

Lab-based pH calibration opens new possibilities

Beiersdorf uses digital Memosens technology for maximum availability

BMH

Beiersdorf Manufacturing
Hamburg GmbH

Beiersdorf Manufacturing Hamburg (BMH) GmbH in Germany is Beiersdorf's largest production site. In 2017, 930 million units were produced in Hamburg. This site is where Nivea Creme and many other Nivea products are manufactured and filled. The factory in Billbrook is the only site worldwide where the primary ingredient of Nivea Creme – the emulsifier Eucerit – is manufactured.

"Our top priority is to guarantee continuous production. We can now maintain a supply of precalibrated pH sensors. This reduces the calibration workload, and the electrodes can be replaced even during the night shift, without a technician on site."

Sven Ritz
Production Engineer
BMH Billbrook
Germany

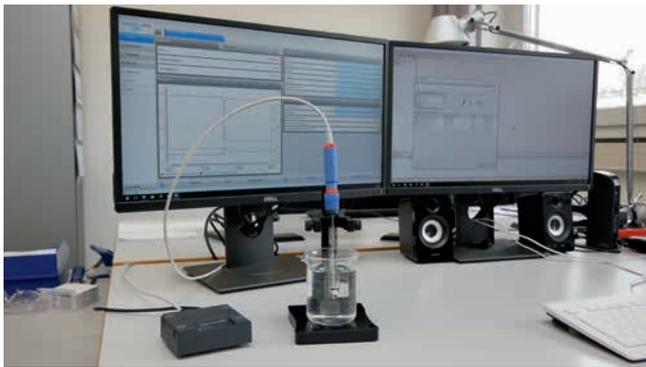


Sven Ritz of BMH Process Engineering performing a calibration in the lab using Memobase Plus.

At its site in Billbrook, Beiersdorf Manufacturing Hamburg GmbH (BMH) operates three shifts around the clock, five days a week. The range of products makes continuous production possible. High availability of systems and equipment is therefore extremely important.

The plant shuts down just once a year for several weeks to allow for maintenance and calibration. Measuring devices, which are permanently installed in the system, are then removed, tested and calibrated. Flow, level, temperature, conductivity and pH measurements are required at the Billbrook site. The production of Eucerite requires the use of alcoholic solutions, acids and alkalis, among other things. It also involves the generation of wastewater, which is neutralized for discharge into Hamburg city's municipal wastewater system.

Customer challenge A special procedure is used at the site to deal with pH measuring points used in production and wastewater treatment. Chemical and physical interactions with the process medium lead to the general contamination of pH sensors. As a result, measuring equipment must be inspected regularly and replaced if necessary, thereby generating costs. In the past, pH sensors at BMW were discarded and replaced after a certain period of time. It was not possible to analyze the actual state of the sensors and therefore to assess their continued suitability for the process. In addition, the analog technology meant that it was impossible to maintain a supply of precalibrated sensors, thus ensuring that a sensor could be replaced during the night shift, for example. With the analog technology, the entire measuring chain comprising a field transmitter, cable and pH sensor had to be calibrated on site. The accuracy of a measuring chain in the process could be guaranteed only in this precise configuration.



During calibration in the lab, the digital pH sensor CPS11D is connected directly to the PC and Memobase Plus via MemoLink.

Our solution This explains why the site has been using Memosens technology for some time now. Several improvements have been implemented in the factory as a result. Digital pH sensors, in this case the Orbisint CPS11D, can now be calibrated in the laboratory; the calibration data are stored in the sensor head. The sensor can now be used with any digital Memosens cable and Memosens transmitter in the field. The calibration data are automatically uploaded to the transmitter, in this case the Liquiline CM42, as soon as the sensor is connected. There is no longer any qualitative difference between calibration in the laboratory and calibration in the field. The laboratory and process values are guaranteed to be 100% comparable, since the digital generation of the measured value in the laboratory and in the process is identical. Costly calibrations in the plant, sometimes at ambient temperatures of 35°C, have been eliminated.

Laboratory calibration During laboratory calibration of the pH sensors using the Memosens Plus software, the slope history and the glass impedance are monitored automatically. This ensures that pH sensors are discarded based on evidence and not on the length of time in use, thus increasing the operating life of sensors. According to Sven Ritz, a member of the BMH Process Engineering staff at Billbrook, the reduction in costs is significant.

However, Sven Ritz believes that the savings achieved are only of secondary importance. As far as he is concerned, the most important benefit is that they can maintain a supply of precalibrated pH sensors. This means that staff can replace sensors quickly should a problem occur with the measurement technology during the night shift. Suspect sensors in the process are replaced with sensors from storage. The transmitter detects the new sensor automatically, and the new sensor proceeds with the measurement. This guarantees maximum availability of the measuring equipment. There's no longer any need to wait for the sensor to be calibrated the next day. pH sensors are replaced depending on the level of contamination caused by chemically aggressive media or depending on the measuring signal in the process. Some measuring points are set up as a redundant version. If the deviation exceeds 0.2 pH, the sensor is replaced or recalibrated.

ATEX sensors All measuring points at the Billbrook site use ATEX with the same measuring range, to eliminate any confusion. This results in increased safety during operation. Using the Memobase Plus software, digital pH sensors are calibrated in the lab directly on the PC. Calibration reports specific to the serial number are stored along with information such as the slope, glass impedance, calibration buffers used, etc. Connection to a higher-ranking IT network topology in compliance with FDA CFR 21 Part 11 is possible. As there is no requirement for pH values to be legally verified at BMH, the data generated are simply stored on one of BMH's own production servers. For user Sven Ritz, this solution provides exactly what he needs for everyday operation.



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