# PulpTech Sales

## Duralyzer-NIR

# Bench Top Kappa and Lime Analyzer

### *Description*

The Bench Top Kappa and Lime Analyzer has been designed to overcome all of the issues associated with manual Kappa and Lime Quality testing, providing fast, reliable and accurate results with minimal operator involvement. The DURALYZER-NIR bench top reflective light analyzer provides the results of the standard lab test, providing results for Kappa and Residual Carbonate measurements for pulp and lime samples.

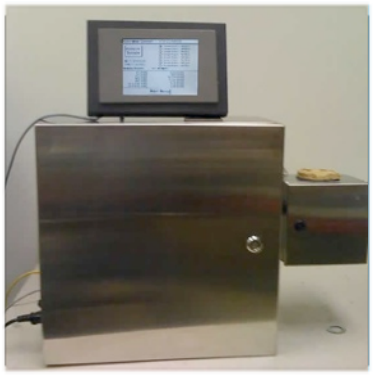
The DURALYZER-NIR bench top reflective analyzer uses the same NIR technology that is used in our online analyzers. This instrument has been designed specifically for the somewhat harsh lab environments of the pulping and lime kiln areas providing many years of trouble free operation. The only required maintenance for the instrument is an annual replacement of the light source and occasional acid cleaning of the sample holders.

### *Manual Kappa and Residual Carbonate Testing* --

has to be performed routinely for quality control purposes. More often than not, lab testing is the only measurement procedure available for process control decisions. The tedious and cumbersome nature of the standard Kappa and Residual Carbonate test for pulp and/or lime does not lend itself well to rapid manual testing.

However, the nature of this testing procedure does lend itself well to induced errors if it is not performed with care and attention. As a result, Kappa and Residual Carbonate testing frequency is low and potentially biased and is usually performed at most once or twice per shift. The result of this practice is that much of the process variation is missed as well as the opportunity to reduce process variations.

The DURALYZER-NIR bench top reflective analyzer completely eliminates all of the negative issues associated with manual and automated titrations by eliminating the chemical requirements, accurate volume measurement requirements and the effects of human errors.



*Bench Top Analyzer*

### *Duralyzer-NIR Reflective Technology:*

The NIR Reflective technology allows very fast and easy sample preparation for Kappa and Lime quality laboratory tests. Samples are prepared and set on the special light and measurement source. Light is transmitted from the light source and at the same time measured for reflective NIR spectrum. Spectrum is compared to internal library of Kappa and/or Residual Carbonate models and the test results are reported on LCD display and send to the mill database for further analysis. Analysis is fast and takes only about 2 minutes. Test itself is operator independent and gives reliable and repeatable analysis of the samples. Analyzer is provided with one or both analysis in the same machine.

*Kappa Sample*

*Lime Sample*

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# Duralyzer-NIR Bench Top Kappa and Lime Analyzer

***A table detailing the primary advantages of the DURALYZER-NIR bench top analyzer compared to current practices is given below.***

| Duralyzer-NIR Bench Top Analyzer vs. Titration Methods | | | |
|---|---|---|---|
| *Character-istic* | *Kappa Lab Method* | *Lime Lab Method* | *Duralyzer-NIR* |
| Available Measurement | Kappa #, Other measurements require different testing methods. | Residual Carbonate. | Brightness, Kappa #, Viscosity, Lignin Content, Residual Carbonate. |
| Measurement Technique | TAPPI standard. Reaction with KMnO4, KI and H2SO4 plus titration with Na2S2O3. | TAPPI standard. Reaction of powdered lime with HCl acid for CO2 liberation. | Inferred - PLS regression technique based on TAPPI test method (Regression model relating spectral signature to chemical composition). |
| Measurement Accuracy | Potential operator bias due to volume errors. Many opportunities to introduce errors. | Potential operator bias due to volume errors. Many opportunities to introduce errors. | All operator bias removed since an accurate volume of sample is not needed. Almost no opportunities for induced errors. |
| Analysis Speed | Slow - Minimum of 20 minutes. | Slow - Minimum of 20 minutes. | Medium – 4 to 6 minutes. Approximately 2 to 3 minutes for sample preparation plus 2 to 3 minutes for analysis. |
| Maintenance | High – Replacement chemicals, pH probe calibration, replacement glassware. | High – Replacement chemicals, pH probe calibration, replacement glassware. | Very Low - Yearly light source replacement. Occasional lab verification. |

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