

Brewery

Perspectives in Liquid Process Analytics



19 News

INGOLD

Leading Process Analytics

Reproducible Fermentation Conditions DO Control in Wort Aeration

The dissolved oxygen level during wort aeration has to be controlled to prevent the beer being adversely affected. For a major Thai brewery, use of METTLER TOLEDO optical DO sensors during cold wort processes has led to improved wort aeration and increased process uptime.

Top Thai brewery

The brewery industry in Thailand started in 1934, and despite competition from major international brands, local producers have successfully established themselves in their own country and abroad.

Our customer is one of Thailand's three major beer producers. In the north of the country they operate a facility with a production capacity of 10 million hectoliters, making it the biggest brewery plant in the country.

DO measurement in aeration is essential

The customer has two lines for cold wort aeration. Control of the process through dissolved oxygen (DO) measurement is a very important step, as excessive aeration

causes oxidation of wort ingredients and insufficient aeration slows fermentation. Both situations lead to reduced production and poorer beer quality.

DO measurement systems using amperometric probes were installed in both lines. Due to plant design, retractable housings that would allow the sensors to be removed during CIP cycles could not be installed. Exposure to the CIP caustic solution, hot water and the high sugar content of the wort was taking a heavy toll on the probes. Measurement accuracy of new electrodes would quickly fall which meant regular and time-consuming maintenance to replace sensor membranes.

Our customer was looking for an alternative solution that would be durable and low



METTLER TOLEDO



maintenance, and that could be installed in the same measuring positions. METTLER TOLEDO suggested a system based around the InPro 6960 i optical DO sensor.

Benefits of optical technology

The optical technology in the InPro 6960 i offers many advantages over other sensor designs. Unlike amperometric probes, the InPro 6960 i requires no polarization before it can begin measuring, therefore sensor start up is almost immediate. Very low drift is another feature of optical sensor technology, so measurement stability remains high over a long period. Servicing is quick and simple as no electrolyte solution is involved. The only part of the probe that requires periodic replacement is the OptoCap sensing element which contains an oxygen sensitive layer. The OptoCap is more robust than the membranes of am-

perometric probes, and its lifetime can be extended by selecting a longer sampling rate and automatically turning off the sensor's internal LED during CIP cycles.

Built-in intelligence

The InPro 6960 i is one of METTLER TOLEDO's expanding portfolio of Intelligent Sensor Management (ISM) instruments. ISM brings benefits to process analytics by simplifying sensor handling and reducing maintenance. Thanks to ISM technology, the InPro 6960 i automatically detects CIP cycles via an integrated temperature probe. The number of CIP cycles, sampling rate, operating time and other wear and tear related data are used to predict the remaining lifetime of the OptoCap. This is displayed on the connected transmitter as the Dynamic Lifetime Indicator (DLI). When the DLI reaches zero, the measurement system generates an alarm for OptoCap replacement. As a result, unwanted use of a potentially failing sensor is avoided.

The M400 was selected as the partnering transmitter for the sensor. The M400 is a versatile multi-parameter transmitter series that offers full support for ISM functions. It accepts analog sensors as well as digital ISM sensors, adding to its flexibility.

Improved wort aeration

Once installed and operating, our customer was pleased to find that lab mea-

surements closely agreed with those from the InPro 6960 i, proving that the influence of CIP cycles on the sensor were minimal.

Our customer is extremely satisfied with the performance of the system. The longer maintenance intervals and DLI have significantly increased process uptime. Of most importance to the brewery, the reliable values from the InPro 6960 i have led to improved wort aeration, smoother production and are helping them brew beer of the highest quality.

Find out more about the InPro 6960 i and ISM at:

► www.mt.com/InPro6960i



ISM

InPro 6960 i optical DO sensor

Publisher/Production

Mettler-Toledo AG
Process Analytics
Im Hackacker 15
CH-8902 Urdorf
Switzerland

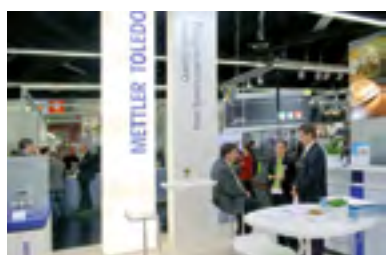
Illustrations

Mettler-Toledo AG
Aphanius, Jgroup | Dreamstime.com

Subject to technical changes.
© Mettler-Toledo AG 01/12
Printed in Switzerland.

METTLER TOLEDO at the 50th Brau Beviale

METTLER TOLEDO was delighted to once again be exhibiting at the Brau Beviale, particularly as this was the 50th year of this hugely popular event.



A birthday party with 31,500 guests! Only real celebrities manage this – like Brau Beviale, which celebrated its 50th birthday from 9 – 11 November 2011 in the Exhibition Center Nuremberg, Germany.

Almost 1,400 exhibitors played host at the European beverage industry's popular get-together. METTLER TOLEDO, as a leading supplier of precision instruments and services for measuring and weighing equipment exhibited its latest developments as well as established solutions for the brewing and beverage industries. At our booth we welcomed highly qualified visitors from all five continents who took the opportunity to learn more about our systems for optimizing processes "From brew house to filling" – including Process and Laboratory Analytical systems as well as Product Inspection devices.



Among the Process Analytical instruments on show were:

InPro 6970 i optical dissolved oxygen sensor

- Immediate availability – no polarization required
- High signal stability
- Plug and Measure feature for fast, error-free start up
- No electrolyte handling

InPro 8600 turbidity sensor

- 25°/90° light scattering technology
- Maintenance-free sapphire optical window
- Color monitoring option
- Easy installation on Varinline® housings

M400 multi-parameter transmitter

- Covers measurement of pH, ORP, oxygen, carbon dioxide and conductivity
- Full Intelligent Sensor Management (ISM) support
- Mixed-mode inputs accepts ISM or analog sensors
- Six output relays and four current outputs

In case you missed this exhibition, visit our website to discover our wide portfolio for improving quality, productivity and safety of your beer and beverage production.

► www.mt.com/beer

Giving Beer a Better Sparkle Monitoring Oxygen in Recovered CO₂

Using recovered CO₂ has become a common process in most breweries. Monitoring purity of the gas is essential if CO₂ of defined purity is to be used in different applications. An intelligent measurement solution from METTLER TOLEDO is providing a major UK brewery with final product quality assurance.

CO₂ recovery in the brewing process

The recovery of carbon dioxide from the offgas of fermentation vessels is an important process in large scale beer manufacture as it has many cost and efficiency benefits. If the carbon dioxide produced is of sufficient purity (i.e. very low oxygen content) it can be utilized in other areas of the plant, such as in post carbonation and as inert gas in filling lines. If the CO₂ is less pure it can contribute to neutralization of caustic in the waste treatment plant. Therefore, measurement of carbon dioxide purity is an important procedure.

METTLER TOLEDO oxygen sensors for low oxygen levels are highly effective in this application. By measuring the O₂ concentration levels in the vessel or pipe, it is possible to extrapolate the concentration of carbon dioxide present. It is this technique that is used by a major UK brewery in their carbon dioxide recovery processes.

Strict limit in O₂ level

The brewery wanted to monitor the CO₂ quality in the maturation vessel ventilation lines and bright beer tanks. The target was for CO₂ with an oxygen level of no more than 0.1 vol% oxygen to be used at the filling line. If this value was exceeded,

the gas would be automatically diverted to the effluent treatment plant.

Dependable oxygen monitoring system

As low level oxygen detection was required with a fast response to guarantee accurate monitoring, METTLER TOLEDO's InPro 6950 i G oxygen sensor was selected. With its measurement accuracy down to 0.0005 vol%, immunity to interference from moisture, and robust construction, the InPro 6950 i G is ideally suited to in-line monitoring of oxygen content in CO₂.

Sensor maintenance such as membrane exchange and calibration are all straightforward procedures requiring minimal specialist knowledge. In addition, replaceable inner bodies for the sensor prevent the need for complete sensor replacement and increases the usable lifetime of each sensor.

The multi-parameter M700 was chosen as the accompanying transmitter. The unit has three module slots (two for measurement modules and one for a communication module), making it very simple to configure for particular requirements.

Completing the system is an InFit 761 e sensor housing. The wide range of materials, O-rings, process connections and insertion lengths makes it one of the most versatile housings in the METTLER TOLEDO portfolio.



An intelligent solution

The InPro 6950iG is a member of METTLER TOLEDO's expanding range of Intelligent Sensor Management (ISM) probes. ISM offers breweries a number of valuable benefits:

Predictive diagnostics: The Dynamic Lifetime Indicator (DLI) is derived from a sophisticated algorithm that uses current and past process conditions to accurately forecast a sensor's remaining lifetime. The DLI prevents a sensor that needs to be replaced from being used in the process. Based on the DLI, the Adaptive Calibration Timer predicts when calibration is next required in order to maximize measurement reliability. The Time to Maintenance tool indicates when the next electrolyte or membrane replacement should be done to maintain the best possible measurement performance.

Plug and Measure: Using METTLER TOLEDO's iSense Asset Suite software running on a PC or laptop, or an ISM transmitter, sensors can be pre-calibrated in a convenient location and stored until they are needed. When sensor exchange is required it is a simple matter of attaching a pre-calibrated probe. Calibration data is automatically uploaded to the transmitter and the system is ready to measure in a few moments.

Digital signal: Unlike conventional analog measurement systems where the process measurement is calculated by the connected transmitter, ISM sensors calculate the measurement in the sensor head and send this digitally to the transmitter. Digital signals are unaffected by electrical interference or degradation caused by long cable runs; therefore, measurement stability is very high.

Ensured product quality

Technicians at our customer's brewery report that the METTLER TOLEDO solu-

tion is operating extremely well. They have greater confidence in the purity of the recovered CO₂ that is being used at the filling lines, helping to ensure final product quality. In addition, the predictive diagnostics of ISM have resulted in less maintenance. Our customer intends to install additional ISM O₂ systems in the near future for further carbon dioxide recovery and monitoring applications.

If you need assurance of CO₂ purity at your brewery, go to:

► www.mt.com/o2-gas



M700 transmitter

Berlucchi

A Glass of Pleasure

Grapes sampled with GPS, intelligent presses, timely laboratory testing: the art of making wine is changing. Over 40 years, the passion and commitment to the Italian classic method together with utilization of modern technologies contribute to the success of the Berlucchi brand.

Precision farming

Franciacorta, situated in northern Italy, has partly morainic grounds and is ideal for viticulture. Franco Ziliani developed a high quality sparkling wine here in the 1960s – thus, Casa Berlucchi was born and, in over 40 years, has reached an almost 30% share of the market and an increasingly important presence in international markets using the classic Italian method.

This company now incorporates tradition and experience using the most modern and advanced techniques. With the 2008 vintage, the Berlucchi's vineyards benefit from "precision farming", making it possible to determine the harvest date and grape destination of the various product types. The technique consists of mapping land parcels according to soil type and

photographing them with infrared rays. The images are then processed according to color. Red areas are characterized by slower growth in maturity, higher acidity and lower sugar levels and green areas identify the fruit with higher sugar and lower production loads. Based on these maps, the sampling technician moves between the rows with a handheld GPS and

visualizes his position in real-time, collecting reliable samples for different ripeness levels.

Grapes are then pressed and vinified separately, creating wines with surprisingly different characteristics even when generated from the same vineyard. This practice is supported by two presses



Analytical lab of Berlucchi.



capable of working continually. Benchmarks are analyzed at each pressing stage (brix, total acidity, pH, etc.), the juice enters various tanks and, after the refrigerated limpid phase, moves to the wine making area.

Precision measurement

The analytical laboratory is equipped with a METTLER TOLEDO DR40 to measure combined density and refractive index. Its ease of use and reliability is thanks to the built-in Peltier cell thermostat measuring the minimum quantity of sample required for analysis. In addition to distillates alcohol content and brix, the system also determines several other parameters specific to the wine sector, i.e. Babo degrees, potential alcohol from refractive index and total dry extract from relative density. The DR40 is a flexible and valuable instrument for quick winemaking results.

Apart from pH and total acidity measurement, Berlucchi also uses the T70 Excellence Titrator to determine free combined and total sulfur dioxide.

Dr. Ferdinando Dell'Aquila, head of laboratory, comments that, "We chose your company as you represent the best among the market offering. It was only with the use of your instruments that we have achieved such high quality and reliability standards. We also appreciate the efficient after-sales support. We are more than satisfied with METTLER TOLEDO."

► www.mt.com/one-click-titration

► www.mt.com/dr



Vineyard evaluation with "precision farming"

Reduced Effluent Treatment Costs with In-line Turbidity Measurement

If not monitored, dosing of flocculants during wastewater treatment can easily be excessive. For a UK brewery, an in-line turbidity measurement system has led to reduced use of flocculants and increased throughput.

Turbidity is ideal measurement in dosing of flocculants

Use of flocculants in wastewater treatment is important for removing contaminants. Flocculation also reduces process time, which means wastewater can be treated faster so throughput can be increased.

A UK brewery was looking for a way to monitor the level of flocculants added to wastewater so that it could be dosed correctly and prevent wasteful over-dosing and potentially ineffective under-dosing.

Turbidity is the ideal measurement for this application as the resulting flocs from turbid sediments can easily be measured using backscatter turbidity techniques. METTLER TOLEDO backscatter sensors have a wide measurement range that provides great application flexibility.

Low-maintenance solution

The brewery required a sensor suitable for medium to high levels of total suspended solids that could be retracted from a pipe installation while the process was running.

The selected METTLER TOLEDO solution comprised the InPro 8200 turbidity sensor, InTrac 779 e retractable housing and Trb 8300 transmitter. The InPro 8200 is a dual optical fiber turbidity sensor that is designed for a wide variety of industrial applications, including liquid/solid separation. Due to the nature of the customer's process, it was important that the sensor be resistant to fouling and easy to maintain. The InPro 8200 was therefore a wise choice as it requires little maintenance and has a uniform structure that reduces fouling on its scratch-resistant sapphire window.

The InTrac 779 e retractable housing with integrated flushing chamber allows the customer to retract the sensor for cleaning and calibration without interrupting the process.

Reduced operating costs

By installing the METTLER TOLEDO turbidity monitoring system the brewery is now able to monitor the dosing of flocculants with precision and ease. This has helped to reduce costs as only the necessary amount of flocculant is added. Subsequently, the process has become more efficient and throughput of the effluent treatment plant has been increased.

If you want to reduce your effluent treatment costs, visit:

► www.mt.com/turb



InTrac 779e retractable housing



Trb 8300 transmitter



InPro 8200 turbidity sensor

The Information You Want is at www.mt.com/pro

The METTLER TOLEDO Process Analytics website contains a vast amount of up-to-date information on all our products and services.



Content is localized for your country and tailored to suit your selections. Simple layout allows you to quickly find the information and features you are looking for.

- Learn about our most recent product developments
- Request further information on products and services
- Obtain a quote quickly and easily
- Read case studies relevant to your industry
- Access buffer and electrolyte solution certificates
- and more ...

- Read the latest product news
- Access our newsletter archive
- Find out when our next trade show or exhibition is in your area
- Register for free webinars presented by our industry experts
- Download our white papers

Minimize Product Loss with an Optical Product Monitor

The InPro 8300 Reflection Absorption Multi-Switch (RAMS) systems are designed for in-line use in phase separation and product identification applications by turbidity or color. The rugged InPro 8300 RAMS systems can be quickly installed on VARINLINE® housings, and need only water for fast, in-line calibration.

To maximize production during the brewing process you need to know exactly when the yeast to beer transition is complete. To minimize loss at the filling line you must determine the precise moment beer and not water is flowing through the line. You also need to know if you are filling with the correct product. And you want to do all this with minimum expenditure.

Using LEDs to instantly detect changes in turbidity or color in liquids, the InPro 8300 RAMS is a unique and versatile instrument.

For product identification it stores a "fingerprint" of up to eight products, preventing losses at the filling line from incorrect product selection.

Find out how the InPro 8300 RAMS can help your brewery operations – go to:

► www.mt.com/InPro8300

Your benefits



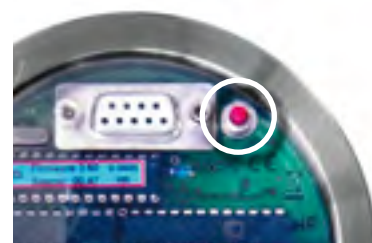
Minimal product loss

Instant recognition of pure product or water ensures neither is wasted.



Low installation cost

Fast and easy installation on Tuchenhaugen VARINLINE housings.



Quick, simple calibration

Time-saving, easy in-line calibration correction with clear water.



InPro 8300 RAMS
optical product monitor

Get in-line with METTLER TOLEDO

Heads – I use the sensor again,
tails – I don't.



Don't leave it to chance!

ISM – True Predictive Diagnostics



No more guessing if a sensor will survive through the next production run. Intelligent Sensor Management's predictive diagnostics analyze process conditions and sensor health to provide you with accurate information on when sensor replacement will be needed.

ISM Intelligent Sensor Management
from METTLER TOLEDO

► www.mt.com/ISM