

IN-PROCESS / AT-LINE ANALYSIS

Nordson
MEASUREMENT & CONTROL



EMPOWERING
TRUE PROCESS AND
QUALITY CONTROL
TODAY AND BEYOND



A New Era in Gauging for
Food Industry Applications

NDC Products

Intelligence that transforms the world.

Maximizing Process Performance and KPIs

Through the Measurement of Moisture, Fat/Oil, Protein, Browning, Bed Depth and More

For more than 50 years, we have designed and built measurement solutions specifically developed to meet the manufacturing challenges faced by the 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 food gauge and InfraLab e-Series at-line analyzer. Our legacy of innovation continues with the Series 9 gauge and the Infralab Series 9 analyzer.

By solving process-specific application challenges, we play a dominant role in supporting the 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.



Series 9 On-Line
Color Gauge



InfraLab® Series 9
Off-Line Analyzer
See page 12



InfraLab® Series 9
Top-Loader
Off-Line Analyzer
See page 12

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.

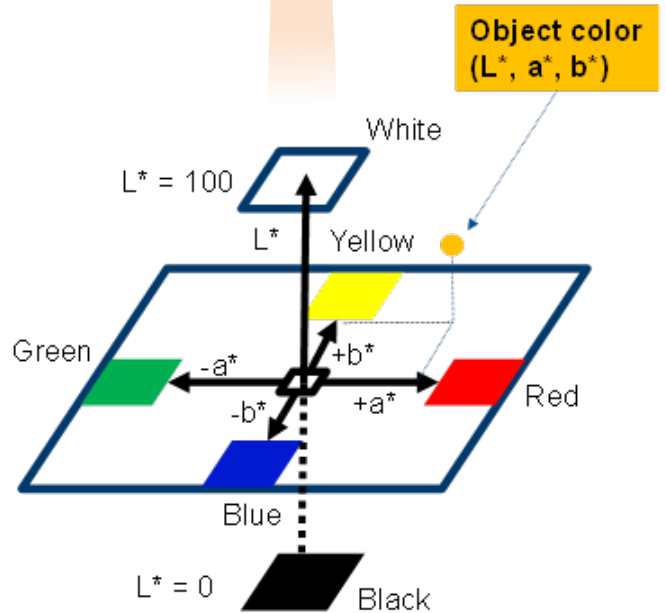
Installed directly on-line, it delivers unparalleled measurement performance while maintaining simplicity and versatility in design and operation. It doesn't require special operator skills or expert knowledge.

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



Improve your Process with Immediate and Long-Term Advantages

We understand your process challenges



Consistent product quality

The food industry faces many challenges as it strives to ensure consistent product quality, strong customer loyalty and maximum production efficiency.

In-process measurement and close control of critical process parameters – such as moisture, fat and protein – present a significant opportunity for food manufacturers to achieve their production and quality goals. However, the complexity and diversity of food products and production methods mean that taking a generic approach to process measurement cannot work.



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

Requirements differ at various stages of the process, such as preparing of ingredients, mixing, forming, wetting, drying, baking/frying, flavoring, sorting and weighing. That's why applications engineering is at the heart of every Nordson solution.

At each stage in the process, the product may appear in a different form – e.g., powder, slurry, dough, flake, granule or final product – and the product may be transported on an open conveyor belt or enclosed duct at the point of measurement. Product flow may be either continuous or discontinuous, while ambient process conditions such as temperature and humidity may vary. In addition, the product itself may be prone to seasonal changes, crop differences and variations in raw material supply.



We understand your process challenges

Nordson understands these critical factors. 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 Series 9 analyzer take you one step further towards maximizing the performance potential of your process. As a result, you'll realize the following benefits:

- Enhanced product quality and consistency
- Reduced waste
- Development of best practices and safety
- Increased process productivity
- Continued brand loyalty



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

- Coffee processing – moisture, degree of roast
- Confectionery – fat, moisture, color
- Cookies and biscuits – fat, moisture, degree of bake
- Dairy powders – moisture, fat, protein
- Meat processing – moisture, fat, protein
- Savory snacks – moisture, fat, degree of bake
- Starch and wet milling – moisture, fat, protein

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 Nordson 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 airflow 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

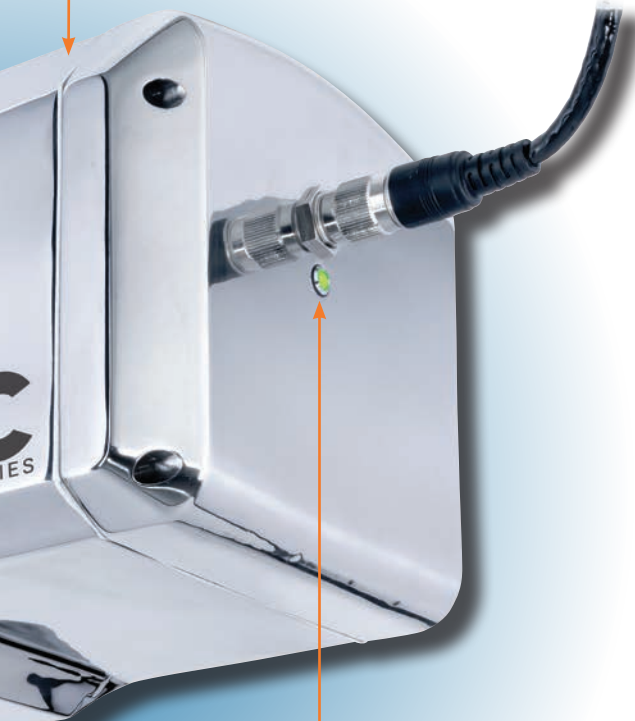
- Ethernet and fieldbus networking with digital and analog connectivity

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

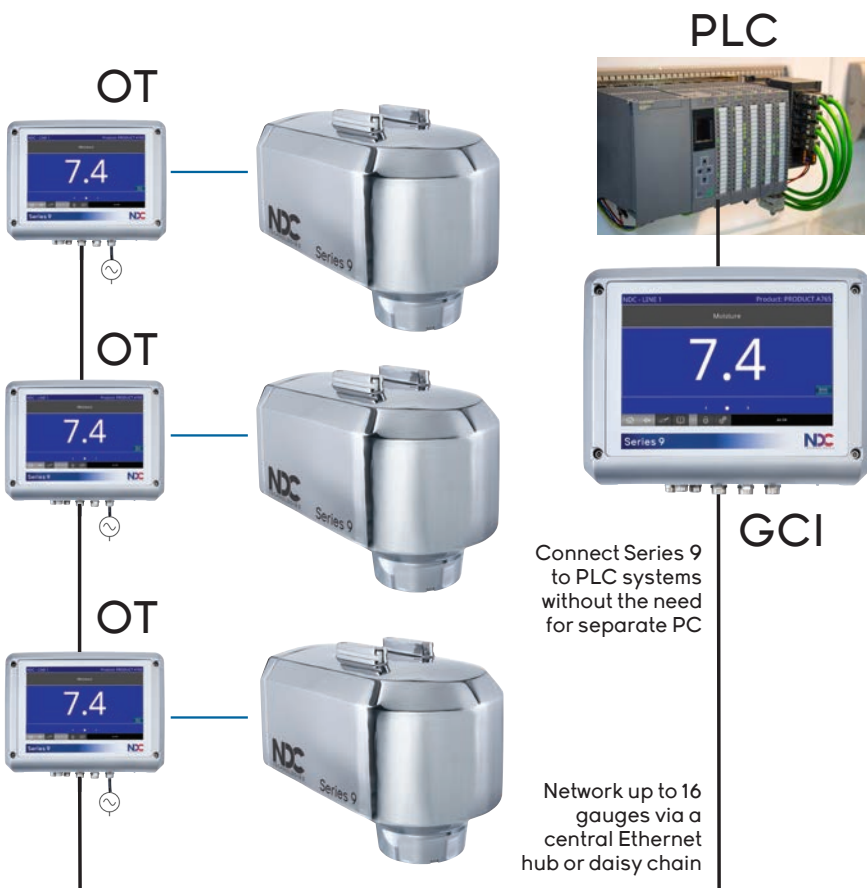
A flexible and scalable in-process gauging system for the food industry



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

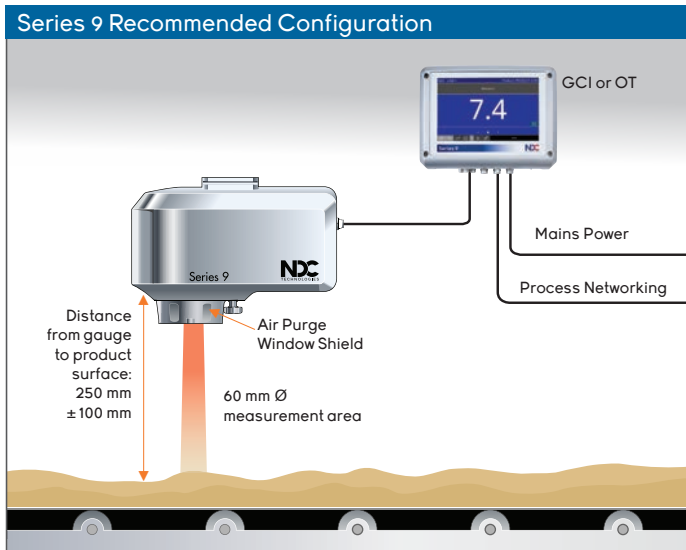
Series 9's flexible building-block architecture enables you to scale Nordson's gauging system to meet current and future site requirements.

- 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

In continuous product flows...

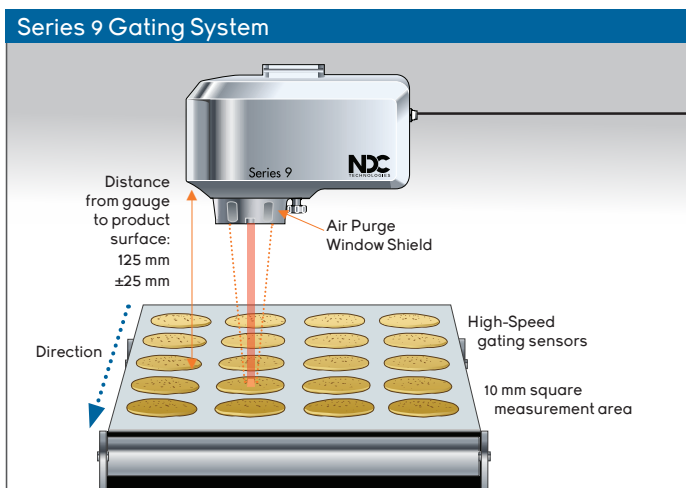


Installation

The Series 9 measures over a 60 mm diameter area (optionally 25 mm or 10 mm) and is suspended over the process line at a distance of 250 mm from the mean product height to the Series 9 measurement window.

The gauge tolerates product height fluctuations of ± 100 mm without the measurement being affected.

Ambient lighting, temperature or relative humidity changes do not affect the Series 9 measurement.



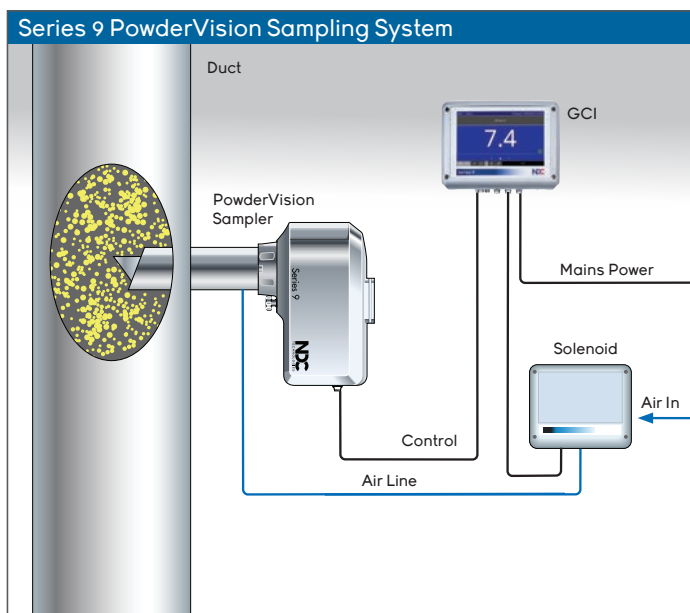
Discontinuous product flows

The optional integrated "high-speed gating" system detects the product's presence or absence in discontinuous flows and avoids recording data when nothing is passing across the measurement area.

High-speed gating can be used for products, such as cookies, biscuits or crackers as shown here, or for processes which simply do not flow continuously.

Beam patch sizes of 60 mm or 10 mm are available.

Used with a PowderVision sampler in gravity-fed product flows



Measuring powders in gravity-fed ducts

The pneumatic PowderVision sampler can be used with the Series 9 gauge for powders transported in enclosed ducts.

This device comprises of a tube fitting with window and a sample collection cup which fills with the falling product. Once a sample has been collected and measured, a jet of air ejects it and the cycle repeats.

Additional technical information sources

For additional technical information about installation, calibration, networking and process connectivity, and to learn more about the Series 9 gauge generally, please consult the product manuals.

Ready for any process condition

The Series 9's stainless-steel hygienic housing is sealed to IP67 requirements and optionally ATEX certified. Its seamless hygienic design is a must for food industry applications and allows operation in ambient temperatures from 0-50°C without cooling.

For higher ambient temperatures, cooling options using a novel heat exchanger arrangement are available:

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



TEMPERATURE



DUST



AMBIENT LIGHT



HUMIDITY

InfraLab® Family of Analyzers

Fast, Accurate & Easy to Operate – Viable Alternative to Laboratory Methods

InfraLab® Series 9

Proven. Cost Effective. Accurate.

The InfraLab® Series 9 food analyzer, designed for both at-line and lab 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 and Oil
- Protein
- Degree of Brownness (fried or baked products)

InfraLab is ideal for bulk products such as snack foods and whole irregular products like breakfast cereals.

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 adjusted 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.



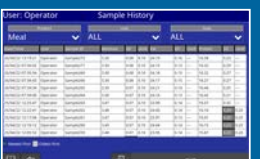
10-inch, high-resolution capacitive touchscreen display



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)

InfraLab Family Advantages:

- Advanced high-accuracy, at-line food 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 user interface that is consistent across the entire product range including integrated calibration adjustment tools to ensure continuity of performance with no loss of data
- Reduces the burden on over-stretched 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

NEW InfraLab® Series 9 Top-Loader

Repeatable & Reproducible Results Every Time.

The InfraLab Series 9 Top-Loader analyzer, is Ideal for powders, ground products, beans, grains, semi solid and sheet products.

Measurement time in less than 5 seconds including simultaneous color (CIELAB) measurements.

Available in single- or multi-component formats, InfraLab is able to simultaneously analyze:

- Moisture
- Fat and Oil
- Protein
- Color (CIELAB, XYZ) including Degree of Roast in Coffee



Fast ROI with Lowest OPEX

Example Applications:

- Bakery
- Breakfast cereals
- Cheese processing
- Coffee
- Cocoa bean processing
- Confectionary
- Dairy products
- Ingredients
- Rice & Noodles
- Pharmaceuticals
- Starch processing
- Sugar processing

User: Supervisor

Audit Trail

Event	User	Date	
Recipe	ALL	24 Hours	
Date/Time	User	Event	Details
23/03/22 10:37:05	Supervisor	Calibration	Rolled Oats - channel13.trim '0.00' => '-48.254'
23/03/22 10:36:37	Supervisor	Calibration	Rolled Oats - channel12.trim '45.00' => '51.232'
23/03/22 10:35:13	Supervisor	Calibration	Rolled Oats - channel11.trim '43.00' => '50.765'
23/03/22 10:17:30	Engineer	Recipe Update	Corn - product.name 'Corn' => 'Rolled Oats'
23/03/22 10:17:08	Engineer	Recipe Update	Corn - channel11.appcodefull '16009083' => '16009100'
23/03/22 10:17:08	Engineer	Recipe Update	Corn - channel12.appcodefull '0' => '16009101'
23/03/22 10:17:08	Engineer	Recipe Update	Corn - channel13.appcodefull '0' => '16009102'
23/03/22 10:16:02	Engineer	Recipe Copy	biscuit crumb => Corn
23/03/22 09:36:31	Supervisor	Recipe Update	biscuit crumb - channel1.trim '37.000' => '43.000'
23/03/22 09:35:31	Supervisor	Recipe Update	biscuit crumb - channel1.trim '5.000' => '37.000'

Newest First
 Oldest First

All OK

Full Audit Trail for GMP and Audits Reviews

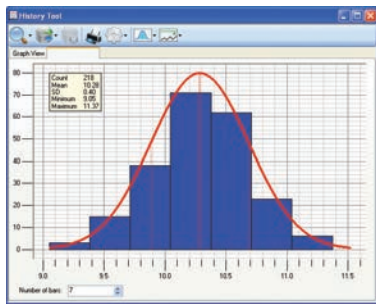
Infralab Manager & Calibration Software

Network connectivity

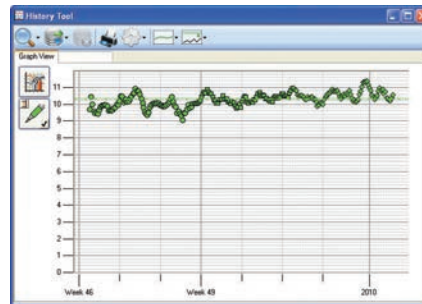
Optional communications interface for sending measurement data over Ethernet for capture and storage in a centralized database.



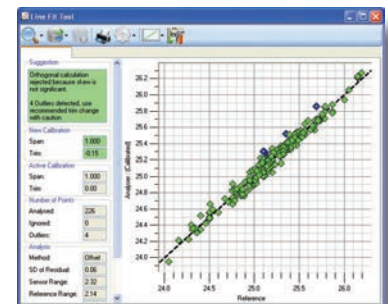
Advanced Data Analysis for Deeper Process Insight



Histogram



Data display



Calibration

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

Integrated Calibration Tools

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



Intelligence that transforms the world.

Get Unparalleled Performance in the Following Food Applications

Applications	On-Line	At-Line	Moisture	Fat/Oil	Protein	DOB	Color	Application areas
Breakfast Cereals	■	■	✓				✓	breakfast cereal - corn, wheat or rice based
Cheese Processing		■	✓	✓	✓		✓	cottage cheese, cream cheese, mozzarella, hard and semi-hard cheeses
Chocolate Making	■	■	✓	✓			✓	cocoa beans, cocoa liquor, cocoa powder, drinking chocolate, molten chocolate, crumb
Coffee and Tea Processing*	■	■	✓				✓	green beans, ground roast coffee, instant coffee, instant tea, finished tea leaf
Confectionery	■	■	✓					sugar coatings, molding starch, fondant cream
Cookies and Biscuits	■	■	✓			✓	✓	cookies - wire cut, biscuits
Corn and Maize Wet Milling	■	■	✓	✓	✓	✓	✓	starch, modified starch, sweeteners, gluten, germ, maize fiber
Crackers and Crispbreads	■	■	✓				✓	sweet or savory crackers, Scandinavian crispbreads
Dairy Powders	■	■	✓	✓	✓		✓	casein, lactose, milk powder, infant formulae, non-dairy creamer
Flour and Grains	■	■	✓	✓	✓		✓	rice, wheat flour (white or wholemeal), soya flour, oat flakes, whole wheat or barley, wheat gluten
Ingredients, Seeds, Nuts and Spices	■	■	✓	✓			✓	sunflower seeds or meal, shea nuts, sesame seeds, spices, yeast, nuts palm fiber
Meat Further Processing**		■	✓	✓	✓			ground beef, pork, lamb, poultry, meat cuts, mechanically reclaimed meat products
Olive Oil Extraction	■	■	✓	✓				olive pomace or "orujo" during virgin oil and standard oil extraction processes
Animal Feed	■	■	✓		✓		✓	pellets, dry feeds, alfalfa, Lucerne, distiller's grains, spent grains, bagasse, brewery waste
Potato Chips and Crisps	■	■	✓	✓		✓		fried potato chips or crisps, baked potato chips or crisps, hand-cooked chips
Snack Products, Baked or Fried	■	■	✓	✓		✓	✓	corn chips, tortilla chips, corn dough, puffed corn snacks, popcorn, pretzels
Starch	■	■	✓				✓	corn starch, potato starch, wheat starch
Sugar Processing and Refining	■	■	✓				✓	granulated sugar, caster sugar, brown sugar, sugar cubes

*Includes Degree of Roast measurements.

** InfraLab Series 9 can be supplied as Fat only, Fat, moisture & Protein OR Fat, Moisture, Protein and collagen. Units can be upgraded at a later date.

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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