GasMix

A unique mixing system
for anaerobic digesters

Landia®

ENGINEERED TO LAST

Landia GasMix

- an unique mixing system for anaerobic digesters in agricultural or industrial biogas plants.

The GasMix is an ideal solution for anaerobic digesters as it generates an increased biogas production due to enhanced cell break down, chopping of solids and unique gas recirculation. Furthermore there is no rotating equipment inside the digester and hence no need of opening the tank cover for service and maintenance – an advantage that also leads to significantly improved health and safety conditions. Also there is no need to reinforce the tank walls as in the case of vertical or side-entry mixers.

Landia GasMix can be installed in most types of digesters and is suitable for a wide variety of biogas feedstocks with a TS concentration of up to 12-13%.

Process benefits

More biogas – University Research* prove up to 11% higher biogas production compared to traditional mixing due to enhanced cell destruction and viscosity reduction.

Cost benefits

No need for hatches, platforms, ladders and structural support for mixers. No downtime – no loss of biogas production during servicing.

Health & Safety benefits

No working at height – no restrictive breathing apparatus required.

**For a copy of The University Report, please contact Landia*


MIXING NOZZLE
UPPER
GASMIX NOZZLE
AUTOMATED
VALVES
MIXING NOZZLE
LOWER
LANDIA
CHOPPER PUMP

Landia GasMix

– how it works

When the GasMix Chopper Pump is running, thick liquid from the bottom of the digester is drawn into the pump where the solids are chopped before being discharged and pumped back into the digester. This accelerates the digestion process and it prevents clogging of pipes and nozzles.

In the first stage of the mixing process, the liquid is injected into the upper half of the tank while biogas is aspirated from the top of the tank and mixed into the liquid.

In the second stage of the mixing process, the liquid is injected into the lower half of the tank causing powerful mixing of the tank content.

Depending on the type and size of the digester there might be a third stage where the liquid is injected into the very upper part of the digester preventing solids to build up a layer of crust on the surface.

1. Landia Chopper Pump
A key component in the GasMix system is the chopper pump. In addition to providing the correct flow and pressure for the GasMix nozzles its integrated chopping device will chop solids into smaller particles, resulting in improved biogas process – and more biogas produced!

2. Mixing Nozzle – lower
The digester content is re-circulated through the lower mixing nozzle in order to create a rotational movement in the lower part of the tank and to avoid settlement at the tank floor.

3. Automated Valves
The Landia GasMix system is a flexible mixing system and the mixing process can is controlled by means of a number of automated valves – pneumatic or electrical. This means the operation time of each nozzle is variable depending on the substrate characteristics and can be fine-tuned to provide effective mixing with the lowest possible parasitic load.

4. GasMix Nozzle
The uniqueness of the Landia GasMix lies in the design of the GasMix nozzle. Years of development has gone into this to achieve the most efficient performance. When substrate is pumped through the GasMix nozzle biogas is sucked from the gas holding part of the digester, mixed with the substrate and injected under pressure back into the digester creating not only a horizontal mixing pattern but also a vertical pattern true 3D mixing.

5. Mixing Nozzle – upper
The digester content is re-circulated through the upper mixing nozzle in order to create a rotational movement in the upper part of the tank and to avoid, or even break down, crust on the liquid surface.w

Unique Advantages

- Up to 11% higher biogas production
- Flexible with regards to feedstock
- No crust on liquid surface
- True external mixing system

A Complete System

– guaranteed...

A key part of each Landia GasMix system is the pipework that connects all the components together in accordance with the designer's specification.

The pipework layout is optimised for maximum performance by Landia's engineers, with its valves, pipe diameters and wall thicknesses considered carefully at the design stage, to provide smooth, even and reliable flow of both feedstock and biogas.

As Landia take care of the pipe design and do not simply hand over a set of components, this is one less thing for the busy project manager to consider, saving you time and money!

- Customized for each individual project
- Flexible pipe system - ensures quick and easy installation
- Flow-optimized design
- Extra thickness for increased lifetime
- Available in both stainless and mild steel
- Landia can offer complete delivery and assembly including startup

The Chopper Pump

– a key component of the GasMix System

The Landia MPTK-GI chopper pump is an integral part of every Landia GasMix system.

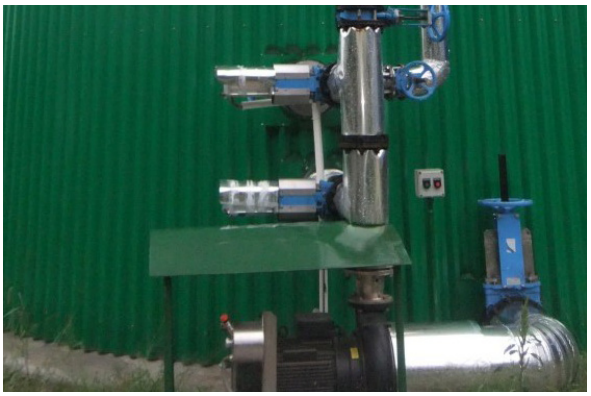
The chopper pump is designed for use under severe conditions and can pump feedstocks with higher solids content than almost any other pumps. The pump's ability to cut large particles ensures that the GasMix system never stops.

The chopper pump's ability to reduce particle size in biogas feedstock is a contributing factor in the fact that biogas digesters equipped with Landia GasMix produce more biogas than digesters with traditional mixing.

The Landia chopper pump is simple and robust in its construction, easy to service and with proven low life-time costs.

Landia GasMix

– recommended by satisfied customers



Nanjing University, China

In April 2014 Landia supplied a GasMix system for Bioenergy Research Institute, Nanjing University of Technology in China. The Institute operates a large pilot plant in order to try out different types of feedstock and to study and optimize the biogas process.

Landia was connected to the Chinese client via a German consultant company. The client was soon convinced that Landia GasMix was the obvious choice for the 300 m³ digester. The most visible advantage was the fact that the entire mixing system is placed outside the digester.

The biogas plant started producing biogas in mid 2014 and the feedstock is mainly rice straw and liquid pig manure.

Mr. Zhang Yabing, manager of the biogas plant says: "Not only is the entire mixing system mounted outside the digester, the power consumption is also low and the cutting system of the chopper pump cuts straw into smaller particles".

Mr. Zhang Yabing continues: "As a side benefit it turned out that the biogas production was higher than expected".

As Mr. Zhang Yabing says: "If just all products on site were like the Landia GasMix!"

Richgro, Jandakot, Western Australia

Richgro, a compost company based in Jandakot, Western Australia, teamed up with several U.K. companies to open its own anaerobic digestion (AD) facility in March 2016. The plant uses pumps and mixers from Landia. Digester mixing is with Landia's externally-mounted GasMix system.

Around 100 tons of food and liquid waste (approximately 35 percent dry solids) is trucked in each day to the Jandakot plant from supermarkets, abattoirs, fast food chains, breweries and soft drink manufacturers. The feedstock is fed into two 2,500 cubic meter capacity glass fused to steel digesters.

Less than two months after the commissioning, the Richgro facility's processing of mixed commercial and industrial food waste was giving a biogas yield of 420 cubic meter per ton. The process capture efficiency was recorded at 91 percent, with one ton of food waste generating 415 kilowatts of energy and 435 kilowatts per hour from the single onsite CHP, which is running at 100 percent, producing up to 1.2 megawatts.

Geoff Richards, Richgro:
"We've always taken the pathway of innovation and adapting technology which is one of the main reasons we chose Landia's GasMix. For access it is like an outboard motor – very easy to get at" says Geoff Richards.

Cory's first AD plant

Cory Environmental, who with over 40 sites are one of the UK's leading recycling, waste management and energy recovery companies, has unveiled its first anaerobic digestion facility, with the Landia GasMix acclaimed system at the heart of the process.

Generating up to 500 kW of energy per hour for on-site use and export to the National Grid, Cory's inaugural digester at Weston-super-Mare has the capacity to handle 12,000 tonnes of food waste pa.

Alistair Holl, Cory's Director of Resource Management, said: "We are very proud of our first AD facility, for which our team were main contractors, as well as plant and site designers, achieving energy production just 18 months after planning consent was gained. This includes us recognising the importance of a highly effective and ultra-reliable mixing system, which is why we've chosen the Landia GasMix. It mixes the digester throughout at a consistent temperature, which will optimise our gas generation".

He added: "The Landia GasMix is mounted externally on the digester so routine maintenance can be carried out with no interruptions, and from our past experience with Landia, we also have peace of mind in the back up service that they provide".

Paul Davies, Landia's UK & Eire Sales Manager commented: "Our relationship with Cory has grown steadily over the years as we've worked together to adapt the best possible pumping and aeration solutions for their wastewater needs. We are very pleased to see the faith placed in us and our equipment, with our Landia GasMix system set to play a long-term role in the success of this impressive new facility".

Comprising three 18.5kW chopper pumps and a self-aspirating system that reduces solids to produce more methane in a much shorter time period, the Landia GasMix (designed specifically for AD/biogas) has no mechanical equipment inside the digester. Simple to regulate,

Landia GasMix also offers significant energy savings because it only has to run for a maximum of 30 per cent of the installed capacity.

BioBuster®

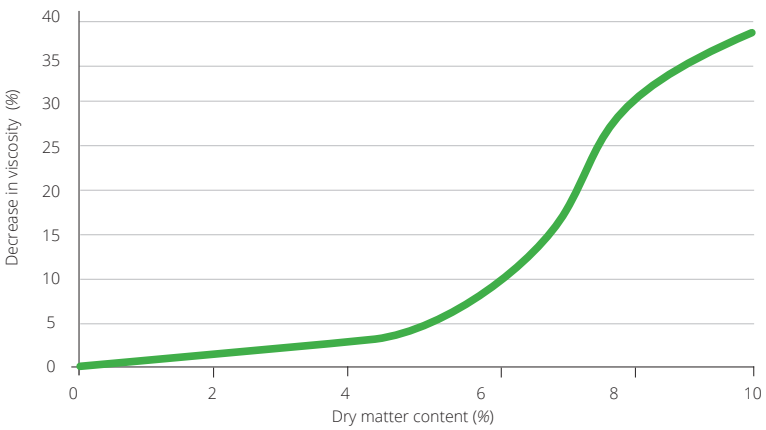
– Pre-treatment of Biogas Feedstock

Landia BioBuster® - a new product utilizing the patented Landia GasMix technology for improved mixing of biogas feedstock

BioBuster® combines the highly efficient Landia Chopper Pump with the patented GasMix liquid/gas mixing technology. BioBuster® is typically used in the reception part of the biogas plant as the reception tank mixer or as a supplement to a propeller mixer. Intensive testing has proven that various feedstock becomes more liquid and are easier, faster and cheaper to pump. The viscosity of the feedstock is decreased using BioBuster® - most noticeable and effective when used for feedstock with a high dry matter content.

Unique advantages

- Increased biogas production due to increased digestion efficiency - up to 10% increase
- Prevention of crust formation due to particle size reduction
- Reduced viscosity – feedstock that is mixed using BioBuster® has lower viscosity, which reduces the loss of pressure during subsequent pumping
- Up to a 15% reduction in energy costs for pumping, when compared to traditional propeller mixing



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Landia is much more

than GasMix!

Landia's experience with biogas goes back to the mid 80's. Since then numerous chopper pump and mixer solutions has been supplied to biogas plants throughout the world. Landia has proven to be not only a supplier of high quality products but also to be a company dedicated to the biogas industry and with extensive knowledge and experience. Below please find examples of other products suitable for your biogas plant.

Submersible Chopper Pump Model DG-I

All DG-I pumps are equipped with a knife system at the inlet to the pump, which ensures hassle-free operation under conditions in which many other pumps have problems with clogging.
Most biogas feedstocks are to some extent abrasive, resulting in wear on the pump housing and impeller. The Landia DG-I chopper is available with special hardened pump components designed for extended lifetime when pumping abrasive fluids.

Dry Installed Chopper Pump Model MPTK-I

The MPTK-I pump with a unique combination of fixed and rotating knives, is the optimal solution for chopping and pumping feedstock with a high dry matter content.
Wearing parts, such as the impeller and the pump housing, can be delivered in hardened materials so that the wear is reduced by 50% when pumping material such as sandy slurry.

Submersible Mixer POP-I 300

The Landia POP-I 300 is a versatile and efficient heavy duty mixer. The three-blade propeller and the low propeller rpm makes it ideal for the mixing of biogas feedstock.
Many sizes, fittings and hoisting systems are available. Easy to install - even in a tank already containing slurry.

Side Entry Mixer POPTR-I

Landia POPTR-I is a versatile and efficient side entry mixer that has the motor outside the tank which eases service and maintenance significantly. Optimum cooling conditions for the motor makes it the ideal selection for high temperature fluids. The POPTR-I is suitable for most types of tanks – concrete and steel.

BioChop Hygeinisation System

Approved for Category 3 ABP waste products
The Landia BioChop Hygienisation System for Category 3 by-products is a compact hygienisation system with an integrated water jacket for heating up the tank content to 70° and maintaining this temperature for one hour. Available with up to 25m³ capacity.

Landia was founded in 1933 and is today a modern, successful manufacturer of a comprehensive range of chopper pumps, propeller mixers and aerators, offering customised solutions and systems for difficult to handle liquids with high dry matter content, liquid biomass and other organic waste.

Our customers are involved in the conception and construction of biogas plants, municipal and industrial wastewater treatment, processing of by-products and waste from the food industry, agricultural slurry handling and much more.

We support our customers through our subsidiaries and offices in the UK, the US, Germany and China – plus a worldwide network of professional distributors.

Distributor:

Landia®

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