PulpTech Sales

Duralyzer-NIR

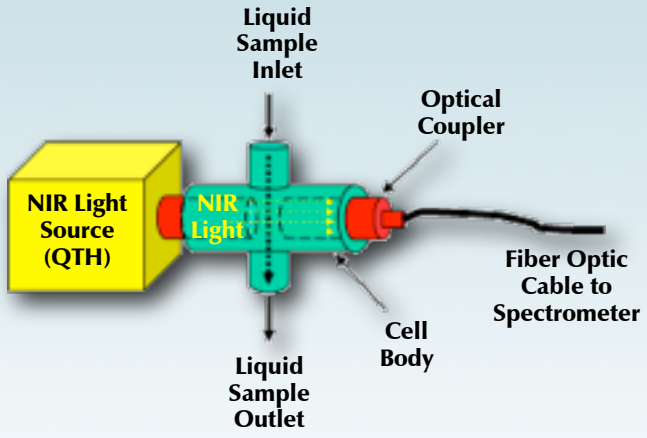
Dissolving Tank Analyzer

Description

The Dissolve Liquor Analyzer ensures reliable and accurate liquor analysis at the dissolving tank and stabilization tank locations for controlling the quality of the green liquor that is pumped to the causticizing process. Stabilizing the green liquor composition as much as possible at these locations ensure that variations in the green liquor are minimized before reaching the recaustizing area. Stabilization of the green liquor at the dissolving tank is also important for controlling the settling characteristics of the liquor and minimizing scale buildup in piping and process equipment. It is desirable to maintain green liquor TTA in as tight a range as possible; too high a TTA can lead to scaling issues, too low a TTA leads to reactivity issues at the slaker. With an online dissolving / stabilization tank analyzer, the green liquor composition can be controlled in real time to meet target TTA or Na2CO3 levels. In addition to the green liquor analysis provided by this analyzer, weak wash TTA is also provided allowing for a feed forward-feedback control arrangement. The DURALYZER-NIR dissolving / stabilization tank analyzer provides the required green liquor AA and TTA measurements in a timely, accurate and reliable manner for green liquor composition control. Additionally, green liquor EA, TDS, TDD and RE are also available from the same analyzer as well as the weak wash TTA measurement.

The unique design of this system minimizes maintenance and system cost by eliminating the large number of moving parts associated with autotitrater technology and eliminating the high pressure or steam washing system used with refractometer approaches. Unlike single point measurements such as refractometers, conductivity meters and density meters, the spectrometer approach provides a complete component analysis such as an autotitrater system without the maintenance and cost associated with autotitrater systems.

The transmission cell provides a means for NIR radiation to interact with the process sample while isolating the light source, fiber optic cable and spectrometer from the process. A typical transmission cell is composed of a body with appropriate sample inlet and outlet connections and a pair of optical couplers to deliver light to the sample and collect light after interaction with the sample. The optical couplers house a set of lenses to focus the radiation onto the tip of the fiber optic cable. The ends of the couplers in contact with the process sample have windows, usually sapphire, to provide a transparent optical path for the entering and exiting light as well as providing isolation from the process sample. Sapphire is usually the material of choice for the coupler windows due to its combination of hardness, chemical and heat resistance and transparency over a broad range of wavelengths.



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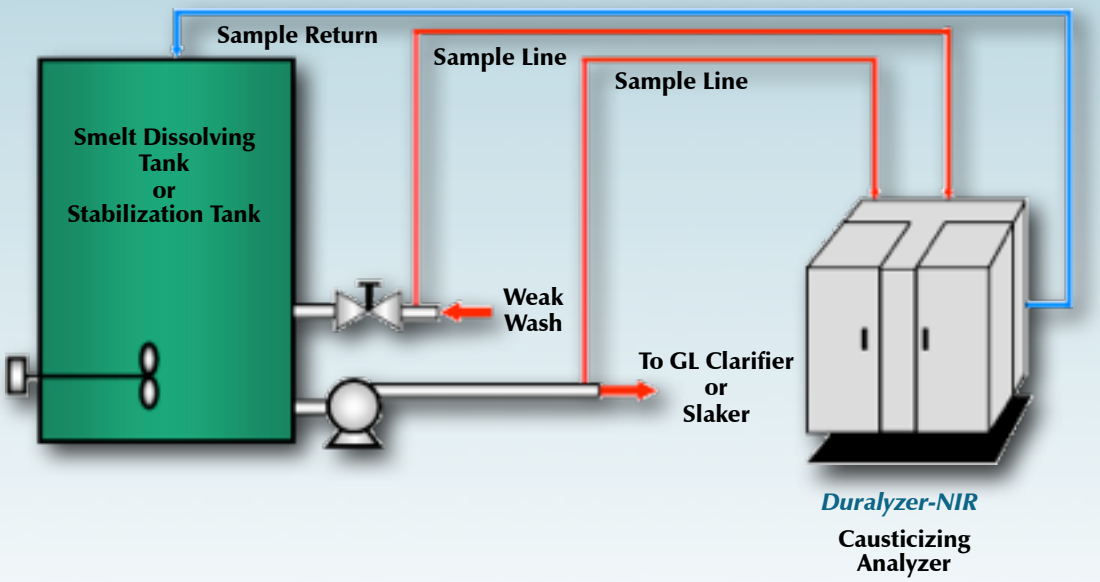
Duralyzer-NIR Green Liquor Analyzer

Application Technology

Reliable and accurate green liquor analysis for the dissolve tank process is important for optimizing TTA or Na2CO3 levels. The graphic presentation on the front page shows how the DURALYZER-NIR dissolving / stabilization tank analyzer can be implemented for controlling the composition of the green liquor exiting these tanks. The standard analyzer configuration comes with three sample lines. A control signal based on green liquor TTA or Na2CO3 levels can then be used to adjust weak wash flow to maintain target TTA or Na2CO3 levels. The combination green liquor analysis and weak wash analysis from the analyzer can be used for stabilization tanks to get tight control over the green liquor composition using a feedforward - feedback control system. Dissolving tank analysis is unique among the liquor analysis applications due to the rapid step changes that can occur from smelt rush conditions. In addition, scaling at this location can also be a serious issue, quickly fouling other sensor solutions to a degree that makes them inoperable. The DURALYZER-NIR analyzer solves both of these issues. Green liquor analysis results can be provided in as short a time as a three minute cycle. Special Teflon lined sample taps ensure that the tap locations do not scale up to a degree that would interfere with collecting a valid process sample.

Utility Requirements

- ***Electrical: 110-120 VAC/60Hz, 30 Amp***
- ***Air: Instrument air 70-120 psi, ⅜" SS tubing***
- ***Sample Lines: ½" SS tubing, ¾" EPDM hose***
- ***Drain: 1" hose back to process***
- ***Water: Mill water 40-80 psi, ¾" tubing***
- ***I/O: 4-20mA or MODBUS/TCP***



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Duralyzer-NIR Green Liquor Analyzer

Advantages of On-Line Duralyzer-NIR Analyzer vs. Refractive Index & Density			
Characteristic	*Refractometer*	*Density Meter*	*Duralyzer-NIR*
Available Measurements	TDS	TDS	EA, AA, TTA, TDS, TDD (total dissolved dead load), RE & WW-TTA
Measurement Technique	Inferred - GL-Ref Index correlated to GL-TDS correlated to GL-TTA	Inferred - GL-Ref Index correlated to GL-TDS correlated to GL-TTA	Inferred - PLS regression technique based on TAPPI test method (Regression model relating spectral signature to chemical composition).
Measurement Resolution	Good	Average	Excellent
Analysis Speed	Fast- Continuos	Fast- Continuos	Moderate - 3 Min. Update
Maintenance - Analyzer	High – Manual cleaning or automated steam / high pressure wash(1).	High – Manual cleaning or automated steam / high pressure wash(1).	Very Low - Yearly light source replacement. Occasional lab verification.
Maintenance - Sampling System	N/A	N/A	Very Low (2) – 1 to 2 year pinch valve tube and, 4-6 month optics cleaning acid replacement.
Total Installed Cost	Low - Moderate(3)	Low - Moderate(3)	Low - Moderate

1. *Automated cleaning system is implemented by the mill. Brute force cleaning methods can lead to sensor head damage.*
2. *Integrated acid cleaning system requires only that acid be refreshed every 4-6 months depending on level of scaling. Cleaning system has no adverse effects on sensor head.*
3. *Total installed cost and operating cost can increase substantially depending on design and implementation of automated cleaning system.*

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