

# **COD REDUCTION CASE**

**75% reduction of wastewater  
discharge fee & reduction in  
chemical consumption.**

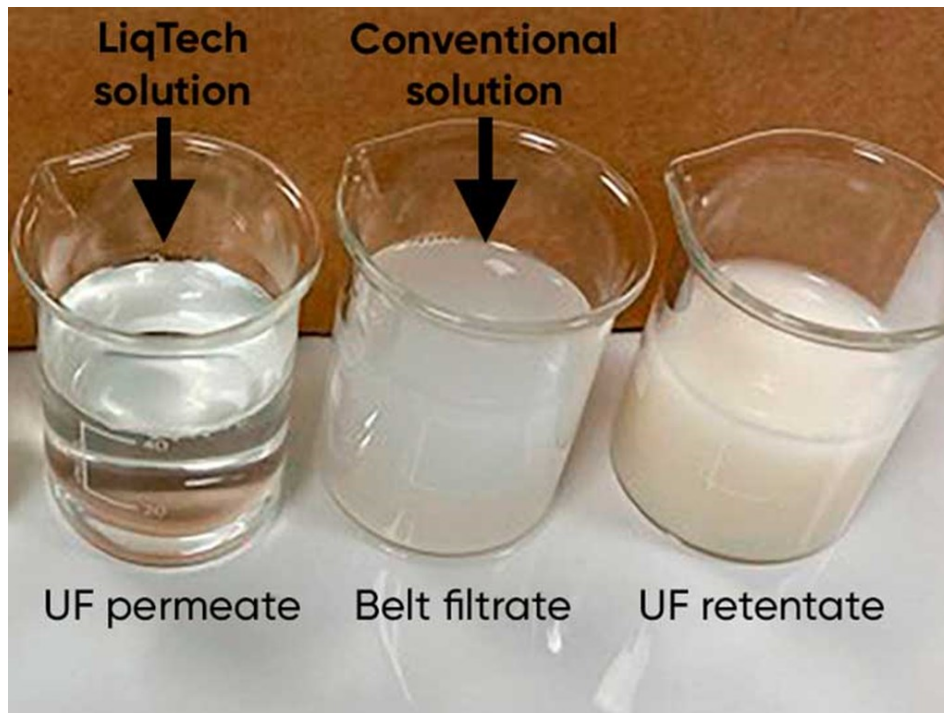
# Achieve Significant Savings in Discharge Fees

**Danish dairy has identified a way to reduce discharge fees and chemical consumption in their production significantly.**

In August 2021, LiqTech conducted a filtration pilot for dairy wastewater treatment at Mammen Dairy. The dairy aimed to increase wastewater production from 72,000 m<sup>3</sup>/year to 110,000 m<sup>3</sup>/year within the foreseeable future. Therefore, LiqTech and Mammen Dairy initiated their collaboration to clarify whether this increase was possible based on this case study.

It has been a priority for Mammen to conduct trials with the present composition of production wastewater and the addition of wastewater with higher concentrations of nutrients. The latter would be relevant for combining waste streams to avoid truck discharge of the higher nutrient wastewater.

- LiqTech dairy wastewater treatment system
- Pilot conducted August 2021
- Purpose: Combining two wastewater flows
- Future annual savings: > 100,000€
- Significant COD reduction
- Reduced chemical consumption



*The difference between the LiqTech solution and the conventional solution.*

## **From Two Wastewater Flows to One Total**

In advance of the case study, Mammen Dairy was facing high annual expenses in discharge fees, chemical consumption, and maintenance. These expenses were set to increase significantly in the following 2-5 years, as the dairy wanted to increase their wastewater production by mixing the floor whey with the wastewater stream.

Mammen Dairy expressed concern about the additional influent coming from their floor whey when mixed with the wastewater stream. The concern was that the total COD number would increase to a level that would affect the results of the LiqTech permeate and prevent reaching low COD numbers.

## **54% COD Reduction and Annual Savings of Over 100,000€**

Mammen's present band filter system demanded high amounts of coagulant and flocculant chemicals to work efficiently. Even with an efficient operation of the band filter, it could only reach a 13% reduction of COD in their wastewater.

The LiqTech filtration pilot was able to prove a significant COD reduction of 54% in the permeate and a COD up-concentration of 445% in the concentrate. In relation to combining separate wastewater streams, it was clear that the permeate composition was insignificantly affected by adding waste streams with a higher concentration of nutrients.

The results mentioned above were clearly shown in the potential yearly savings as a direct result of the filtration with a LiqTech dairy wastewater treatment system. The results exclusively show the savings in discharged fees and chemical consumption.

PRODUCED WASTEWATER (M <sup>3</sup> /YEAR)	SAVINGS (€/YEAR)
72,000 m <sup>3</sup>	>130,000€
110,000 m <sup>3</sup>	>180,000€

**75%**

Reduction of wastewater discharge fee

**54%**

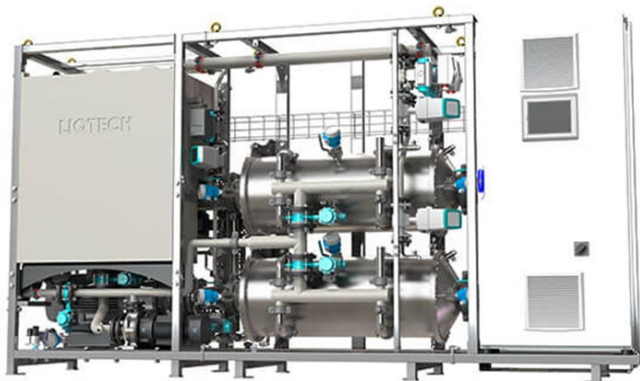
Reduction of COD

**47%**

Reduction of Nitrogen

**27%**

Reduction of Phosphor



## Operational Benefits of The LiqTech Filtration System

Apart from the financial benefits, the LiqTech system added operational benefits to the overall value proposition compared to their present band filter solution.

The LiqTech solution for Mammen contained 60 nm membranes in a crossflow system combined with the new batch mode solution. With the batch mode solution, the retentate was not bled continuously but only by backwash to combine high and efficient fouling mitigation.

On the other hand, the band filter solution relied on coagulant and flocculant chemicals to reduce the amounts of COD in the wastewater. The disadvantage of this solution was that the chemicals had to be adjusted continuously according to the flow, which was a constant manual job. Because the band filter did not have as fine mesh size distribution and was not hydrophilic as LiqTech's membranes, the study showed it could not retain an equally high amount of COD in the permeate.

### Safety Benefits of the LiqTech Filtration System

Another detection was the inevitably health and safety risk linked to the chemical handling required for the operation of the conventional system. The LiqTech Water solution eliminated the need to handle bulk volumes of coagulant and polymeric chemicals and the attention needed for frequent adjustments of the flocculation system.

LiqTech and an independent corporation have analyzed the tests performed under the case study.

**We are here to help you**