

CASE STUDY:

LACKEBY HEAT EXCHANGER SLUDGE/WATER  
DRAMMEN, NORWAY



## Lackeby Heat Exchanger optimizes energy savings in biogas production

### **The challenge:**

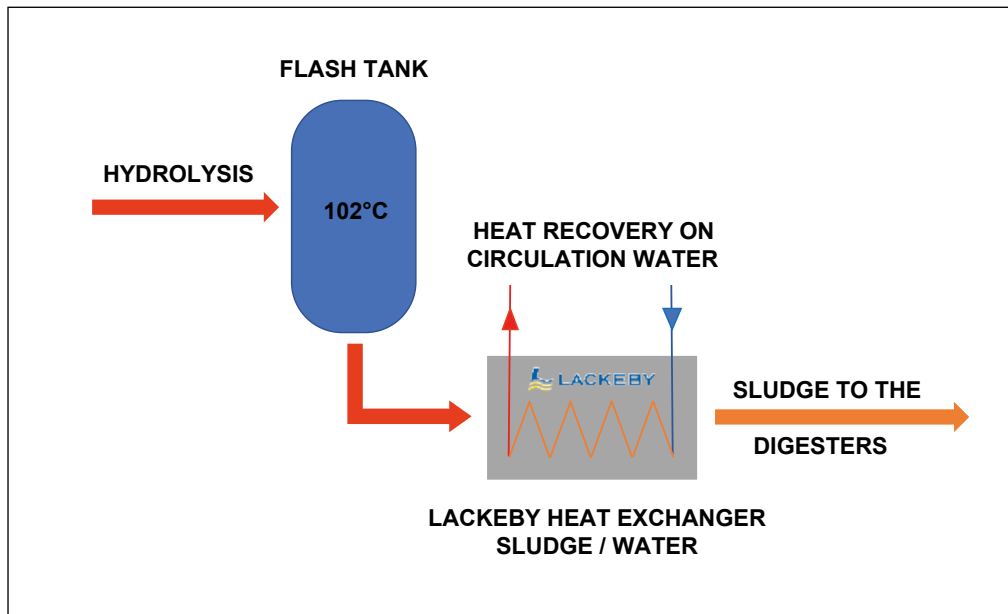
The arriving raw waste is unsanitary, why the first step is pasteurization (sterilization). This is done in a thermic hydrolyzing process (pressure boiling with steam), in which the media is heated to a minimum of 133°C and hold for 20 minutes. The maximum temperature is set to 160°C and for that the pressure demand is 5-6 bar. When the boiling time is over, the temperature is quickly reduced to about 40°C, in which the cellular walls and fibers breaks up into smaller particles. This is where the use of a heat exchanger is the most efficient and cost-effective way.

---

### **Lindum A/S**

*Lindum A/S is dedicated to the continuous work of developing the ultimate process for the waste. Lindum is the central player in the green technology with a great focus on the use of all resources of the waste. A very good example of precisely that, is the biogas they produce from manure, sludge and household waste. They spend much time and resources on the work and are proud of playing a big role for the environment and the future.*

---



### The Lackeby solution:

In 2016 Lackeby was contacted by Lars Erik Smith at COWI, who had the mission to find a solution in which they could use existing process water as cooling media for the sludge and then re-use the heated water back into the process. Since the available water was not as cold as first expected and there was a limited space in the facility, we could not reach the requested 40°C in one step, but we got closer than they had calculated from start.

After the cooling, the sludge gets mixed with water before entering the digester tank which gives it a temperature of the needed 40°C. That together with previous good experience with our heat exchangers delivered to Lindum several years back, gave us the order to supply. We came up with a Lackeby Heat exchanger HSW 40-120-6 which was installed in 2017.

### The result:

Hydrolyzed sludge with a DS of 12 – 14% has a viscosity more like a municipal sludge of around 6% DS. The hydrolyzed sludge from the flash tank enters the HSW 40-120-6 with a temperature of 107°C and a flow rate of 8 m<sup>3</sup>/h. Using water at 56°C and a flow rate of 5.9 m<sup>3</sup>/h, we end up with a sludge temperature of 73.3°C which is well within the expectations.

The process was started up after the summer of 2017 and at the beginning there were some problems with sudden increase of pressure drop measured after the heat exchanger which caused the process to stop. However, after investigations, they found the problem to be in the flash tank when adding new effluent. This was solved, and the heat exchanger is working perfectly.

*Lackeby Products AB has more than 50 years of experience in designing and manufacturing high performance products for resource-efficient heat recovery and wastewater recycling. In our production facilities in Sweden we have made thousands of products for the toughest environments worldwide. We are well known for our ability to customize products to each customer's unique requirements.*

*All of our products are characterized by reliability, long life cycles and easy maintenance making Lackeby Products a trusted partner and supplier of products for plant upgrades or new plant constructions. We guarantee high quality, excellent performance and complete satisfaction.*