

FRANCE

ENVIRONMENT AND PROCESS

SEPARATION TECHNOLOGIES

Large decanter centrifuges and centrifugal pumps for Lillebonne bioethanol plant



Mont-Saint-Michel, Normandy, France



'I AM IMPRESSED WITH THE EQUIPMENT QUALITY AND LEVEL OF SERVICE THAT ANDRITZ BRINGS TO ITS CUSTOMERS.'

ANTOINE PRADEL

Managing Director, BENP Lillebonne, Tereos Group

The Tereos Group of France is the third largest alcohol/ethanol producer in the world. Its 17,000 employees in the Group's 32 large and modern industrial facilities in Europe, Africa, and South America process the sugar beets, sugar cane, and cereals out of more than 900,000 ha of land into sugars, various starches, and alcohols, such as ethanol. Along with 4.3 million tons of sugar, more than 1.3 million m³ of alcohol/ethanol are produced every year, as well as co-products for animal feeds. We spoke with Antoine Pradel, Managing Director of Tereos' Lillebonne plant, about the production of bioethanol and the utilization of Andritz technology.



WHEAT FOR FUEL

Interview with **Antoine Pradel**,
Managing Director, BENP Lillebonne, Tereos Group

Experience

I graduated from ENITIAA in 1994, an engineering school in France, with a specialty in agro-industry and food processing. That same year, I joined Tereos as a Production Engineer for their beet sugar production facility in Origny. I became Plant Manager for the Alcohol Division at Origny and later served as Technical Director for alcohol production for the entire Tereos Group. Now, I am Managing Director of our ethanol plant in Lillebonne. France has been one of the leading nations in Europe promoting biofuels, which are blended into gasoline. Tereos, as one of the leaders in the agro-industry, wanted to be part of this development of the biofuel industry. We invested in two large plants: one using beet as feed stock based in Origny (one hour's drive north of Paris) and one in Lillebonne based on wheat.

The Lillebonne project

The Lillebonne plant started as a major producer of synthesized alcohol. It is located in Normandy on the banks of the river Seine, so we have to respect the most stringent environmental regulations. In 2007, we completed a project to add a wheat-based ethanol production facility at Lillebonne. While there are many bioethanol plants in operation in the world, most use corn as a feed stock. So, that makes Lillebonne a bit unique in using wheat as the feed stock – and one of the largest in the world. Every year, it can convert 820,000 tons of wheat into 300,000 m³ of ethanol and 300,000 tons of distillers' grain for animal feed. The waste streams from the whole plant are received by a wastewater treatment plant, with the same capacity of a town of 250,000 people. There, a methanization process produces biogas used as a fuel for our turbine that powers the plant.

Selection of Andritz

I was familiar with Andritz from my time at the Origny plant. We had two Andritz decanter centrifuges running in parallel with another unit from a major European manufacturer. This gave us the opportunity to evaluate their performance and reliability. We also visited the Andritz installation at the Valenton wastewater treatment plant near Paris. There we saw five large decanters running 24/7 and feeding two Andritz drum dryers. The simple operation of these machines, the reliability, and the low maintenance requirements were confirmed to us by the operating managers of the Valenton plant. What was most important for us at the end of the day was the quality of service. This was a key reason to select Andritz technology.

The Andritz scope

Andritz technology is involved in several stages of the process. At the beginning, up to 140 tons per hour of wheat are ground into whole flour. Andritz supplied two double-shaft mixers to mix this flour with liquid and other products into a slurry that goes to ferment. After fermentation, the alcohol is then separated by distillation. The remaining material (whole stillage) contains water and unfermented organic matter (bran, proteins). These fibers, along with the dissolved protein, are used to produce a high quality animal feed product. Thus, the first stage is to separate the solids from the liquid phase (thin stillage) as efficiently as possible. Andritz supplied seven large decanter centrifuges from their D7 Series to carry out this critical separation step. The centrifuges have a large diameter of 750 mm and are equipped with parts specially designed for this application such as the scroll conveyor, capable of high capture rates of the insolubles solids and high dryness for the solids separated. Additionally, a special

energy recovery system developed by Andritz reduces the power absorbed by the centrifuges. Finally, Andritz also delivered more than 100 centrifugal pumps of various sizes installed throughout the process.

The project schedule

The project schedule was very tight and I believe we have established a record. From the first stages of procurement to the start-up was only 14 months. We built the plant in less than nine months. In May 2007, we started up the plant for the first time; within 15 days we had commissioned all the different process units. After one-and-a-half months, we were at 80% of the production capacity of the plant. Andritz is a very good supplier. They were very competitive from the beginning and delivered what they promised on time. This was critical for the success of our project given the very short construction period.

Performance

We were expecting a very easy start-up and adjustment of the centrifuges in order to produce as quickly as possible. The Andritz equipment has been available and performing well since the first day we put product in it. The performance and mechanical reliability of the machinery is top-notch. We have been running every day at the maximum capacity possible in order to meet our customers' expectations. The quality of service is also very high. Andritz engineers and technicians are highly skilled professionals and they listen to the needs of our crews. This makes a big difference at the end of the day. We know our process best and Andritz knows its technology best. By working together as trustworthy partners, both of us benefit. ○

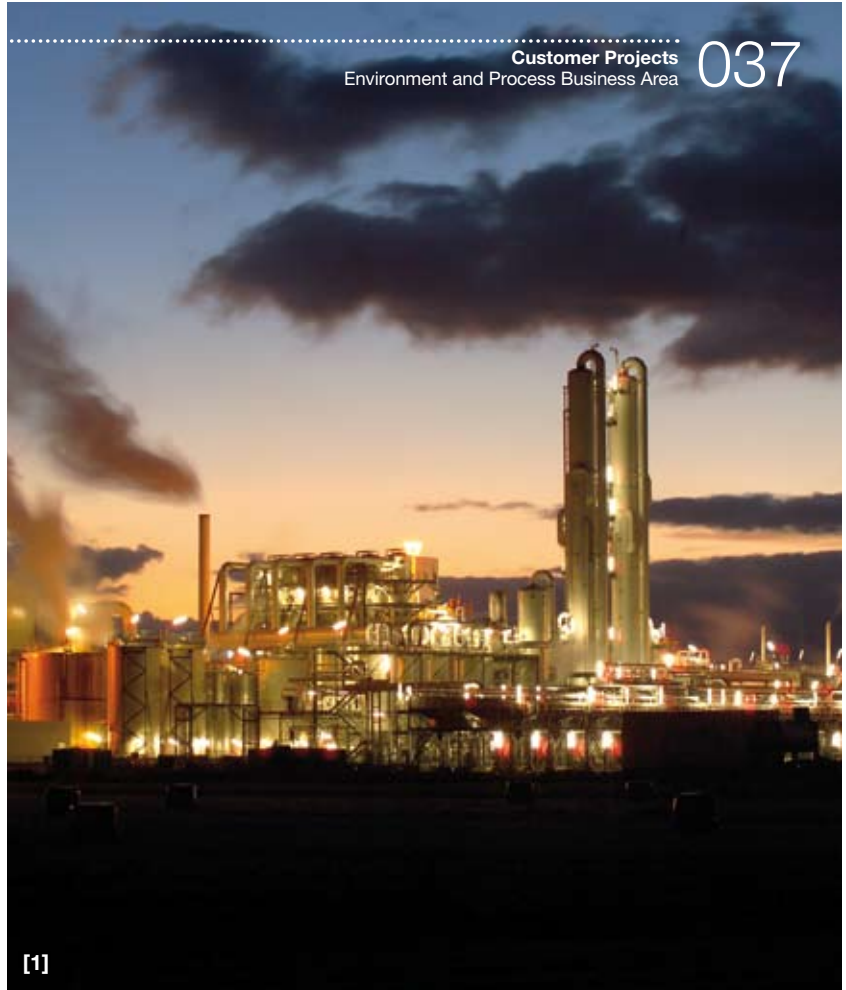
SEVEN HIGH PERFORMANCE DECANTER CENTRIFUGES FOR A 300 MILLION LPY WHEAT-BASED ETHANOL PLANT.

[1] The BENP Lillebonne wheat ethanol plant is strategically located in the heart of France's largest oil refinery industrial complex and close to the port of Le Havre on the Seine River and Atlantic Ocean.

[2] The seven High Performance D7 Series Decanters are running 24 hours a day, seven days a week with minimum operator attention. The solids discharged from the decanters are fed directly to the dryers; about 35 tons per hour of high-quality distillers' grain are thus produced.

[3] One decanter is shown in the background enclosed in its noise hood supplied by Andritz, to reduce the noise level by more than 15 decibels. This special design allows operators to have complete access to the decanters in less than one minute.

[4] The plant wastewater is digested in a treatment plant equivalent to the size of a 250,000 people town. The solids issued from a methanization process (biogas is used to produce power for the plant) are dewatered on an Andritz D4 Series decanter centrifuge to high dryness.



[1]



[3]



[2]



[4]