

Liquids to Value



Westfalia Separator®
biogasplus

Westfalia Separator® **biogasplus** – Sewage Sludge Treatment

With low-pressure homogenisers and decanter centrifuges





GEA Westfalia Separator is an experienced partner to municipal and industrial waste water treatment plants. The engineering for the new combination process is in the hands of its exceptionally capable specialists. Targeted use is also made of the experience of GEA Niro Soavi with homogenisers.



Westfalia Separator® **biogasplus**: 25 Percent More Gas and 25 Percent Less Sludge

The intelligent combination of homogenisers and decanter centrifuges opens up a new economic dimension in sewage sludge treatment.

The investment requirement for digesting and conventional sludge dewatering is high and is putting even more pressure on the already increasing costs of sewage sludge disposal. In view of this situation, Westfalia Separator® **biogasplus is the ultimate innovative solution.**

Many waste water treatment plants are not optimally utilising the digester gas potential. The basic reason for this is the coarsely structured organic material which has unfavourable reaction surfaces for further biodegradability. The new process combines low-pressure homogenisers from GEA Niro Soavi and decanters from GEA Westfalia Separator to form an efficient process line without interfaces. The economy of this combination is clearly reflected in figures: 25 percent more gas and a sludge reduction of likewise 25 percent. Sludge structure-related process disturbances caused by scum and bulking sludge or foaming of the digester are likewise effectively improved.

Westfalia Separator® **biogasplus** is the result of leading environmental technological competence

GEA Niro Soavi and GEA Westfalia Separator are technology leaders in the field of environmental technology and are members of the globally operating GEA Group. Westfalia Separator® **biogasplus** demonstrates the entire environmental technological competence of

the group of companies. At the same time, the operators have only one contact: the complete process is in the hands of GEA Westfalia Separator.

An overview of the plant engineering

- Homogenisation of the flocs in the digested sludge without destroying the cells (no desintegration)
- Short payback time, even when retrofitted in existing plants
- In the case of new plants, cost minimisation of up to 25 percent due to a smaller digester volume
- Combination process consisting of sludge treatment with low-pressure homogenisers and sludge thickening and dewatering with decanters
- Bundled competence of the GEA Group
- Standardised and proven function units
- Plug-and-play concept
- Optimum adaptation to local conditions
- All components from a single source
- No interfaces

Westfalia Separator® **biogasplus** – This is the New Economic Dimension

The new process optimises the biological conversion process in digested sludge and the energy balance

Westfalia Separator® **biogasplus is easy to realise by the installation of a patented external circuit at the digester.**

Before the decanter optimally dewateres the digested sludge, it is processed with the low-pressure homogeniser. The sludge is forced under pressure through a homogenising valve to break up the sludge particles and form a stable dispersion. In this way, the reaction surface is enlarged which in turn results in increased gas production and a reduced sludge volume. The digesting times are shorter, less polymer is required for dewatering and there is no increased COD load on the process.

Time for a positive energy balance

A positive energy balance is produced in the digesting process through the use of the low-pressure homogeniser, i.e. more energy is generated than consumed. Westfalia Separator® **biogasplus** is therefore also valuable in terms of conserving resources.

The treated digested sludge is subsequently dewatered in a decanter. The proven decanter technology from GEA Westfalia Separator ensures optimal dewatering. The high dry substance content in the dewatered sludge reduces the sludge volume and therefore makes a significant contribution to the minimisation of disposal costs.

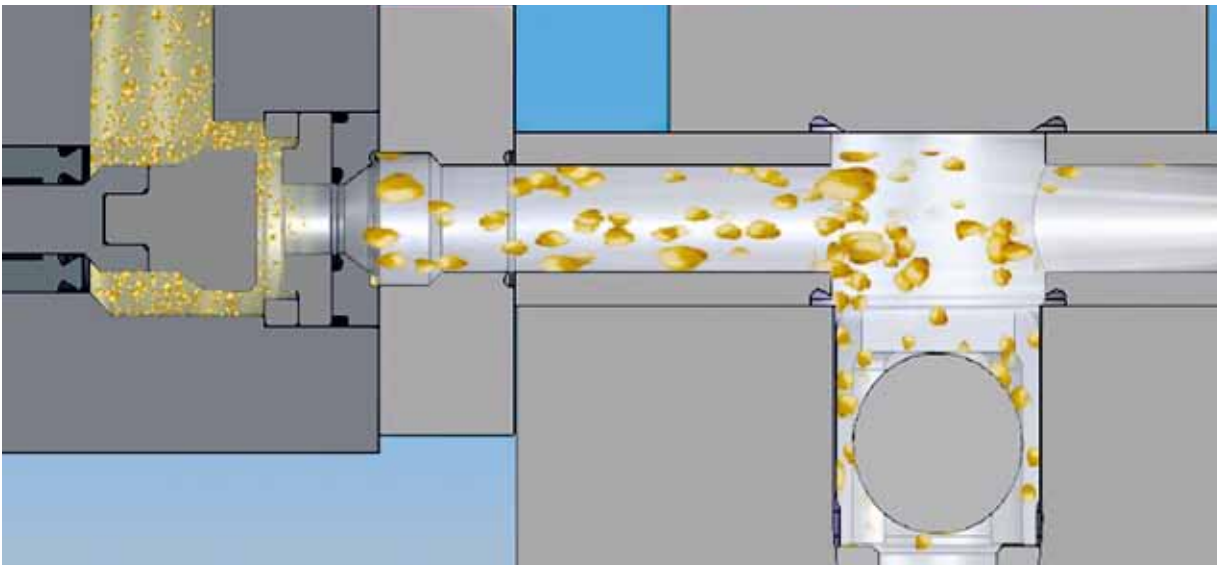
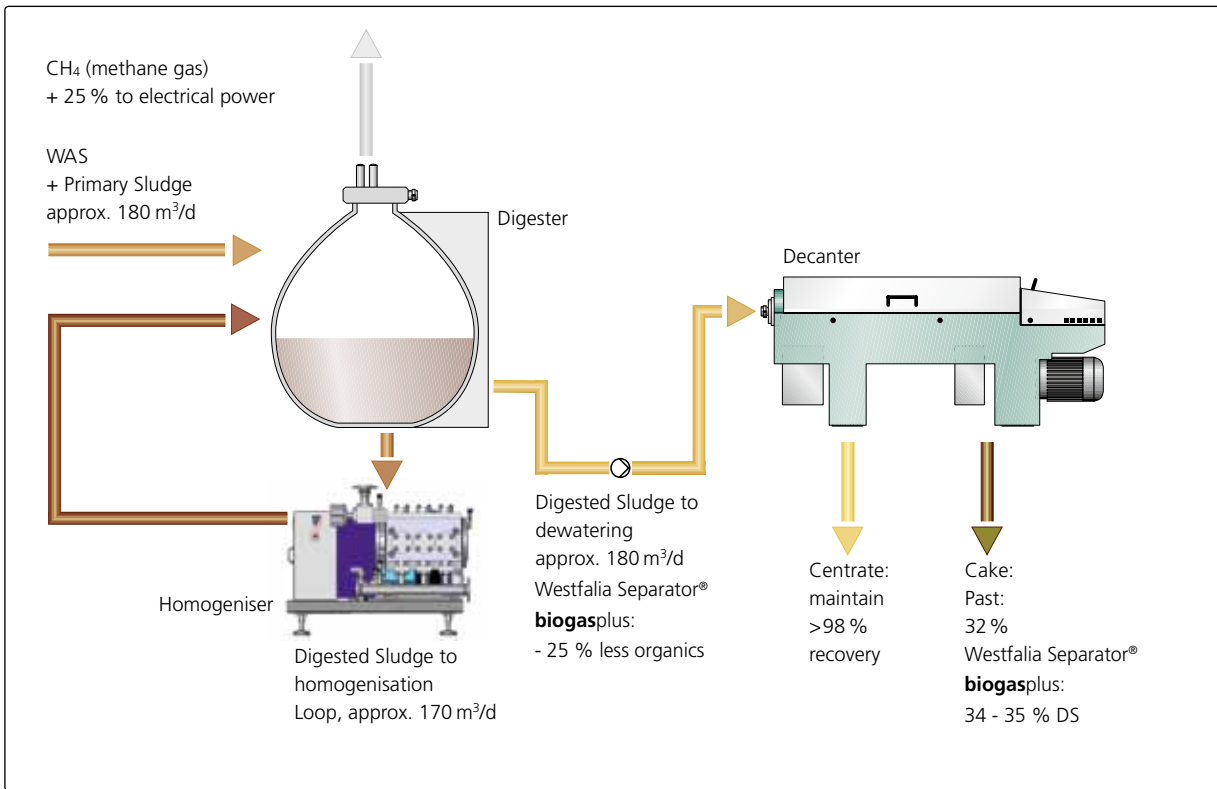
Westfalia Separator® **biogasplus** – more efficient across the board:

- Contribution to conserving resources through increased gas yield
- Short payback times of 2–3 years for plants with a size of approx. 100,000 PE
- Operating cost minimisation due to a reduced sewage sludge volume
- High dry substance content in the dewatered sludge
- Reduced polymer requirement
- Improvement of the biological conversion processes in the digested sludge
- High process safety through avoiding process disturbances
- Reliable, continuous operating mode

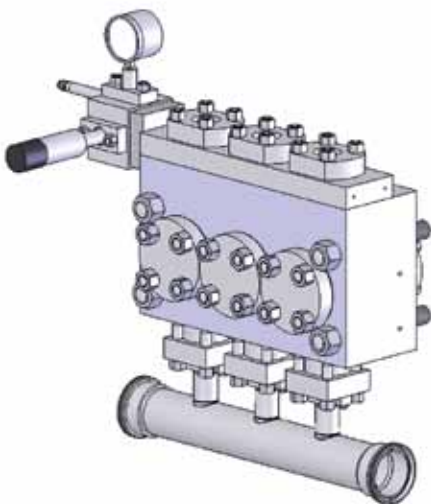


Mass/Energy	Conventional	Westfalia Separator® biogasplus
Organic in feed (kg/d)	3484	3484
Organic in discharge (kg/d)	1376	849
Converted to gas (kg/d)	2108	2635
Difference (kg/d)		527
Digester gas volume (m ³ /d)	1792	2239
Energy content (kWh/d)	11,469	14,329
Difference (kWh/d)		2860
Additional energy (kWh_{el.}/d)		1000
Energy requirement Westfalia Separator® biogasplus (kWh_{el.}/d)		556
Net surplus (kWh_{el.}/d)		444
Net surplus (kWh_{therm.}/d)		1600

Mass and energy comparison (example for the digester of a waste water treatment plant with 100,000 PE)



Schematic of the homogenising valve (free-floating valve)



The central element of the homogeniser is the homogenising valve, which is used to break-up particles, clusters and fibre structures of digested sludge, for improved bio-reaction. The homogenising valve is designed to achieve the desired micronisation effect with lowest possible pressure, to avoid disintegration of cells and particles, and is manufactured with high wear resistant materials; a self-cleaning automated valve function is implemented to avoid the homogenising valve clogging to ensure machine operation. The pumping block design of the homogeniser features a free flow and patented configuration called OpenXFLO™, which is able to pump the sludge containing solids, particles, clusters and fibres to the homogenising valve for product micronisation without clogging, build-up and consequential downtime of the equipment.



Westfalia Separator® capital**care** – Maximum Process Efficiency, Installation Availability and Budget Security

Westfalia Separator® capital**care** combines decades of service experience for mechanical separation technology.

Wherever separating technology tasks have to be carried out, Westfalia Separator® capital**care** assures comprehensive services right from the very beginning. In close cooperation with the customer, solutions are identified to meet their needs.

The partners benefit not only from traditional services such as inspection, maintenance, original spare parts and repair work provided by the original manufacturer; they also benefit from pro-active solutions which avoid risk, e.g. online and offline monitoring with Westfalia Separator® **wewatch**®.

Accompanying modernisation or upgrading to state-of-the-art technology also offer the option of boosting performance as required.

Training provided on site or in the modern training centre of GEA Westfalia Separator ensures that the customer's employees receive training in the proper handling of the high-tech installations. This provides additional safety.

Authorized workshops worldwide

And if problems occasionally occur or if a spare part is required at short notice, the specialists are able to attend to the customer quickly. This is ensured by a global network with more than 50 sales and service companies as well as 60 further sales partners. Authorized workshops are able to service every location in the world at short notice.



Westfalia Separator® capitalcare accordingly makes for maximum process efficiency and installation availability as well as budget security. And these benefits are provided throughout the entire life cycle of the entire installation.

Service from the original manufacturer:

- Service engineers quickly on site
- Extensive service network
- Risk avoided by service provided by the original manufacturer
- Pro-active solutions which avoid risk
- Upgrading to boost performance
- Staff training

Maximum availability
Absolute budget reliability
Permanent efficiency

In addition to traditional services such as maintenance or repair, Westfalia Separator® capitalcare also provides solutions which avoid risk and with which the installation availability can be pro-actively assured.

- Beverage Technology
- Dairy Technology
- Renewable Resources
- Chemical/Pharmaceutical Technology
- Marine
- Energy
- Oil, Gas & Industrial Fluids
- Fluids & Water
- Engineering
- Second Hand Machinery
- Original Manufacturer Service

The information contained in this brochure merely serves as a non-binding description of our products and is without guarantee.

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