

IN-PROCESS / AT-LINE ANALYSIS

Nordson
MEASUREMENT & CONTROL



EMPOWERING
TRUE PROCESS AND
QUALITY CONTROL
TODAY AND BEYOND



A New Era in Gauging for
Snack Industry Applications

NDC Products

Intelligence that transforms the world.

Maximizing Process Performance and KPIs

Through the Measurement of Moisture, Fat/Oil and Surface Browness

For more than 50 years, we have designed and built measurement solutions specifically developed to meet the manufacturing challenges faced by the snack food industry.

Our leading position in process measurement has been achieved by working closely with our customers and developing solutions that meet their needs – for better process insight and quality control. We set the bar in the industry for best-in-class performance with our MM710e on-line snack gauge and InfraLab e-Series at-line analyzer. Our legacy of innovation continues with the Series 9 gauge.

By solving process-specific application challenges, we play a dominant role in supporting the snack food industry and forging successful relationships with the leading manufacturers.

Today, tens of thousands of Nordson gauges are in service around the globe. That's because we are trusted not just to meet process needs, but to uncover new efficiencies, ensure quality and add value wherever our products are installed.



Stay Ahead with the Series 9 On-Line Gauge

The Only On-Line Sensor on the Market that can Simultaneously Measure Color, Moisture, Fat/Oil, and Protein...Out of the Box

The Series 9 gauge is a best-seller in the food industry. It is specially engineered for 24/7 duty, helping manufacturers to meet product quality demands and efficiency goals.

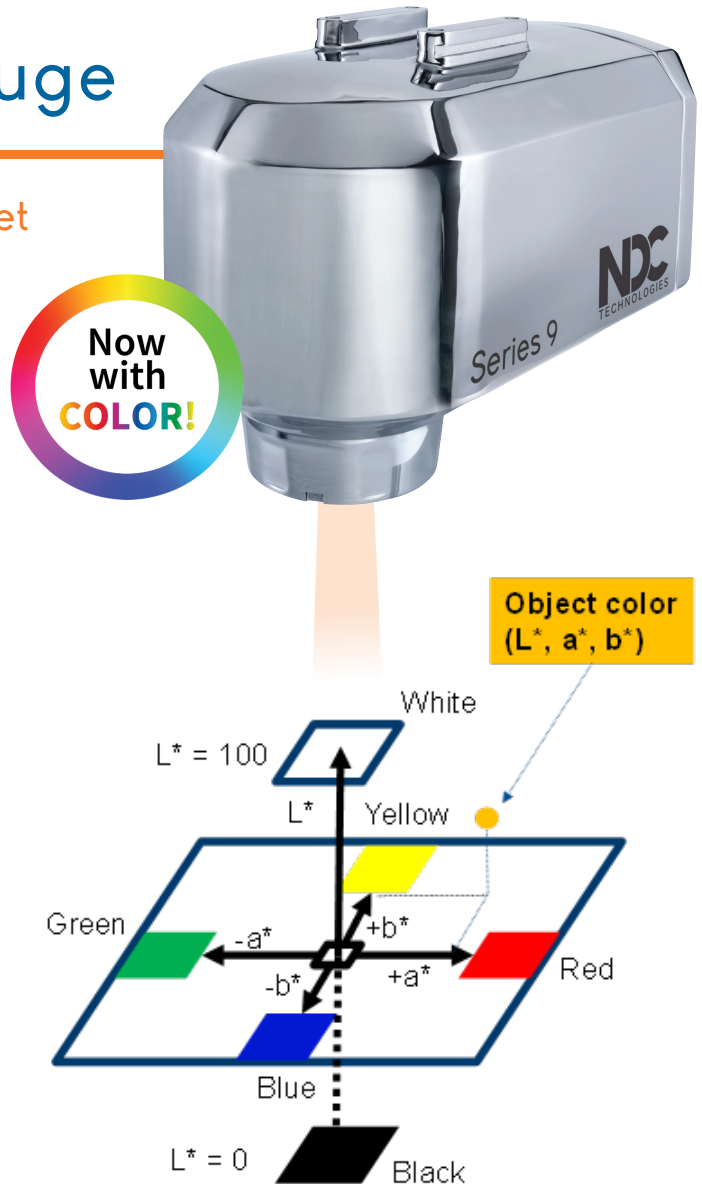
Installed directly on-line, it delivers unparalleled measurement performance while maintaining simplicity and versatility in design and operation. It doesn't require special operator skills or expert knowledge.

The Series 9 can simultaneously measure key constituents such as Moisture, Oil/Fat, Protein and Color in Food or solid products. Color can be measured across a wide range of standard scales, including CIELAB (L^* , a^* , b^*), Tristimulus (X, Y Z), RGB, CIELCh (L^* , C^* , h) ΔE^* & ΔE_{cmc} , Degree of Roast (DOR).

Application tests in leading companies have proven that repeatable numeric color readings, combined with other critical measurements such as moisture, fat/oil, and protein, can be confidently used as part of a process control strategy to deliver consistent product quality every time.

The Series 9 Color Gauge keeps you ahead with:

- Evolutionary technology that is flexible, adaptable and scalable to meet your changing needs
- Enterprise-level intelligence compatible with Industry 4.0
- Easier operation and maintenance
- Lower cost of ownership over a long lifetime of operation



Leverage the Power of At-Line Analysis

The **NEW** InfraLab® Series 9 – benchtop analyzer to the Series 9 on-line gauge – is the latest leading at-line analysis solution on the market. Designed to be used anywhere in the process, the InfraLab Series 9 offers an expanded range of features and capabilities that will help you elevate your quality assurance process. Benefit from rapid, accurate and consistent measurements for a wide variety of tobacco applications. Learn more about this powerful analyzer on page 12.



Improve your Process with Immediate and Long-Term Advantages

We understand your process challenges



Consistent product quality

Established snack products are associated with key quality attributes by the consumer, differentiating themselves from the competition by delivering consistent quality and optimum value.

New snack products must build a new consumer base through innovation in taste, nutrition and value.

Our Series 9 gauge meets snack industry demands for accurate, reliable and continuous measurements of moisture, fat/oil and surface brownness.

Regardless of whether the product is fried or baked, or is potato-based or corn-based, these measurements can be used to enhance quality and process control.



A pre-engineered out-of-the-box solution

Moisture control is critical because it affects taste, texture and end product quality. Too much moisture may result in reduced shelf life of the product, and insufficient oil uptake.

For fried snacks, controlling the moisture content not only helps to manage and control the cooking process, but also helps reduce the formation of acrylamide in potato-based snacks.

Monitoring oil content is essential to maintain consistent flavor and to meet labelling requirements. It also provides an early indication of process changes. For example, the oil content in potato chips will increase when slicer knives need changing.

The surface brownness of a snack affects its appeal to the consumer. For fried products, it is also a strong indicator of an optimal cooking process.

Being able to monitor surface brownness while simultaneously measuring moisture and/or oil content delivers process insight.



We understand your process challenges

Nordson Measurement & Control understands your process challenges. That's why we've engineered robustness into our measurement solutions. This ensures that any changes in the measurement output are due solely to varying levels of the measured parameter, without influence from other product or process variables. With immediate access to data, the Series 9 gauge and InfraLab analyzer take you one step towards maximizing the performance potential of your process.



Operate your process at peak performance with single- or multi-component measurements in applications, such as:

- Corn-based snacks – moisture, fat/oil, degree of brownness
- Potato-based snacks – moisture, fat/oil, degree of brownness
- Potato crisps/chips – moisture, fat/oil, degree of brownness
- Corn chips/tortillas – moisture, fat/oil, degree of brownness
- Popcorn – moisture
- Potato powder – moisture
- Pretzels – moisture

Refer to the list of applications later in this brochure to see how the Series 9 delivers value to your process.



Engineered with your process in mind

Greater processing power to perform more advanced measurements and gauge operations

- Powerful, dual-core processor with large on-board storage

Unparalleled process vision

- 12 hours of measurement trending and embedded product calibration adjustment tools

Expansive measurement database to meet your needs

- Every application is fully documented

Hygienic, seamless stainless-steel enclosure with sapphire window

- 316L stainless steel, sealed to IP67

Integrated Air Purge Window shield to keep window clean from process environment

- Advanced window contamination monitoring with an optional air flow monitor



Simple slide-on sensor mounting



Integrated Air Purge Window



Removable service backplate

Innovative removable backplate for easy service and maintenance

- Remove gauge internals while leaving enclosure in place

ATEX certification for safe use in dust hazardous environments

- DUST: II 1 D Ex Ta IIIC T288°C Da Ta
-20°C to 50°C and II 2D Ex Tb III C T80°C Db

Versatile connectivity for flexible integration into production networks

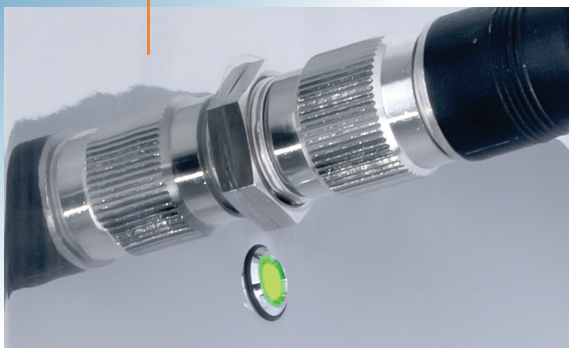
- Ethernet and fieldbus networking with digital and analog connectivity

Easily connect to Series 9 via hand held tablet

- Connect from any location wirelessly or via internet for sampling and configuration

Advanced diagnostics for maximum uptime

- Includes Status indicator light for at-a-glance confirmation with integrated Auto-Check feature for total piece of mind



Status indicator light

Easy to Install,
Integrate and Operate

Connectivity and Interfacing to Enhance Process Insight and Control

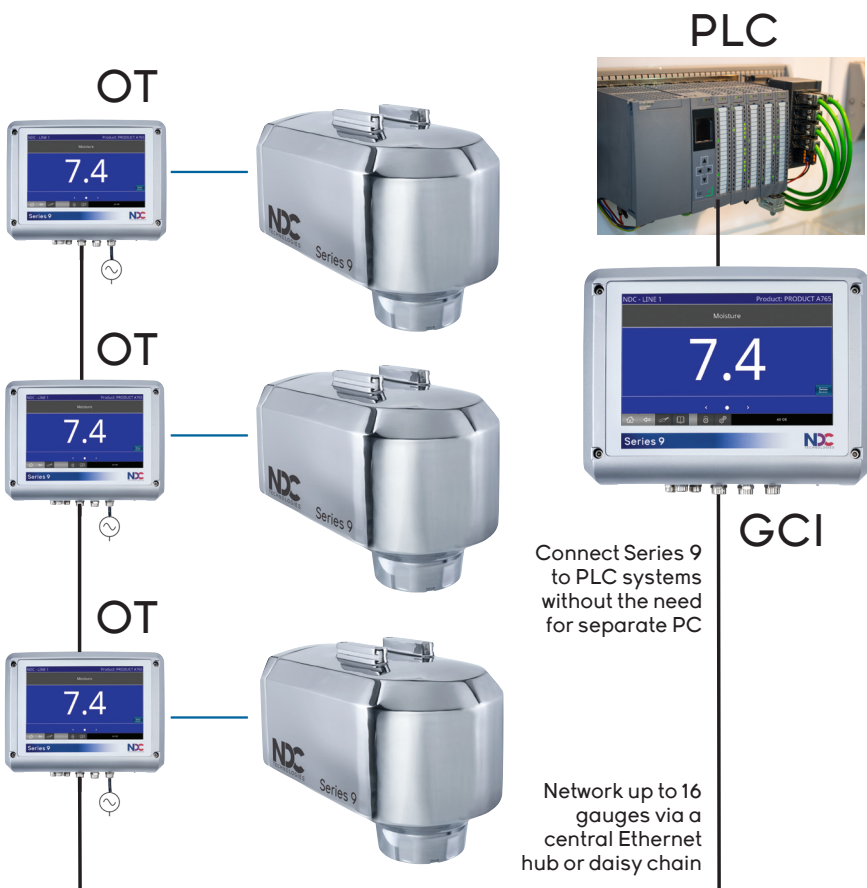
A flexible and scalable in-process gauging system for the snack food industry



Gauge Control Interface (GCI)

Series 9 gauge control interface

- 10-inch, touch-screen GCI
- Three Ethernet ports and RJ45 external port
- Interfaces up to 16 gauges
- Multi-lingual interface



Portable interface

Accessing your Series 9 gauge is even easier with our portable operator terminal. It can be docked in the control room or operated near the gauge (wirelessly or via Ethernet cable) for sampling and configuration.

Series 9 devices

Series 9 peripheral devices all run on 24V DC power and include:

- Operator Terminal
- Gauge Control Interface
- Gauge Control Port
- Power Hub



OT

Operator Terminal

The OT provides 24V DC to a single gauge and operator-level interaction access to its measurement, data trending, sampling and diagnostic functions. Three (3) Ethernet ports are available for convenient networking configurations.

GCI

Gauge Control Interface

The GCI provides 24V DC power to a single gauge. It enables you to perform multi-gauge setup (up to 16 gauges), calibration adjustments and product management. Both the GCI and OT feature high-definition, multi-lingual, color touch-screen displays.

GCP

Gauge Control Port

The GCP provides three (3) Ethernet ports, allowing multiple gauges to be networked (daisy chained). It also has additional options for analog outputs and digital I/O for any connected gauge.

PH

Power Hub

The PH provides 24V DC power to a single gauge. It also enables convenient networked arrangements of multiple Series 9 gauges and devices via three (3) Ethernet ports.

Industry
4.0

Scalable solution to meet your plant configuration

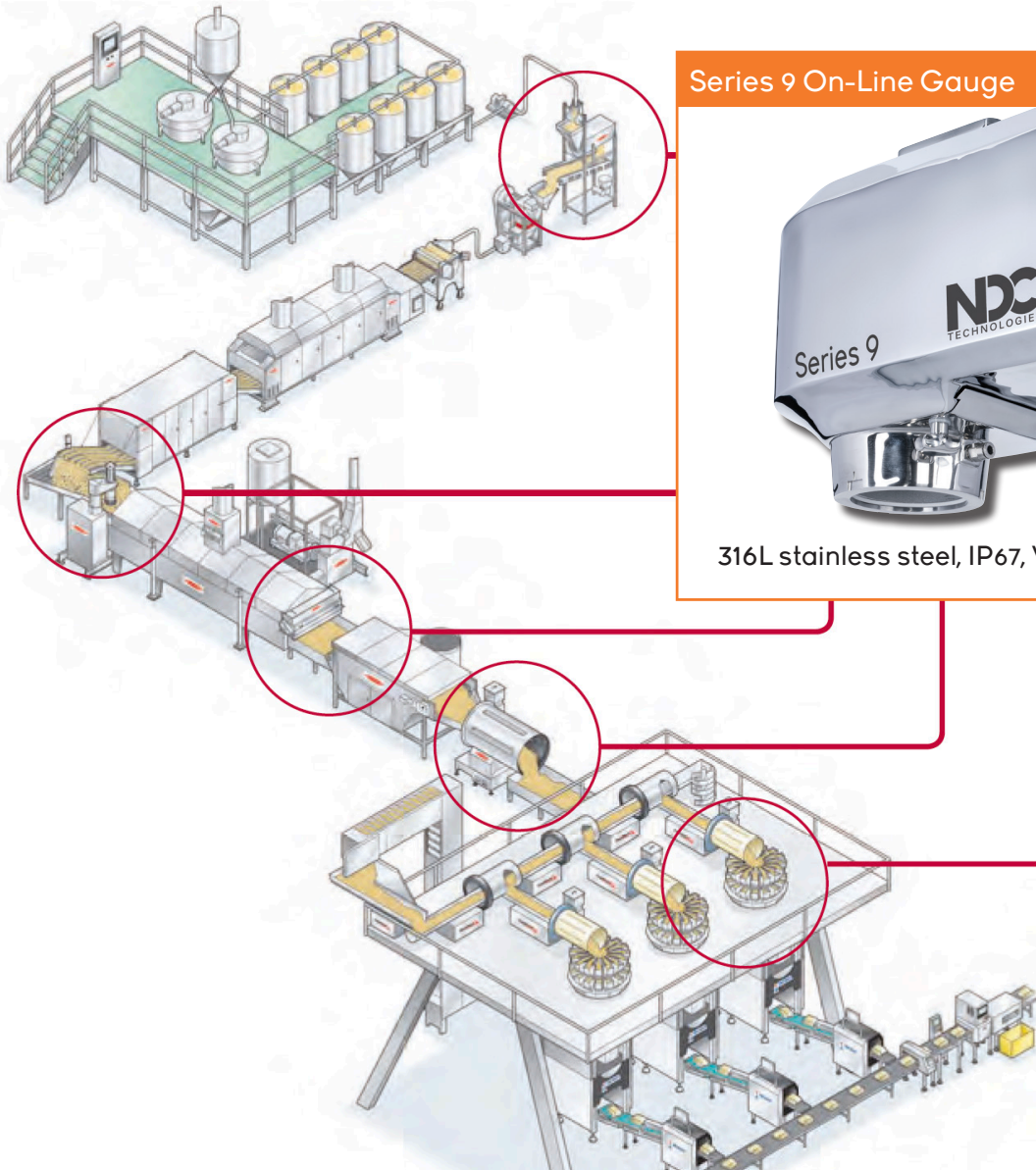
Series 9's flexible building-block architecture enables you to scale Nordson's gauging system to meet current and future site requirements.

- Keep pace with changing demands
- Meet the needs of your plant
- Protect current investment while realizing additional benefits
- Maintain a competitive edge



Fully Engineered to Deliver Accurate, Reliable Measurements

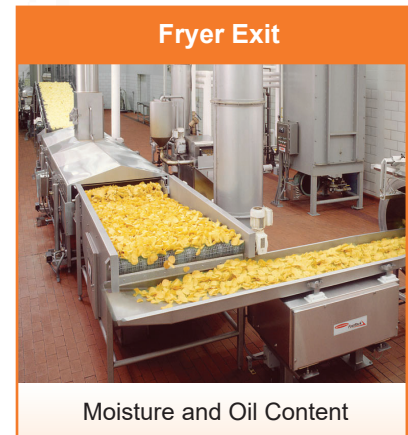
Corn Snacks Processing



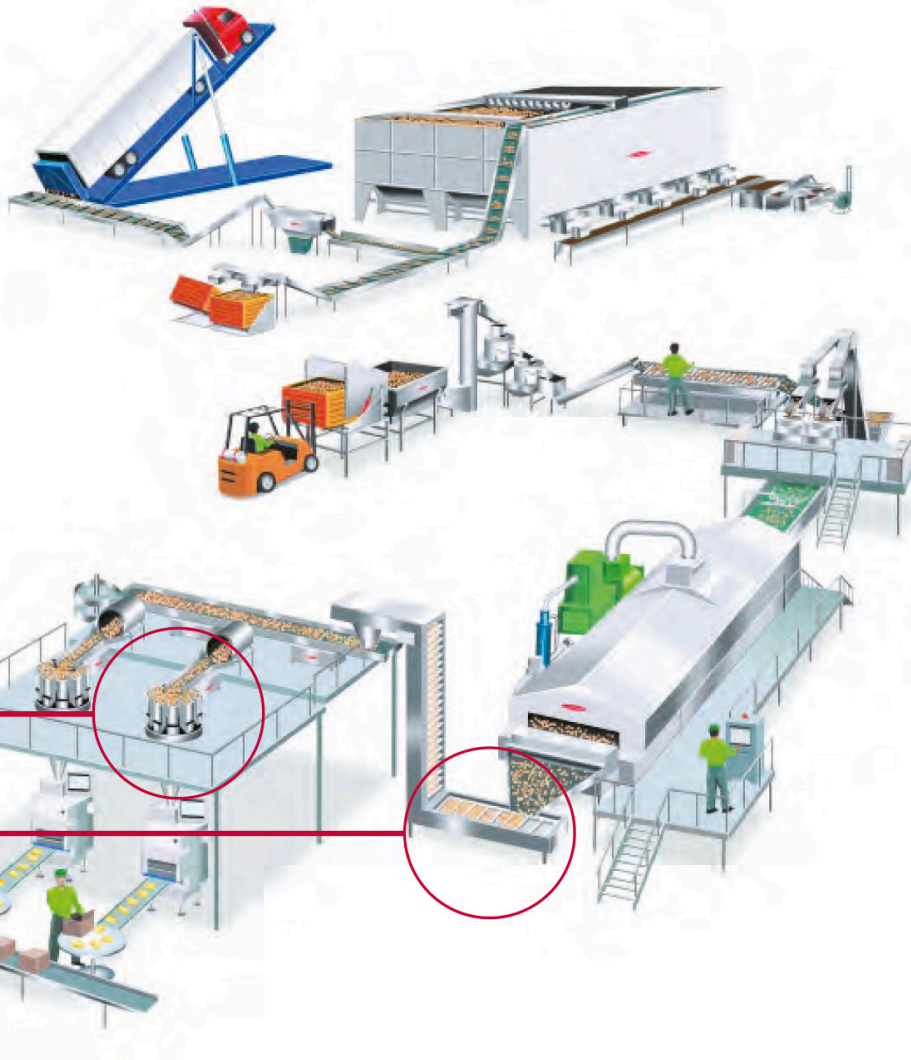
Series 9 On-Line Gauge



316L stainless steel, IP67, Vortec Cooled (optional)



Potato Snacks Processing



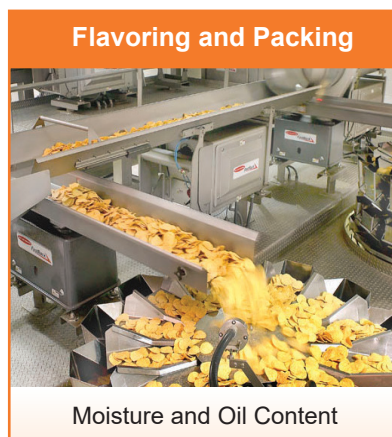
Installation

The Series 9 gauge measures over a 60 mm diameter standard beam patch size. It is suspended over the process line at a distance of 250 mm from the mean product height, and tolerates product height fluctuations of ± 100 mm.

Cooling options

For ambient temperatures above 50°C, these cooling options are available:

- **Vortec air cooling:** with an optional air control solenoid to optimize air consumption and reduced operating cost
- **Water cooling**



The **NEW** InfraLab® Series 9 Snack Food Analyzer

Fast, accurate and easy to operate,
InfraLab is the viable alternative
to laboratory methods

The InfraLab® Series 9 snack food analyzer, designed for both at-line and laboratory use, measures samples taken from the process in less than 5 seconds. Available in single- or multi-component formats, InfraLab is able to simultaneously analyze:

- Moisture
- Fat/Oil
- Degree of Brownness

InfraLab is designed as a routine replacement for loss-on-drying, Karl Fischer or gravimetric moisture testing and to replace chemical methods for fat or protein analysis, such as Soxhlet, Weibull-Stoldt or Kjeldahl.

Once calibrated to your preferred reference methods using the built-in calibration tools, its key advantages are: speed, minimal sample preparation and the fact that it measures a larger, more representative sample than other techniques. InfraLab is accessed via its intuitive, touch-screen interface and requires no special user skills in routine use.



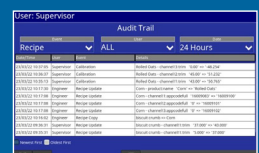
10-inch, high-resolution
capacitive touchscreen display



Use encrypted USB sticks
(BitLocker) for data download to
spreadsheet programs



Reference standard for
routine stability checks and
standardization after servicing



History Audit Log and
On-board data storage (up to
10,000 sample measurements)

The InfraLab Series 9 Advantage:

- Advanced high-accuracy, at-line snack analyzer designed for rapid analyses in process environments
- Direct replacement for time-consuming laboratory analyses or at-line instruments such as loss-on-drying or gravimetric moisture or testing which has inherent operator-dependent repeatability and reproducibility performance issues
- Intuitive to use with user-friendly reporting of measurement values for rapid monitoring of processes
- Reduces the burden on overstretched QA Laboratory resources
- Enables cross-checking of on-line measurements
- Enables greater processing and measurement capability for deeper process insight, creating new and exciting opportunities for application development
- Significantly reduces your operational expenditure and delivers a strong return-on-investment over the lifetime of operation

What's NEW

The InfraLab Series 9 platform processing power enables it to deliver unparalleled capability to snack processors.

- **Fully-Featured**

New, innovative processor allows the InfraLab Series 9 to perform more processing operations and includes embedded calibration tools, a comprehensive user interface with rich feature set of functions.

- **Unrivaled Performance**

Ultra-high-speed measurement outputs capture changes in the process in real-time. The InfraLab Series 9 boasts a faster sampling rate and several filter wheel options for all current and future single- and multi-component measurement opportunities.

- **Intuitive Operation Consistent with Series 9**

The InfraLab Series 9 includes a graphically rich software interface that's displayed on a large 10-inch, high-resolution capacitive touchscreen.

- **Enhanced Secure Data Storage**

In addition to its speed and precision, InfraLab Series 9 benefits from substantial data storage (up to 100,000 sample measurements) and security features.

- **Advanced Diagnostics**

Ready for Industry 4.0, the InfraLab Series 9 provides advanced warning of failures related to power supply voltages, lamp, motor and vibration.

- **Improved Robustness**

The rugged InfraLab Series 9 is fit-for-purpose for a broad range of production environments. The technology has a serviceable lifetime of at least 10 years.

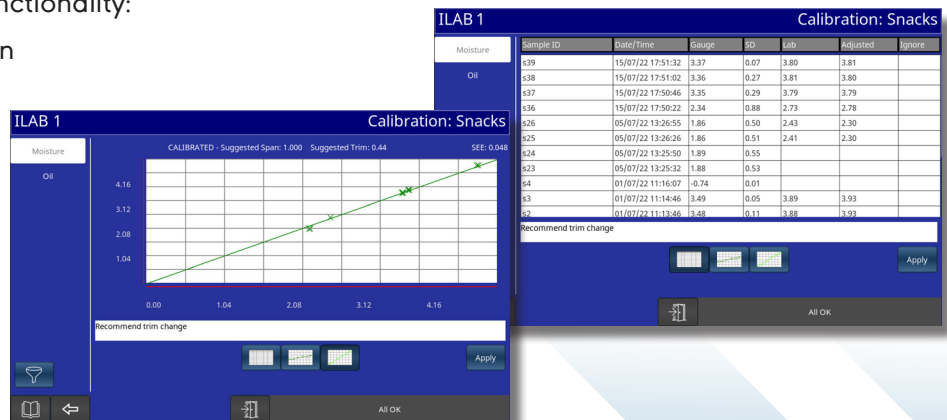
- **Compatibility**

InfraLab Series 9 lamp and motor can also be used in our previous generation models. Sample bowls are also interchangeable. And we guarantee proven measurement equivalence.

Calibration Software

The Series 9 and InfraLab are delivered with our unique factory calibrations that are ready for use for the specified measurements and ranges. On installation, they are adjusted to agree with your reference method. The software simplifies this process by enabling a comparison of instrument values with laboratory results and features the following tools and functionality:

- Instrument setup and calibration
- Product management (product settings)
- Displays of measurement and other key parameters
- Data logging and export
- Diagnostic functions



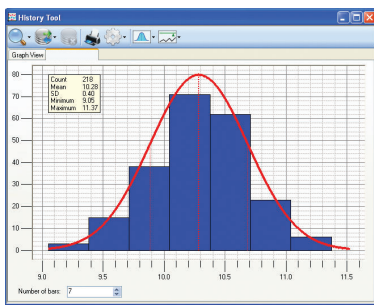
Infralab Manager Software

Network connectivity

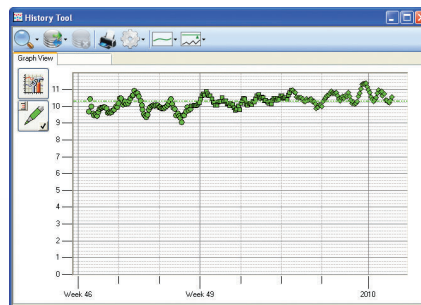
Optional communications interface for sending measurement data over Ethernet for capture and storage in a centralized database.



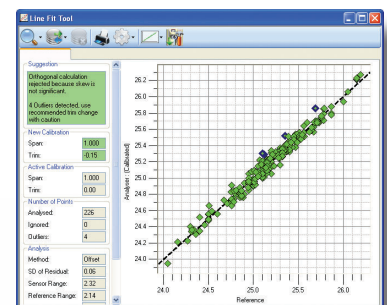
Advanced Data Analysis for Deeper Process Insight



Histogram



Data display



Calibration

With InfraLab Series 9, you realize a greater return on investment by reducing routine sample testing costs.

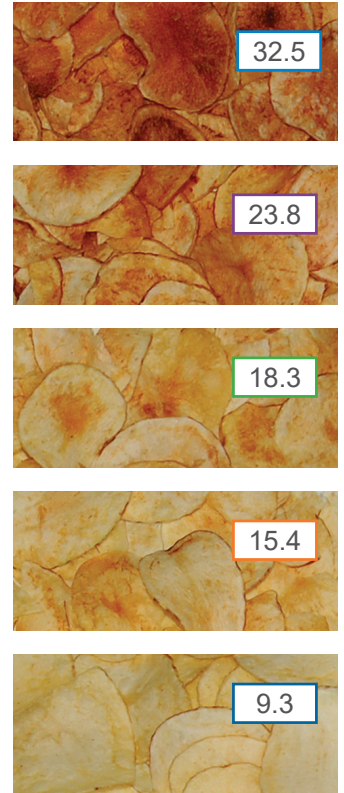
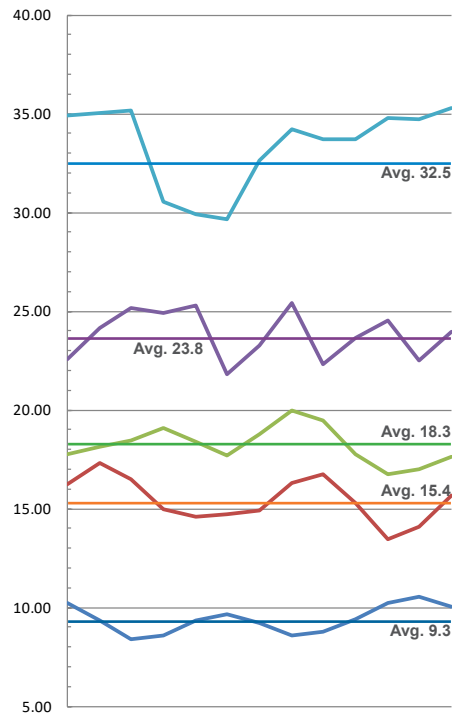


Get Unparalleled Performance in the Following Snack Applications

Potato Chip Brownness

The color of a fried potato product, such as a potato chip or crisp, is a strong indication of whether or not it has been fried to perfection. Being able to monitor the surface brownness while simultaneously measuring the moisture (and/or oil content) delivers not only greater process insight but also data that can be used as part of a control strategy to minimize Acrylamide development.

The Series 9 snack food gauge is available with degree of brownness measurement capabilities as an option on either a moisture gauge or a dual-component moisture and oil gauge. Brownness measurement values are displayed with the other parameters on the GCI or OT screen and can be output in analog or digital format.



Applications	On-Line	At-Line	Moisture	Fat/Oil	Surface Brownness
Corn-based snacks – fried	■	■	✓	✓	✓
Corn-based snacks – baked		■	✓	✓	✓
Potato-based snacks – fried	■	■	✓	✓	✓
Potato-based snacks – baked	■	■	✓	✓	✓
Extruded snacks	■	■	✓	✓	✓
Potato chips/crisps	■	■	✓	✓	✓
Corn chips/tortillas	■	■	✓		
Popcorn	■	■	✓		
Pretzels	■	■	✓		
Puffed corn	■	■	✓		

Optimizing Your Investment with World-Class Service and Support

Nordson Measurement & Control's technical expertise comes from deep experience supporting thousands of products at the world's leading manufacturers. Our portfolio of support offerings leverages this expertise to assist you through the service lifecycle. We offer a complete range of cost-effective support solutions including commissioning, training, technical assistance and service agreements. Customers rely on our 24-7 availability via myNDC – the industry's most progressive service cloud portal. Whether it's configuring new equipment, training your technical staff or solving a technical problem, you can count on our experienced team to help maintain the health and performance of your Nordson product.

Visit myNDC service cloud at myndc.com.



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