Application Description
AG/PP102-EN

Professional Instrumentation for the Bleaching of Pulp Suspensions

Pulp & Paper

Instrumentation Solutions

- Reliable and noiseless high-quality measurement
- Efficient chemical dosing for energy cost reduction
- Low environmental load due to continuous measurement
- High availability and long life cycle of the measuring systems
- Best in class measuring accuracy and long-term stability for increased productivity
- Robust design for low maintenance cost

ABB Instrumentation

1 General description and technical principle

Unbleached pulp has a brown color due to the remaining lignin of the mechanical pulp. As a result, the pulp must be bleached to achieve the required quality for producing white paper.

Bleaching is a process which improves the purity and brightness of fiber suspensions using chemicals.

Usually, a bleaching plant comprises the reaction container and machines, the piping, the equipment for refilling, storing and conditioning the bleaching chemicals, and the control system for pulp bleaching. A bleaching plant is normally made up of several bleaching stages, for economic reasons.

A conventional multi-stage bleaching plant comprises several bleaching towers and peroxide stages with downstream washing units. Using multi-stage systems on one hand reduces the expenditure regarding chemicals and heat, but on the other hand requires specific bleaching chemicals and processing conditions to achieve some targets (e.g. a high degree of whiteness combined with a low stability loss of the fibers).

2 Solution and process description

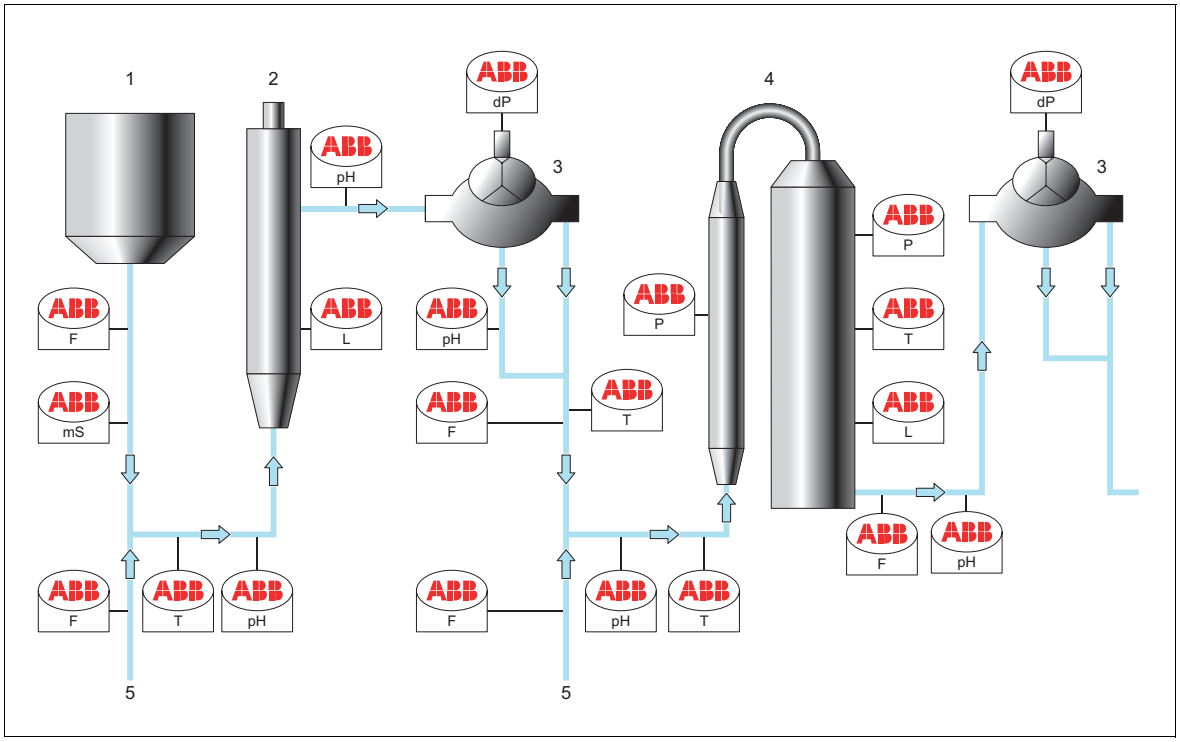

Fig. 2-1: Schematic diagram of a bleaching plant

1 Storage tower
2 Bleaching tower
3 Washing unit
4 Oxygen and peroxide stage
5 Chemicals/Dosing

Colored pulp is conveyed from the digester via the delignification to the first stage of the bleaching system. The pulp reaches the first bleaching tower, where a hydrostatic pressure transmitter (L) and electromagnetic flowmeters (F) provide for constant levels and optimal production rates. Additionally, the chemicals are supplied to the bleaching tower.

Electromagnetic flowmeters (F) are used for dosing control. Pressure transmitters (P), temperature sensors (T) and pH measuring systems (pH) monitor the chemical reactions and reduce both quality variations and the energy cost.

After this, the pulp reaches the washing unit, where the unrequested bleaching products are removed by a wash filter. Conductivity measuring systems (mS) ensure an optimal washing process and provide for constant bal-

ancing of the salt content in the process. Filter and sieve monitoring for long-term efficient filtration is realized using differential pressure transmitters (dP).

The process described here is repeated in the following oxygen and peroxide stages.

3 Features of the used components

Meter Location	Instrumentation	
F		**Electromagnetic flowmeter FSM4000, separated model** • Suitable for multi-phase liquids • High performance due to DSP technology • Short response time and undisturbed output • Local indication of measuring value • Integrated monitoring and diagnosis functions • Primary with nominal size DN1 to DN 1000
T		**Temperature sensor TSP121 with integrated head-mounted transmitter TTH300** • Universal designs • Various process connections • Optionally with tip for short response time • Measuring insert can be replaced during operation • Various selectable transmitter types • Numerous installation variants
P, L		**Pressure transmitter 261G** • Wide range of possible spans • Compact, high operational reliability • Various process connections • Optional control and display panel • Optimized for harsh process conditions • Robust stainless steel housing
dP		**Transmitter for differential pressure 265DS** • High-performance transmitter for even the smallest measuring spans • High base accuracy: 0.04 % • Long-term stability • Turndown ratio of up to 100:1 • Wide range of available sensors • Various process connections

pH		**pH/Redox measuring system with transmitter TB82PH and sensor TB557** • High performance and availability • Single-rod measuring cells with wood diaphragm • Various electrode models, resistant to deposits • Long life cycle, minimum maintenance requirements • Robust transmitter with sensor diagnostics • High availability and easy operation
mS		**Conductivity measuring system with transmitter TB82EC and sensor TB465** • Sensors for compensation of pollution • Easy to install, universal use • High pressure and temperature resistance • Various optimized designs • Robust transmitter with sensor diagnostics • High availability and easy operation

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