

The background of the entire page is a photograph of industrial machinery, likely from a pulp mill. Several grey and blue analyzers are mounted on a complex network of pipes and metal structures. One analyzer in the upper left has a label that reads 'SV9A'. Another in the lower right has a label that reads 'SV7A'. The lighting is dim and blue-toned, creating a technical and industrial atmosphere.

FITNIR

The Next Generation of Process Analyzers

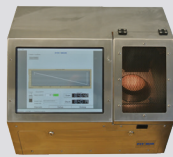
FITNIR's fully automated online and benchtop analyzers reliably measure key woodchip, liquor and pulp properties throughout all process areas of the mill to improve efficiencies and profitability. Fast, frequent and accurate measurements drive process control strategies for optimization. With proven online and benchtop applications for the recovery boiler, dissolving tank, recausticizer, digester, fibre properties, brownstock washer, chlorine dioxide generator, and woodchip moisture content, FITNIR is the next generation of process analyzers.



FITNIR MC



FITNIR BENCHTOP



FITNIR KAPPA

ELIMINATING THE MEASUREMENT GUESSWORK

Operators and control systems require accurate and reliable information to optimize strategic processes. FITNIR's next generation process analyzers, developed by FPIInnovations™, use Fourier-Transform Near Infrared (FT-NIR) spectroscopy to measure key woodchip, liquor and pulp properties throughout the mill. Our patented online and benchtop technologies provide frequent measurements of liquor streams, while our benchtop kappa analyzer measures fibre properties such as kappa number and viscosity. And, woodchip moisture content can be rapidly determined by FITNIR MC, further eliminating operators' measurement guesswork.

THE SIMPLE POWER OF NIR SPECTROSCOPY

At the crux of NIR spectroscopy are the unique frequencies generated from the absorption intensity of the NIR light by the sample's molecules in relation to concentration. Based on the absorption features, preconfigured algorithms analyze and determine key properties in the sample. The distinctive spectral frequencies of the sample allow for simultaneous quantification of multiple liquor constituents. The spectrometer measures and records the spectral features and the data is transferred to the mill's DCS. Simple in concept. Powerful in application.

FITNIR BENCHTOP

FITNIR Benchtop is a compact, plug and play pulp liquor analyzer providing fast and accurate measurements of a complete suite of key liquor properties. FITNIR Benchtop provides a cost-effective solution utilizing the same optically-based technology of FITNIR Online.

Main Features

- Heated vial holder
- Disposable vials for contamination-free operation
- No chemical reagents or dilution required
- Large patented pathlength for high accuracy and precision
- Measurements completed in seconds
- Samples from any location can be tested immediately
- Printable reports and historical values

Key Benefits

- Low cost of ownership
- Provides a safe lab environment
- Eliminates manual preparation errors
- High repeatability and accuracy of measurements
- Reduces test time and operators' lab time
- Quicker analyses improve per sample cost
- Chemical savings

FITNIR MC

FITNIR MC characterizes wood chip moisture content along with the potential to analyze other biomass properties. Online measurement is performed via a non-contact sensing head installed above the conveyor. FITNIR MC provides clarity of feedstock properties essential for cost savings and process optimization, such as production rate control.

Main Features

- Non-contacting, over-the-conveyor system
- Real-time, online measurements
- Digester and power boiler applications
- Expandable applications
- Measures frozen and unfrozen materials

Key Digester Benefits

- Improves digester operations and production rate control
- Chemical savings from reduced white liquor addition
- Reduces kappa number variability

Key Power Boiler Benefits

- Minimizes power boiler instability and downtime
- Decreases fossil fuel consumption and costs
- More reliable and profitable steam and power production

FITNIR KAPPA

FITNIR Kappa measures the kappa number of unbleached and linerboard pulp so mills can monitor and control pulp production for improved efficiency. FITNIR Kappa directly quantifies residual lignin on the pulp, simplifying the measurement in an automated two-step process. This makes standardization possible and significantly reduces testing errors.

Main Features

- Rapid analysis of wet and dry kraft pulp
- Does not rely on other measurement parameters
- Minimal sample preparation and chemicals
- Results presented in less than 4 minutes
- Proficiently measures high kappa numbers

Key Benefits

- More frequent testing
- Significantly reduces operator-to-operator variability
- Quicker adjustments improve efficiency
- Eliminates exposure to hazardous chemicals
- Substantially reduces testing chemical costs
- Helps meet quality standards and product segregation, improving customer satisfaction

FITNIR ONLINE

A complete solution for your pulp liquor measurement needs, FITNIR Online is a fully automated process analyzer capable of sampling from multiple sources and testing numerous components simultaneously for green, white and weak black liquors as well as ClO₂ generator liquor.

Main Features

- Proven technology as a process analyzer
- Fully automated for frequent testing
- Large patented pathlength for high repeatability and accuracy
- Automated flushing of sample lines and cell with water to prevent scaling
- Sample measurements take only minutes
- Data transfer to mill's PLC and DCS via Modbus and/or OPC
- Automated process and diagnostic alarms
- Remote analysis via fibre-optic cable
- Little or no need for recalibration resulting in nearly 100% uptime
- No chemical requirements

Our customers have experienced many expected, and some unexpected, benefits from the FITNIR Online system. The integration of FITNIR Online allows mills to accurately and consistently determine what is happening in the various unit operations. We've eliminated the measurement guesswork so you can confidently control and optimize your mill processes.

Key Benefits

- Reduces variability of Green Liquor Total Titratable Alkali (TTA) and White Liquor Effective Alkali (EA)
- Increases Causticizing Efficiency (CE)
- Reduces purchased lime consumption
- Improves evaporator and recovery operations
- Increases production
- Chemical and energy consumption savings
- Decreases operator safety risks



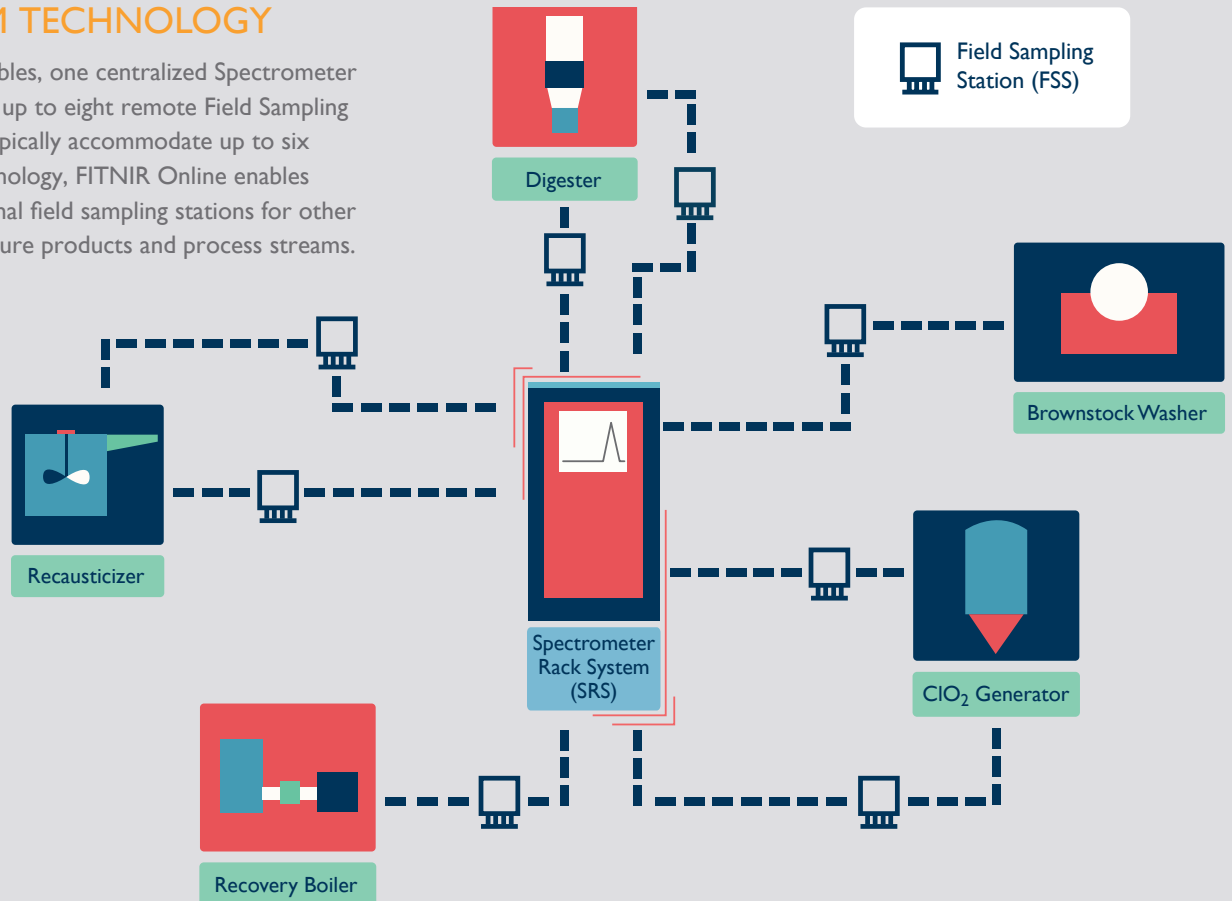
Spectrometer Rack System (SRS)



Field Sampling Station (FSS)

A TRUE PLATFORM TECHNOLOGY

Connected with fibre optic cables, one centralized Spectrometer Rack System (SRS) can handle up to eight remote Field Sampling Stations (FSS). Each FSS can typically accommodate up to six samples. A true platform technology, FITNIR Online enables expansion by installing additional field sampling stations for other process areas and even for future products and process streams. The advantage: a smaller spare parts inventory, reduced maintenance, and less training to maintain and operate.



PROPERTIES MEASURED BY FITNIR ANALYZERS

FITNIR Analyzers' FT-NIR technology provides the most comprehensive and accurate suite of pulp and paper properties measurements necessary for optimizing pulp mill processes.

Recovery Boiler – Unclarified & Clarified Green Liquor

- Total Titratable Alkali (TTA)
- Effective Alkali (EA)
- Active Alkali (AA)
- Sodium Sulfide (Na_2S)
- Sodium Carbonate (Na_2CO_3)
- Sodium Sulfate (Na_2SO_4)
- Sodium Thiosulfate ($\text{Na}_2\text{S}_2\text{O}_3$)
- Reduction Efficiency (RE)

ClO_2 Generator

- Acid and Chlorate Concentrations
- Solids Content*

Slaker and Causticizers – Clarified Green & White Liquor ABCs

- Effective Alkali (EA)
- Active Alkali (AA)
- Sodium Carbonate (Na_2CO_3)
- Sodium Sulfide (Na_2S)
- Causticizing Efficiency (CE)
- Sodium Sulfate (Na_2SO_4)
- Sodium Thiosulfate ($\text{Na}_2\text{S}_2\text{O}_3$)
- Solids Content*
- Polysulfides: Active, Inactive, Total, Residual Sulfide

Brownstock Washer

- COD/ ClO_2 Demand

Digester – Chips and Black Liquor Properties

- Residual Effective Alkali (REA)
- Solids: Inorganic, Organic and Total Solids*
- Lignin
- Density
- Moisture Content of Wood Chips

Fibre Properties

- Unbleached, Sack and Linerboard Kappa
- Wet and Dry Pulp Kappa
- Viscosity

*FITNIR Online measurement only



FITNIR SUPPORT

At FITNIR, we understand your business. Our expertise in both the lab and in the field goes into every aspect of our products and services. Our innovations, process knowledge and dedication are focused on supporting your business success. We're not just suppliers to our customers; we are your partner.

SUPPORT SERVICES

- Project coordination
- Application engineering: kickoff meeting, system configuration, calibration and validation
- System verification and testing
- Application documentation
- Initial and refresher mill personnel training
- After-sales support: remote system monitoring service via VPN connection, system auditing, configuration changes, routine and scheduled maintenance

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