

Pulp & Paper

Perspectives in Liquid Process Analytics

22 News

INGOLD

Leading Process Analytics

Uninterrupted pH/ORP Measurement for Twice as Long as Previous System

pH and ORP measurement in bleaching towers is demanding on sensors. High temperature and harsh bleaching agents necessitate regular sensor maintenance and inevitably reduce sensor life. For an American mill, switching to a METTLER TOLEDO solution has doubled the time before sensor maintenance is required and increased operator safety.

Specialist in packaging

Our customer is a USA-based international company specializing in the manufacture of packaging solutions for the cosmetics, healthcare, pharmaceutical and food industries.

Harsh process conditions take their toll

In the production of bleached paperboard for high-end packaging solutions, the pulp is bleached in multiple steps involving both chlorine dioxide and hydrogen peroxide as the bleaching agents.

The first stage bleaching tower, where chlorine dioxide is used, runs at greater than 100 °C and at pressures above 100 psig (6.9 barg). Measuring pH and redox potential is critical to control-

ling the bleaching process and fiber quality.

The mill operates for months at a time without shutting down. Normally, pH and ORP sensors require extensive and very frequent maintenance under these harsh conditions. Therefore, measurements are typically installed in a bypass line in order to provide continuous access to the sensor.

Longer availability is vital

Our customer was looking to extend the period between cleaning/calibration of the electrode in order to maximize availability of the measurement. Also, they preferred a hot-tap style solution rather than a bypass installation, so that measurement directly into the process could be achieved.



METTLER TOLEDO



pH sensor for pulp and paper applications

After closely examining the customer's requirements, METTLER TOLEDO recommended the use of our InPro 4801 SG flat glass pH sensor in a titanium hot-tap housing, along with an M700 transmitter.

The InPro 4801 SG is ideal for high temperature, high pressure environments. It is specially designed for operation in oxidant media and, due to its flat membrane glass, is much less susceptible to fouling. Moreover, it allows the measurement of both pH and redox simultaneously off the same sensor.

Simpler and safer

The multi-parameter aspect of the M700 transmitter is a huge advantage for our customer, as they require redundant measurements and therefore were able to move from four sensors to two. This meant that the installation became much simpler in several ways. Firstly, only two process connections were needed instead of four, limiting the potential for leaks. Secondly, the M700 can handle all four outputs, so on the electrical side the installation was

simplified as well. Finally, the hot-tap style housing allows for continuous and safe access to the electrode, meaning that maintenance can be done without interrupting the process, despite the high pressure on the process side.

Time and costs saved

In addition, our customer found that the InPro 4801 SG sensor performed for twice as long as the previous solution before requiring cleaning or calibration, thus making valuable savings on maintenance costs and time.

► www.mt.com/InPro4801SG



InPro 4801 SG pH sensor

Publisher/Production

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

Illustrations

Mettler-Toledo AG

Subject to technical changes.
© Mettler-Toledo AG 08/14
Printed in Switzerland.

Now for All Major Bus Networks the M400 Transmitter

By enabling real-time monitoring of sensor assets, fieldbus networks can add long-term value to production facilities. With the M400 series of multi-parameter transmitters, advanced sensor diagnostics information is available over HART®, FOUNDATION fieldbus™ and now PROFIBUS® PA; helping to improve process reliability and safety, and lowering operating costs.

Fieldbuses are prolific

The adoption of fieldbuses in the world of automation continues to grow rapidly across all process industries. It is a very well accepted technology and is installed by all major manufacturers worldwide.

Benefits including reduced wiring and installation costs are obvious. Less apparent are the long-term advantages of fieldbus networks that become clear many months after a facility has been commissioned. According to research by the ARC Advisory Group, the greatest benefits of fieldbus networks are realized in relation to maintenance and operation. This means fieldbuses themselves are often not a lasting cost-saver directly, but merely

allow a higher level of asset management that can significantly reduce operating costs.

As an example, a fieldbus can simplify the collection of device data for Plant Asset Management systems that track the condition of the connected field devices and sensors. METTLER TOLEDO, as a manufacturer of intelligent sensors and transmitters, rose to the challenge of providing real-time information on the installed sensor base.

Remote diagnostics avoid needless maintenance trips

We fulfill this requirement with our unique Intelligent Sensor Management

(ISM®) technology. Contrary to conventional analog sensors, digital ISM sensors offer flexible integration of key diagnostics data into control systems for remote monitoring. Besides the transmission of the process variables via common communication protocols, sensor identification as well as the diagnostics can be directly accessed via control systems or standard asset management tools. Due to this direct access to information on fieldbus instruments, unnecessary trips to the field can be avoided.

M400 – a common platform for all applications

Our successful M400 transmitter series exemplifies our commitment to continuous improvement in order to meet customer requirements, especially in the area of digital communication.



Highlights of the M400 PA

- PROFIBUS PA communication
- Covers wide range of parameters including (optical) dissolved oxygen
- Multi-parameter capability reduces inventory
- Mixed mode for easy transition from analog to ISM technology
- Available approvals for hazardous area use: NEPSI, ATEX/IECEx Zone 1

The M400 is already available with HART and FOUNDATION fieldbus communication protocols. Now we have completed the portfolio with the introduction of our PROFIBUS PA version.

Across all process industries the M400 provides excellent reliability and reduced total cost of ownership by offering diagnostic utilities and a wide range of communication capabilities.

Find out more at:

► www.mt.com/M400

Keeping Silica at Bay with a Low Maintenance Analyzer

Silica in boiler feedwater can lead to unplanned shutdowns and extra maintenance. Brazil's biggest paper and paper-based packaging company has switched to a METTLER TOLEDO silica analyzer. Its accuracy, low maintenance and easy operation are saving them many man hours.

Highly damaging deposits

Brazil's largest producer of paper and paper-based packaging, exports its products to over 70 countries. It has 14,000 direct and indirect employees across its 16 plants. At one of these, power plant engineers were having problems with silica deposition.

Silica has no significant corrosive effect on boilers, but its presence in water/steam is nonetheless very detrimental. It forms extremely hard coatings in water/steam passageways and on turbine blades, leading to reduction in heat transfer efficiency and unbalanced turbine blades. If left unchecked increased silica build-up can

result in unplanned shutdowns and extra maintenance.

Ppb level measurements best detect condenser leaks

Silica is in all water supplies and requires membrane separation and ion exchange for its removal. Direct, continuous silica measurement is the most effective means to protect against contamination from silica escape due to spent anion resin. Silica is always present in cooling water so ppb level silica measurement provides excellent sensitivity in detecting small condenser leaks and for monitoring concentration of silica in the water/steam cycle. Moreover, a growing number of

turbine manufacturers are requiring ppb level silica limits in incoming steam as a condition for their turbine warranty.

Time-consuming maintenance can be avoided

A competitor's silica analyzer was installed at the power plant to monitor boiler feedwater, but its performance was not as good as instrument engineers were hoping for, and it required regular, time-consuming maintenance. Having heard of METTLER TOLEDO Thornton's 2800 Si silica analyzer, the engineers asked for a demonstration unit to gauge the unit's capabilities and maintenance requirement.

Low maintenance analyzer

The 2800 Si is a highly reliable on-line instrument designed for power cycle chemistry monitoring. It provides early detection of trace silica contamination with minimal operator supervision. In addition, the 2800 Si analyzer allows unattended automatic calibration at a user-configured interval. Its large-volume reagent containers enable long-term operation before refilling becomes necessary.

Trouble-free operation

Over the test period, plant engineers were delighted not only with the analyzer's measurement accuracy, but also with its trouble-free operation and low maintenance. They also highly appreciated the





automatic calibration feature which would save them many man hours.

After the successful test, three 2800 Si analyzers were ordered for the paper plant. Instrument engineers report that since installation in early 2014, the analyzers have performed without any issues and their reliable data has led to improved production efficiency.

Features and benefits

- Large reagent containers enable a long service interval and reduce maintenance time
- Full enclosure safely protects reagent containers and components from the plant environment
- Simultaneous display of silica and measurement timing provides convenient analyzer status at a glance, saving operator time
- Continuous reaction chamber temperature monitoring ensures reliable operation

For more information visit:

► www.mt.com/Thornton-silica



Improve Process Yield and Product Quality with the InPro 7100 i Conductivity Sensor

The extremely fast response, precise measurement and instant availability of the InPro 7100 i will enable you to improve your process control – leading to higher product yield and quality.

Designed for demanding applications

The quicker and more accurately you can measure conductivity, the faster you can respond to process changes. The new InPro 7100 i has been designed to provide outstanding performance in the pulp and paper industry.

The PEEK shaft material offers high resistivity against aggressive solutions, and the WideRange technology feature allows the combination of compact design for ease of installation, with a very wide measuring range of 0.02 – 500 mS/cm.

Electrodes are available in Hastelloy C22, Titanium or 1.4435 stainless steel for use in harsh or non-harsh environments.

Reliable signal, instant availability

The InPro 7100 i features METTLER TOLEDO's Intelligent Sensor Management (ISM) technology, developed to reduce sensor configuration and maintenance, while increasing process uptime and safety.

Like all other ISM-equipped sensors, the InPro 7100 i contains a microchip in the sensor head that converts the analog measurement signal into a digital one which is sent to the transmitter. As digital signals are almost unaffected by moisture or cable length, measurements at the transmitter are always reliable.

Installation is simple with the InPro 7100 i. ISM's Plug and Measure feature means that no configuration at the transmitter is required. Simply install the sensor in the process, connect it to the transmitter and begin measuring.

Easy process integration

The InPro 7100 i is compatible with a broad range of METTLER TOLEDO static and retractable housings, opening a wide variety of integration options. In conjunction with the InFit 761 e housing, process insertion in the pulp and paper industry is safe and reliable.

Benefits of the InPro 7100 i

Fast response:

- Improves process control
- Increases yield
- Lowers costs

Reliable digital signal:

- Unaffected by moisture
- No degradation over long cables

Suitable for a wide variety of applications:

- Extensive measuring range
- Choice of sensor pin material

Low maintenance:

- Resists aggressive solutions

Easy installation:

- Compact design
- Compatible with many housings

To find out more about the InPro 7100 i go to:

- ▶ www.mt.com/InPro7100
- ▶ www.mt.com/ISM

ISM[®]



InPro 7100 i conductivity sensor

Boost Lifetime of pH Sensors by up to 30% and Reduce Maintenance Costs

Conditions in pulp and paper mills can be very hard on measurement equipment. Keeping pH sensors clean not only helps ensure they are operating correctly, but by using an automated cleaning system you will increase sensor life and reduce maintenance.

The need for sensor cleaning

Depending on the type of application and actual operating conditions, sensors used in pH measurement may require more or less frequent maintenance attention. Particularly in processes which produce a coating on pH electrodes and block the diaphragm it is necessary to clean the sensor at regular intervals.

Automation of these tasks results in a significant increase in measurement accuracy and service life of electrodes. And thanks to the improved accuracy and increased lifespan of up to 30%, the manpower requirement for sensor maintenance work will be substantially reduced.

Benefits of EasyClean 100

The EasyClean 100 is a specially designed module within the EasyClean family for automated cleaning tasks, and provides many benefits:

- Reduced maintenance costs
- Higher productivity
- Increased process reliability
- Reduced downtimes
- Longer operational life of the sensor
- More precise process control

The EasyClean 100 carries out sensor rinsing automatically. The timing for the cleaning procedure is triggered via signals from the transmitter which can set the unit for cleaning interval and cleaning time period. A specially designed spray head directs a jet of water (or compressed air) at the sensing end of the sensor and

ensures effective cleaning. It is therefore completely unnecessary to remove the sensor from its measurement position. The spray head is directly mounted in the lower end of an InDip 550 immersion housing.



The EasyClean product family

With the EasyClean systems, METTLER TOLEDO offers solutions for a diverse range of application requirements. EasyClean 100 and 150 are both suitable for the regular rinsing of sensors subject to light/medium contamination. For heavily contaminated sensors the EasyClean 200e provides regular rinsing plus additional cleansing with a cleaning agent. The EasyClean 350e and 400 are fully automated calibration systems and reduce the maintenance costs of pH measuring points to an absolute minimum. In addition, the EasyClean 400 provides easy system integration and with the 400X METTLER TOLEDO offers a solution for hazardous area applications.

If you want to reduce maintenance costs at your mill, go to:

► www.mt.com/EasyClean



Stop Wasting Time Prevent Unnecessary Maintenance

Every minute spent repairing your vehicle scale is lost production time. POWERCELL® PDX® load cells protect your profits by keeping service to a minimum. In addition to providing unmatched reliability, they dramatically reduce the time it takes to carry out troubleshooting and replacement work.

The first thing you can do to reduce unnecessary service is to select a load cell network with proven reliability. When it comes to preventing problems, your best bet is the POWERCELL PDX load cell network. It eliminates troublesome junction boxes and uses a built-in predictive diagnostics system to monitor network health. If a problem does occur, POWERCELL PDX load cells make solving it quicker and easier than ever.

Load cell replacement

Vehicle scales are often used in harsh environments, where there are many ways to damage a load cell. Every minute your scale is shut down to replace a damaged load cell can mean lost business. POWERCELL PDX load cells help you avoid those losses by speeding up the replacement process every step of the way.

Firstly, the predictive diagnostics system identifies the problem load cell quickly. In fact, it can alert you the instant a load cell is damaged. Other load cell systems often continue producing costly weighing errors for months before you notice something is wrong. Even then, time-consuming tests might be needed to locate the problem load cell.

With POWERCELL PDX load cells, the predictive diagnostics system tells the service technician exactly which load cell needs to be replaced.

Secondly, replacing a POWERCELL PDX load cell is a quick and easy job. Just disconnect the cables, jack up the scale, and remove the load cell. Then connect the cables to the new load cell, position it in the receiver, and lower the scale. Replacing



Quick-locking connectors make it possible to replace a POWERCELL PDX load cell cable in minutes.

other types of load cells can take much longer. Even the simplest analog system requires extra work, such as opening the junction box, routing the load cell cable, and wiring the cable to the terminals inside the junction box.



The POWERCELL PDX load cell network combines unequalled reliability with easy troubleshooting and replacement.

And finally, a POWERCELL PDX network requires very little setup. Just use the scale terminal's simple addressing procedure. In most cases, no adjustments are needed, so the scale is ready to weigh. If local weights and measures regulations require calibration, the job can be done in about an hour. Compare that with conventional load cells, which require numerous re-adjustments and can easily take a full day to calibrate.

Stop Downtime in Its Tracks

Spend your time weighing vehicles, not servicing your scale. With its unequalled reliability and simplified service, the POWERCELL PDX load cell network is your most potent weapon in the fight against downtime.

Visit our website to watch a video that shows how easy it is to replace a POWERCELL PDX load cell.



► www.mt.com/vehicle-videos-che1

Cable replacement

POWERCELL PDX load cells use cables with quick-locking connectors that make replacement a snap. Just turn the connector slightly and remove it from the load cell. Plug the new cable's connector into the load cell and turn it until it clicks into place. The watertight connection seals the network to IP 68 standards. As soon as the new cable is connected, the scale is ready to weigh. No recalibration is needed.

Most other load cells have permanently attached cables. If a cable is damaged, you need to replace both the cable and the load cell. Instead of a simple cable replacement, you are faced with time-consuming recalibration and the extra downtime it requires.

Junction box replacement

Since a POWERCELL PDX load cell network has no junction boxes, there's nothing to replace. That is not the case with conventional load cell systems. They all use some type of junction box, totalizer, or sectional controller to combine the load cell signals. Not only are these components the most frequent cause of vehicle scale failures, they are also difficult to troubleshoot. Once you have found the problem junction box, replacing it means disconnecting the wires for each load cell and for adjacent junction boxes. After the junction box has been replaced, recalibration is required.

The biggest problem is moisture, and there are plenty of ways for it to enter a junction

box. Most junction boxes have five or more openings for cables, with connectors that are tightened by hand. The lids are fastened with screws, so again you rely on hand tightening to seal out moisture.

Stop wasting valuable time on repairs and recalibration. The POWERCELL PDX load cell network combines unequalled reliability with quick and easy service to keep your vehicle scale up and running.

► www.mt.com/powercell-che1



Replacing a conventional load cell, cable, or junction box requires time-consuming recalibration with heavy test weights.

Intelligent Sensor Management (ISM[®]) for the Pulp and Paper Industry

Ensuring your production can cope with today's competitive challenges includes the use of highly dependable process analytical instruments. With ISM, METTLER TOLEDO's digital sensor technology, maintenance becomes predictable, sensor handling is easy, and production becomes more efficient.

The benefits of ISM translate into substantial gains for pulp and paper mills in relation to process reliability, sensor lifecycle management, and cost of ownership.

Unlike analog probes, ISM sensors output a robust digital signal and retain their own calibration as well as process data. Thanks to diagnostics tailored to

pulp and paper production applications, ISM sensors even predict when they will need maintained or replaced. And the new mobile app provides a quick sensor check on the go.

In pH, conductivity, and turbidity measurement systems ISM gives you much more than just a measurement.

Greater process reliability



Increased operational uptime

ISM provides real-time information on sensor condition, helping you run production at peak efficiency.

Read the white paper on achieving greater process integrity:

► www.mt.com/ISM-chem-wp

Easy sensor handling



Convenient lifecycle management

With iSense software you can pre-calibrate sensors for error-free exchange at the process.

Discover the new iSense software for ISM sensors:

► www.mt.com/iSense

Reduced maintenance



Low cost of ownership

ISM reduces sensor lifecycle costs and enables higher sensor use.

Find out how much time and money you can save by switching to ISM:

► www.mt.com/ISM-cost-calculator



ISM®

Systems for your processes ...

From the digester to the paper machine to effluent monitoring, your entire mill benefits from the unsurpassed reliability, simplified sensor handling, and low maintenance requirement of ISM solutions.

... adaptable to your requirements

Our ISM transmitter portfolio covers single-parameter, single-channel units for maximum process safety, to multi-parameter, multi-channel devices for greater convenience and flexibility.

Incorporating ISM solutions into your asset management or plant control system via transmitters or converters allows seamless integration of sensor diagnostics information for remote monitoring.



M800 transmitter showing iMonitor sensor diagnostics utility.

Discover how ISM can help you at:

► www.mt.com/ISM

Get in-line with METTLER TOLEDO



Find the Best pH Sensor for Your Process

Selecting the right pH sensor for a pulp and paper application has not always been easy – but it is now. Go to our online pH Sensor Selector, enter the details of your process conditions and the Selector will show you the best sensor for the job.

► www.mt.com/pro-pHsensor