

METTLER TOLEDO APPLICATION NOTE

pH In Pulp And Paper Processes

BACKGROUND

Measurement of pH in the pulp and paper industry is important for economical, ecological and quality control reasons. The measurement is done at different stages of the process, such as bleaching, paper refinement, and in the waste water stream.

The difficulty of measuring pH in pulp and paper applications is the high level of solids and the presence of sulfides in the process stream. The pulp consistency typically is 3% solids or more. Sulfides are used as cooking chemicals in the digester and are therefore present at every stage of the process.

THE PROCESS

There are many different types of process flows in the pulp and paper industry such as the kraft or sulfate pulping, sulfite pulping, semi-chemical pulping, etc. A typical process flow sheet is shown in Fig.1, indicating the sites where pH measurements are important.

Pulp coats the pH sensor and blocks the diaphragm within a short time, resulting in the need for frequent cleaning. Sulfides clog the ceramic diaphragm of conventional pH sensors by formation of non-soluble silver sulfides. Therefore the lifetime of conventional pH sensors is very short.

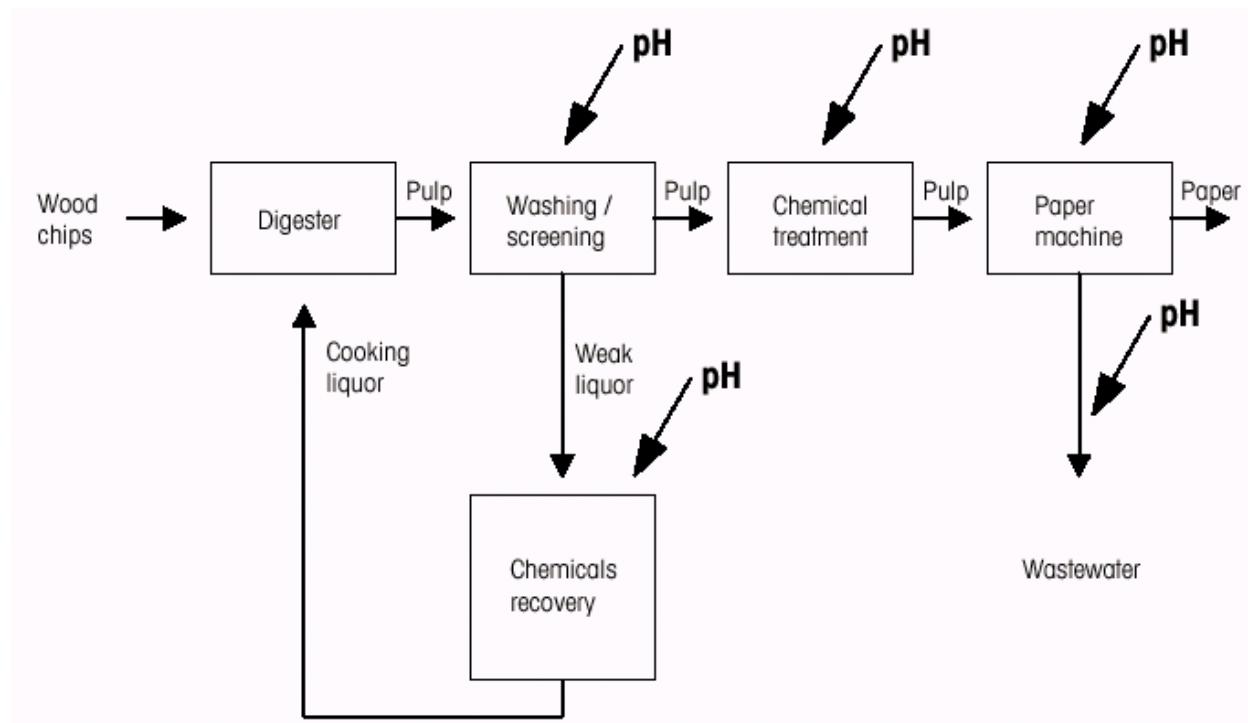


Figure 1: pH in Pulp and Paper Process, Operation Schematic

INSTRUMENTATION

The InPro[®] 4200 pH electrode with Xerolyt[®] solid polymer reference system from METTLER TOLEDO has been developed for this type of application and is now used successfully in many paper and pulp processing plants.

The Xerolyt reference system features a pressure-resistant solid polymer electrolyte and an open aperture junction, which allows the

electrolyte and the sample solution to be in direct contact with one another. The Xerolyt polymer is free from AgCl and therefore protected against contamination caused by silver sulfide precipitate that can clog the junction of ordinary pH sensors. This ensures accurate measurements and longer electrode lifetimes. The InTrac[®] 777-SL or InTrac[®] 787 retractable housings are recommended along with the 2100 pH analyzer.

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[®] 4200 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
- Integral RTD for higher measurement accuracy
- Rugged IP67 rated quick connect VarioPin connector

InTrac[®] 777-SL Retractable Housing

- Rugged 316L SS and PVDF construction for maximum chemical resistance
- Flushing chamber for automatic cleaning and calibration reduces overall system downtime
- Patented immersion tube design isolates the sensor on retraction and guarantees complete separation of the process from the outside environment.
- Safety interlocks prevent sensor removal from housing while in measuring position
- Manual or pneumatic operation

InTrac[®] 787 Hot Tap Retractable Housing

- Fast and easy sensor maintenance or replacement without process interruption
- Double o-ring process seals
- Integrated blow-out protection
- Mechanical linkage ensures safe operation
- Self-wiping retractable tube reduces o-ring wear