

pH CONTROL FOR PIGMENT PRODUCTION

BACKGROUND

In pigmentation process applications, the liquor influent entering a process tank is composed primarily of ferrous sulphate (FeSO_4), in addition to manganese, zinc, cadmium, and other alloying elements. As a result, treatment with sulphuric acid (H_2SO_4) is necessary to maintain the pH at the required levels to control ferric ion conversion. Ferric ion conversion is detrimental to the process of pigment production; therefore, pH must be closely monitored.

LIQUID MONITORING

Monitoring the process liquor can alert the control system to variations in pH. The control system responds to the changes in pH by dispensing doses of H_2SO_4 through a modulating valve. The H_2SO_4 activates the steel stampings in the process liquor to optimally maintain the pH at or around 2.2. At this pH the conversion of ferric ion to ferrous ion is complete ($\text{Fe}^{3+} + e \rightleftharpoons \text{Fe}^{2+}$). Figure 1 illustrates this process.

The process liquor is essentially ferrous sulphate and other alloying elements, produced by filtration through an iron oxide slurry. Due to the aggressive

nature of the liquor the pH sensor becomes easily coated with iron oxide. The usual procedure is to routinely remove the sensor from the process and clean off the thick yellow, cement like deposit with 5% HCl, and then recalibrate.

INSTRUMENTATION

The Model 396P TUpH™ sensor is especially recommended for harsh dirty applications such as this. The advantage of the 396 is its ability to resist process coatings, such as iron oxide, resulting in less maintenance and downtime. The sensor's extended life is attributed to the newly designed polypropylene reference junction.

The TUpH Model 396P is only available without a preamp and is compatible with all Rosemount Analytical analyzers/transmitters.

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INSTRUMENTATION

Model 1056 Dual Input Intelligent Analyzer



- Dual configurable inputs and outputs
- Large, bright LCD display
- Intuitive menus with advanced diagnostics
- Four alarm relays with timers
- Optional HART or Profibus DP
- Polycarbonate NEMA 4X (IP65) enclosure

Solu Comp Model Xmt-P pH/ORP Smart Two-Wire Transmitter



- Digital communications
 - FOUNDATION Fieldbus
 - HART
- Complete diagnostics
- Two-wire, 4-20 mA output

Model 396P TUpH pH/ORP Sensor



- Polypropylene reference junction and helical pathway mean longer sensor life in process solutions containing heavy solids.
- Disposable, one-piece construction is convenient and economical where minimal troubleshooting and maintenance downtime are of prime importance.
- Versatile. Can be used in numerous loop configurations with all Rosemount Analytical and other manufacturers' instruments.

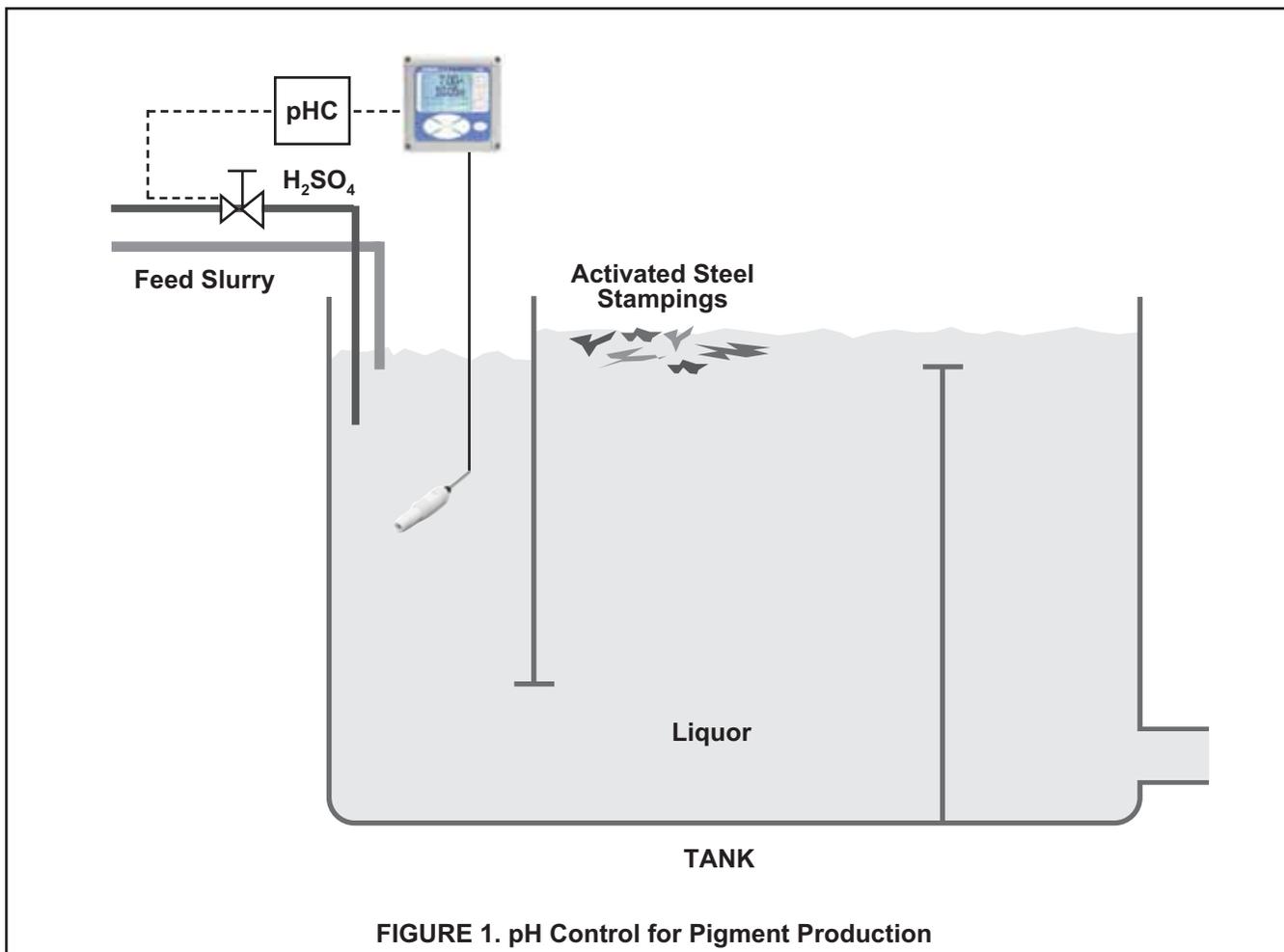


FIGURE 1. pH Control for Pigment Production

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