

# METTLER TOLEDO APPLICATION NOTE

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## Continuous pH Measurement At The Inlet Of A Wastewater Treatment Plant

### BACKGROUND

Unpolluted water is a valuable natural resource which has always been crucial to life on this planet. Due to population growth and increasing industrial activity worldwide, efficient water management has become a matter of major concern, both in the public sector and in the industrial domain. Consequently, measurement systems for the monitoring of municipal sewage and industrial effluents continue to grow in importance. Modern measurement technology must therefore be able to cope with the problems of pH measurement and signal transmission under particularly harsh conditions. Optimally, such applications call for the employment of a self-cleaning electrode system based on an unbreakable, watertight, liquid-free reference electrode with integrated temperature sensor.

### THE PROCESS

To ensure smooth operation of a biological wastewater treatment plant, it is essential that the pH value of the incoming effluent be maintained within the relatively narrow range of 6.5 to 8.5 pH. Brief deviations are acceptable only if the inflow is allowed to mix with other water in the primary settler, resulting in neutralization.

Precision and continuous on-line measuring techniques are requirements that today can be fulfilled by most measuring devices. The majority of problems tend to occur at the electrode itself, such as fouling, clogging of the diaphragm, electrolyte loss, and electrolyte contamination. These problems lead to the need for continuous replacement of the electrodes or to labor-intensive cleaning and recalibration procedures, all resulting in additional and unexpected high costs for the end user.

### INSTRUMENTATION

For this application the InPro<sup>®</sup> 4500 pH electrode is recommended with a 2100 pH analyzer.

The PVDF body of the InPro 4500 minimizes electrode breakage. The integrated temperature sensor allows compensation of the pH value and increases the accuracy and reliability of the measurement. Errors due to seasonal temperature changes no longer arise.

Very often, clogging is the main reason for inaccurate pH measurements. Our solid polymer reference system and annular junction minimize such risk. Especially in heavily polluted effluents these features offer a major advantage over the conventional ceramic diaphragms of liquid-filled electrodes. This leads to extended intervals between service and thus reduces costs.

Optimized pH measuring systems installed in the inlet of a wastewater treatment plant reduce the costs of maintenance, material and labor. With the above described measuring system, long calibration intervals, minimum service time and excellent electrode lifetime are achieved for the benefit of the customer and of the environment.

## 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<sup>®</sup> 4500 Solid Polymer pH Electrode

- Patented Xerolyt<sup>®</sup> 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