Automation saves time in wastewater analysis

Kerry DCF improves speed and reliability of COD measurement

KERRY

DairyConsumerFoods

Kerry Dairy Consumer Foods is a subsidiary of Kerry Group, a global leader in the food industry headquartered in Ireland. Kerry DCF produces milk, cheese, butter and dairy spreads for the retail market. More than 23,000 people are employed by Kerry Group across 147 manufacturing locations and 70 technology and innovation centres worldwide.

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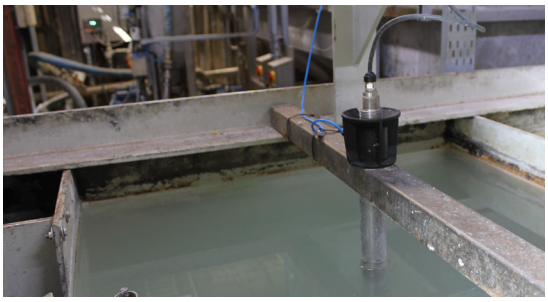

CAS80E sensor installed directly in the tank

The challenge Kerry DCF's site in Ossett, West Yorkshire, UK, primarily manufactures spreads from margarine and butter products. The treated effluent from the cleaning process has to be checked to ensure that the chemical oxygen demand (COD) – the amount of oxygen required to break down organic material such as fats via oxidation – is below a set limit before being discharged to the sewer. The water company responsible for the site's sewerage performs frequent spot checks to ensure the limits aren't breached, and can issue fines if the samples are found to be above these limits.

After mechanical and biological treatment of the effluent, the COD test used to be carried out manually – an offline process that could take up to two hours. To improve the treatment, more frequent testing was required, which increased costs and led to variability in the results. "Different people in the workforce interpreted the results differently, so we needed a solution to automate the COD and suspended solids testing," confirms process automation engineer Matthew Routledge.

The solution Endress+Hauser's Memosens Wave CAS80E spectrophotometer offers reliable real-time measurement of up to five different analytical parameters in one single device. Suitable for drinking water and surface water applications as well as wastewater and utilities, the sensor uses an optical method to scan the sample across a wide spectrum from ultraviolet through the visible light spectrum to the near-infrared.

Kerry DCF initially trialled the CAS80E for six weeks, installed directly in the treated effluent tank to provide COD and TSS (total suspended solids) readings approximately every thirty seconds. With a small adjustment to the sensor, the data compared well to the offline tests and the CAS80E became the controlling instrument. When the CAS80E measures COD above the consent limit, the wastewater treatment plant automatically goes

Liquiline transmitter

Memosens CAS80E in treated effluent tank

into recirculation, meaning no water is discharged to the sewer until the effluent has been manually checked and the outfall reset. “The automation is a fail-safe,” explains Matthew Routledge, “particularly on nights when there are less people on shift. I’ve set the limits very conservatively in the COD probe so it kicks in a lot earlier than our actual limit with Yorkshire Water.”

The benefits The CAS80E proved itself not only faster but also more reliable than the old system by removing the possibility of human error. And staff have been freed up for other tasks now they’re not responsible for manually testing samples several times a day. “The sensor has saved us a lot of time and we’re happy with its stability,” confirms Matthew Routledge. Endress+Hauser service engineers calibrate the sensor every six months when they also calibrate the site’s flowmeters and pH probes, but it’s otherwise virtually maintenance-free. As the CAS80E is an optical sensor, it requires no routine chemical reagents, just a regular wipe of the optical windows.

Having real-time data ensures better control of the effluent, preventing consent breaches and optimising the wastewater treatment process. The data is also stored in the plant’s data historian so it can be accessed immediately for compliance reasons or product information. As Matthew Routledge says, “It’s helped to improve the overall performance of the water treatment plant and if other sites asked I would recommend it.”

Memosens Wave CAS80E

The sensor operates directly in the process for real-time measurement of:

- Chemical and biological oxygen demand (CODeq and BODeq) and total organic carbon (TOCeq)
- Turbidity/suspended solids
- Spectral absorption coefficient (SAC254)
- Nitrate
- APHA-Hazen color.

The multiparameter device increases efficiency and minimises costs for measuring points. It’s easy to install and maintain and ensures reliable, interference-free communication.

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