

UMICORE TESTS NEW PH SENSOR CONFIGURATION

To monitor waste water at its Hoboken plant, the materials technology group Umicore has tested a new configuration of a pH sensor and a liquid analyser. During the first test, the lifetime of the pH sensor was extended from three days to five weeks.

Umicore Precious Metals Refining recycles and refines precious metals and other non-ferrous metals from a wide range of complex industrial intermediate materials. This includes precious metal bearing scrap from applications such as electronic, photographic and catalytic processes.

The company was experiencing problems with the existing equipment used to measure the pH levels of its waste water produced during the recycling process. The waste water contains traces of sulphuric acid and chlorides and metal compounds, which fouled the glass and attacked the reference electrode in the pH sensor, resulting in incorrect measurements.

Sensors were typically lasting only two or three days in these harsh operating conditions and the costs associated with purchasing, installing and calibrating replacement units were significant. It was also necessary to revert to manual checks during the downtime whilst sensors were replaced.

Whereas the pH sensor would be continuously monitoring the water, the manual checks were only carried out every two hours - this meant that operators were much slower to react to any out of range measurements. This could result in lost revenue from precious metals which should have been recovered and added costs due to the need for water to be reprocessed.

Umicore had tried alternative pH sensors from many different suppliers but each produced similar results. Following a discussion with Emerson engineers, Umicore asked for a demonstration of a (Rosemount) high



Test configuration of the pH sensor and liquid analyzer at the Hoboken plant of Umicore.

performance pH sensor. This was supplied with a poisoning resistance kit, which is specifically designed to protect sensors in challenging poisoning applications.

Impressive demonstration

“The demonstration was impressive,” said Randy Verbeeck, Maintenance & Service Engineer at Umicore. “Following calibration, the sensor has been working continuously for over five weeks now without a problem, and it is expected to have a life of between two and three months.”

The chosen pH sensor features advanced technologies for performance in aggressive fouling applications. Most pH measurements fail due to fouled or poisoned electrolytes and clogged reference junctions. The Rosemount sensor (type: PERpH-X) features an enhanced double junction electrode that excels in harsh applications, and the specially designed porous Teflon liquid junction has a large surface area to maintain a steady reference signal in dirty and

fouling applications.

The outer reference electrolyte can be recharged using a gel-filled syringe supplied in the various solution kits. Replacing a clogged junction or recharging the electrolyte will rejuvenate most failed sensors. Proper preventative maintenance can dramatically extend the life of the sensor by minimising the depletion or poisoning of the primary reference. “But during the five weeks the systems is installed, we haven’t needed to refill the sensor’s electrolyte, further reducing maintenance requirements and costs,” adds Maintenance & Service Engineer Ludo De Vogelaer.

Following the success of this installation, a further sensor has been added to the secondary section of the waste water treatment at the plant and Umicore is also considering using a sensor for a difficult application at its Heus-



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