



System for Processing Slurry and Digestate

PROCESSING TECHNOLOGY



Organic energy worldwide



Slurry and Digestate Processing

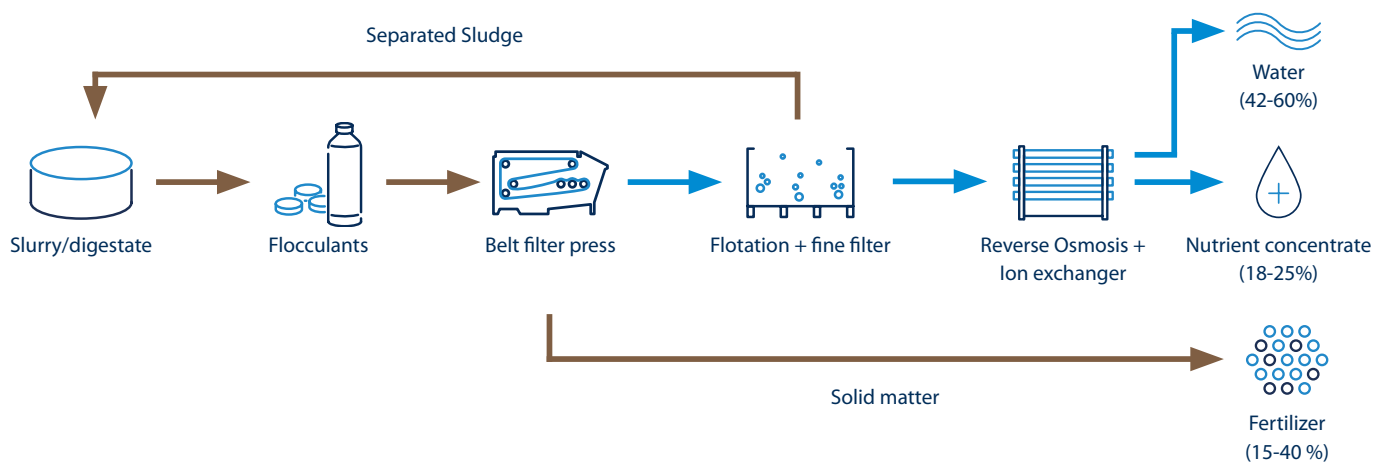
Regions with intensive livestock breeding have a serious oversupply of liquid manure. The available area in such regions is often not large enough to make use of the accumulating amount of nutrients. Political regulations will reduce the farm fertilizer dosage and also the permissible application times especially in areas with a nutrient excess. This makes the transportation to other locations even more time- and cost-intensive. Therefore, there is a need for sustainable solutions for improved transportability and reduction of the nutrient surplus.

WELTEC BLUE WATER

The state-of-the-art treatment plant from WELTEC BIOPOWER makes an effective contribution to solving this problem. The distribution of the separated substances can vary depending on the dry matter content of the input material. An independent investigation of the treatment plant in Deurne in the Netherlands by the Lower Saxony Chamber of Agriculture in 2015, for example, revealed the following segmentation: 55 percent dischargeable water, 25 percent solids and 20 percent liquid nutrient concentrate.

This technology has already been in continuous use since 2007 and is successfully applied at 17 locations with intensive livestock breeding or large biogas plants. One of the key benefits of the solution – which is already well established worldwide – is the high technical plant availability. The scalable modular system can be used from an amount of 50,000t/year. If processing needs are higher, a combination of several WELTEC BLUE WATER lines can easily be implemented.

How it works



1 Addition of Flocculants

At the beginning of the process, additives are mixed into the source materials to increase efficiency. This flocculates the finest components and makes them easier to separate. At the same time, certain substances are better separated from each other and odour emissions are minimized.

2 Belt filter press

In the next step, the substances are drained in a special belt filter process. In this process, they are transported on a belt filter over various rolls and cylinders and pressed against a second water-permeable belt with increasing pressure. The drained solid matter has a dry matter content of about 30 percent and can subsequently be used as fertilizer, compost, litter or biogas substrate.

3 Flotation Tank and Fine Filter

The remaining liquid phase is first treated in a stainless flotation tank. Using fine air bubbles, small organic particles and suspended matter are separated and settle in a floating layer and to the bottom of the tank. The foam and sludge are then re-transferred to the treatment process. The other solid components of the liquid phase are separated by a filter.

4 Reverse Osmosis and Ion Exchanger

In the final process step, multi-stage reverse osmosis is used. The remaining liquid phase is already highly purified. The semi-permeable membranes of the reverse osmosis can separate 95 to 99 percent of the dissolved salts and nutrients. The separated nutrient concentrate can be used as a liquid fertilizer. After treatment in the ion exchanger, clean water remains.



Mass Balance

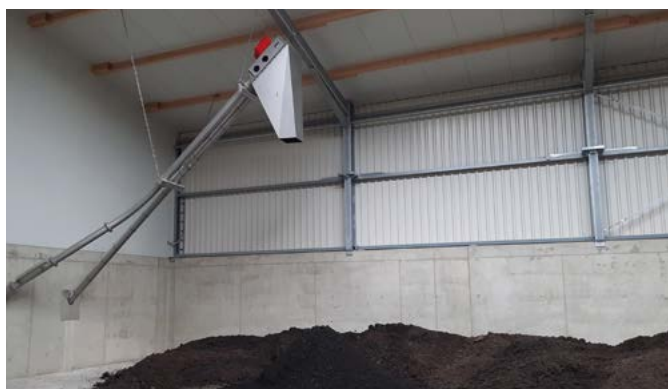
An independent study of the Slurry and Digestate processing plant in Deurne, Netherlands, which was conducted by the Lower Saxony Chamber of Agriculture in November 2015, delivered the following results*:

	Source product	Products of the slurry processing		
Proportion of total quantity	Pig manure 100%	Solid matter ca. 25%	Nutrient concentrate ca. 20%	Water ca. 55%
Dry matter content	6,9 %	31,15 %	4,01 %	0,025 %
N _{total} (kg/t)	5,26	15,67	7,35	0,02
Ammonium (kg/t)	3,01	3,27	6,16	0,01
P ₂ O ₅ (kg/t)	3,10	14,94	0,10	0,01
K ₂ O (kg/t)	4,65	4,43	8,50	0,01

(*Studies conducted by Wageningen University back in 2011 had delivered similar results.)



The solid matter of the liquid manure is separated from the water in four process steps. The result: Water, nutrient concentrate and dry fertilizer.



The drained solid matter has a dry matter content of about 30 percent and serves as a high-nutrient fertiliser that is easy to transport.

Your benefits

- Around 99.5% of the phosphorus and around 70% of the nitrogen are bound in the solid phase
- Field-proven, mature technology with high system availability
- Increased transportability and lower application costs due to nutrient concentration
- Significantly fewer transports for spreading digestate
- Higher nitrogen concentrations of the input materials in the biogas plant possible due to the cycle without a heat source
- Significant reduction in the storage volume for liquid manure and digestate
- Modular design, therefore scalable
- Fully automatic operation
- Wide range of marketing options for the solid phase as fertilizer, bedding or compost

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