

pH measurement increases process safety

DAW relies on inline measurement for quality control



DEUTSCHE
AMPHIBOLIN-WERKE
VON ROBERT MURJAHN

Since 1895, DAW has been developing, producing and selling innovative coating systems and driving innovations in paints, thermal insulation and building protection. The DAW company group is the umbrella for numerous well-known brands, such as Caparol or Alpina. The main production facility of this global company is located in the Hessian town of Ober-Ramstadt in Germany.

"Performing pH measurement directly in the production system not only increases our process safety but also provides additional information about our mixing processes, thus helping us to meet our high quality standards and the demands of steadily increasing productivity. This pH measurement is undoubtedly just the first in a series of inline measurements."

Markus Schneider,
Quality Control



Markus Schneider



Headquarters of DAW SE in the Hessian town of Ober-Ramstadt

Real-time pH measurement is possible even in the case of abrasive and highly alkaline media: ISFET technology enables pH measurement in heavy-duty processes too, while still ensuring a long service life.

The challenge One important quality characteristic of paint, in particular of preservative-free paint, is the pH value. It indicates whether the constituents and quantities have been mixed in accordance with the specified formulation. Previously, the pH value was measured in a laboratory. However, the inevitable delays associated with lab measurements give rise to interim production stoppages, or deviations that must be corrected later on at great expense. Due to the characteristics of the media, however, inline pH measurement is not entirely straightforward. This is due to the fact that an essential ingredient of these paints is water glass, which is often used as a binding agent for

strongly colored, waterproof paints and coatings (mineral paints) on siliceous substrates. It is therefore not possible to use conventional glass pH electrodes for highly viscous, abrasive and highly alkaline paints.

Our solution Endress+Hauser installed a pH measuring system based on ISFET technology. This technology offers glass-free pH sensors that are also capable of withstanding highly alkaline and abrasive media. The unbreakable PEEK shaft guarantees a long service life while the open-aperture diaphragm ensures reliable measurements even under heavy-duty process conditions.

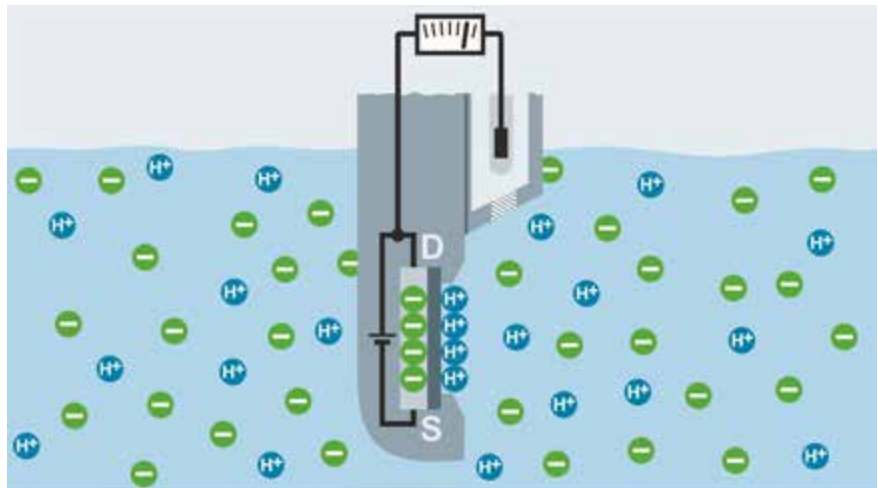
In addition, an automatic retractable assembly makes it possible to calibrate and replace the sensor without interrupting the process, thereby saving maintenance time and costs. Thanks to the installed ball valve, the process can be safely and reliably sealed off, even under challenging conditions. An integrated

wiper and sleeve seal make the automated retractable assembly suitable for use in sticky and fibrous media. In addition, an automatic retractable assembly makes it possible to calibrate and replace the sensor without interrupting the process. The measuring system was commissioned by Endress+Hauser Service, thus ensuring that the measuring point functions correctly. As part of this process, essential parameters were adapted to the application to suit the customer's requirements.

An app programmed by DAW is used to display the pH values of the inline measurement directly on a computer connected to the PCS. This means that DAW can (in future) receive automated warnings and alarms live from the process. In just a short period of time, the installation has already proved worthwhile: inline pH measurement meant that it was possible to detect defective system components and prevent process water from entering the filling process.

Summary

- Increased process safety due to inline pH measurement without time delay
- Satisfactory electrode operating time (ISFET) of more than eight months despite challenging process conditions
- Zero productivity loss since electrodes are calibrated and removed using an automatic retractable assembly without interrupting the process.



Measuring principle of a pH measuring system with ion-selective field effect transistor (ISFET)



Liquiline M CM42 transmitter and Memosens CPS77D pH sensor (ISFET)



Automatic Cleanfit CPA473 retractable assembly with pneumatic ball valve

Solution comprises the following:

- Memosens CPS77D pH sensor (ISFET)
- Liquiline M CM42 transmitter
- Automatic Cleanfit CPA473 retractable assembly with pneumatic ball valve
- Commissioning of measuring system

www.addresses.endress.com