

# Manual Biogas Utilisation Process

Municipality of Höganäs



HÖGANÄS  
KOMMUN

# Euroslam



## Drainbelt



Part-financed by the European Union  
(European Regional Development Fund)



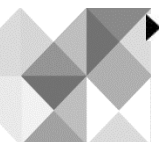
## HÖGANÄS WASTWATER TREATMENT PLANT

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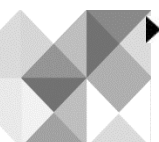
## 1 Summary

Höganäs has under Euro Slam project procured and installed a so-called Drainbelt. During the six months the plant has been in operation, the machine has worked well. Some minor problems have happened but they have been corrected. The problem with the floating sludge in the basins have disappeared. A further report with the results will be produced when there is more operating results available.

## 2 Background

Höganäs Municipality's sewage treatment plant was built in the early 70's, then it is developed in the 90's with nitrogen removal and digesters. 2008 began a further extension of the wastewater treatment plant with two sedimentation tanks. After expansion in the 90's was the permitted load on the treatment plant 20 000 (PE), after the expansion in 2008 will the permitted load be 35 000 PE.

The treatment plant is charged today with about 23 000 PE. A bottleneck in the plant is the digester facility. To increase the possibilities to charge the digesters more, has Höganäs Municipality in an EU project (Euro Slam) for the exchange of knowledge in sludge management, decided to test a Drainbelt in order to increase the dry solids content in the sludge to increase the load to the digesters.



### 3 Conditions and the existing plant

Sludge handling at Höganäs sewage treatment is done by excess sludge and primary sludge is pumped to a circular gravimetric thickener where the sludge is thickened to a dry solids content of about 1.3% to about 2.5-3% before it is further pumped to the digesters. The surface of the thickener is about 50 m<sup>2</sup> and the volume is about 180m<sup>3</sup>. There are two reactors, each about 640 m<sup>3</sup>, and a total volume of 1,280 m<sup>3</sup>. The digesters are loaded with about 3.5 m<sup>3</sup> / h, resulting in a sludge age in the digesters of about 15 days. The average gas production is about 30 m<sup>3</sup>/h, the methane content is about 65%. Degradation efficiency of the sludge is about 65%. TS content from the digesters is about 2.2% and the dry solids content after the centrifuge is about 24%.

#### 3.1 Problems

At the treatment plants presedimentationbasins is there a lot of floating sludge this is likely from the sludge that floated to the surface in the gravimetric thickener and then passed with the reject from the thickener and returned to the incoming water and then presedimentationbasins.

The sludge age in the digester is as mentioned earlier about 15 days, which is on the short side to obtain a good digestion of the sludge.

### 4 New construction

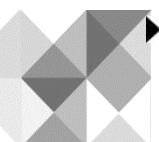
To overcome the problems decided VA department in Höganäs municipal themselves to under Euro Slam project to procure a Drainbelt.

A Drainbelt have rotating wire which the sludge is led to. Before the sludge is come to the Drainbelt a polymer is added. The sludge is a mixed sludge that is pumped from the presedimentationbasins and from the biological sedimentation tanks to the drainbelt. DS content coming to the drainbelt is approximately the same as for the gravimetric thickener, about 1.3%.

The Drainbelt was installed in spring 2012. A trial began in the spring after a period of startup . The results of the trial will be reported in 2013.

#### 4.1 Starting up problems

During the startup, there have been some minor problems. During installation, the wire was mounted incorrectly by the supplier so that it broke. This was corrected by the supplier. A recurring problem is that it has been some type of fat deposition in the lead after Drainbelt causing blockage in the pipe. The pump, which pumps sludge from Drainbelt (thick slurry pump) to the digesters is a eccentric screw pump. This pump wears abnormally fast and the stator must be changed relatively often. So far it has around 5 months of life.



## 4.2 Polymers

To the sludge a polymer is added before the sludge comes to the Drainbelt. It is a relatively high dose, about 6 g/kg TS. The polymer is needed so the water in the sludge will release and the sludge is will be dewatered.

## 5 Results

The result after six months of operation is that the problem of floating sludge in the presedimentationbasins has ended. You can also see that the dry solids content after the Drainbelt is higher than for the previous gravity thickener. There is pretty high polymer consumption. Experience shows that the sludge in Höganäs always required high doses of polymer in thickening and dewatering.

