

METTLER TOLEDO APPLICATION NOTE

Continuous Neutralization Of Acid/Alkaline Industrial Waste

BACKGROUND

Continuous neutralization of acid or alkaline industrial wastes is preferable to batch neutralization in three situations: when there is a high volume of waste, roughly 190 L/min (50 gpm) or more; when the hold-up time in the reaction tank is less than five minutes; or when there are wide swings in the pH value of the waste (roughly 3 pH units or more). Reliable neutralization under any of these conditions requires a proportional-plus-reset control system, as opposed to simple on-off control.

THE PROCESS

In the system shown in Figure 1, spent acid continuously flows into the reactor tank(s). A

submersion pH sensor is used to measure the pH value, which is transmitted via the pH analyzer/transmitter to a controller with proportional and reset action. The 4-20 mA control signal is converted to a pneumatic, 3-15 psig, signal to operate a control valve for the addition of alkaline reagent.

INSTRUMENTATION

Coating of the pH sensor by undissolved materials in the waste stream leads to decreased responsiveness to changes in the sample pH and poorer control. In cases where severe coating is anticipated, we recommend using the InPro® 4500VP pH electrode with our patented Xerolyt® Solid Polymer reference system, and the Model 2100 pH Analyzer.

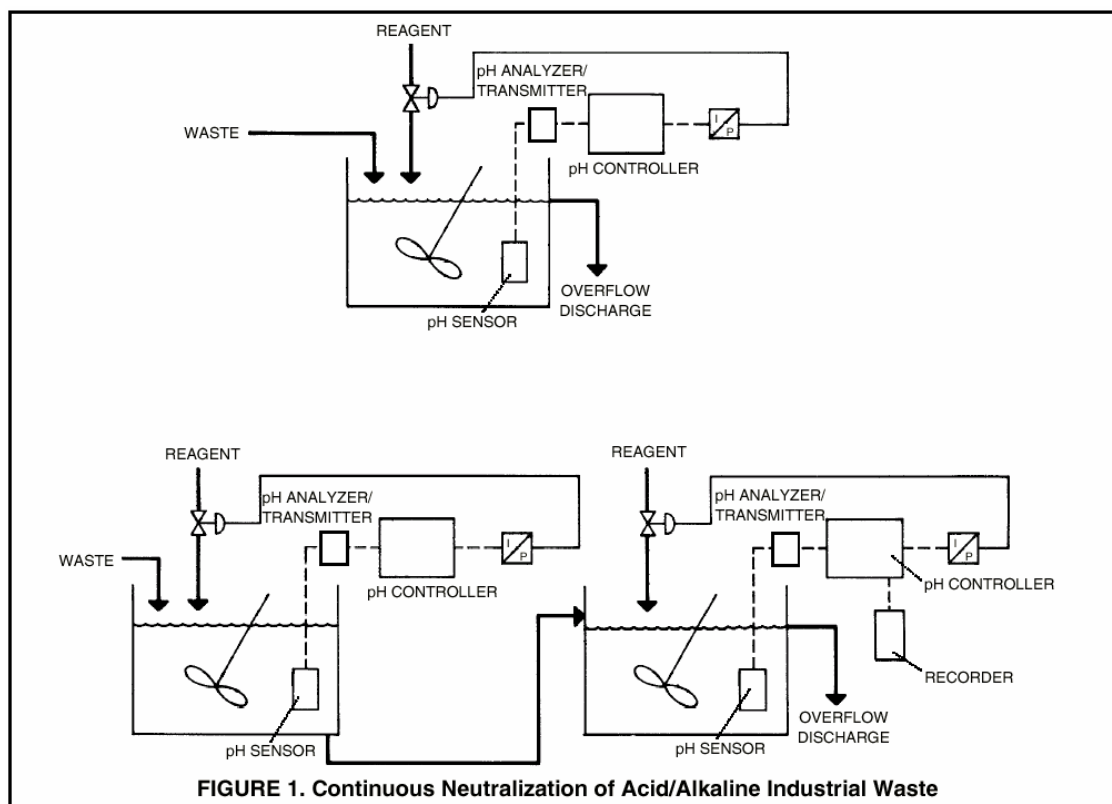


FIGURE 1. Continuous Neutralization of Acid/Alkaline Industrial Waste

Ref: RA ADS 2800-01

PRODUCTS

2100 pH Analyzer

- Detachable front panel and plug-in terminals for ease of installation
- All functions accessible through the keypad for increased ease of use
- Continuous sensor and transmitter diagnostics to monitor performance
- FM certification for Class I, Div 1 & 2 Environments and CSA General Purpose Approval
- 3 year warranty

InPro[®] 4500VP Solid Polymer pH Electrode

- Patented Xerolyt[®] solid polymer reference system maintains a stable potential for accurate and repeatable pH measurement and low maintenance
- Open junction eliminates reference clogging and extends sensor life
- High pressure resistance eliminates requirement for pressurizable housing
- Xerolyt solid polymer is particularly suitable for use in emulsions, suspensions, heavily contaminated or sulfide-containing media, and solutions with a high concentration of suspended solids