

Benefits of the agriFer process

Saving digestate stores

- ✔ The digestate volume is reduced significantly.
- ✔ It is possible to save up to 80% of digestate stores.
- ✔ No expansion of existing storage capacities or lower investment into new digestate stores to comply with amendments of the applicable ordinances AwSV and DüV

Increasing the fertilising value

- ✔ Upgrading the digestate to concentrated liquid fertiliser
- ✔ Fertilisation with high-quality fertiliser
- ✔ Better absorption of the produced liquid fertiliser by plants
- ✔ Substantially less additional mineral fertiliser needs to be purchased.

Boosting the cost effectiveness

- ✔ Boosting the efficiency of the biogas plant by using the CHPS exhaust heat
- ✔ CHP bonus guaranteed by utilising the heat to produce fertiliser
- ✔ Saving costs by using the water produced by agriFer for operating purposes

Reduced spreading costs

- ✔ Substantially fewer trips to spread the digestate on the fields
- ✔ Lower fuel consumption
- ✔ Lower transport costs

Minimised emissions

- ✔ By converting the volatile ammonia contained in the digestate to stable ammonium sulphate, ammonia emissions are prevented almost entirely.
- ✔ Producing nearly pure water by treating the condensate produced with reverse osmosis

Better acceptance by neighbours

- ✔ Less traffic – as many residents have a negative attitude to the traffic associated with plant operation, this is an important argument to improve the acceptance of biogas plants.
- ✔ No odour nuisance for residents



Avoid the new construction of digestate stores and benefit from your biogas plant's improved efficiency!



Use high-quality liquid fertiliser produced from the digestate and save fertilising and spreading costs!



Contribute to protecting the environment and earn the respect of the society!

PLANTS
efficient, flexible, sovereign.

COMPONENTS
powerful, proven, in demand.

EXTENSIONS
clever, individual, high-performing.

SERVICE
holistic, biological, technical.



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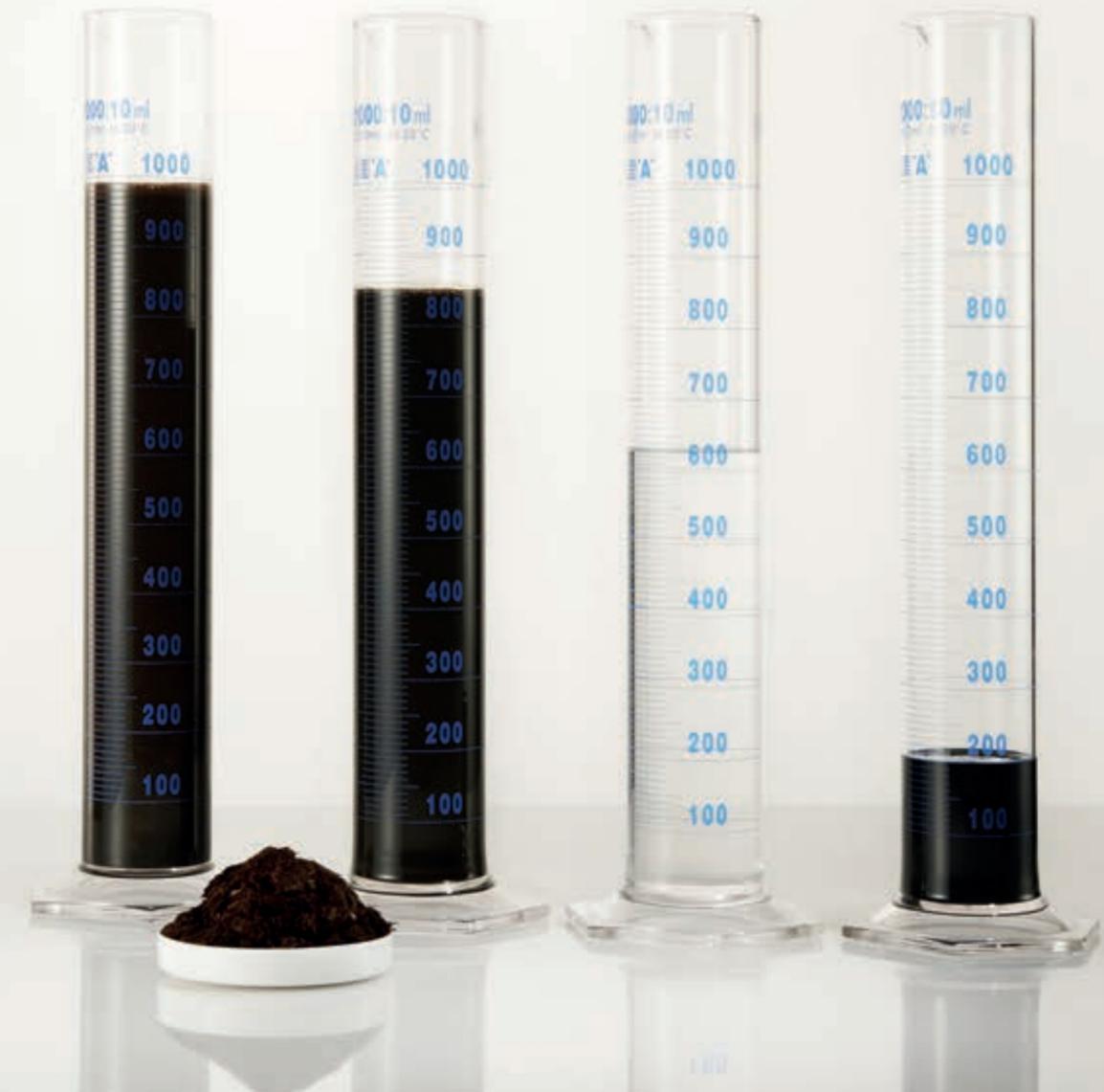
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Photos page 5
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AGRIFER
The new Generation of Digestate Treatment



Interested? Then contact us. We will be pleased to advise you about agriFer, the novel efficient method to process digestate.

Subject to errors, typos and changes. The information reflects the knowledge at the time of printing. We reserve the right to make technical modifications.

agriFer: the novel way to process digestate

flexible & efficient

The agriFer method – sophisticated technology

Although standard methods of digestate processing usually improve plant efficiency by utilising the CHPS exhaust heat, heat utilisation is highly inefficient. Moreover, only a comparably small amount of water is extracted from the digestate and the environment is usually impacted heavily by ammonia, hydrogen sulphide or other materials contained in the vaporised water.

The agriFer method in contrast uses the CHPS's exhaust heat multiple times through vacuum evaporation resulting in a much more efficient use. This allows the volume of the digestate to be reduced drastically, producing a valuable concentrated fertiliser that can be spread with substantially less effort.

The design of agriFer – robust and reliable

agriFer is a sophisticated system consisting of ideally matched components. In addition to the main components such as the vacuum evaporators and reverse osmosis, agriFer also includes an upstream separation, all required tanks (press water tank, condensate tank, sulphuric acid tank), a cooling-down unit and an optional cooling tower.

Only superior materials are used to manufacture the agriFer. The frame and the steam boilers are made of V4A stainless steel to assure a long service life of the system. The agriFer has a modular design, which allows the system to be installed into an existing building.

The agriFer process comprises the following sub-processes:

1 Digestate separation

The first step in the agriFer process is the mechanical separation of the digestate into a liquid phase (press water) and a solid phase (pressed material). The press water is filtered through a screen and led to the evaporators, while the separated pressed solid can be put out on a suitable area for intermediate storage.

We recommend our proved and tested Quetschprofi® as separator which has a rugged design and is easy to maintain. As with all other agriKomp components, superior materials combined with sophisticated technology provide for top reliability also with the Quetschprofi®.

2 Evaporation of the press water

In the agriFer, the press water is heated under negative pressure causing a large portion of the water to evaporate and the press water to be thickened. This process can take place simultaneously in one to three evaporators at different temperature and pressure levels. This allows the heat to be used multiple times and a greater amount of water per quantity of heat applied to be yielded with each additional stage.

The thickened press water, the concentrated sludge, is usually led out of the process semi-continuously. The evaporated water is cooled down in the condensers and is thus liquid again. This operating principle maximises the energy-efficient use of the existing thermal energy and minimises emissions.

The thickened sludge produced is a highly concentrated fertiliser which contains all nutrients of the press water except for ammonia. The ammonia is included in the condensate which is processed further.

3 Condensate processing

The ammonia in the condensate from the evaporator stages is converted into stable ammonium sulphate, a valuable plant fertiliser, by adding sulphuric acid.

Subsequently, the nitrogen-rich condensate is filtered in a reverse osmotic process and purified to water that is almost free of nitrogen.

4 Reverse osmosis

The reverse osmosis is a physical process that enables the substances dissolved in liquids at the molecular scale to be concentrated. The process uses pressure to reverse the natural osmotic process.

The condensate produced in the evaporators is pressed against the semi-permeable reverse osmosis membranes, allowing the water molecules to pass and the contamination in the form of a concentrate to be held back by the membranes. They are discharged immediately to prevent clogging of the membrane.

The system consists of several filter stages which optimally purify the condensate. The resulting water contains less than 30 mg/l COD, less than 12 mg/l BOD₅, under 15 mg/l ammonia and can be used for operational purposes without any further processing, or it can be led into draining channels.

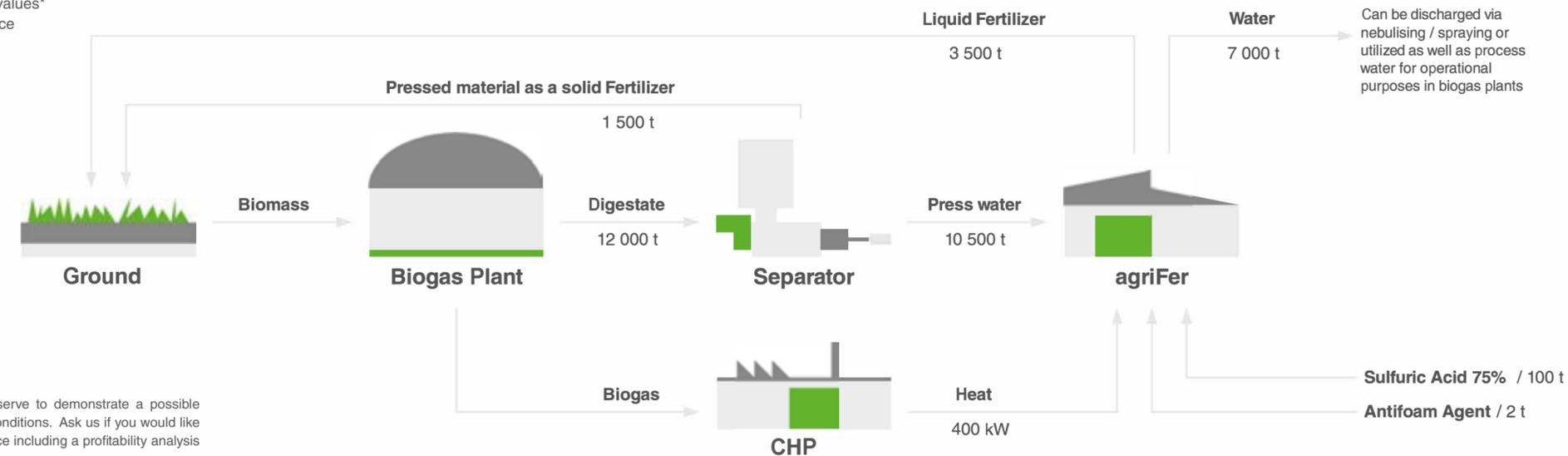
Evaporator



Reverse osmosis



Flow chart with annual guide values* from the agriFer's mass balance



* The values shown here only serve to demonstrate a possible process and cannot reflect real conditions. Ask us if you would like to have an individual mass balance including a profitability analysis based on your data.