BIOTHANE

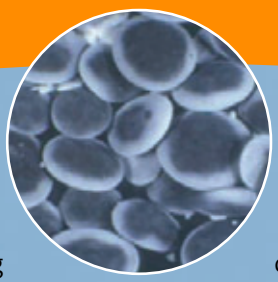
Biological treatment of Wastewater

Highly efficient, cost effective biological methods to reduce pollution and recover energy with a minimal environmental impact.

VEOLIA WATER

Solutions & Technologies

About Biothane



Anaerobic biomass

Biothane, part of Veolia Water Solutions & Technologies, is one of the world's leading companies in the field of biological treatment of industrial and municipal wastewater. More then 500 installations located in over 40 countries operate in a wide variety of industrial sectors. This unique reference base underlines our company's extensive experience.

Our technologies can be applied to a great variety of waste (water) streams from industries such as:

- Breweries
- Pulp and Paper
- Chemical/Pharmaceutical
- Sugar
- And many other industries
- (Bio) Ethanol
- Food & Beverage
- Dairy
- Yeast

Company profile

Biothane has main locations in the United States, The Netherlands and Indonesia, an office in China, plus a network of worldwide partners and using the global structure of Veolia Water Solutions & Technologies. With this outreach, we are able to work in close cooperation with our customers to seek the most cost effective economic solution for every treatment problem.

Biothane is the developer and exclusive owner of the anaerobic Biothane® UASB and Biobed® EGSB technologies, the most successful anaerobic technologies for treatment of industrial wastewater.

This line of anaerobic treatment technologies is complemented by extensive experience in aerobic treatment processes for BOD and nitrogen removal (nitrification, denitrification), various proprietary processes for anaerobic digestion of solid waste and slurries, and extensive experience and references in cleaning of biogas. Biothane is part of Veolia Water Solutions & Technologies. Our customers not only benefit from Biothane's leading aerobic and anaerobic technologies, but also from the combination with a wide range of proprietary technologies of Veolia Water Solutions & Technologies, especially adapted to the requirements of each individual project. In addition to the wide array of water treatment solutions we offer, you can rely on the innovation, reliability and organizational strength of the entire group.

Veolia Water Solutions & Technologies is a world leader in engineering, design, project management and execution of construction projects for water and wastewater applications, and it also creates dedicated technological solutions, using a unique portfolio of differentiating technologies developed by the group's R&D centers. The company is a subsidiary of Veolia Water, a leading design & build company, and a specialized provider of technological solutions in water treatment.

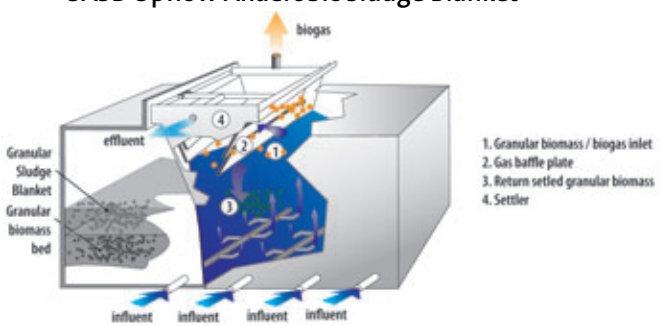
Anaerobic

More and more emphasis is being placed on low operational costs, small footprint, energy from waste and low sludge production. Because they excel in these areas, UASB and EGSB technology have dominated the market of anaerobic biological industrial effluent treatment worldwide.
Both technologies utilize anaerobic bacteria growing in a granular matrix without use of any carrier materials. The anaerobic process enables removal of COD by converting it into biogas (= methane + carbon dioxide) at low operational costs and with a very compact plant design.

Biothane® UASB

The Biothane® UASB process is a maintenance free, corrosion-free, rugged and straightforward design. We do not incorporate complex interfering design parts nor any rotating equipment within the reactor and therefore the reactor requires no maintenance at all. Biothane's philosophy is not to design to the limitations of the technology, but to design for process stability and flexibility.

UASB Upflow Anaerobic Sludge Blanket



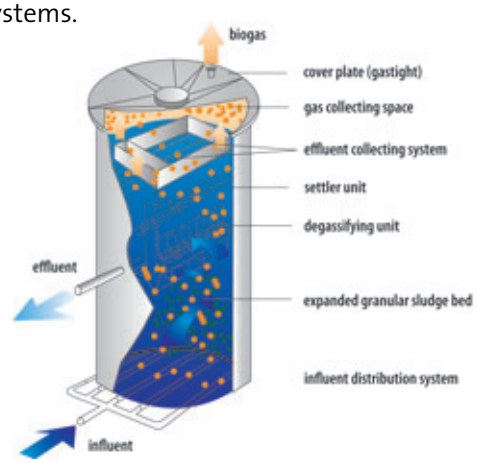
Characteristics Biothane® UASB

- High Organic Loading Capacity (10 - 15 kg COD/m³/d)
- Compact Design
- Patented Double-Baffle Internal Settler
- Highly Settleable Granular Biomass
- Methane Energy Byproduct
- Economical Operation
- Proven Reliability

Biobed® EGSB

The Biobed® EGSB process is based on a high-tech and proven process design. Because of the higher-pressure design of the Biobed® EGSB plants, no gasholder or biogas compressor is required. This limits the costs substantially, both capital and maintenance.
The Biobed® EGSB sealed-reactor design eliminates emissions of nuisance odors. All potential odor emission locations are integrated into the pressurized biogas circuit, thus avoiding the need to install external odor removal equipment (e.g. biofilters), which typically are necessary with other systems.

EGSB Expanded Granular Sludge Bed



Characteristics Biobed® EGSB

- Ultra High Organic Loading Capacity (15 - 35 kg COD/m³/d)
- Extremely Small Footprint
- Patented Triple-Baffle Internal Settler
- Highly Settleable Granular Biomass
- Methane Energy Byproduct
- Economical Operation
- Proven Reliability

Features

The Biothane® UASB and Biobed® EGSB processes have proved to be the optimal technical and technological solutions for the treatment of many different kinds of waste waters. The Biothane® UASB and Biobed® EGSB processes offers maximum stability because of their external recirculation flows. It enables a flexible operation, efficient mixing and optimum use of available biomass, ensuring the lowest possible biomass loading. This results in maximum flexibility and capacity (high turn-down capacity).

Waste water treatment

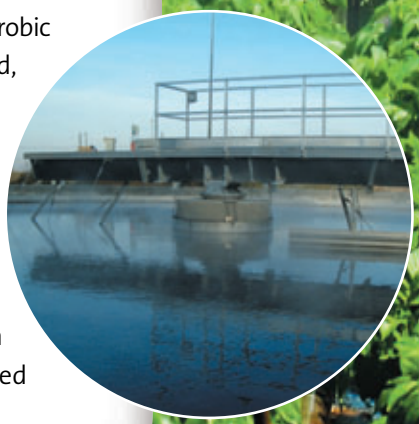
Biobed® Modular Plant

Biothane has developed a cost-effective anaerobic wastewater solution for smaller COD load and flow applications. The core unit for a Biobed® MP system includes two modules consisting of a 50 m^3 Biobed® EGSB reactor with one service module. Each service module can be expanded up to 6 Biobed® modules.

This system is pre-fabricated and transported to the site complete. The modules are 40ft container framed modules, which makes them easily transportable. COD loads of up to 1,000 kg/d per reactor module contained in a flow of up to 480 m^3/d are efficiently treated in this very compact plant. As production increases, many users have incorporated additional reactors, making expansion of the wastewater plant fast, easy and economical.

Aerobic

Aerobic waste water treatment converts the organic pollutants (COD, BOD) in wastewater into a fair amount of excess sludge, and oxidizes the rest with oxygen (air) to carbon dioxide. Furthermore the priority pollutants nitrogen and -phosphorus can be effectively removed.
However, the operating costs for aeration, sludge treatment and -disposal are high so that, whenever feasible, anaerobic treatment systems are preferred. On the other hand, when certain (surface water) discharge standards have to be met, the aerobic process will always be needed as a complementary polishing treatment step. Furthermore, the aerobic process step can treat waste waters for which anaerobic treatment is not suited. Biothane has extensive experience with the design and operation of aerobic systems for both organics- and nutrient removal, including combined anaerobic/aerobic systems.



Aerobic processes that Biothane can offer:

- Conventional activated sludge system
- SBR (Sequence Batch Reactor)
- MBR (Membrane Bioreactors)
- MBBR (Moving Bed Bio Reactor)
- Nitrification and denitrification (N-removal)
- Biological- and chemical phosphate removal (P-removal)

Biopuric

The Biopuric Process is an unique combination of existing technologies, wherein sulfur oxidizing microorganisms in the biofilm metabolize hydrogen sulfide into elemental sulfur and sulfuric acid, thus purifying the biogas. This proven, exclusive Biothane process is installed in municipal and industrial fields. Operating plants are effectively treating biogas with hydrogen sulfide concentrations ranging from 1,000 ppmv to 15,000 ppmv. Removal rates consistently range from 90 - 98%.

The process is environmentally safe and has minimal power requirements. Absence of harsh chemicals ensures that the waste products are not detrimental to the environment.

Benefits of the Biopuric technology include:

- Low energy requirements
- Little (if any) chemical usage
- No hazardous chemicals to work with
- Easy to operate and maintain
- Proven track record of performance

Biobulk CSTR

The Biobulk technology is the anaerobic equivalent of the concept of conventional activated sludge digestion.

The key to the Biobulk design is the manner in which the reactor vessel is mixed and the design of the passive degassing step prior to clarification.

The mixed liquor suspended solids (MLSS) concentration in the reactor is controlled by periodic wasting of biomass returned from the clarifier. The process is simple to operate and maintain and has been found to provide a very effective method for the efficient anaerobic digestion of wastewaters containing high concentrations of TSS and/or FOG.

Biological Treatability

Biothane has the capability in-house to test samples of wastewater streams to gain a first impression of the digestibility of a given wastewater sample.

By testing the wastewater under controlled conditions, one can obtain an indication of the sludge activity, the possible COD reduction, possible short term adverse effects of components in the wastewater and sludge adaptation potential.

For example, wastewaters with high concentrations of sulfur-bearing compounds should be tested in the laboratory as the first step in determining the advisability of proceeding with more detailed pilot studies.

Services that can be delivered by Biothane:

- Detailed Waste water analysis
- Detailed Nutrient analysis
- (An)aerobic toxicity test
- (An)aerobic biodegradability test
- Biomass Activity test
- Biomass settleability characterisation
- (An)aerobic Continuous laboratory test
- (An)aerobic pilot-plan experiments (on site)

Contact us for further information!

Selection of references

Sugar

CSM	The Netherlands	1976, 1980, 1981
Suiker Unie	The Netherlands	1981
Van Melle	Indonesia	1996
British Sugar	U.K.	1996, 2000
Chiba	Japan	2001
Aksaray	Turkey	2006
Bogazliyan	Turkey	2006

Chemical

DSM Special Products	The Netherlands	1985
Shell Nederland Chemie	The Netherlands	1985
Caldic Europoort	The Netherlands	1992
Castagna Univel	Italy	1995
DuPont de Nemours	The Netherlands	1995
Eastman Chemical	Singapore	1997
KoSa (Hoechst)	The Netherlands	1998
SASA	Turkey	1997
Reliance Industries	India	2000
Confidential	China, Taiwan	2000
Confidential	Belgium	2007
Confidential	Portugal	2008

Food

Häagen-Dazs	France	1992
Cham	Israel	1992
McCain Foods Holland	The Netherlands	1991, 1993, 2006
Smiths Food Group	The Netherlands	1994
Yamada Akita	Japan	1994
Universal Dehydrates	The Netherlands	1997
Wedel / Frito Lay	Poland	1997
Uzay Gida / Frito Lay	Turkey	1997
Cargill	USA	1999
Frito Lay	Russia	2002, 2005, 2007
Bulmers	Ireland	2007
Eckes Granini	Germany	2008
Universal Beverages	U.K	2008

Pulp & Paper

Stone Cons. Bathurst	Canada	1987
PWA	Germany	1987, 1992
Smurfit	U.K.	1993
K.A. Wiesloch	Germany	1995
Kartonfabrik Rieger	Germany	1997
Alier	Spain	2006
Oji Paper Co	Japan	2006
Mondi	Poland	2007
Lee & Man Paper	China	2007
Dunapack Paper Mill	Hungary	2008
Sappi	Austria	2008

Brewery

South African Breweries	South Africa, Romania	1985, 2006, 2007
Asahi Breweries	Japan	1989 - 2000 (10x)
Anheuser-Busch	U.S.A.	1989 - 2000 (8x)
Oriental Breweries	South Korea	1990, 1991
Heineken	The Netherlands	1992
Grupo Cruzcampo	Spain	1992
Quilmes	Argentina	1993, 1994, 1995
Carlsberg	Israel	1994
Kingway Shenzhen	China	1995
EFES Pilsen	Turkey, Romania, Russia	1996 - 2000 (6x)
Stag Brewery	U.K.	1996
Lapin Kulta	Sweden	2005
Inbev	Romania	2006
Unicer	Portugal	2006
Cesu Alus	Latvia	2007

BIOTHANE

Biothane Corporation
2500 Broadway/Dwr. #5
Camden, NJ 08104 - USA
Phone: (856) 541-3500
Fax: (856) 541-3366
Email: sales@biothane.com

Biothane Asia Pacific
Ventura Building 605
Jl. R.A. Kartini no 26
Jakarta Selatan 12430, Indonesia
Phone: +62 (0)21 750 4707
Fax: +62 (0)21 750 4708
Email: sales.asia@biothane.com

Biothane Systems International
Tanthofdreef 21
P.O. Box 5068
2600 GB Delft – The Netherlands
Phone: 31 15 270 0111
Fax: 31 15 256 0927
Email: sales.europe@biothane.com

Biothane Systems China
Cross Tower #1810
318 Fuzhou Road
Shanghai 200001
China
Phone: +86 (021) 6391 2525
Fax: +86 (021) 6236 3092
Email: sales.china@biothane.com

www.biothane.com

Biothane is a part of
Veolia Water Solutions & Technologies

www.veoliawaterst.com

VEOLIA
WATER
Solutions & Technologies