InfraLab Overview

NDC Infrared Engineering has over 40 years experience in the design and manufacture of process instruments using NIR (Near Infrared) measurement technology. An installed base of thousands of units worldwide helps users control product quality and improve process efficiency.

The InfraLab e-Series Tobacco Analyzer is the company's 5th generation at-Line tobacco analyzer and designed to be used anywhere in the process as part of the Quality Assurance System. Its short measurement time and laboratory accuracy mean it is ideal for rapidly analyzing multiple samples taken from production lines.

The InfraLab complements the TM710e on-line tobacco gauges and provides non-skilled access to complex analyses in just a few seconds, with minimal or no sample preparation.

Connectivity via Ethernet to Management Information Systems, LIMS laboratory networks or to a PC, as well as extensive integral memory capacity, ensure that key quality data is displayed or stored at point of need.

The Need for Measurement

The Need for Measurement

To achieve consistent quality, tobacco product manufacturers constantly measure and control the content of Moisture, Nicotine and Sugars.

These constituents significantly influence product attributes such as taste and consumer perception, as well as packing efficiency and in the case of moisture, speed of the making machines in the secondary process

Analytical Methods

The Primary Reference Methods use a controlled, often semi-automated, scientific technique to determine the constituent measurements with very high precision. Such techniques include:

- Gravimetric Oven (Moisture/Volatiles)
- CFA - Continuous Flow Analyzer (Nicotine and Sugars)
- HPLC - High Pressure Liquid Chromatography (Nicotine or Sugars)

Though the Primary Methods provide highly precise individual sample data, they are not regarded as a production tool, as the analysis may take a number of hours from sample receipt to generation of result and require skilled operators and often the use of expensive reagents. In essence, they provide only historical data, making them impractical for product release, quality control or production troubleshooting and optimization.

The InfraLab e-Series

Calibrated to your preferred Primary Reference Method, the InfraLab e-Series At-Line Analyzer is designed to provide frequent, rapid, single or multi-component analysis of the key tobacco process constituents.

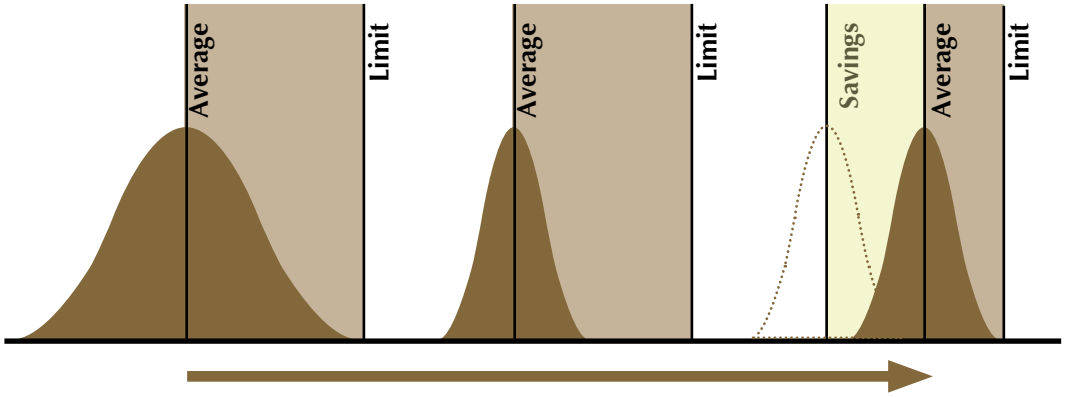
Easy-to-use and robust enough for the processing environment, the versatile InfraLab is applied both in production and quality testing, providing non-skilled access to complex analyses in just a few seconds, with minimal or no sample preparation.

Connectivity via Ethernet to Management Information Systems, LIMS laboratory networks or to a PC, as well as extensive integral memory capacity, enable display or storage of vital quality data at point of need.

Improving the Process

Even a stable process may not be running optimally due to the spread of values about the average. Process insight gained through enhanced testing with the InfraLab can help process managers reduce variation and control the process average closer to the specification limits.

Achieving Consistent Product Quality through Improved Process Visibility...



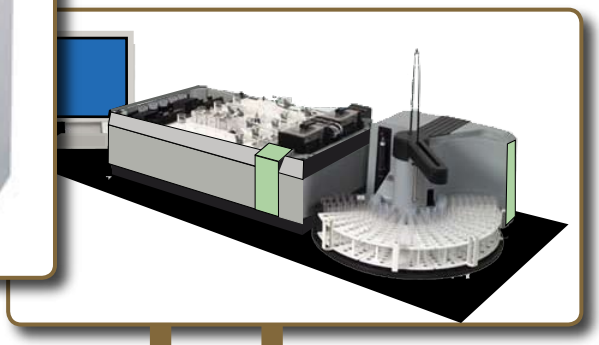
InfraLab - the Viable Replacement for Lab Methods

3 into 1 with the InfraLab

At-Line Tobacco Analyzer...

Moisture

Primary Reference Techniques



Nicotine

Total Reducing Sugars

Using the InfraLab

- user logs on
- selects product definition
- presents sample
- within 5 seconds data is presented on screen and stored in the memory or transmitted to a management information system via Ethernet

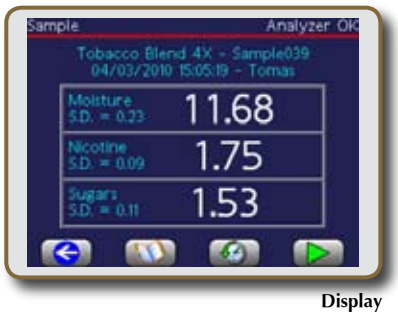
Process Samples

...Fast, Accurate, Easy-to-Use

Fast, Accurate & Easy to Use

User Interface

The interface features passcode controlled access, so that operators and supervisors are directed to functions relevant to their responsibilities.



Display

Data Storage and Extraction

The integrated flash memory holds up to 10,000 sample files, single or multi-component, all of which can be accessed for viewing from the touchscreen. Data can be downloaded to a USB memory device, or transmitted via Ethernet to a management information system or viewed and managed on a PC using InfraLabXL Software.

Connectivity

In addition to Ethernet connectivity, InfraLab can be incorporated into a LIMS (Laboratory Information Management System) which brings in data from a number of sources into a central database.


USB Port

The additional USB connection on the rear of the InfraLab can be used to connect a Bar Code Reader (which can be used for product recipe selection and sample ID input) or a USB printer for simple report printing.

Sample Sizes

A choice of sample containers is available:

- deep dish for most tobacco products
- shallow dish for milled or fine product


External Reference Standard

The unique and patented optical arrangement means that InfraLab is not sensitive to height changes in the sample dish, ensuring that accuracy is unaffected by sample presentation.

Most tobacco products require no preparation before being presented to the InfraLab.


Bar Code Reader (option)


Standard Rotating Dish


Shallow Rotating Dish

Calibration

The initial calibration process of the InfraLab to the Primary Reference Method(s) is simplified by NDC's SpeedCal™ measurement algorithms. Each algorithm is already optimized over the specified range, and in most cases, only the offset (TRIM) value will require adjustment. InfraLab is delivered with InfraLabXL Calibration Management Software which facilitates the calibration adjustment process and provides access from a PC to data displays, trends, historian function and more. InfraLab's inherent long-term stability eliminates the need for any routine calibration.

InfraLab e-Series Key Features:

- Single or multi-component analysis with a measurement time of less than 10 seconds
- Ergonomic hygienic design
- InfraLabXL PC Software for data management and enhanced functionality
- Quarter VGA colour touch-screen with multi-lingual interface
- Security protocol with pass-code protection for operator, supervisor and administrator levels for up to 200 users
- USB ports for data download to memory stick and barcode reader and printer connection
- Automatic window contamination monitor
- Internal (automatic) and external (manual) Reference Standards
- Capacity for up to 200 product definitions and 10,000 sample files
- History audit log (time & date) of calibration records and Auto Reference Values
- Ethernet networking for PC connectivity & LIMS capability
- Choice of 4 sample dish sizes, static or rotating

InfraLab Applications

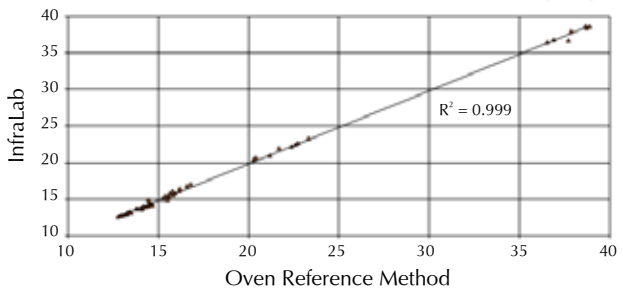
KEY INFRALAB APPLICATION AREAS:
Processes & Products
Green Leaf Threshing
Incoming Bales/Cases
Primary
Expanded Tobacco
Reconstituted Sheet Tobacco
Treated Stem
Chewing Tobacco and Snuff
Final Blend
Roll-Your-Own
Pipe Tobacco
Cigar Filler
...and more

Measurement of Moisture, Nicotine & Total Reducing Sugars is possible in most tobacco processes and products.
Please consult our Application Notes or our Applications Technical Support Group for further detail.

The Robustness of the NDC factory calibration means that adjustment to achieve agreement with the primary methods requires no more than an offset change

PERFORMANCE:

Calibration Illustration: InfraLab calibrated against Gravimetric Oven for Moisture in a Virginia Tobacco



Applications

The InfraLab Tobacco Analyzer is available in three configurations:

- Single Component Moisture
- Dual Component Nicotine + Sugars
- Multi-Component Moisture + Nicotine + Sugars

Each InfraLab is optimized for the required applications and contains the relevant measurement algorithms for each constituent for the following ranges:

- Moisture Range: 0.0 to 60% Accuracy*: 0.1% 2σ
- Nicotine Range: 0.0 to 6% Accuracy*: 0.2% 2σ
- Sugars Range: 0.0 to 30% Accuracy*: 1.0% 2σ

Accuracy*

It is the NDC policy to express accuracy as *twice* the Standard Deviation of the differences between the values measured by the InfraLab and the values obtained for the same samples using the Primary Reference Technique.

Achievable accuracy is dependent on the measured product, sampling techniques and the Primary Reference Method used. The indicative accuracy values shown above are obtained when InfraLab is compared to Gravimetric or Wet Chemical methods for moisture and the Continuous Flow Analyzer for Nicotine or Sugars.

Stability

The InfraLab is designed for ultimate long-term stability. Users can test and prove the stability themselves using the external Reference Standard. However, the InfraLab automatically monitors and manages its opto-electronic stability, ensuring its measurement capability in the process environment and remaining completely uninfluenced by product and ambient changes in the process area such as:

- Temperature
- Relative Humidity
- Ambient Lighting

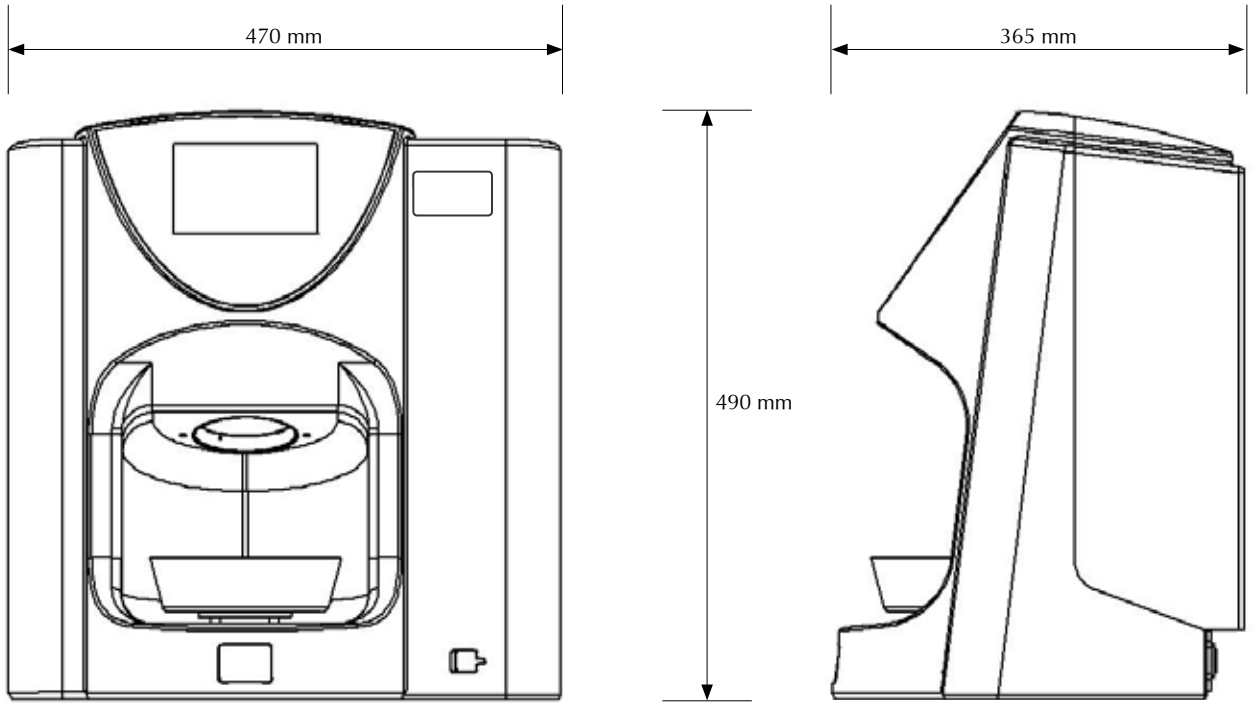
Maintenance

Other than simple cleaning, the InfraLab requires no routine maintenance, nor does it require any routine re-calibration.

Technical Specifications

Dimensions:

Weight: 12kg



Technical Specifications:

Measurements
Moisture, Nicotine, Sugars (Total Sugars or Total Reducing Sugars) - depending on application.

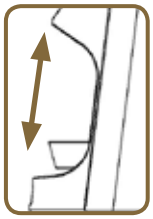
Sampling Period and Measurement Speed
User Configurable Sampling Period, typically 2 - 10 seconds
Measurement Speed: 133Hz, equivalent to one complete measurement, single or multi-component, every 7.5 milliseconds

Sample Preparation
In most cases, the tobacco samples are simply presented to the InfraLab in the appropriate bowl

Sealing
The InfraLab Housing is constructed from tough Polyurethane and sealed to IP65 [NEMA 4 Equivalent] (excluding rear connector panel)

Sample Size
Choice of Deep or Shallow Sample Bowl or (with optional adapter) 90 mm Ø Petri Dish
Measurement Area is a 50mm diameter circle

Product Height
Note that the height of the product within the sample bowl is not critical and there is no sensitivity to changes. The only important criterion is that the bottom of the sample bowl must be completely covered



Storage, Safety, Environmental and Electrical
Power Supply: 80-265VAC, 50/60Hz
Power Consumption: 50 Watts
Pollution Degree: Degree 1
Ambient Temperature Range: Storage -20 to +70°C, Operation 0 to 50°C
Humidity: 80% max (non-condensing) over full operating temperature range

Connectors:
2 x USB, one front, one rear
1 x Ethernet Port
1 x IEC Mains Socket

NDC is represented in over 60 countries worldwide

a spectris company

Reg. No Q06197
ISO9001:2008

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InfraLab™

e-Series

Tobacco Analyzer

- At-Line
- Quality Assurance
- Laboratory
- Quality Control

InfraLab
- e-Series -

The Measure of Quality™