



Alfa Laval MBR membranes keep Danish potato starch plant up and running

KMC, Brande, Denmark

Case story



In 2006, Danish potato starch producer KMC was facing a threat from local authorities of having to restrict—or even stop—production due to high levels of bacteria in the effluent from the company’s wastewater treatment plant. KMC solved the problem by installing five Alfa Laval MBR membrane modules that remove all bacteria in the effluent.

High COD levels and changing conditions

The KMC processing plant produces roughly 250,000 m³ of wastewater per year. The wastewater is treated in the company’s own wastewater treatment plant before being treated in a municipal wastewater plant.

The wastewater from the production process is characterized by a very high COD content (10,000 mg/l), and the composition of the wastewater varies

greatly with changes in the production processes.

Challenging treatment

Technical Director at KMC, Jesper Jensen explains that the tough conditions require KMC to use many different types of bacteria for the biological treatment process.

“We need to be flexible in the type of bacteria we use, and depending on the composition of the influent, the mix of bacteria differs,” he says.

Floating bacteria caused problems

Some of these bacteria cannot be removed in a traditional wastewater plant since they do not settle to the bottom of the treatment tanks.

“The type of bacteria that are most efficient for COD removal in our plant do not settle,” says Jesper Jensen.



Jesper Jensen, Technical Director at KMC

“This meant we could not remove them in our old plant, which was a big problem for us. Our effluent goes to a municipal wastewater plant and the bacteria in our effluent caused big problems there. Eventually, they threatened to limit production or even to shut us down if we couldn’t find a way to clear our water of all bacteria.”



The special bacteria used in KMC's wastewater treatment plant give the sludge its unique colour, and some of them cannot be removed in a traditional wastewater treatment plant. To be able to clean the water to a level accepted by the local authorities, KMC installed five Alfa Laval MBR modules that have been cleaning the effluent of all types of bacteria and solids since 2007. The MBR modules are installed in the small, white houses in the background.

The solution – Alfa Laval MBR membranes

After a thorough investigation and comparison of possible solutions, KMC decided to install five Alfa Laval MBR modules holding four membrane packs each for a total of 20 packs.

The MBR modules were installed in 2007 and are still in operation 11 years later. The membranes clear the water of all types of bacteria and solids, and the problem with non-settling bacteria in the effluent was completely eliminated.

“The main benefit for us with our MBR system is that we can use the most efficient species of bacteria in our treatment process without having to worry about bacteria in our effluent,” says Jesper Jensen.

Low energy consumption and minimal fouling

Thanks to the extremely low trans-membrane pressure, the MBR filters operate using only gravity as the driving force.

“The low trans-membrane pressure saves us energy since we don't have to use any pumps for the water flow through the MBRs. But most importantly, it minimizes fouling,” says Jesper Jensen.

Sludge dewatering

The sludge is taken out from the biological treatment tank and is dewatered in an Alfa Laval G3 decanter and is thereafter used for biogas production.

Expansion plans

KMC is planning to expand its wastewater treatment plant to be able to handle larger volumes in the future. This will increase the number of MBR modules by 4 to 8.

“Until now, we have not found another technology that, at the same investment cost, can clean our wastewater so effectively as Alfa Laval MBR membranes,” Jesper Jensen says.



The sludge is dewatered in an Alfa Laval G3 decanter before being used in biogas production.

Fast facts

The plant

KMC produces 250,000 tonnes of potato starch and 20,000 tonnes of granules and flakes per year for the international market.

The challenge

The wastewater from the production processes contains up to 10,000 mg COD/l and to be able to clean it, special species of bacteria must be used in the company's wastewater treatment plant. These bacteria do not settle to the bottom and therefore cannot be removed using traditional treatment technology.

The solution

The company installed five Alfa Laval MBR modules that remove all types of bacteria and solids from the effluent water.

The benefits

- No bacteria in the effluent and full compliance with local environmental regulations
- Compact installation
- Pump-free operation, saving energy
- Minimal fouling

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com.