

Petrochemical

Perspectives in Liquid Process Analytics



3 News

INGOLD

Leading Process Analytics

How Precise pH Control in Process Water can Reduce Costs and Lower Maintenance

Water is necessary in refineries, but in certain processes if its pH is not properly regulated the resulting corrosion leads to high maintenance. The new InPro 4260 electrode reduces maintenance costs significantly.

pH measurement is essential

Water is an essential agent in refining crude oil. However, due to many contaminants present in crude oil, water becomes one of the major causes of corrosion in petroleum refineries. Accurate pH control of the process water can significantly reduce corrosion in several key processes.

Refining crude petroleum

Crude oil that enters a refinery undergoes a series of operations in order to arrive at products that industry and especially we ourselves need daily: gasoline and diesel fuel, naphtha, kerosene, domestic fuel, oils, bitumen, butane and propane gas.

In refining crude there are three main operations:

- Separation – obtaining the different types of products from the heaviest to the lightest
- Conversion – modifying the natural properties of the types of products to respond to consumer demands
- Upgrading – removing undesirable compounds and modifying the characteristics of certain products to obtain high octane fuel.

Some of the key processes of the refinery such as desalination and distillation of the crude, as well as the cracking units and hydrotreatment, use significant amounts of water.

The problem

Our customer is a French refinery that is part of a large petroleum group which



METTLER TOLEDO

employs more than 100,000 people worldwide. A pH loop is installed in the overhead condenser boot water and is a classic application that is notoriously problematic. Parts of the top section of the distillation tower and condenser tubing suffer seriously from corrosion if pH is not properly controlled. Various contaminants such as sulfur, salts, and organic and mineral acids that are naturally present in the crude dissolve in the process water and are very damaging under low and high pH conditions.

The customer already had a competitor's pH measurement loop installed, however, the electrode required daily maintenance and cleaning, and measurement was not reliable.

Customer requirements

The customer wanted electrodes that were reliable, accurate, required less maintenance and, in particular, would be less susceptible to fouling – thus ensuring a longer service life. They approached METTLER TOLEDO for a solution.

The solution

METTLER TOLEDO proposed the InPro 4260 electrode. This pH electrode addresses the requirements of many chemical processes and ensures high performance in a wide range of applications. Improvements made to our Xerolyt solid polymer reference electrolyte makes it particularly well suited to difficult applications in the petrochemical industry.

The InPro 4260 electrode with the Xerolyt Extra polymer offers the following advantages:

- High performance over a pH range from 0 to 14
- Minimal maintenance costs due to the solid polymer reference system
- Enhanced longevity in acidic/basic environments or in the presence of organic solvents
- Reduced maintenance – no electrolyte top-off required
- Integrated temperature sensor – its positioning in the glass membrane ensures fast and reliable temperature measurement
- Open junction between the measurement medium and the reference electrolyte (no diaphragm means no

blockage) enables reliable measurements in highly contaminated media or those containing proteins, as well as in suspensions and emulsions.

Longer lifetime and reduced maintenance

The customer's high expectations were met during a testing phase during which the following results were obtained:

Compared to the competitor's electrode, the InPro 4260...

- was far more resistant to fouling
- had a significantly longer lifespan
- provided more accurate measurements
- required cleaning only every one to two months.

The customer purchased our electrode and even informed one of their associates in the petrochemical industry of our electrode's performance. This refinery also ordered our InPro 4260. The equipment has now been installed and pH measurement is functioning perfectly to both customers' complete satisfaction.

For more information, go to:

- ▶ www.mt.com/PRO-pH
- ▶ www.mt.com/ISM

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pH electrode InPro 4260 i



Transmitter M700

Gas Scrubber Application Superior Reliability of InPro 4800 i

Gas scrubbers are highly toxic environments for measurement instruments. A METTLER TOLEDO electrode was chosen over two competitors' due its greater reliability and lower maintenance requirement.

A METTLER TOLEDO customer

Our customer is a petrochemical industry group that manufactures additives for fuels. They were already using METTLER TOLEDO instruments for turbidity and redox measurement and decided to ask us, and two of our major competitors, to compete for a pH measurement solution in a scrubber application.

Eliminating hazardous compounds

Gas scrubbers remove harmful substances from waste gases by spraying these gases with a scrubbing solution. Polluting fumes and odors are eliminated almost completely. pH is a critical measurement for the operation and efficiency of the scrubber. The customer's product is very fouling with a considerable amount of sulfur and a very low pH.

The customer's aim

The customer was using two electrodes: one pH measurement electrode and one reference electrode which was installed via an electrolyte bridge. The customer wanted to eliminate the bridge in order to simplify the installation.

Advanced pH electrode

METTLER TOLEDO therefore recommended the InPro 4800 i pH electrode with the M420 transmitter. The InPro 4800 i combination electrode would eliminate both the need for an electrolyte bridge and the separate reference electrode.

This state-of-the-art electrode is designed for the toughest applications in the chemical industry. It enables precise measurement of oxidant media, strong acids or strong bases, and resists elevated pressures and temperatures.

A winning solution

The InPro 4800 i produced complete satisfaction compared to the competitors' equipment: installation was simpler, pH measurement more reliable, and less maintenance was required. It was therefore the electrode our customer chose.

Since testing, three additional METTLER TOLEDO measurement stations have been installed at the customer's plant.

To find the right solution for you, go to:

- ▶ www.mt.com/PRO-pH
- ▶ www.mt.com/ISM

Advantages of the InPro 4800 i

- Low-maintenance – no electrolyte refilling required
- Long life due to its:
 - very high resistance to oxidant media, solvents, strong acids, and strong bases
 - very high resistance to fouling and to contamination (e.g. from sulfides) thanks to a long diffusion path and a PTFE "dirt repellent" annular diaphragm
 - pressure-compensated diffusion path enabling use at very high pressure
 - ability to measure at high temperatures.
- Features an integrated temperature sensor
- Provides exceptionally reliable pH measurement over the entire pH range: pH 0...14



pH electrode InPro 4800 i

ISM



Transmitter M420 pH

New M420 Transmitter Series A Reliable and Intelligent Solution

The new M420 transmitter series stands for reliability in hazardous area loop-powered applications. It features Intelligent Sensor Management (ISM) technology for better process and maintenance control.

Greater reliability

Development for the M420 transmitter was focused on rugged design and resistance to the most difficult operating conditions. This allows the M420 to stand out for its superior operational reliability in chemical, pharmaceutical or gas phase applications.

Designed for your process

Available for a whole range of measurement parameters, the M420 series is compatible with both conventional and ISM sensors, making it suitable for a wide variety of applications.

Additional functionality for greater flexibility

The M420 can be configured to better suit your process needs. Add a second analog output or select the extended logbook, CFR21 Chapter 11 conformity with AuditTrail or trace oxygen measurement.

Key features of the M420

- Mixed-mode input
- Rugged design – IP 67
- Intuitive interface with full text messages
- IrDA service interface
- CIP/SIP counter
- Ex approved

Maintenance only when required

Stay ahead of your maintenance tasks with the ground-breaking ISM technology from METTLER TOLEDO. ISM-equipped measurement loops are efficient to maintain without compromising on your process reliability.

Thanks to the Adaptive Calibration Timer calibration intervals for each measurement loop can be based on the real-time sensor information and current process conditions.

Real-time monitoring of sensor condition

Sensors equipped with ISM technology have an internal microprocessor which anticipates in real time early signs of sensor failure. All contributing factors are combined to produce the Dynamic Lifetime Indicator which can be viewed on the M420.

For more information, go to:

► www.mt.com/M420

ISM



Transmitter M420 O₂

Intelligent Sensor Management Intelligence Starts in the Head

You want to optimize your processes, reduce maintenance and suffer less downtimes. METTLER TOLEDO's Intelligent Sensor Management (ISM) for pH and DO can do it all – and more!



Why do I need ISM?

Intelligent Sensor Management reduces the installation, maintenance, and calibration effort for METTLER TOLEDO's new digital sensors to a minimum. This considerably improves your process reliability, productivity, and system availability.

ISM for advanced process analytics

A sensor with ISM technology is equipped with an integrated chip in the sensor head that stores all relevant parameters, and algorithms that provide enhanced sensor diagnostics. Now you know more than precise process measurements; you also know when a sensor needs calibrated, cleaned or replaced. So now you can conduct maintenance only when it is required!

Quick sensor replacement with "Plug and Measure"

Calibration values and calibration history are stored in the microprocessor in the sensor head. This allows sensors to be pre-calibrated in the controlled environment of a maintenance shop or laboratory, then stored ready for use. Replacing a failing sensor with a pre-calibrated one is quick and simple.

Complete sensor asset management

Using a standard PC and METTLER TOLEDO's proprietary iSense software, true asset management is at hand. With iSense you can store the complete sensor calibration history in a database. Thanks to iSense, the fast and easy exchange of pre-calibrated sensors saves you time and improves process control.

When is a sensor about to fail?

As well as recording the process measurement precisely, the ISM sensor continually monitors itself, therefore it can estimate its own lifetime! The Dynamic Lifetime Indicator makes sensor maintenance more efficient and more dependable. Process reliability is greatly improved as process downtime and loss of product quality due to sensor failure are minimized.

Further features

- All transmitters from METTLER TOLEDO can be used with ISM sensors.
- Connection of ISM sensors requires only two cables instead of up to eight with analog sensors
- Digital signal transmission is extremely stable, even under very harsh conditions.

METTLER TOLEDO – intelligent solutions

Our wide product range covers all high demanding applications in the Petrochemical industry.

Discover more at:

▶ www.mt.com/ISM



iSense Asset Suite

ISM

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 overviews 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 these parameters:

- pH
- Dissolved oxygen and O₂ in gases
- Ozone
- Dissolved CO₂
- Conductivity
- Turbidity
- TOC
- Flow

The featured product range includes:

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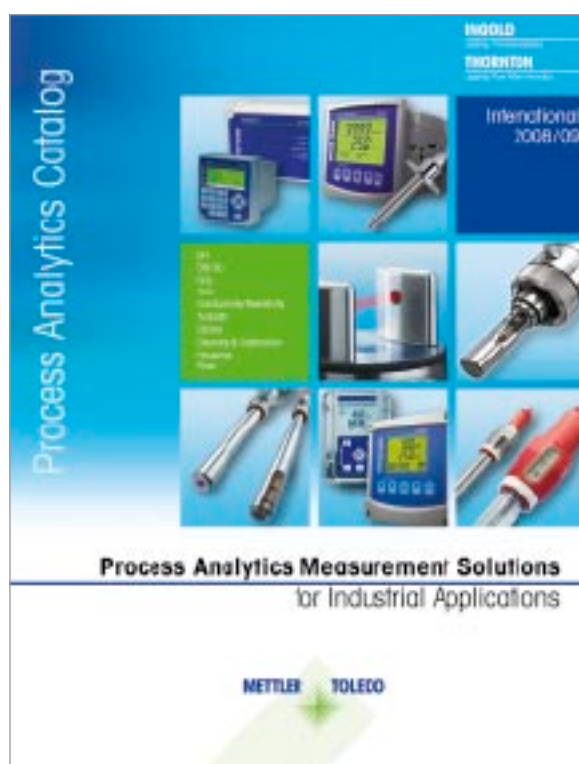
Tel: (0)116 235 7070

Fax: (0)116 236 5500

Email: enquire.mtuk@mt.com

Mettler-Toledo AG

Process Analytics
Im Hackacker 15
CH-8902 Urdorf
Switzerland



www.mt.com/pro

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