Success Story

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Cost saving and improved quality with DO monitoring at canning and bottling plant

A major UK beer canning and bottling plant implemented a new low-level dissolved oxygen in-line measuring system to ensure consistent beer quality. Significant cost savings through simple on-site calibration and reduced maintenance effort were important positive side benefits.

Customer background information
A major beer canning and bottling plant in the North West of England has been successfully using METTLER TOLEDO dissolved oxygen instruments over the last years.

In particular they were monitoring dissolved oxygen in the canning machine delivery line to ensure that the packaged product met the stated quality requirements for flavor and shelf life.

This measurement is very important during the start of the canning run when the lines have previously been cleaned. The success of this existing installation has been such that it is proposed to install similar systems on their other can and bottle packaging lines.

Improving the taste of beer
The original discussion involved the customer's desire to monitor low ppb levels of dissolved oxygen in the line just prior to the canning machine. The negative effects of high oxygen levels on flavor, color and shelf-life of beer were well known to the customer and the target was to maintain a dissolved oxygen level of below 200 ppb.

The high gravity beers from the storage vessels are blended with deaerated liquor and it is during this process that the product can pick up oxygen from equipment such as pumps and valves. The industry as a whole is striving to drive down finished product oxygen levels as a means of improving beer quality.

Inner body of dissolved oxygen sensor InPro 6900.

METTLER TOLEDO

The METTLER TOLEDO in-line measuring system

Previously an "off-line" measuring method was used, but the customer wanted to move to an "in-line" continuous measurement solution. Off-line measurement will still be taken in the future but this reliance is expected to diminish over time.

This requirement coincided with the introduction of the InPro 6900 dissolved oxygen sensor, especially designed for brewery applications at low dissolved oxygen levels (to 3 ppb). Our recommended brewery industry transmitter at the time was the model O_2 4500 that offered high levels of diagnostic and logbook capabilities which proved invaluable when assessing the system.

Successful sensor testing

The sensor has been found to be highly accurate with a fast response to temperature variations. The low maintenance requirement of the system has also proven a hit with the customer. Maintenance of the system has been restricted to three monthly calibration checks with membrane / electrolyte changes not always being required. The system has produced results in line with independent off-line readings. The sensor's long-life membranes mean extended intervals between replacements, an exercise that only takes a matter of minutes. The latter consideration proved a big ad-vantage to the customer in view of competitor products which often necessitate time consuming and complicated membrane changes.

Supplier independent sensor maintenance

The maintenance of the sensor is designed in such a way that the customer is completely autonomous – even eventual change of the inner body anode cathode cartridge can be done quickly and easily on site without any need to return the sensor to the manufacturer. All in all the customer finds the fact that his maintenance team can perform calibration and longer term service tasks easily at site, a significant advantage in both cost saving and instrument up-time.

Satisfied customer is going to multiply its measuring loops

The company is now looking to multiply their in-line dissolved oxygen points. 4 systems are envisaged in total (including upgrading of the original installation) comprising 2 each for canning and bottling lines. Since the installation of the initial systems METTLER TOLEDO have introduced the M 700 transmitter together with the InPro 6900 sensors and the InTrac 777e retractable housing which offer a state-of-the-art measurement solution for the low level dissolved oxygen application.

Retractable housing and multiparameter transmitter allow outstanding measuring flexibility

The retractable housing InTrac 777 e allows inspection and calibration of the sensor without interruption of production.

The M 700 comes in solid stainless steel enclosure and can measure up to 3 parameters simultaneously. In addition to the graphic backlit display, the customer is very keen on the modular nature of the transmitter which provides a large choice of configuration possibilities. This leaves open the possibility of installing additional oxygen sensors, or even conductivity for monitoring of CIP procedures. Although not being actively considered at the moment, the versatility of being able to upgrade from analog to digital outputs such as Profibus® or FF in the future is perceived as an advantage.

Portable off-line measuring system to measure bright beer in storage vessels

METTLER TOLEDO also supply the "off-line" instruments for this bottling and canning plant. There are several InTap 4000 e at site. Employing a similar design to the "in-line" sensors, the "off-line" version shares the same performance and maintenance advantages.

The portable meters are used to measure the oxygen levels in the bright beer storage vessels of bulk beers that are delivered to site by road tankers. The remarkably portable yet rugged design makes the InTap the ideal instrument for multiple dissolved oxygen measurements all around the plant.

Mettler-Toledo GmbH
Process Analytics
Im Hackacker 15
CH-8902 Urdorf
Switzerland – 02 / 06