

Dry fermentation: from biowaste to biogas



Biogas in general



Biogas – clean energy with a big future

BIOFerm is the dry fermentation specialist in the Viessmann Group. We make a real contribution to CO₂-neutral energy generation with innovative technologies.

Since 2007 BIOFerm has been a member of the Viessmann Group, one of the internationally leading manufacturers of heating systems. The resulting technological synergies in the areas of gas utilisation and heat generation provide real benefit to our customers. With sites in Germany and around the world, we can realise international projects in the closest proximity to our customers.

BIOFerm offers a comprehensive output range around fermentation systems for solid matter. The crucial benefit: You, as the client, only need to refer to one contact for the entire project. We will take care of all of your concerns, right from the initial consultation to viability considerations and the overall concept design through to project implementation and commissioning.

Discovering biowaste as a valuable resource

BIOFerm technology enables the generation of primary energy from biowaste and waste material from landscape gardening. It is environmentally friendly, sustainable and CO₂-neutral in production. Only the most rudimentary demands are made of the source material. Food and feedstuffs are not used to generate biogas.

Biogas creates independence

The utilisation of biowaste and home-grown raw materials has a long-term positive effect on the handling of fossil fuels. Short transport distances and independence from expensive energy imports, too, make their contribution felt.

Top Fig.:

The Hitzacker biogas plant, with decentralised CHP/Vitoplex unit, supplies consumers (hospital, retirement home, etc.) via a local heating network.

Bottom Fig.:

The Fortex biogas plant in Šumperk-Temenice – the first plant operating according to the dry fermentation principle in the Czech Republic.



Filling the digester: Our patented process yields high grade biogas

Biogas is a fuel that can be stored, enabling it to be used where and when it is required. Today, approximately 3.5 million German households cover their electricity demand with biogas.

In rural areas with poor infrastructure, building biogas plants also contributes to local job creation – currently some 16,000 are employed in the German biogas sector.

Highest system safety

All BIOFerm plants have been TÜV-certified and meet the highest criteria for operational reliability. Thanks to its modular design, the system can be extended at any time if demand, or the amount of available biomass, increases.



BIOFerm biogas plants are TÜV-certified and meet the highest safety standards.



The BIOFerm system: turning biomass into valuable energy

Dry fermentation refers to the fermentation in airtight sealed digesters, of organic solids with up to 60 percent dry matter, that can be tipped.



- 1 Biomass
- 2 Mixing area
- 3 Digester
- 4 Gas storage
- 5 Heating technology
- 6 Combined heat and power unit
- 7 Cooling/heat utilisation
- 8 Power feed into the grid

The fermentation of biomass forms high quality biogas with a high methane and low hydrogen sulphide content.

BIOFerm relies on dry fermentation when generating biogas. Compared to wet fermentation, the demands this process makes of the source material are extremely low. Any organic solid mass that can be tipped, such as biowaste, cuttings and solid manure with up to 60 percent dry matter can be used. Furthermore, no sorting of interfering material or pre-treatment is required.

The innovative BIOFerm system enables biomass to be utilised with minimum effort and energy. In our biomass systems, the fermentation process is divided between individual digesters where the biomass is fermented under exclusion of air. The BIOFerm system ensures constantly high gas yields with a methane proportion in excess of 60 percent.

The biogas produced can be fed into the gas mains following treatment or can be converted into heat and power in a CHP unit. The generated power can be fed into the grid and the thermal energy can, for example, be utilised in local heating networks. Biogas converted into bio natural gas can be used in all vehicles that can operate with natural gas.

Technically perfected systems

The fermentation residue can be used in agriculture as a high grade organic fertiliser or can be further composted. With the exception of filling and removal by wheeled loaders or similar, the system operates under fully automatic control.

The BIOFerm system is technically perfected. Through practical research and development, we make constant efforts to advance the development of our BIOFerm system.



Vitobloc 200 CHP modules

Top Fig.:
Hellabrunn Zoo, Munich:
Fermenting zoo waste into biogas

Bottom Fig.:
Benatti, Italy:
Filling the digester with beef manure, amongst others

Economy from which you profit both now and in years to come

Biogas from biomass is not only ecologically sensible, but also highly profitable

Our advice

Combined heat and power units (CHP) are ideal for operating with biogas. For detailed information regarding CHP modules from ESS, the CHP expert in the Viessmann Group, see the brochure "Combined heat and power modules up to 401 kW_e and 549 kW_{th}".

For further information see also

www.viessmann.de



BIOFerm technology enables the conversion of biowaste and cuttings into genuinely valuable material. The resulting primary energy can be fed into the grid; each kilowatt hour is remunerated in accordance with the EEG (Renewable Energy Act [Germany]) at a specified level. The heat generated during combustion can be used for the heating or cooling of buildings and systems. This creates an additional source of income. Even the fermentation residue is a useful end product as it can be used as agricultural fertiliser or processed into high grade compost or soil.

BIOFerm offers completely new opportunities, particularly for municipal operations, the food processing industry and landscape gardening, where large volumes of biowaste and cuttings are produced. Instead of paying for the expensive disposal of this waste, it can be turned into valuable energy, thereby generating a sustainable payback, whilst helping the environment. Composting and farming enterprises can also easily secure additional income from a BIOFerm biogas plant. The BIOFerm system ensures a system operation that is always economical.

This reliable and proven process ensures constantly high gas yields. The high system availability of at least 95 percent minimises idle times and subsequent drops in income. Compared to wet fermentation systems, the operator effort involved with a BIOFerm biogas plant is also significantly reduced. You will need less time, energy and water. Your benefits are greater yield and higher profitability.

Benefits at a glance:

- Profitable material management, instead of expensive waste disposal
- Additional income for composting and farming enterprises
- Affordable, home-grown source material, shielded against price fluctuations
- Fixed feed-in remuneration according to the EEG [Germany]
- High system availability, minimum idle times
- Rapid amortisation
- Low operator effort
- Low costs for maintenance and wear and tear
- Additional income possibilities through forthcoming CO₂ emissions trading

Sizing the biogas plant accurately is essential to effect the most efficient and economical operation.



Tailor-made technical and biological service

Technical and biological service to safeguard maximum yields

BIOFerm customers can rely on an extensive range of technical and biological services even after their biogas plant has been completed. All services are delivered by our affiliate Schmack Biogas Service GmbH.

With the elements that comprise the Schmack Service Concept, our customers are able to safeguard the operational availability of their plant and keep it permanently at peak performance.

Competent and fast technical service

For us, customer service begins long before any component wears or needs replacement – through qualified advice, preventative maintenance and appropriate planning by our in-house customer service department. Our service engineers, who of course have the use of company service vehicles, safeguard the function of your biogas plant through appropriate spare parts logistics.

Laboratory service

Apart from safe, reliable plant technology, another factor exerts a decisive influence on the viability of a biogas plant, i.e. a stable fermentation process. Our bio-service takes care of monitoring and supporting biogas plants from commissioning onwards.

Biomass consultation

Scientific experts determine, in our own laboratory, the quality of the matter to be used and check the fermentation contents by means of process-specific parameters. The results form the basis for individual advice and feed recommendations to maintain and/or improve the capacity of your plant.

We also train our customers on an individual basis and tailor the training to the specific plant to enable optimum and economical operation.

The in-house laboratory of Schmack Biogas Service GmbH is accredited to DIN EN ISO/IEC 17025:2005.

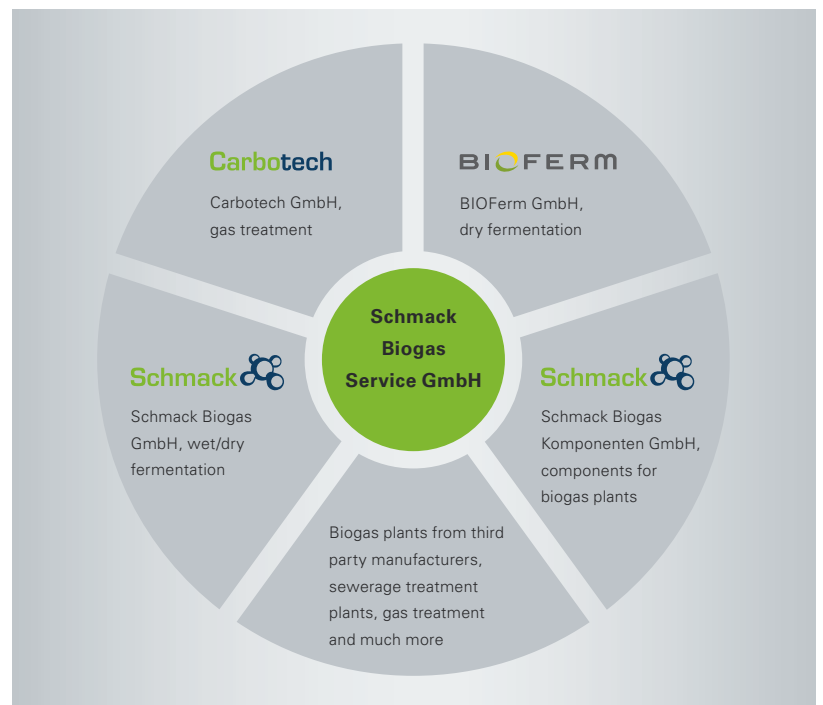


Accreditation of the laboratory at Schmack Biogas Service GmbH



Laboratory at Schmack Biogas Service GmbH

All-round service – not just for their own plants



BIOFerm biogas plants – full output in constant use

Our biogas plants stand out through their high performance. They operate with great reliability whatever their size or system design.



**Società Agricola Aziende L. Bennati S.p.a.,
San Canzian D'Isonzo (Italy)**

Installed output: 910 kW (electrical)
Throughput p.a.: 28,000 t (NawaRo)
Number of digesters: 11
Digester size: 30 x 7 x 5 m
(length x width x height)
Construction starts: August 2009
Commissioning: March 2010



Fortex, Sumperk (Czech Republic)

Installed output: 526 kW (electrical)
Throughput p.a.: 12000 t (NawaRo)
Number of digesters: 6
Digester size: 35 x 5.70 x 4.70 m
(length x width x height)
Construction starts: August 2008
Commissioning: March 2009
Special aspects: Extension to existing
factory building

Viessmann Biomasse KG, Allendorf (Eder)

Installed output: 190 kW (electrical)
 Throughput p.a.: 4500 t (waste from landscape operations)
 Number of digesters: 4
 Digester size: 20 x 7 x 4.50 m (length x width x height)
 Construction starts: September 2009
 Commissioning: August 2010





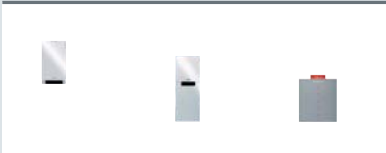

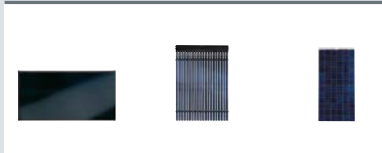

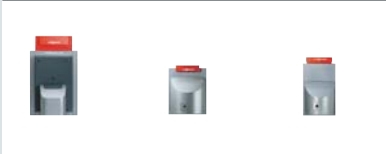

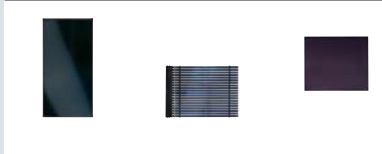



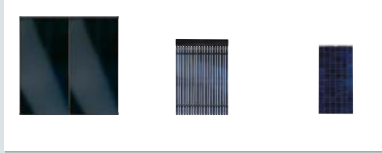






Biomethan Moosdorf

Installed output: 460 kW (electrical)
 Throughput p.a.: 13,000 t (biowaste, cuttings)
 Number of digesters: 7
 Digester size: 30 x 7 x 4 m (length x width x height)
 Construction starts: March 2007
 Commissioning: December 2007
 Special aspects: Micro gas network with Viessmann biogas boiler



The comprehensive range of products and services from Viessmann

	 Oil low temperature and condensing technology 13 – 20,000 kW	 Gas low temperature and condensing technology 4 – 20,000 kW	 Solar thermal and photovoltaics
 Detached houses			
 Apartment buildings			
 Commerce / Industry			
 Local heating networks			

Individual solutions with efficient systems

The comprehensive range of products and services from Viessmann

The comprehensive range of products and services from Viessmann offers individual solutions with efficient systems for all applications and all energy sources. As environmental pioneers, the company has, for decades, been supplying particularly efficient and clean heating systems for oil and gas, as well as solar thermal systems along with heat generators for sustainable fuels and heat pumps.

The comprehensive range of products and services from Viessmann offers top technology and sets new benchmarks. With its high energy efficiency, this range helps to save heating costs and is always the right choice where ecology is concerned.

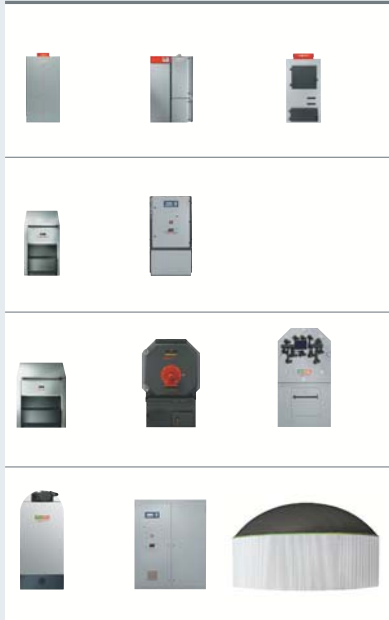
Individual and efficient

Viessmann offers the right heating system for any demand – wall mounted or floorstanding, in individual combinations – all are futureproof and economical. And whether for detached houses or two-family homes, large residential buildings, commercial/industrial use or for local heating networks; for modernising existing properties or new build – they are always the right choice.



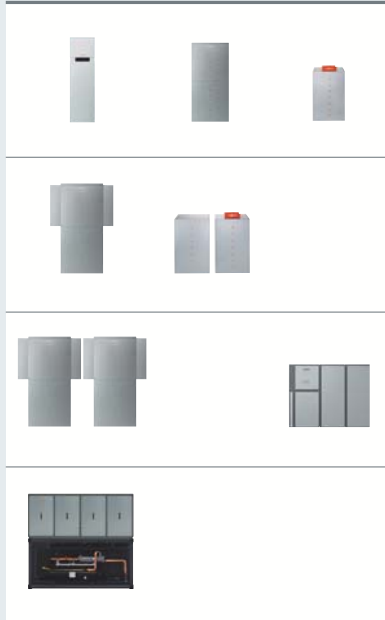
Wood combustion technology,
CHP and biogas production

4 – 13,000 kW

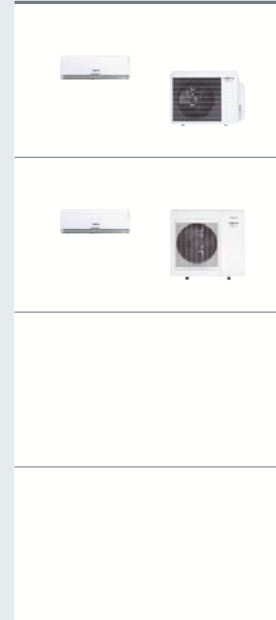


Heat pumps for
brine, water and air

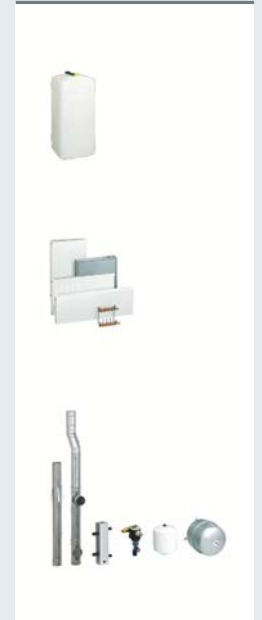
1.5 – 2000 kW



Air conditioning technology



System components



The comprehensive range of products and services from Viessmann: Individual solutions with efficient systems for all energy sources and applications

Key performers

The Viessmann Group sets the technological pace for the heating industry. This is what the Viessmann name represents, and also what the names of the subsidiaries in the Group represent, as they are founded on the same pioneering spirit and power of innovation.

The company offers the following:

- Condensing technology for oil and gas
- Solar thermal systems
- Heat pumps
- Wood combustion systems
- CHP modules
- Biogas plants
- Services

Viessmann is extremely highly specialised in all these market segments, yet at the same time the company has a crucial advantage over specialist suppliers: Viessmann understands heating technology as a systematic whole and offers unbiased advice on technology and fuel type. This guarantees the best solution for every application.

Viessmann Group



The comprehensive range of products and services from Viessmann



Detached houses



Apartment buildings



Commerce / Industry



Local heating networks



Oil low temperature and condensing technology
13 – 20,000 kW



Architect's own home, Bad Füssing, Germany



Residential development Zi Wei Garden Xi'an, China



Ameco A380 Hangar Beijing, China



European Parliament, Strasbourg, France



Gas low temperature and condensing technology
4 – 20,000 kW



Detached house, Kevelaer, Germany



„Wohnoase“ residential park in Regensburg, Germany



Porsche Leipzig, Germany



European Parliament, Brussels, Belgium



Solar thermal and photovoltaics



Heliotrop Freiburg, Germany



HafenCity Hamburg, Germany



City of Tomorrow, Malmö, Sweden



The Palm Jumeirah, Dubai



Wood combustion technology, CHP and biogas production
4 – 13,000 kW



Detached house, Wiesloch, Germany



Hotel Lagorai Cavalese, Italy



Congressional Centre, Brunstad, Norway



Monastery St. Ottilien, Germany



Heat pumps for brine, water and air
1.5 – 2,000 kW



Loftcube Regional Garden Show, Neu-Ulm, Germany



Studio flats, Brandenburg, Germany



University library, Bamberg, Germany



Residential estate, Pfäffikon, Switzerland

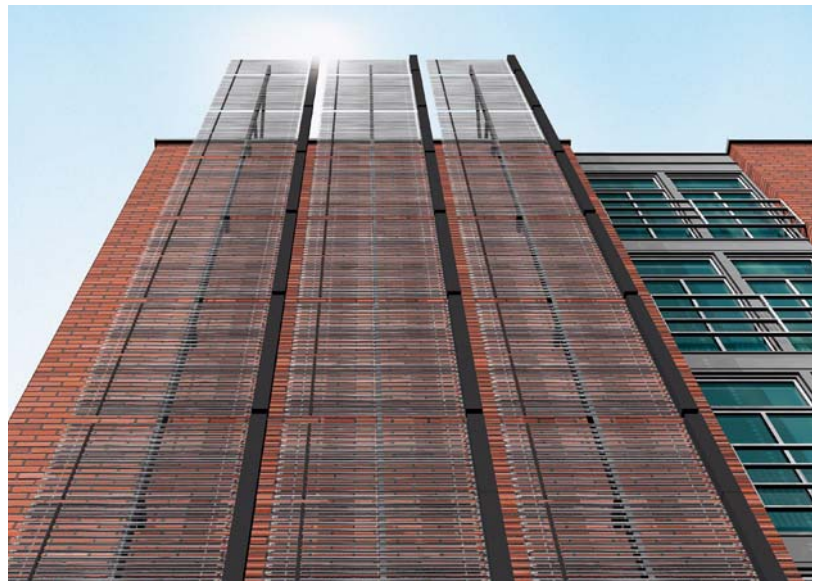
The comprehensive range of products and services from Viessmann:
Individual solutions with efficient systems for all energy sources and applications

Futureproof heating technology for all requirements

Energy consumption worldwide has doubled since 1970 and will triple by 2030. The result: The fossil fuels, oil and gas, are dwindling, energy prices are on the rise and excessive CO₂ emissions continue to affect our environment. Energy efficiency is a must if we want our future to be secure.

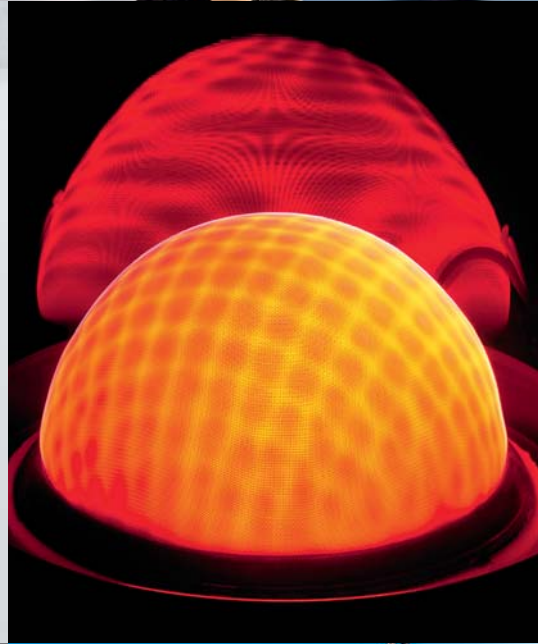
In almost every industrial nation, supplying heat to residential and commercial buildings accounts for the largest share of energy consumption – consequently it also offers the greatest savings potential. Advanced efficient heating systems from Viessmann are in use around the world, not only in many private households, but also in numerous major international projects, where they make a sizeable contribution to the efficient use of energy resources.

In these projects, Viessmann again and again faces up to the most varied challenges to supply efficient heating technology by offering innovative solutions – in historical listed buildings as well as in modern industrial complexes or in the large-scale residential and industrial arena.



City of Tomorrow, Malmö, Sweden

The company



Viessmann – climate of innovation

The Viessmann brand promise concisely expresses all that we hope to achieve. It is our key brand message and, together with our brand label, is an identifying feature throughout the world. “Climate of innovation” is a promise on three levels: It is a commitment to a culture of innovation. It is a promise of high product utilisation and, at the same time, an obligation to protect the environment.

Comprehensive range of products and services for all fuel types

Viessmann is one of the leading international manufacturers of heating systems and, with its comprehensive range of products and services, offers individual solutions in the shape of efficient systems for all applications and types of fuel. As an environmental pioneer, the company has been supplying particularly efficient and clean heating systems.

Acting in a sustainable manner

For Viessmann, to take responsibility, means a commitment to act in a sustainable way. This means bringing ecology, economy and social responsibility into harmony with each other, ensuring that current needs are satisfied without limiting the basis for life for the generations to come.

Efficiency Plus

With the sustainability project “Efficiency Plus” Viessmann shows at its Allendorf site, that the political goals set for 2020 with regard to climate and energy can already be achieved today with commercially available technology.

This project demonstrates:

- Environmental protection
- Efficiency with resources
- Securing manufacturing sites for the future

As a result, fossil fuels have been cut by 40 percent and CO₂ emissions reduced by a third.



Viessmann won the German Sustainability Award 2009 for its commitment to climate protection and efficient use of resources.



For the particularly efficient utilisation of energy through the innovative heat recovery centre at the company’s main site in Allendorf/Eder, Viessmann was rewarded with the Energy Efficiency Award 2010.

Viessmann Werke GmbH & Co. KG

Company details

- Established in: 1917
- Employees: 9000
- Group turnover: €1.7 billion
- Export share: 50 percent
- 16 factories in Germany, France, Canada, Poland, Hungary, Austria, Switzerland and China
- Sales organisation in 37 countries
- 120 sales offices worldwide
- 3 service providers

Performance spectrum

- Condensing technology for oil and gas
- Solar thermal systems
- Heat pumps
- Wood combustion systems
- CHP modules
- Biogas plants
- Services

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Your heating contractor: