

# PULP AND PAPER INDUSTRY APPLICATIONS



SCIENCE OF SENSING

## Process, Laboratory, Field

### Variety of Measurement Devices

Kett offers a wide array of test devices for use in the pulp and paper industry. Test measurements can be categorized in two areas - composition and physical characteristics. This brochure will describe several Kett products, specific uses in the pulp and paper industry, and ways our customers have used our equipment to produce more consistent quality, eliminated product failure, reduced manufacturing costs, and ultimately improved profitability.

### Composition Measurements

Wood products, either paper related, hard wood or composition board are manufactured from two principle components - wood and water. The ability to control the mixture or composition of these two inputs is essential to optimize quality, production throughput, and overall manufacturing cost. Kett was founded in 1946 to design and manufacture moisture analyzers. Since that time Kett has developed over one hundred specific analyzers for testing product or component moisture.

In the pulp and paper industry Kett utilizes several technologies for measuring moisture. These methods include Near-Infrared Reflectance (NIR), high-frequency capacitance, and conductance.

### NIR

NIR meters reflect light off the surface of the product. Wavelengths are used which excite the moisture molecules. The higher the percentage of moisture, the higher the amount of light absorbed by the product (which causes the molecular vibration). The reflected light is measured by the instrument and converted into a moisture content. This method is instantaneous, non-contact, and non-destructive.

Moisture levels can be measured from 0.0% to 100% content. Kett offers on-line systems, laboratory or near-line systems, and portable systems that use this technology to measure moisture.

## Application Summary

Application	Continuous	Batch	Field/Remote
Wood Chips - Moisture/Additives	KJT350 550 10	KJT200 350 550	KJT100
Digested Feed - Moisture/Additives	KJT350 550 10	KJT200 350 550	KJT100
Pulp Washer - Consistency	KJT350 550 10	KJT200 350 550	KJT100
Stock - Consistency	KJT350 550 10	KJT200 350 550	KJT100
Liquor - Solid	KJT550	KJT200 350 550	KJT00
Fourdrinier - Moisture/Consistency	KJT35 /550	KJT200	KJT100
Dryer Section - Moisture/Streaks	KJT350 10	KJT200	KJT100
Reel - Moisture/Streaks	KJT350 10	KJT200	KJT100
Sludge - Solid Content	KJT350 550 10	KJT20 /350 550	KJT100
Hardwood - Moisture	MM94L	MM94T HM530 H500	HM530 H500
Plywood/Composite - Moisture	MM94L	MM94T HM530 H500	HM530 H500
Coating Analysis - Basis Weight	KJT550		
Coating Analysis - Physical Properties		Heidon Series/Coating Thickness Gauges	Coating Thickness Gauges

The sensor heads on Kett process analyzers are self-contained. They have the capability to perform calibrations, adjustments and measurements without attachment to controllers. Simply connect the head to a remote PC for control and monitoring. This allows sensor heads to be easily placed in very remote locations within the plant. A virtually unlimited number of sensor heads can be wired to a single PC providing one control point for the entire plant.

Kett on-line systems have successfully measured wood chip moisture, consistency, dryer moisture, and finished moisture at the reel. This versatility, combined with the "Smart" nature of the device makes Kett an obvious choice when standardizing on an instrument for process control.



### Multi-Component Systems

Kett recently introduced new NIR sensors that offer the capability to monitor other components, in addition to moisture. Using the same technology as Kett moisture meters, these systems monitor multiple wavelengths and can be used to simultaneously measure numerous organic components.



Tomorrow's Testing, Today !  
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## Handheld Systems

Our innovative handheld system, the KJT100, is the world's only portable NIR moisture meter. Using camcorder batteries, simply point at the product to be tested and moisture values are instantly displayed on the LCD panel. This system can be used for problem determination, defect identification and location, as well as calibrating other on-line equipment (such as Accuray™ or Measurex™ control modules). Moisture in the dryer section can now be successfully tested! If you can get to the location, we can get accurate moisture values.



## Desktop System

Kett offers a tabletop version, the KJT200, for use in laboratories or near-line. With this system, a sample is placed in a sample dish. The system rotates the sample to automatically calculate the average moisture in less than six seconds. This test can be used to eliminate the TAPPI consistency test.

## High Frequency Capacitance

Kett offers two handheld units for the measurement of moisture content in solids. To operate, place the unit on the product to be measured. An electrical field is generated from two metal "feet". Resistance is measured, internally converted into moisture content, and displayed on the digital LCD in less than 2 seconds. Tests are non-invasive and non-destructive.

The HM530 is pre-calibrated for wood. Simply enter the density of the wood and the measurement depth desired and place on the wood. An integrated temperature compensation feature allows you to measure in the kiln with confidence in the measurement accuracy.

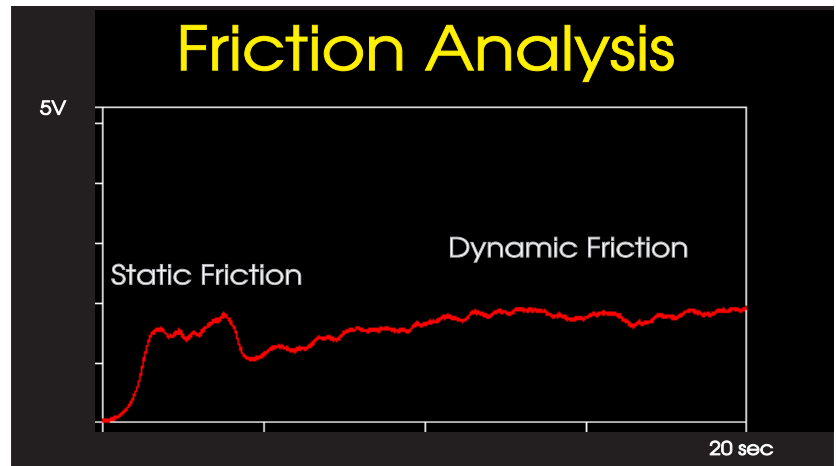
## Tomorrow's Testing, Today!

Kett offers a complete line of innovative measurement devices — for laboratory, field, and commercial applications. If your company needs fast, accurate measurements, get Kett!

The HI500, while pre-calibrated for concrete and mortar, has a stronger field strength (for such higher density products). It offers an uncalibrated mode that can be used to quickly develop calibrations on heterogeneous products such as laminates, ply, and composites

## Conductance

Should a penetrating test be required, we offer the MT100 moisture tester. The device has two metal probes which are driven into the wood. A current is generated and based on the conductivity of the product, the moisture is calculated and displayed on the LCD in less than 2 seconds. Hardwood and Softwood calibrations are included, as well as a measurement compensation grid for individual species. Our one-piece design makes it easy to perform many tests without undue operator effort or safety issues inherent in two-piece models.



## Physical Property Analyzers

Two product lines are offered - surface characteristics and thickness gauges. These systems provide the tools necessary to ensure consistent quality is being produced.

## Surface Characteristics

These desktop units can measure friction (static and dynamic), wear resistance, adhesion and peel. Our 14DR multi-tester provides a one-stop shop for the modern physical testing laboratory. Multiple test fixtures (Jigs) can be attached to the system to test most physical properties. Data are sent to the PC for automated collection, analysis and reporting.

## Coating Thickness Gauges

Initially used in the metal plating and finishing industries, these devices can be used to measure caliper or thickness of both full sheets and coatings. Multiple calibrations can be stored for specific product settings. Many models offer integrated statistical analysis, RS232 output and thermal printers.



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