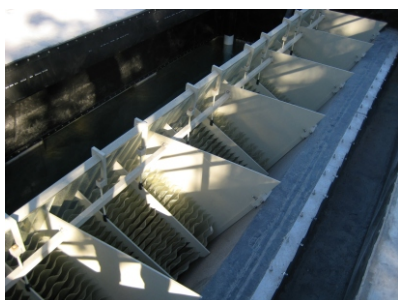
In the two-stage anaerobic reactor the organic compounds (primarily the organic acids provided by the preacidification) are converted into Biogas. Because of the double-stage configuration and a low volume load, a high degradation rate (biogas production) and a high methane content (energy content of biogas) are reached.



## Gas storage

is configured as a hood covering the whole plant. It is generously dimensioned in order to catch up the fluctuations in gas production, i.e. during the weekends.

The hood is made of high-quality, multi-layer PVC textile membrane with UV-protection and has frequency damping weights for stabilization to withstand heavy storms.



## The lamella separator

is used as clarifying unit and even retains light anaerobic sludge. Its size is individually dimensioned depending on the inlet characteristics and hydraulic load.

The separator is easy to operate and to maintain.



## The basin lining

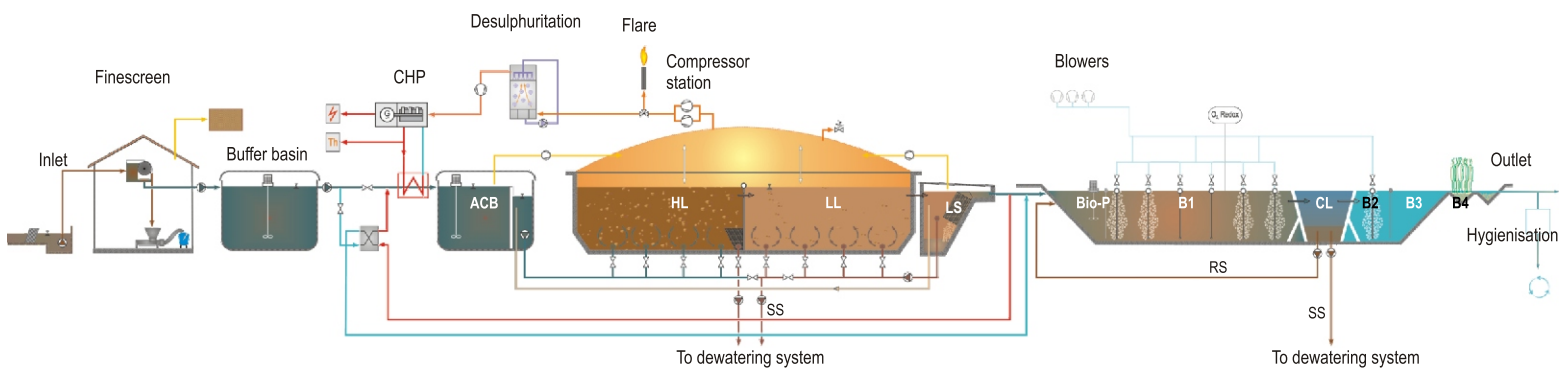
made of a high-quality, strong HDPE lining enables the construction of a biogas plant as an earth basin. As in a toxic-waste deposits HDPE-lines of 2 mm thickness are used for BIOLAK®GAS Liquid plants. Welding is carried out by TÜV (Technical Supervisory Association) certified welders according to strict regulations.

HDPE-lining is designed to have a life time of at least 50 years. The lifetime of such lining exceeds that of concrete. BIOLAK®GAS Liquid uses this inexpensive construction type in order to build robust and completely lined basins.

# COMBI System

The combination of anaerobic (BIOLAK® GAS Liquid System) and aerobic (BIOLAK® Integral System) wastewater treatment allows complete recycling of your wastewater by the recovery of energy and process water.

- The space requirement of such combination is ranging from 30% to 50% compared to a purely aerobic treatment plant.
- The whole energy balance of the combination is positive. More electrical and thermal energy is generated than required for the operation of your plant.
- The effluent of the BIOLAK® Integral plant can be alternatively reused as process water.

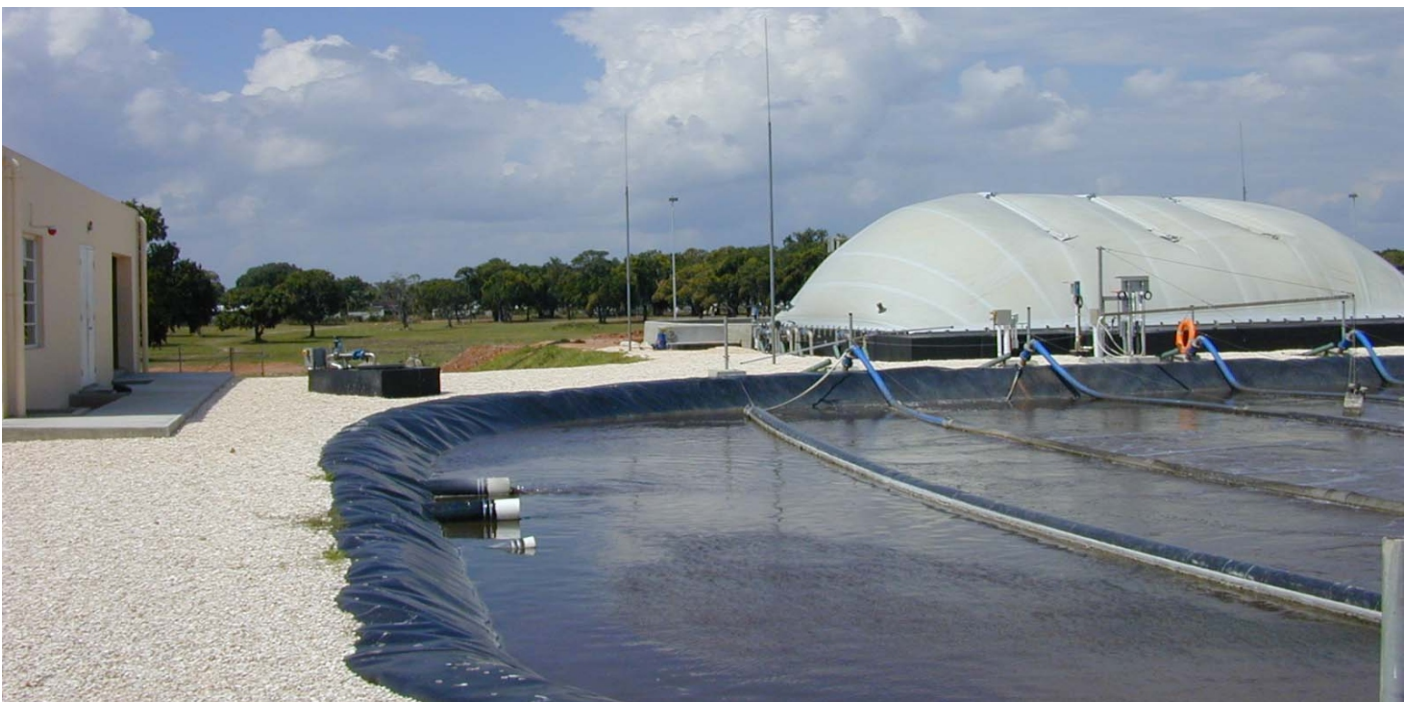


ACB Preacidification  
HL High load stage  
LL Low load stage

LS Lamello separator  
Bio-P Biological P-Elimination  
B1 Activated sludge basin

CL Clarifier  
B2 Post aeration  
B3 Polishing stage

B4 Biofilter  
RS Return sludge  
SS Surplus sludge



COMBI plant for a brewery and beverage industry of approx. 0.2 Mio. hl/a

# Experience, service and customer support

## Over 35 years of experience worldwide

Since the member companies of BIOLAK® GROUP were founded in 1973, they have expanded their activities in process engineering all over the world. They have built plants for biological wastewater treatment, biogas production and refinement of fermentation residues according to their patented systems.

Reference is made to 750 plants built worldwide, many of which have been installed in Asia, the United States, Europe, Central America, the Middle East and Africa.

## Customer support

Our plants' engineering includes the entire technical equipment of the plants. It consists of the design, control, installation and commissioning of the plants, as well as the extensive training of operating personnel.

A continuous contact to the customer is ensured by local representatives and partners in each individual country. This is to ensure that special requirements of the countries recognized and reflected in the concepts are taken into consideration.

## Training and effective support

All systems are delivered to the customer with a training program tailored to the specific requirements of the client and is performed by experienced process engineers.

Our personnel accompany the Operation of the plants, also after handing-over to the customer. Regular visits and immediate support in case of any problems are of course part of the Service, as well as a monthly check of the operating parameters. This allows the client's operating personnel to benefit from the extensive experience of BIOLAK® Technology GmbH. The client will never be left out in the rain!



# Supply of a BIOLAK® GAS Liquid pilot plant

In difficult cases, e.g. in wastewaters where the COD value is highly fluctuating, we offer our customers to carry out a series of representative tests.

For this special case we developed our pilot plant, which fits on a truck and is easily to install everywhere. In the 33 m<sup>3</sup> methane reactor reliable results for the dimensioning of major plants are obtained.





**BIOLAK® Technology GmbH**  
COMPETENCE IN WATER AND RENEWABLE ENERGY



## Contact

BIOLAK® Technology GmbH  
Killistrasse 3  
85658 Egming-Muenster  
Germany  
Phone +49 (0) 8093 902 40 0  
Fax +49 (0) 8093 902 40 91  
info@biolak.de  
www.biolak.de

## Representatives

Bosnia-Hersegovina  
Bulgaria  
China, Hongkong  
Croatia  
Egypt  
Hungary  
India  
Iran  
Latin America  
Montenegro  
Poland  
Romania  
Saudi-Arabia  
Serbia  
South Africa  
Syria  
Turkey

