

Bulk storage tanks for biomass

Green Farm Energy A/S

When something is too large to transport, it must be built on site. Following this logic, Tunetanken A/S in Denmark has developed a new on-site production facility making it possible to build fibreglass reinforced silos and tanks with a volume of up to 2,000 m³. The new construction technique enables tanks and silos to be used in many more applications than previously possible – and on a much larger scale.

BIOLOGICAL WASTE

The first bulk tank built on-site using this concept was for Green Farm Energy A/S at the GFE-Dammen biogas plant near Hjørring. The vessel is used as a digestion tank at the plant, holding almost 700 m³ of biological waste at a temperature of up to 80°C.

THE ATLAC SOLUTION

To ensure the required chemical resistance performance, Atlac 430 was selected for the liner

of the tank, while the structural part was constructed using Palatal P69-02. The resins were selected to withstand this aggressive media at elevated temperatures.

BIG TANKS

The digestion tank at Green Farm Energy's Dammen plant is equipped with connectors and flanges. The tank also contains a so-called mammoth pump that utilises air to agitate the medium. In addition, the tank is fitted with



SUMMARY

> large volume biomass storage tank

OPERATING CONDITIONS

> biomass at 80°C

ATLAC SOLUTION

> Atlac 430 bisphenol-A vinylester liner in combination with P69 reinforced wall

IN SERVICE

> 2006

BENEFITS

> Composites are able to withstand this aggressive media at elevated temperatures.

REMARKS

> site manufacturing

mechanical agitation equipment, and baffle plates inside the tank prevent the medium from merely rotating. Hot-water heating coils allow the ammonia-rich medium to be heated to the required 80°C.

THE PURPOSE

Green Farm Energy has developed an overall solution for future agriculture based on new biogas, and separation plants. The solution meets the demands of consumers and politicians. Slurry, solid manure, deep litter etc. is transformed to pure fertilisers of commercial quality. The slurry is dispensed with. The operation of the energy plant is also integrated with the operation of the animal houses and agricultural fields, which gives additional benefits. For instance, the process water from the energy plant is used for daily flushing of the slats, canals etc. in the animal houses, while the pure N and P fertilisers can be added according to precision farming. The reject water is irrigated to fields. The system generates a number of operational advantages as well as advantages for food safety and quality, animal health and welfare as well as advantages for energy and environment.

About DSM

DSM Composite Resins is the largest producer of unsaturated polyester resins in Europe. With production facilities in many different European countries, DSM Composite Resins offers a wide range of resins, matching every conceivable processing and end-use requirement, in the most diverse applications. Local Sales offices and Technical Service laboratories enable close cooperation and partnerships between customers and DSM Composite Resins. Central Research & Development is fully equipped to develop and test new resins and to tune systems for optimal results in specific processing techniques. The development, service and manufacture of composite resins are certified according to ISO 9001.

About Atlac

For several decades Atlac resins have proven themselves highly suitable in applications where chemical and thermal resistance, in combination with high mechanical properties, are required. Atlac resins have outstanding corrosion resistance to a wide range of organic and inorganic acids, alkalines, solvents and bleaches. They are widely used for fibre-reinforced applications such as storage tanks, vessels, pipes and ducts. Atlac resins can be processed by means of regular fabrication techniques, such as filament winding, hand lay-up, spray-up, and polymer concrete.

Technical details

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|----------------------|---|
| Application | Vessel to digest biomass at 80°C |
| Medium | Biomass |
| Conditions | Static head at 80°C |
| Construction details | Filament winding on site |
| Resin | Atlac 430 bisphenol-A vinylester liner combined with P69 ISO polyester wall |
| Commissioning | 2006 |
| Inspected | Not inspected |
| Manufacturer | Tunetanken A/S in Denmark, www.tunetanken.dk/English.aspx |
| End user | Green Farm Energy A/S. |
| Location | GFE-Dammen biogas plant near Hjørring |
| Remarks | Vessel is manufactured on site. |

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