

METTLER TOLEDO APPLICATION NOTE

pH Measurement In Pulp Production/ Chlorine-Free Bleaching

BACKGROUND

In this process the digested and washed pulp is first bleached. The technique of bleaching is in a state of flux, however. Chlorine and hypochlorite, the materials originally used to oxidize and destroy the dyes and tannins of the wood, leave chloride residues in the wash water and harm the cellulose fibers. More and more pulping plants are switching over to the use of environmentally friendly bleaching chemicals such as hydrogen peroxide or ozone.

pH is measured in this application to improve the quality of the pulp and to decrease chemical costs by increasing effective usage.

THE PROCESS

Typical parameters for the bleaching process are:

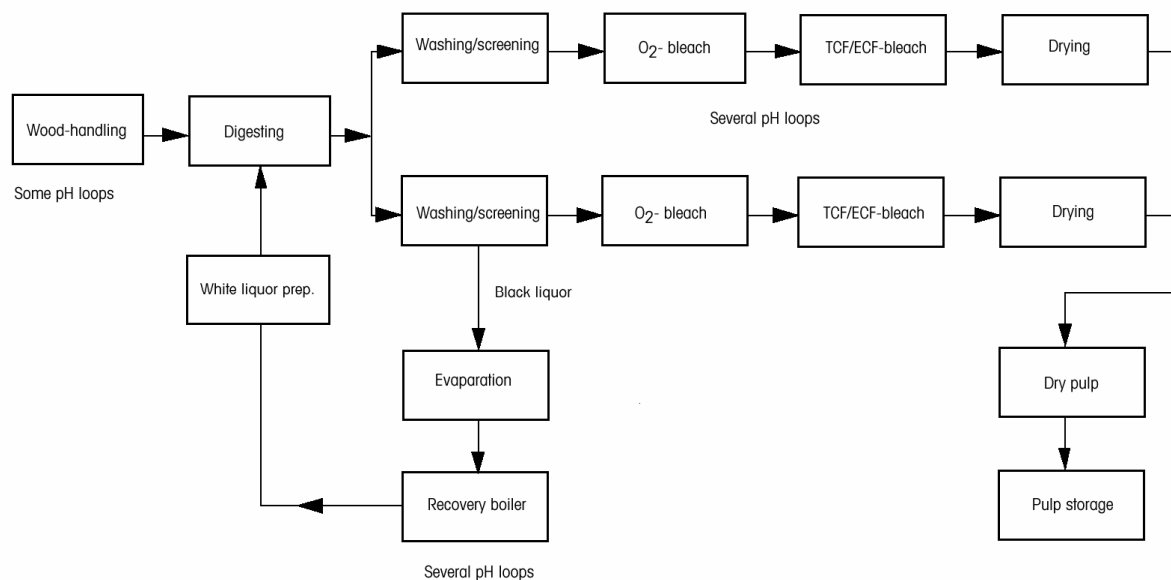
- Pulp Stock Concentration: 12% or greater
- Process Temperature: > 212 °F
- Process Pressure: > 174 psi

pH electrodes tend to have a very short lifetime in this environment due to harsh process conditions and the need for daily maintenance, cleaning, and recalibration. Installation of the pH electrode in a bypass line decreases process temperatures and pressures and increases the lifetime of the electrodes.

INSTRUMENTATION

The 465-SC pH electrode mounted in an InFit®764-50 housing in a 764-20 flow-through assembly is recommended for this application. This rugged electrode has a silver ion barrier to minimize reference poisoning or contamination problems. Pressurization of the housing prevents hydrogen peroxide from entering into the reference system of the electrode and reduces its susceptibility to diaphragm clogging from the high pulp stock concentration. Maintenance is reduced since recalibration is needed only once a month, and sensor life was extended to an average of one year. The 2100 pH Analyzer is also recommended for this application.

Flow Chart Pulp Production



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

465-SC Combination pH Electrode

- Liquid electrolyte provides accurate and precise pH measurements
- Silver ion barrier eliminates diaphragm contamination
- Highly accurate and reproducible results in harsh process conditions
- Choice of electrolyte solution ensures chemical compatibility

InFlow[®] 764-20 Flow Through Assembly

- For in-line mounting in small pipes
- Choice of materials of construction for chemical compatibility

InFit[®] 764-50 Stationary Housing

- In-situ sterilizable for hygienic applications
- Electrode is subjected to an overpressure relative to the process pressure to ensure electrolyte outflow for accurate measurement
- Inspection glass allows monitoring of the electrolyte level to ensure it is never too low