

Compliance made easy

Accurate phosphate monitoring in frozen vegetable production with Liquiline System CA80PH



Pasfrost in Belgium has been producing and distributing high-quality frozen vegetables since 1977. The Lafaut family built this company with their agricultural background and know-how up to a specialist in production of frozen vegetables.

"When we planned our new industrial wastewater treatment plant, bigger than the old one was, it was obvious that we couldn't manage plant control by manual measurements anymore. Now we benefit from the certainty of automated, comparable measured values."

Alexander Wallays
Pasfrost NV.
Passendale, Belgium



Wastewater treatment plant at the Pasfrost plant in Passendale, Belgium

Legislation for phosphate concentration in the outlet of industrial WWTPs is very strict. For Pasfrost, it was clear: An automated, easy-to-use solution was needed to help ensure the compliance with the strict legislations. Liquiline System CA80PH is able to measure very low phosphate concentrations accurately - and once installed it needs very little maintenance.

The results

- Accurate and reliable phosphate measurements ensure that legal requirements are met.
- The two CA80PH analyzers require low maintenance and are easy to use.
- Cost savings thanks to more efficient phosphate elimination as the dosing of precipitant can be adapted according to the measuring results.

Customer challenge Pasfrost processes fresh local vegetables to

frozen vegetables. Therefore, many water consuming process steps are necessary, eg. washing vegetables and blanching them. As the company is growing continuously, it built a new wastewater treatment plant to ensure the capacity of treating the increasing amount of wastewater from frozen vegetable production. The new plant is designed to purify 250 m³ water per hour. In addition, Pasfrost also has a water treatment plant where they purify a large part of the arising wastewater to drinking water, which is then re-used. The additional highly concentrated wastewater from this drinking water purification plant challenges the customer in meeting legal guidelines.

Automated measuring and monitoring of critical parameters like phosphate has become essential and necessary as manual phosphate measurement isn't possible anymore. The new automated phosphate measuring points had to meet the following requirements:



- accurate measurements at low phosphate concentrations
- reliable measured values
- low maintenance effort
- easy handling.

Our solution Pasfrost installed two CA80PH analyzers: The first one measures phosphate in the water stream after anaerobic. The second analyzer measures after the denitrification step. Pasfrost opted for the CA80PH because its molybdenum blue method comes to much more precise measuring results compared to the yellow method which is used by competitors.

By law the average phosphate concentration has to be below 3 mg/L at the outlet of the wastewater treatment plant in Belgium. The effect of wastewater concentration at the drinking water purification plant by factor four actually requires phosphate concentration to be lower than 0.75 mg/L. For such low phosphate concentrations, the yellow method is error-prone for yellowish water, which is the case in wastewater. In contrast, the CA80PH using the blue method provides reliable measured values ensuring compliance with effluent legislation.

Liquiline System CA80PH

- Based on the Liquiline platform
 - Easy handling and uniform user experience with other products
- Reduced operating costs through automatic calibration and cleaning
- Easy maintenance
- The web server enables remote control
- ISO- and DIN-compliant measurement
- Plug & play installation of up to 4 Memosens sensors possible

i Phosphate determination: blue or yellow method?

With the molybdenum blue method (DIN EN ISO 6878), orthophosphate ions are converted to complex phosphomolybdic acid in the acid medium of ammonium molybdate. Reducing agents are then used to convert this product to phosphomolybdenum blue. The intensity of the blue-colored substance is measured photometrically at approximately 810 nm. This technique covers the range of concentration from 0.005 to 15 mg/L PO₄-P, making it especially suitable for low concentrations.

With the vanadate-molybdate method, orthophosphate ions in an acid medium of ammonium molybdate and ammonium vanadate react to form the yellow vanadomolybdophosphoric acid. The color intensity of this acid is measured photometrically at approximately 430 nm. We offer the yellow method for higher measuring ranges and in applications where maintenance costs are more important than measuring accuracy. For a long time, the yellow method was the preferred option because the reagents are easy to handle and they have a relatively long shelf life without the need for cooling.