Dairy
Perspectives in Liquid Process Analytics

6
News

INGOLD
Leading Process Analytics

Monitoring Turbidity Improves
Solid Separation in Cheese Plant

Applications in cheese processing help improve product quality and conserve water. Return on investment for turbidity measuring systems was reached in 3 months by water savings and improved product recovery.

World's largest barrel cheese plant

Glanbia Foods, Inc. is a division of Glanbia plc based in Kilkenny, Ireland. The Glanbia Foods facility located in Gooding, Idaho, is the largest barrel cheese producing plant in the world. This US cheese and whey facility processes over 9 million pounds (4 millions kilograms) of milk per day converting it into 500 pound (227 kilograms) barrels of American-style cheese, as well as a large portfolio of dairy-based nutritional ingredients.

The process

Glanbia's use of the InPro 3300 non-glass pH electrode and InPro 7108 conductivity sensors were featured in an earlier Dairy newsletter. Today we will see how they are utilizing turbidity measurements to determine milk solids in water to optimize its cheese processing plant.

Turbidity measurement

The addition of a single drop of milk to a glass of water demonstrates that the use of optical turbidity sensors can provide an accurate, sensitive indication of milk solids. This principle is applied in several stages of the milk processing and cheese making. The turbidity measurement is capable of making a quantitative determination of the solids content, and process control action is determined based on this reading.

Turbidity interface detection

Numerous applications involve flushing process lines with water to flush out milk or cream, or follow milk and cream after

METTLER TOLEDO

water in line. It is important to know which is in the line in order to prevent adding water to product, or sending high excess water to treatment facility. As milk or cream products are flushed from a line with water, turbidity is used to determine when to divert the contents to waste and when to recover. Liquids containing high levels of solids are diverted to a recovery process, thereby minimizing product loss. Waste treatment facilities often charge based on COD (chemical oxygen demand) value. High milk solids loading results in high COD levels sent to waste treatment which will result in back-charges to operations. Therefore, product recovery goes hand-in hand with reduced waste treatment expense. Once the line is adequately flushed with water as determined by the turbidity sensor, the flushing cycle can be terminated, thereby conserving precious water. Water reclaim and reuse was a significant consideration in automating the flushing cycle.

METTLER TOLEDO solution

Two styles of turbidity sensors are used within the facility.

- The probe style InPro 8100, backscatter turbidity sensor is ideal for measuring high suspended solids content of milk or cream.
- While the across the pipe design of the InPro 8400 is superior for measuring low levels of milk product in water.

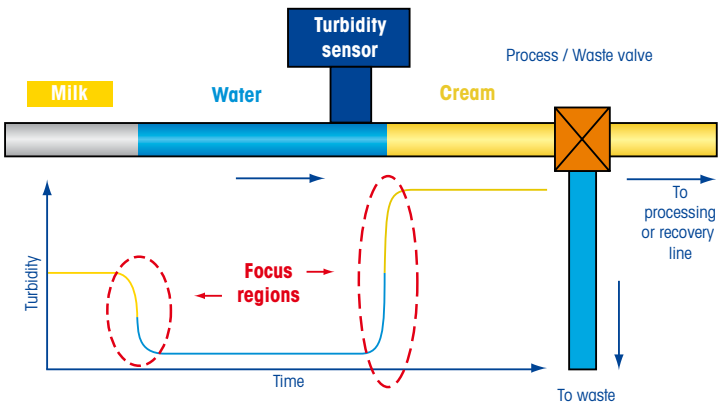
Two loops of each style are used for interface detection within the plant. Both designs meet the rigorous hygienic requirements of the dairy industry, and can readily withstand CIP, (Clean-In-Place), cycles.

Benefits of monitoring turbidity

- Monitoring turbidity in the permeate stream helps monitor the efficiency of the solids separator and minimizes operation costs of the downstream evaporator.
- The use of METTLER TOLEDO turbidity sensors has been found to be more robust than previous competitive optical sensors which were found to suffer from condensation problems or liquid leakage internal to the sensors.
- The InPro 8100 and InPro 8400 easily withstand the normal 27 – 49 °C (80 – 120 °F) as well as maximum 71 – 82 °C (160 – 180 °F) process conditions.
- Return on investment calculations based on water savings, reduced waste treatment costs, and improved product recovery were typically 3 month ROI. These sensors have been in use since 2005 and require minimal maintenance.
- Use of automated turbidity systems to control process conditions has been demonstrated to improve operation profitability by reducing rinse water requirements, minimizing wasted product and reducing wastewater charges.

www.mt.com/turbidity

Turbidity interface detection.



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Improve Your Process Further
With ISM Technology

Low maintenance costs and reduced downtime leading to significantly lower operation costs are typical benefits of high performance, reliable pH electrodes.

A logical evolution

Many years of experience in the field of industrial measurement systems form the basis of METTLER TOLEDO's competence. Now with its ground-breaking ISM technology, it combines these years of experience with digital technology and processing power for advanced sensor diagnostics.

The digital ISM solution

Specific to the new line of ISM pH electrodes the signal processing takes place within the electrode head itself. Digitizing the signal where the sensing element is a logical idea, because low impedance signal transmission is much less prone to electromagnetic interferences.

ISM means efficient maintenance

In addition to its digital signal, each ISM pH electrode continuously performs its own "health check" and monitors such critical parameters as reference impedance for pH on-line. By doing so, it can alert the user of a possible junction blockage, allowing him time to take preventive measures. This is just an example of what ISM is able to do for better process control. Across the world, ISM technology has clearly demonstrated its usefulness in hundreds of successful applications.

iSense – the key to maximize the benefits of the ISM technology

iSense allows verification and calibration of METTLER TOLEDO digital ISM pH and dissolved oxygen sensors under laboratory conditions.

The following pH electrodes with ISM technology are available for Dairy:

- InPro 3250 i
- InPro 2000 i
- InPro 3100 i

Electrode
InPro 3250 i.

iSense
ISM Asset Suite

iSense is a very user-friendly and unique software.
Just connect your sensor via a USB port to your computer.

www.mt.com/ISM

M400 – the Versatile Transmitter
for Advanced Process Measurements

The new flexible M400 transmitter is designed for demanding applications and features ISM® technology with a new unique Dynamic Lifetime Indicator. It covers pH/ORP, oxygen and conductivity measurements, and accepts analog as well as ISM sensors.

M400 – the multi-parameter transmitter for more flexibility

Keep your inventory complexity low with the versatile M400:

- Each model can be used for several input parameters
- 3 types are available to suit your process needs
- The M400 can input either any analog or innovative ISM sensor. You decide which sensor type is best suited for each application

Real-time status information with ISM® technology

ISM makes it much easier to operate process analytical systems from initial installation to maintenance right through to sensor replacement. ISM is available for all key analytical measurement parameters. Real-time status information from the ISM sensor allows true predictive maintenance:

- The Dynamic Lifetime Indicator (DLI) tells you when the sensor needs to be replaced
- Only calibrate when necessary: The Adaptive Calibration Timer (ACT) monitors the time to next calibration
- Traceability support thanks to built-in "Clean-in-Place"/"Sterilization-in-Place" counter and calibration history

Plug and Measure™ feature minimizes maintenance costs

Plug and Measure allows the user to start measuring within seconds:

- Minimized risk of installation troubles thanks to simplified commissioning
- Up-to-date calibration data are stored in ISM sensors and sent directly to the transmitter

High reliability even in advanced process applications

The M400 transmitter is the choice for advanced applications in the dairy, food & beverage, and in the pharmaceutical industry due to its high reliability and advanced ISM capabilities. It can input either any analog or innovative ISM sensor.

In addition, the unique iSense Asset Suite for pH and DO (to be released in Q4/2008) offers a reliable control calibration in a QA Lab and ensures a fully traceable documentation for each sensor over its lifetime.

www.mt.com/m400

The multi-parameter transmitter M400 is compatible with ISM® electrodes and sensors.

With the iSense Asset Suite you run your ISM® sensors with maximum performance over the entire life cycle.

Non-Glass pH Measurement in Milk Processing

The METTLER TOLEDO InPro 3300 non-glass pH electrode combines maximum measuring convenience with maximal reliability.

Innovative sensor technology without the risk of glass breakage

In contrast with classical glass electrodes, the InPro 3300 has no glass components. Instead of the glass membrane, the measurement function is taken over by a microchip (ISFET = ion-selective field effect transistor) whose electrical signal is dependent on the pH of the sample medium.

Hygienic design

All of the sensor materials in contact with the medium are food-grade (PEEK plastic shaft, EDPM sealing rings) and FDA-rated for the application in the food production. The sensor itself can be steam sterilized up to 130 °C (266 °F) but should not be exposed to hot caustic soda or else the ion-selective coating will be destroyed. During the CIP process (Clean-in-place) the electrode is brought into the maintenance position using a retractable housing, where it is treated in the rinsing chamber with a mild cleaning agent and can then be sterilized before redeployment.

Reproducible measurement

Measurement comparability of the InPro 3300 with laboratory measurements is very good. Deviations are only 0.05 to 0.1 pH units and are constant and reproducible.

Benefits

- Quality and process control
- Monitoring of the ripening process in yogurt production
- pH monitoring before filling of U.H.T. milk

Results

Using ISFET sensors the pH in the food production can be measured risk-free, reliably and reproducibly, without worrying about glass breakage. The technology and the food-grade design of the METTLER TOLEDO InPro 3300 can be fully integrated into an HACCP program.

www.mt.com/pro-pH

Non-glass pH electrode InPro 3300.

Process Analytics Product Catalog
New Edition 08/09 Available

Get an overview of the latest INGOLD and THORNTON products available for your process application with the new product catalog 08/09.

The catalog offers comprehensive overview on product features and specifications, benefits and recommended application areas, order details and much more for process analytics measurement solutions.

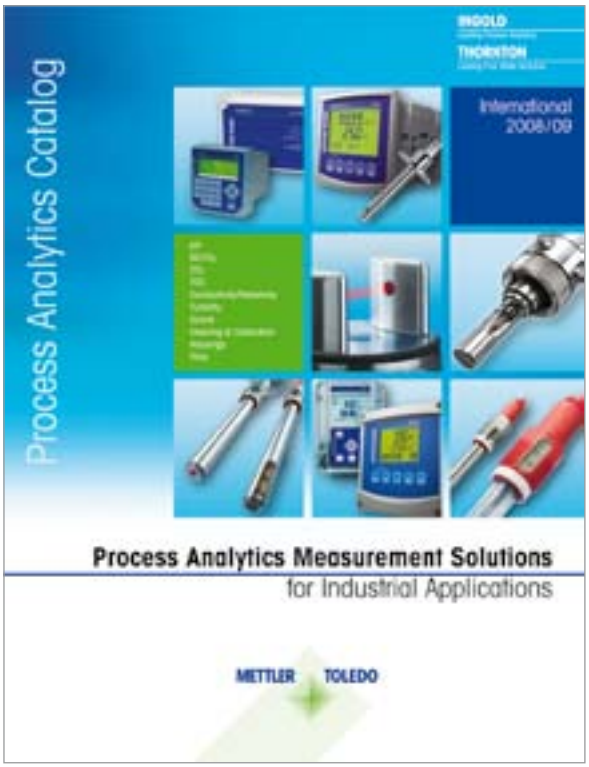
The product catalog covers complete measuring solutions for the parameters:

- pH
- Dissolved oxygen and O_2 in gases
- Ozone
- Dissolved CO_2
- Conductivity
- Turbidity
- TOC
- Flow

The featured product range includes:

- Electrodes / sensors
- Housings
- Process connections
- Transmitters / analyzers
- Cleaning and Calibration systems
- Cables
- Accessories

Order your copy of this useful desk tool today!



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