

Improving Coagulation Efficiency



RAPID pH MEASUREMENT RESPONSE CAN HELP SOLVE OVERDOSING EVENTS

Maintaining pH is vital for the efficiency of coagulation and flocculation in water treatment systems. Rapid measurement response to pH change allows tighter control of dosing chemicals, lowering costs both directly and indirectly.

Deviations from optimum coagulation conditions (i.e. coagulant chemical dosing rates and pH) can seriously affect treatment performance in water treatment plants. Coagulant chemicals are often sensitive to pH and perform best when pH is maintained within a tight range. Less than optimal conditions can have significant impact on residual coagulant concentration, turbidity, particle count, NOM (Natural Organic Matter) and micro-organisms making the proper control of coagulant dosage and coagulation pH important operational challenges.

Often, turbidity and NOM removal performance is best achieved at pH ranges from 5 to 6, while at pH > 6, NOM removal efficiency lessens significantly and requires higher dosage of coagulant. It is clear that rapid and large variation in raw water quality represents major operational challenges to ensure optimal coagulation conditions suitable to the actual raw water quality are maintained.

GETTING A SOLUTION THAT WORKS

pH probes with a solid state reference electrode provide instantaneous response to pH change. This very important measurement quality is vital where chemical dosing is required to maintain optimal conditions. Slow response can lead to both overdosing and underdosing of often expensive correction chemicals, increasing costs directly with greater use of those chemicals and indirectly by lowering coagulation efficiency.

The slow response of conventional electrodes in correction chemical control systems leads to over-shoot of set points (Fig. 1). This leads to greater chemical usage as correction chemicals are needed to correct for the overcorrection!

REFEX reference electrodes provide rapid response because their entire wetted surface is electrochemically active. This helps to prevent pH over-shoot (Fig. 2), resulting in significant chemical savings and improved operational efficiency.

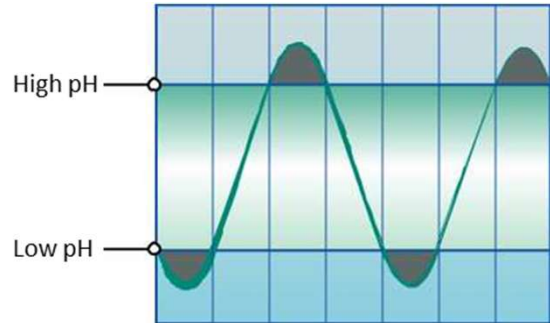


Fig. 1 Conventional Porous Junction pH Sensor Response Speed Leads to pH Overshoot

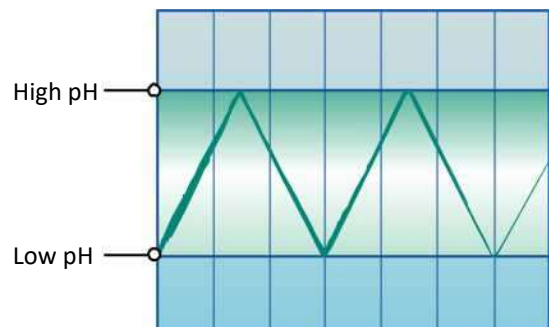


Fig. 2 REFEX Solid State Non-Porous pH Sensor Response Speed Allows Tight Control within Setpoints



REFEX SENSORS HAVE NON-POROUS POLYMERIC REFERENCE JUNCTIONS

REFEX sensor reference junctions are uniquely manufactured from an electrochemically conductive, salt loaded, polymeric matrix - there is no porous junction to allow liquid contact between process fluids and the internal (sealed for life) Ag/AgCl reference half-cell. This non-porous barrier ensures lightning-fast response to pH changes and super-stable measurement by ensuring that that process fluids do not poison, deplete or dilute the reference cell electrode and electrolyte.

Using the right sensor makes all the difference. Refex Sensors provide:

- Fast response to give real savings by preventing chemical overdosing
- Drift free operation
- Accurate measurement that is repeatable and above all, reliable
- Confidence in meeting statutory / regulatory measurement requirements
- Very low maintenance overhead – no need to calibrate every week!
- Maximized plant throughput by dramatically reducing downtime
- Long life – up to 10 times longer than other sensors. Fewer sensor changes means real cost savings
- Reduced cost of ownership from their greater reliability & reduced maintenance needs



REAL LIFE TESTING PROVED THE WORTH OF REFEX SENSORS

Kelda Water Services in Ireland were having issues with their pH measurements:

"Due to contractual parameters we had to keep our final water within very tight margins. Our maximum aluminum reading on our final water could not exceed 50 parts/billion so the coagulation control was very tight.

The existing pH sensors struggled to keep within the accuracy required and needed constant cleaning, at least twice a week. They needed calibration weekly.

We tested a Refex sensor at Dunore WTW as a potential solution to the problem. With Refex, we were able to move the cleaning period to once a month and calibration interval to 3 months. The sensors lasted much longer, so despite their slightly higher initial cost, they proved to be less expensive in the long run."

A Refex sensor may be the solution to your pH measurement problem. Try a Refex sensor in your process risk free with the Refex **"Try Before You Buy"** program.



REFEX SENSOR FEATURES:

- Resistant to fouling and poisoning
- Suitable for temperatures between 0...100°C
- Pressure from vacuum and 20 bar / 290 psi
- Instantaneous response to pH change
- Constant Eo zero - drift free operation
- Long electrode life - many times longer than all others
- Exceptionally low maintenance requirements

GET IN TOUCH

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