

Reduced maintenance effort, enhanced safety

Memosens CPS47D in cyanide leaching at a gold mine



FMR Investments is an investment organisation with interests predominantly in the mining and mining related industries. One of its various mining and milling projects is Greenfield's Mill in Western Australia. The mill has provided a first class toll milling facility to the gold industry for over twenty years.

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John Taafe
Electrical Supervisor
Greenfield's Mill, Western Australia



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Greenfield's Mill



The Greenfield's Mill in Western Australia

At a typical gold mine leaching process, cyanide in the form of NaCN is used to dissolve gold in leach tanks. At the beginning of a leach cycle, the pH of the slurry is raised to a pH between 9.4-10.5 via lime dosing. To avoid formation of extremely dangerous cyanide (HCN) gas and to keep cyanide in solution for gold dissolving, it must be ensured that the pH does not fall below 9.3. Reliable and robust pH sensors are therefore essential to ensure optimal conditions for effective gold leaching and to contribute to the safety of the leaching process.

Challenge

Like many gold mines, Greenfield's Mill considers pH as a critical parameter. The pH sensors are immersed from the top of two leach tanks into an abrasive gold ore containing approximately 47% of solids with a particle size of 106 µm. The operational pH level is maintained

through lime milk addition. Cyanide concentration is kept between 200-400 ppm. The former installed glass sensors had limitations in terms of robustness. Moreover, maintenance of the sensor at place where it is installed is difficult and can be dangerous for the maintenance personnel due to cyanide gas formation. Consequently, the minimization of any work conducted on the tanks is very important. Greenfield's Mill was looking for a sensor that had improved stability, buildup resistance and the added bonus of a non-glass body.

Our solution

For this demanding environment, the non-glass ISFET sensor Memosens CPS47D was offered. The liquid type reference system helps to keep the ceramic diaphragm clean and prevents blocking. The big ISFET chip surface ensures best contact with the process medium and has a self-cleaning effect for less soiling and longer lifetime.

The measuring point consisted of the following components:

- pH sensor: Memosens CPS47D
- CPY7B with KCl-Electrolyte
- DO sensor: Memosens COS81D
- Transmitter: Liquiline CM442
- Holder: CPA111

Benefits

- **Longer sensor lifetime:** Memosens CPS47D is more robust than any other pH sensor made out of glass. This results in a reliable measured value and extended sensor lifetime up to 6 months.
- **Reduced maintenance effort saves time and money:** Weekly maintenance was reduced to cleaning and calibrating the sensor every two weeks. Electrolyte filling is only necessary every four weeks.
- **Enhanced safety:** Memosens technology enables sensor calibration in the workshop and allows for quick and easy exchange of pre-calibrated sensors. This reduces the technician's working time on the leach tanks where there is a high risk of hazardous cyanides being present to a minimum.
- **Software supported tracking:** Memobase Plus tracks the stability of the new probes.
- **Ease of connectivity** between the sensor and customers' PLC through Ethernet IP has improved how sensor data is interpreted.



CPA111 with COS81D and CPS47D in cyanide leaching measuring point. Plastic protection stands are completely worn out but sensors are not.



CPA111 with sensors covered with slurry, before cleaning.



A measuring point at the leaching tank.