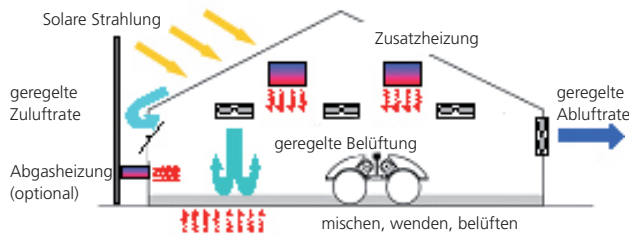


③ Functional description

The THERMO-SYSTEM drying process was developed jointly with the UNIVERSITY OF HOHENHEIM to achieve an optimum balance between the demand for a robust, fail-safe and energy-efficient process on the one hand and low investment and operating costs on the other. The concept applied has already proven its worth over many years in the drying of sewage and industrial sludges.



The liquid or separated fermentation residues are spread on a concrete slab, surrounded on all sides by walls, for drying. During drying the material is distributed, mixed continuously and aerated by a fully automatic turning robot, the so-called ELECTRIC MOLE®. A closed, transparent building enclosure allows specific control of the drying conditions. While rain and snow are kept away, sunlight can penetrate almost unimpeded and support the drying process.

The waste heat is usually introduced by a combined floor and air heating system. Speed-controlled, low-pressure ventilators and controlled ventilation flaps see to an optimum air flow and exactly

controlled air exchange at all times. A sensor-aided controller based on a Siemens PLC controls and monitors the process fully automatically. This reduces the monitoring requirements and workload for the operator to a minimum.

The simple and carefully thought-out concept keeps the number of moving parts and parts in contact with the material being dried to a minimum. Machines already available on site can be used to load the dry material. This minimises the investment costs and maintenance requirements and maximises the expected lifetime. Although an installation to treat the exhaust air can be supplied if necessary, this is usually not necessary because of the low temperature level and ingenious process control and regulation system.

Contact us for further information or a profitability assessment!


Waste heat assisted
drying plants for
fermentation residues

Contact



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① Challenge

Nutrient surpluses from manure have long limited the further development of agricultural enterprises. In view of the strong increase in biogas plants and therefore also in fermentation residues for field disposal, this problem is likely to intensify in the near future. A shortage of fields for disposal, regional nutrient surpluses, rising transport costs and a low fertilising value of 2 to 5 euros per ton of liquid fermentation residue can therefore be a big obstacle and production risk for biogas plants without sufficient areas of their own. Assuming a production period of at least 20 years, this represents an immense economic risk. Make a virtue of necessity and produce a valuable organic fertiliser or peat substitute instead.

In spite of regional nutrient surpluses, considerable quantities of mineral fertilisers are still bought externally. The nitrogen in them is won from the air and the phosphate from finite resources using high amounts of energy. Nutrient-rich, organic dry fermentation residues could substitute at least a part of these mineral fertilisers.

② Process and advantages

A significant prerequisite for the production of a mineral fertiliser substitute is concentration of the nutrients or withdrawal of the water. Separation is only suitable to a certain extent for this because the residual water content in solid matter is still very high afterwards at approximately 70% and a considerable proportion of the nutrients are also removed in the thinning phase. Drying, by contrast, can achieve significantly higher nutrient and dry substance concentrations and the fertilising value of the substrate rises depending on the process and initial concentration to 20 to 80 euros per ton.

If liquid fermentation residues are dried directly, it is possible to produce a marketable organic fertiliser with the highest-possible nutrient concentration. By contrast, if previously separated fermentation residues are dried, a less peaty soil conditioner with considerably fewer nutrients is obtained. Depending on the customer, market and framework conditions, both methods could, however, be

suitable. In drying plants from THERMO-SYSTEM, therefore, it is generally possible to dry – apart from many other products such as sewage sludge or spent grains – both liquid fermentation residues and separated fermentation residues. As inexpensive sources of energy, they can use waste heat and solar energy. Available waste heat including exhaust gas can be used the whole year round. The savings in storage, transport and field disposal, sale of the end product and the KWK bonus (in Germany, cogeneration bonus) significantly improve the profitability of biogas generation and reduce the production risk.

