

Achieving sustainability Highly automated optical oxygen



Consistent product quality is one of the most important factors in the brewing and beverage industries. An important quality parameter is the product's taste, which is compromised of, among other things, the entry of oxygen during the production and packaging processes. For example, during the production of beer, oxidation can lead to the product tasting like cardboard and even premature spoilage. For this reason particular care is taken to ensure that the product is manufactured in an oxygen-free environment. It is possible to keep the dissolved oxygen content in the beer low by means of diatomaceous earth (DE) free beer membrane filtration – Norit's BMF – as during this filtration method the process remains closed. While this helps reduce oxygen there are still other opportunities during production and packaging for oxygen contamination.

Therefore, even under ideal processing conditions, it is crucial to monitor the Total Package Oxygen (TPO) during the packaging process. Norit Haffmans' Inpack TPO/CO₂ Meter, type c-TPO sets new quality benchmarks in this important step of quality control.

Traditional TPO

To calculate the TPO of a product both the oxygen in the headspace (HSO) and the dissolved oxygen (DO) in the liquid must be measured. There are various analysis methods for detecting both these levels. Traditional systems require several steps and measurements, by trained personnel, in order to detect the HSO and DO levels. The sample preparation alone takes 10 to 15 minutes and because the product must be removed from its original container there is the risk of contaminating the product with oxygen during the measuring process. In addition, traditional measuring methods are not able to determine whether the oxygen is HSO or DO. This underlines the need for an automated method to provide precise measurements.

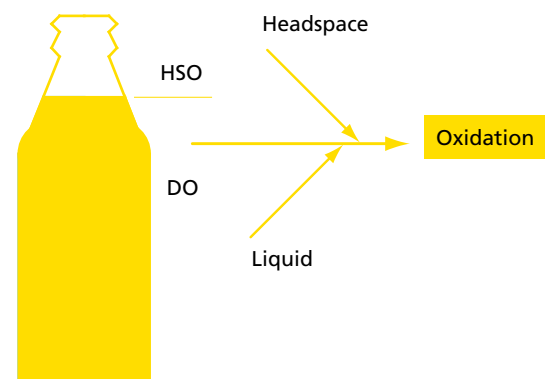
Improved TPO measuring

Norit Haffmans' c-TPO enables brewing and beverage producers to control the final stage

of the production process - packaging - more effectively. This measuring system detects both HSO and the DO using a highly automated system. With this highly flexible method no sample preparation is needed and the sample remains in the package, which greatly reduces the chance of oxygen contamination and allows for beverages with pulp or fibers to be measured.

It can also be used by untrained personnel. Once the measurement is underway supervision of the fully automatic operation is not needed. The individual measurement results are immediately shown on the display of the c-TPO or can be interpreted in the laboratory.

"The measurement of the total oxygen content, divided into HSO and DO is a more efficient measurement method, which can be used to enable significantly improved differentiation of the individual measurement results," explained Peter Houwen, Product Manager Quality Control at Norit Haffmans. "The fact that it is possible to detect both types of oxygen content means that production errors can be better detected, enabling a correspondingly improved response to such errors. In contrast, no clear source of product

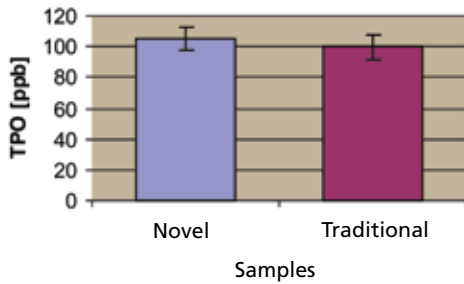


error can be found when only measuring the total oxygen content."

This principle is based on Norit Haffmans' proven optical oxygen measurement technology that is already employed in quality control instrumentation used during the production process. "Optical measurement provides many advantages for beer and beverage producers," Houwen continued. "These include optimal product monitoring, very precise oxygen measurement, operator-independent measurement results, ease of use, low calibration intervals, and low maintenance costs."

measurement

Comparison TPO measurement
(novel method versus traditional method)



Using the c-TPO, the packaged product can be directly analyzed, which allows for the quality assurance analysis to be perfected. "We are able to support beer and beverage manufacturers in regard to sustainability and the traceability of their end products," Houwen said.

Return on investment

The time saved in sample preparation and the fact that trained personnel are not required to take the measurements both contribute to the ROI of the c-TPO. However, when calculating ROI, it is not only the pure analysis work and operation that need to be taken into account, but also the maintenance and calibration outlay. Based on the results evaluated, the maintenance and repair work to be carried out at production plants can be controlled and optimized in a targeted manner. This also contributes to achieving continuous production.

In addition, because the c-TPO directly measures both headspace oxygen and dissolved oxygen quickly and pinpoints the cause of the oxygen contamination immediately, expensive product is not wasted. Ultimately in the filling department - the final production phase - impact of any waste is highest. The c-TPO enables the customer to be in control at the most critical step, enabling the customer to reduce waste and at the same time contribute to the company's sustainability challenges.

Frank Verkoelen



knowhow@norit.com