

Solution Note

Compliance: More Efficient Monitoring for Flue Gas De-Sulfurization with Durafet pH sensors



Challenge

Acid rain, caused by sulfur dioxide emissions, has concerned governments worldwide for decades. As a result, coal fired power stations face strict environmental laws, such the U.S. Clean Air Act Amendments (CAAA), and must monitor and control sulfur in the flue gas.

Wet scrubbers have proved effective for this by consistently removing 95 percent of SO₂. However, in that scrubbing process, it's crucial to continually measure and control the liquid pH levels. This presents challenges of its own.

pH probes suffer from harsh process conditions in the scrubber environment, where process fluid temperatures are about 120°F at approximately 20 to 50 psig, flow rates are often in excess of 100 gallons-per-minute, and pH values can be as low as 2 during startup and process upsets. pH sensors can suffer from fouling, abrasion, slow responses and drift.

As a result, probes can require frequent cleaning and recalibration with many facilities employing dedicated personnel to maintain the pH system. Others address concerns over reliability by installing multiple pH sensors at the same location. Both result in high overall system costs.

Solution

Honeywell's Durafet industrial, non-glass, unbreakable, Ion Sensitive Field Effect Transistor (ISFET)-based pH sensors drastically reduce pH measurement problems. Users benefit from stable, accurate and low maintenance pH measurement.

ISFET technology provides a response that is directly related to the pH level. Glass-free electrodes allow pH measurement with less drift in areas where the use of glass can lead to frequent breakage and device replacement. Unlike glass electrodes, where a pH-sensitive bulb has to be filled with a buffer solution, ISFET-based probes operate as a true solid-state pH sensor.

Ruggedized reference technology, meanwhile, reduces poisoning, which is a major cause of failure and drift requiring recalibration in high sulfur environments.

The Honeywell Advantage

Honeywell's break-resistant, non-glass silicon measuring electrodes combine rugged reference and ISFET technologies. The result is a longer service life and less frequent calibration compared with traditional Ag/AgCl-based solutions in environments where sulfides, cyanides and other corrosive substances are present.

The sensors offer significantly faster responses to process changes and are specifically designed to resist reference electrode poisoning, junction fouling and pressure and temperature fluctuations. Users benefit from more accurate, reliable pH measurements, as well as reduced reagent usage and minimal calibration and maintenance requirements.



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For More Information

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