

Measuring point	Installation	Measuring task
1	pipe after dilution	process monitoring of recycling process
2	pipe to clarifier	determination of green liquor concentration
3	pipe after clarifier	concentration measurement for subsequent causticizing

Green liquor treatment

Introduction

One of the most important processes in the pulp and paper industry is the alkaline sulphate process where lignin is separated from the fibrous material. Due to economic and environmental reasons, the chemicals used in this process need to be recycled.

In the recycling process the black liquor will be concentrated and burned to remove organic materials like lignin. This recovery process generates - in addition to energy - a smelt with high salt content, the base material for green liquor. Through causticizing with lime, the sodium carbonate in green liquor is converted to sodium hydroxide, re-used in white liquor for the next pulping process.

By using LiquiSonic® analyzers, each process step can be inline monitored and set in an optimal way. The LiquiSonic® system provides an optimized quality control and productivity increase, especially through fast process monitoring while liquor recycling.

Application

The base material in the liquor recycling process is black liquor. While burning an inorganic salt-rich smelt is formed, sediments on the ground of the recovery boiler and has to be diluted by water or weak white liquor. The result of this process is green liquor, rich in Na_2S and Na_2CO_3 . The green liquor is often collected in a separate stabilizing tank before it is clarified. While clarification of green liquor, dregs have to be removed. The clarified green liquor is used for the following causticizing to regenerate NaOH.

The LiquiSonic® measuring technology provides a precise inline concentration determination, based on sonic velocity measurement. Through this real-time monitoring each process step (green liquor generation, storage and clarification) can be permanently monitored, regulated and optimized. LiquiSonic® convinces customers with quality improvement and economic advantages, like optimally regulated lime dosage in causticizing.

Customer value

The LiquiSonic® technology offers customers in the pulp and paper industry, numerous advantages:

- robust and maintenance free even with high coating of green liquor
- easy to clean, no cleaning adapter necessary
- highly accurate inline concentration measurement of green, black and white liquor
- ideal lime dosage
- enhancement of operational safety

Cost and time savings:

- reduced laboratory costs: 1 hour per day or 50 € (60\$)
- mounting and dismounting of common measuring technology for maintenance and cleaning: 1 day per month or 800 € (900\$)
- ideal lime dosage

Investment: approx. 20.000 € (23.000 \$)

Amortization: approx. 1 year

Installation

The LiquiSonic® flange sensor is easily installed into pipelines transporting green liquor. The PFA-coating guarantees minimal maintenance and highly accurate measurement over years, even for alkaline, hot liquids with highly coating tendencies.

By using the LiquiSonic® controller 30, up to four sensors can be connected, allowing the simultaneous monitoring of several measuring points:

- after dilution tank
- after stabilizing tank
- after clarifier

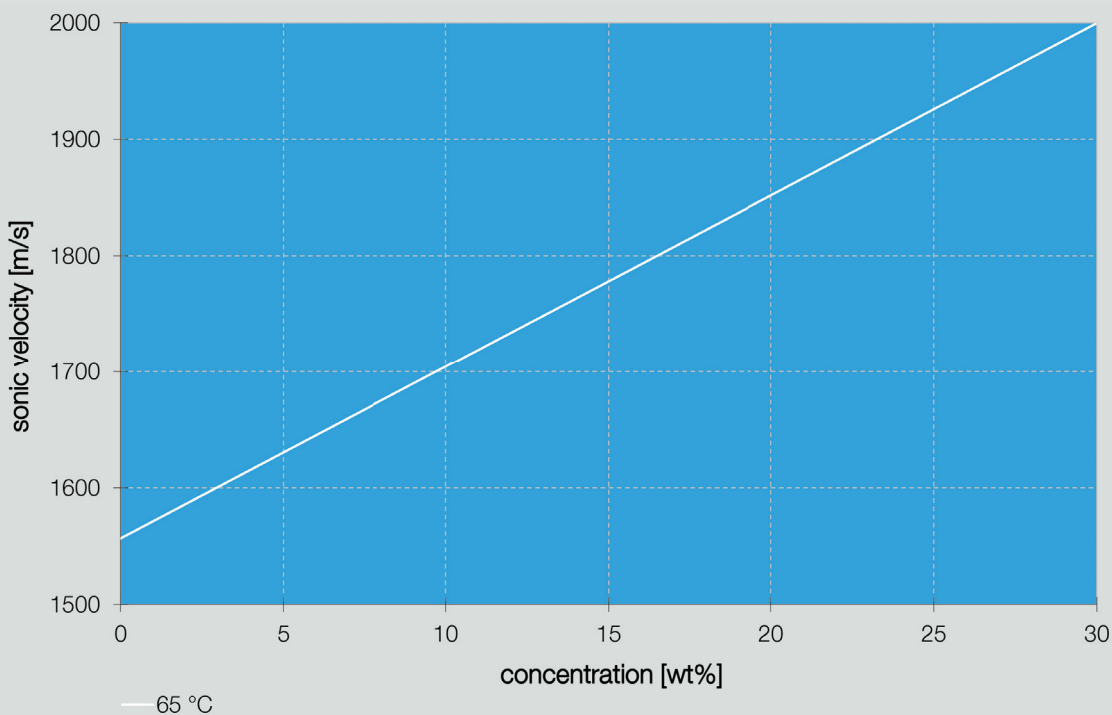
Typical measuring range:

concentration range: 0 to 30 wt% or 950 - 1200 g/l
temperature range: 5 to 95 °C (40°F to 200°F)

References

The LiquiSonic® analyzer is successfully implemented in pulp and paper plants, e.g. by „Metsä Group“ (Metsä, Finland).

LiquiSonic® sonic velocity measurement in green liquor



LiquiSonic® 30



21001311
LiquiSonic® Controller 30 V10



21010123
Flange sensor V10 DN80 (3"), PFA coating

BUS

21004435
BUS connection: Profibus DP



21004449
Network integration



21004110
High power sensor electronic



21004202
Bus cable indoor (100m)



21007846
Factory acceptance test (FAT) certificate



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