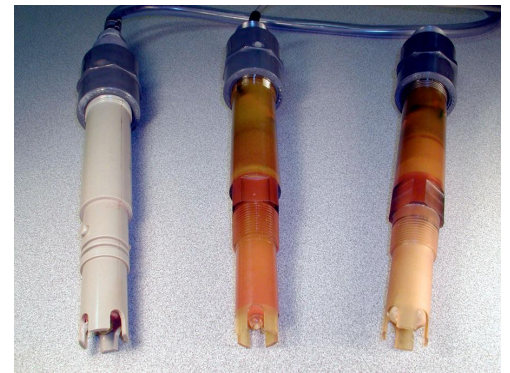


Features

- Guaranteed Longest Lasting Sensors Available with performance guarantee *
- Sensors are compatible with most existing pH/ORP Meters, Transmitters & Analyzers **
- Application Specific Engineering results in optimum Lifetime & Performance ***
- Integrated Temperature Compensation, Preamplifiers & Solution Ground Elements
- Solid State Reference System offers superior resistance to Fouling & Dehydration
- Applications such as Acid/Fluoride, Hi-Temp, Saturated Sodium and Sulfide Resistant are available as standard options
- Custom Applications are available, often at no additional charge
- Most Installation Styles are Supported Including: Immersion, Twist Lock, Valve Retractable & Sanitary
- Available in a wide range of plastics, from cost effective CPVC to thermally & chemically resilient ULTEM® and PEEK thermoplastic
- High Pressure Applications up to 100 psi for Valve Retractable & 150 psi for Inline Installations can be supported for continuous use
- Operating Temperatures from -30 to +150 °C (-22 to +302 °F) can be supported for continuous use



Case Study No. 5 – pH Control in Copper Mining

High Temperature Agitated Slurry Copper Ore Mixtures

- ✚ Agitated heavy slurry mixtures are endured by the sensor by use of a strong break resistant thick-wall pH glass element (nearly unbreakable under ordinary mining slurries use)
- ✚ Build up on reference element is minimized by solid state reference system, which also allows for aggressive chemical and mechanical cleaning
- ✚ Retrofit sensor can connect to almost any existing pH Transmitter
- ✚ Advanced waterproofing assembly allows for continuous submersible installation with little or no solution intrusion onto cable from back of probe
- ✚ Unique sealing technology that is custom built and engineered for mining applications allows for continuous and aggressive dissolved ammonia gas exposure

The Problem

A mining company needed a pH sensor to monitor the extraction of the desired metals from a sulfide containing ore. The extraction involved the oxidation of the sulfides at high temperature and pressure by means of injected ammonia gas in a strong acid solution. Previously used sensors had lasted such a short period of time that the installation point of the measurement was changed so as to be farther away from the ammonia injection point. This lengthened the previous sensor's lifetime but reduced the accuracy and quality of the process control measurement resulting in lower product yields and efficiency.

The sensor required by the mining company needed to withstand (and be once again installed at) the high temperature process conditions at the ammonia injection point to provide good process control values. Initially the sensor would need to resist the dissolved sulfides in solution and later in the process the resulting mixtures of diluted strong acids. The sensor had to resist the temporarily liberated hydrogen sulfides at excess dissolved ammonia gas at high temperature and pressure. The heavy slurry solution was agitated, which can result in the breakage of the pH element. The constant build-up of the slurry on the reference and pH element caused inaccurate pH readings and required frequent cleaning and calibration. These cleanings slowed or stopped the extraction process. Previous sensors rarely lasted long enough to have cable corrosion appear to diminish sensor performance.

Features

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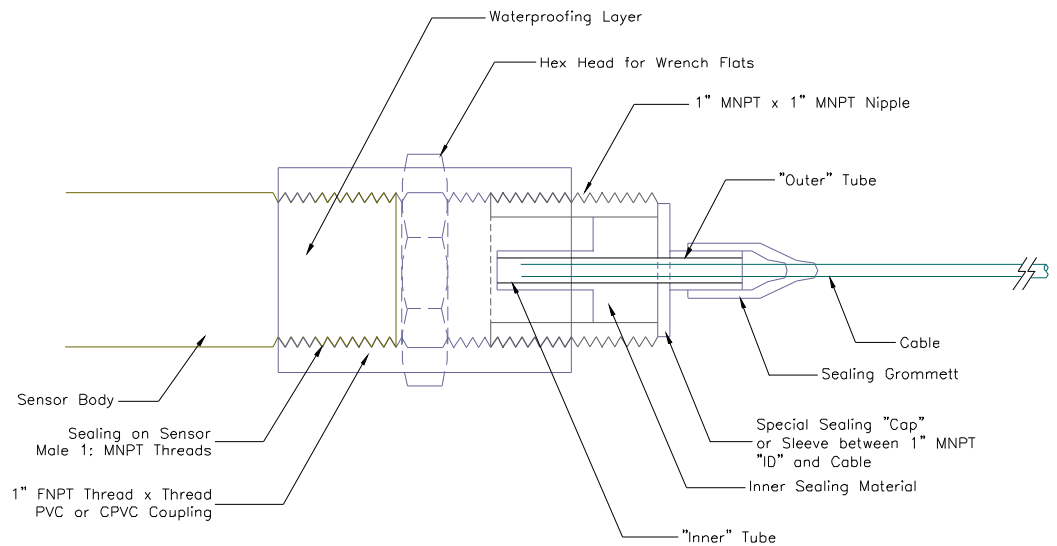
The Solution

The solution to this very tough measurement application was the combination of a high temperature, sulfide, acid and slurry/viscous material resistant pH element with a high temperature, dissolved ammonia gas, acid and sulfide resistant solid state triple junction reference system. A chemically and thermally resistant immersion ULTEM sensor body housing was employed. The high performance waterproofing style "C" assembly was implemented to offer maximum resistance against cable corrosion even during deep and continuous submersion installation (shown below) under aggressive conditions. The lifetime in this application was increased over five-fold and the required pH calibrations were nearly reduced to one-third of the previous frequency.

The pH Sensor Used:

Model: PNCTJHR 6031/6131/6631-3000JYC-25 pH Sensor - with Waterproofing Option "C"

Description: ¾"- 1" MNPT Immersion ULTEM Bodied Low Impedance, High Temperature, Sulfide, Dissolved Gas and Hysteresis Resistant pH Sensor with Triple Junction reference system; Integrated 3000 Balco Temperature Element and Stainless Steel Solution Ground; 25 feet cable to connect directly to Johnson Yokogawa pH Analyzer/Transmitter – with Waterproofing Option "C" (Shown Below)



Choosing the Correct pH/ORP Sensor

1. Choose a sensor body type that suits the physical parameters of the installation (refer to the *Configurations Portion of pH/ORP and Ion Selective webpages*).
2. Choose a sensor that suits the process application, temperature, chemistry, and physical parameters of the installation (refer to *Sensor Selection Guides and call factory or local sales agent for support*).
3. Choose a sensor housing material that is compatible with the process chemistry, temperature & pressure (refer to *Chemical Resistance Charts as posted under the Technical Documents portion of the website*).
4. Select suitable temperature compensation element, solution ground & integrated preamplifier based upon the mating pH/ORP Instrument (refer to *Electrochemical Instrumentation Page & ask for factory support*).
5. Specify the required cable length based upon installation location (refer to *Part Numbering Guide*).

* Subject to application qualification and review by an approved ASTI sales agent and/or factory. Performance guarantee is posted on the ASTI online application questionnaire page.

** See list of supported pH/ORP/ISE Instruments webpages as posted on the ASTI website.

*** Completion of Application Questionnaire form is required. Other restrictions may apply.