FOSS

Infratec™ NOVA
Grain Analyzer for grain and flour

Infratec™ NOVA is the 'best-in-class' whole grain analyzer using globally recognized near-infared transmittance technology to simultaneously test multiple parameters (moisture, protein, oil, starch, etc.) in a broad range of grain and oilseed commodities. Offering unparalleled levels of speed and usability, Infratec NOVA can test grain at rates up to 20% faster than other NIR solutions. True networking and identical instruments reduce instrument management work required for consistent test results throughout grain receival networks. There are optional modules for flour analysis, test weight and flexible sample handling.

Sample	Parameters
Grains, oilseeds and beans and pulses – they can all be tested quickly, easily and accurately for payment and segregation. Most grains or oilseeds can be analyzed directly without any grinding or sample preparation	Moisture, protein, oil, test weight and many more

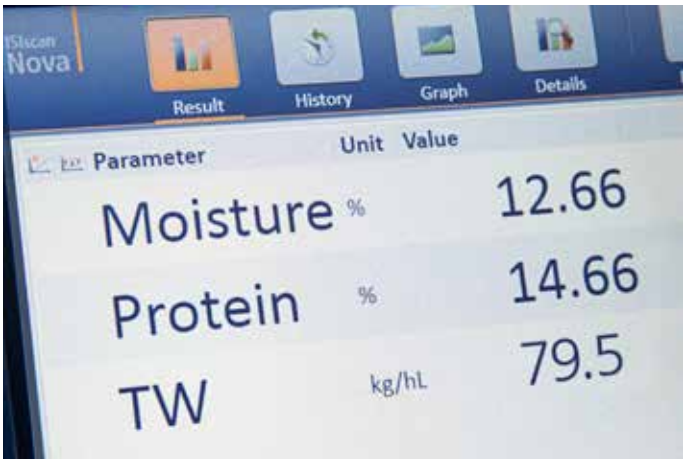
The easiest solution for reliable grain testing

If you need to determine the value of grains and oilseeds you need to know that quality in the fastest and most reliable way possible.

One way Infratec™ NOVA does this is by minimizing operator training requirements during the busy harvest season and reducing the risk of operator error.

A tablet-like screen mounted on the instrument offers intuitive touch-screen interaction. The ease of operation is further supported by FOSS' purpose-built ISIscan NOVA Touch operator software. This is ideal, for example, for getting temporary staff up to speed and operational quickly. The sample area is smooth and uncluttered for easy cleaning compared to other Infratec models.

The Infratec NOVA is 30% smaller and lighter than the previous model Infratec 1241. It is more transportable and does not take up much bench space.



Infratec accuracy up to 20% faster

Offering unparalleled levels of speed and usability, Infratec NOVA can test grain at rates up to 20% faster than other NIR solutions. Using FOSS Dynamic Sub-sampling™ technology, the instrument can recognize a normal sample and handle it more quickly, whereas unusual samples are given more sub-sampling for greater confidence.

Infratec measurements are based on the highly stable and unrivalled FOSS ANN global grain calibration including over 50,000 sample data and offering unbeatable consistency even during difficult harvests. The broadest wavelength range in its class gives many options for new parameters.

The Infratec NOVA is fully backwards-compatible, allowing cost-free calibration transfer from earlier Infratec versions.

True networking and identical instruments reduce management work

Superior product design and strict manufacturing tolerances ensure every Infratec NOVA instrument is identical from the factory. You can expect a maximum 0.1% variation for measurement of protein in wheat. This can reduce the instrument standardization work sometimes associated with managing a population of instruments.

The true networking capability keeps down the cost of calibration maintenance across multiple instruments and ensures that all measurements are consistent throughout the network. Networking capability can sometimes mean little more than a connection to the internet or remote desktop support as you might do on your home PC. In contrast, Infratec NOVA provides true networking allowing calibration updates to be made in one go from a desktop. In addition, experts working remotely can look inside units to monitor performance.

Instant payback

Just plug in the instrument to your power supply and you are up and running, ensuring a fast return on investment. No experience is needed. Behind each instrument there is a proven ANN calibration that performs unaffected by sample temperature changes, ensuring accurate results from the very first analysis. Simple, out-of-the-box installation and the stability of the instrument over time minimises operational concerns.

Single calibration covers multiple samples and parameters

The huge Infratec calibration database consists of over 50,000 cross checked samples collected from over 20 years of harvests. This gives a level of accuracy and stability that enables Infratec to analyze even the most unusual samples. New Infratec models are backwards-compatible with the older calibration databases. In this way, databases are continuously expanded and today the largest ones contain more than 50,000 samples.

Expand capabilities with additional modules

The Infratec NOVA is part of a modular system that includes a Flour module, a Test Weight module and a Sample Transport module to test small samples, wet samples and even liquids.

Infratec grain networks – consistent quality across regions and continents

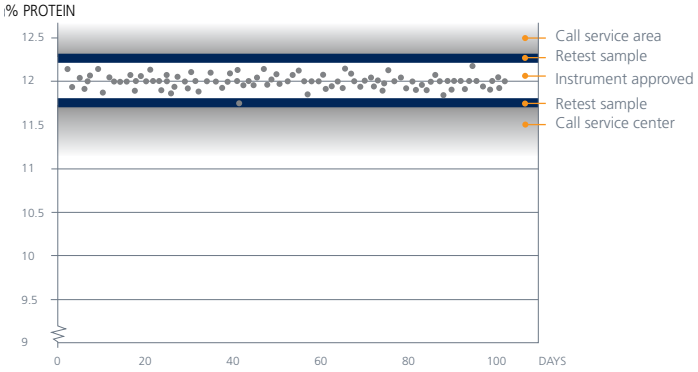
Payment analysis must deliver unquestionable reliability and uniformity, regardless of location and operating conditions. It's a requirement that networked Infratec instruments have effectively addressed this by giving identical measurements, wherever they are located.

Infratec networks have been recognized by both commercial and governmental authorities from the introduction of the first network in 1991, and today more than 7,000 Infratec instruments are linked in global networks.

Long term instrument and calibration stability

Infratec gives accurate results over many years of use.

Other analyzers need frequent re-adjustments in order to keep their accuracy level. Not so with the Infratec NOVA. At the heart of the analyzer is a stabilising technique patented by FOSS, that ensures that calibrations are transferable between instruments. This ensures that Infratec delivers unquestionable accuracy over years of use with an absolute minimum of re-adjustment, regardless of location and operating conditions.



Proven instrument stability during 100 days of operation, with no adjustments made.

Grain receiving stations:

Wheat, durum wheat, barley, corn, malt, green malt, oats, rye, triticale, sorghum/milo, rough rice, brown rice, milled rice, lentils, faba beans, chick peas, green peas, lupines, etc.

Flour Milling:

Wheat flour, semolina, soy meal, ground wheat, middles, rice meal and corn meal.

Oilseed Crushing:

Soybean, rapeseed/canola and ground sunflower.

Plant Breeders/Seed Companies:

Small samples of seeds, tissue analysis, color, etc.

Malting and Biofuel:

Barley, malt, green malt, DDGs.

Other industries; brewing, baking, pasta and starch extraction:

Beer, whiskey, spirits, wort, cooked rice, pasta, etc.

Technology

The power of Infratec NOVA NIT

Near Infrared measurements of grain have shown superior performance when measuring in transmittance mode instead of reflectance mode. Transmittance mode measurements are made in a lower wavelength range, 400 – 1050 nm, whereas the primary information for reflectance measurements is obtained between 1100 – 2500 nm. The higher energy level of the light in the lower range allows for deeper penetration into the kernels, so not only the surface but also the inner part of the kernel is measured. All of this allows a larger sample volume when transmittance is used, thereby giving a superior representation of the sample analyzed.

Advantages include:

- Larger sample volume
- Measurement of entire kernel, not just the surface
- Modulation of NIR signal
- Deeper penetration
- Low influence of particle size

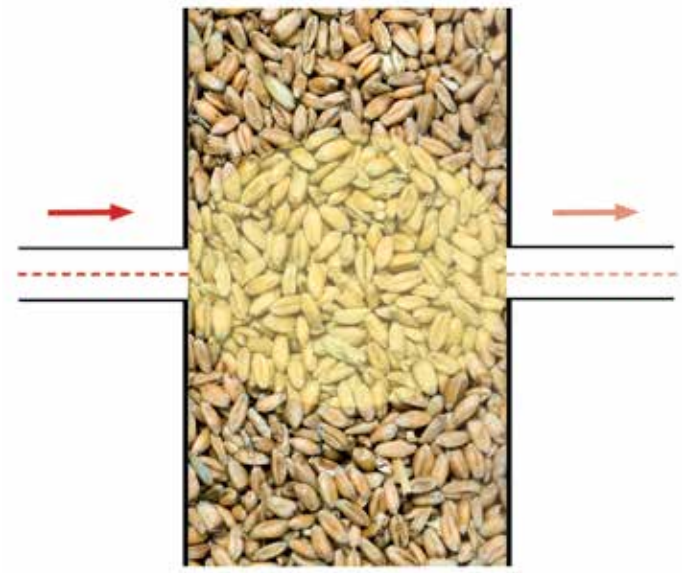
Touch screen operation

An tablet-like screen is mounted on the instrument, bringing the obvious benefits of touch screen operation to grain receival. The screen can be tilted for optimal viewing and to facilitate easy data input in the onscreen keyboard.

Dynamic Sub-sampling™ for faster throughput of normal samples

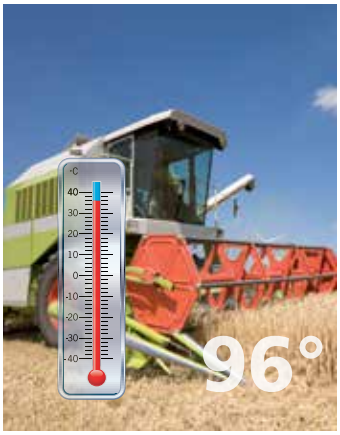
It is often said that sampling is the most critical part of any analysis and the sampling that occurs inside the instrument is as important as the sampling before analysis.

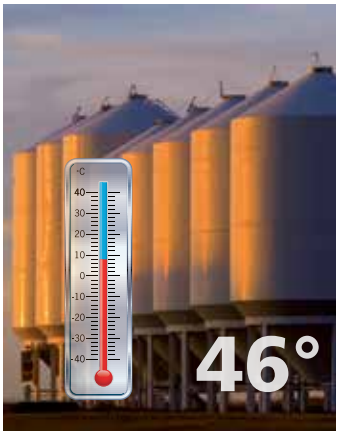
Built on 30 years of experience of producing whole grain Near-infrared Transmittance analyzers, the Infratec™ NOVA uses a unique conveyor belt sample delivery system enhanced and updated based on previous versions.



Every sub-sample is presented in the same way. In contrast, other solutions relying on gravity suffer from different compaction of each subsample which affects the information gathered.

Careful attention to sub-sampling also allows Infratec NOVA to use innovative and intelligent sub-sampling techniques. By conducting statistical analysis of sub-sample data throughout the analysis, Infratec NOVA can determine if the sample is common and homogeneous enough to cease further sampling while still presenting highly accurate results, thus saving vital seconds during the busy harvest period. Conversely, if the sample is variable or a less common type, it can continue to conduct full sub-sampling and take the time needed to give the right result.





Measurement procedure

Analyzing different sample types is easy – just select the type and continue to run. The instrument automatically takes care of all the settings required for correct results.

ANN calibrations

The introduction of ANN (Artificial Neural Network) calibration technology has revolutionized grain testing by delivering simplicity of use in combination with unsurpassed accuracy. FOSS global ANN calibration models are used today by all major grain producing countries. The largest FOSS ANN model contains over 50,000 reference data sets, giving stable, transferable calibrations and accurate analytical results. Applications (ANN and PLS) are available covering a wide range of commodities and parameters.

Stabilizing technique

Regardless of conditions you can plug the Infratec NOVA unit in, turn it on and after a short self test you'll be producing accurate results. The accuracy is unaffected by sample and ambient temperature changes. Thanks to a stabilizing technique that was patented by FOSS, you get correct results under all conditions.

Transferability from instrument to instrument

Infratec NOVA delivers true transferability between instruments. All instruments are supplied with accuracy within ± 0.1% Protein from the master instrument. Over years of use, more than 90% of the instruments remain within these limits without the need for yearly adjustment. This secures correct grading of the grain at all times and keeps support costs at a minimum.

Optional modules

- Test Weight Module for measurement of volume weight
- Sample Transport Module for liquids, moist samples and small sample volumes
- Flour Module for measuring on flour, semolina, soy meal and other ground samples

The **Test Weight Module** allows rapid and accurate volume weight determination of the grain. Test weight is a widely recognized specification in grain grading because it is related to the degree of quality, and is often used as an index of milling potential. Moisture content, climate conditions, kernel size, density and packing factors affect test weight. The volume weight can also be used as a silo management tool to optimize the storage space in the silo.

The **Flour Module** allows the flour mill to obtain critical information about the wheat blending process and milling with a simple and rapid analysis of the flour. Just fill up the cup with flour and place it into the hopper, in less than a minute your will get Moisture, Protein, Wet Gluten, Water Absorption and Ash results. This information provides you with full knowledge required to take an early action if needed. In the Oilseed crushing industry, the flour module will help ensure that your extraction process is within target, by analyzing finished soy meal.

With the **Sample Transport Module** you can measure products such as high moisture green malt, plant tissue, sunflower meal, spirits and beer, from a sample in some cases as small as one ear of grain - without destroying the sample.

Standalone or networked

The Infratec NOVA can be used as a stand-alone or as a networked unit via MOSAIC software. Transfer of data between instrument and LIMS systems as well as remote control of the unit is facilitated by the instrument software.

An Infratec network consists of a group of standardized instruments controlled from a Network Administration Centre ensuring that all units will give the same performance independent of operator or location. The master instrument is also used to monitor the accuracy of the calibrations. The entire network can quickly be updated or upgraded with new calibrations from the centre.

MOSAIC remote Software

MOSAIC is the latest in intelligent remote support. The MOSAIC concept is based on centralized configuration, support and surveillance. All you need to do is run your samples and leave the rest to FOSS or your own central team of specialists.

Completely independent Mosaic networks can also be set up and managed by customers wanting to take advantage of the Mosaic software without the added services from FOSS. It eliminates complexity at instrument level and allows a specialist to monitor and manage remote instruments. Automated surveillance alerts and new reporting options ensure that each part of the analysis process is monitored, managed and optimized at a level of detail and accuracy not previously possible.

Identical instruments

For grain analysis, particularly for grower payment it is essential that instrument units all read the same, especially in a local area, but also around the world. This is a concept referred to as transferability - the ability to get the same result with the same sample on a number of instruments. Acceptable levels of transferability can be achieved in a number of ways with regular standardization being common. These techniques remain important, but it makes sense to reduce reliance on standardization by ensuring that all instruments are designed and manufactured to be identical from the factory. Advances in design and manufacturing have resulted in the Infratec NOVA with which you can expect, for example, that all instruments will measure to within 0.1% of each other (for protein on wheat).

Secure your investment with a FossCare™ Support Agreement

Let FOSS take care of you for a maximum return on your analytical investment. Get a four year warranty as part of the new FossCare Premium Preventive Maintenance Agreement or two years as part of any other FossCare agreement. In addition to the peace of mind afforded by the warranty period, the continual preventive maintenance pays off by keeping your analytical instruments working perfectly every day, year after year.

Why preventive maintenance?

As with any analytical solution, it is essential that your FOSS instrument receives regular maintenance to ensure optimal performance and extended lifetime. Avoiding expensive downtime is a matter of following factory standards and preventively replacing parts before they wear out. In turn, this helps ensure reliable and consistent results at the highest level.

Preventive and predictive maintenance combined with global support from 300 dedicated service, application, software and calibration specialists keeps your instrument running perfectly all year round.

Benefits of a FossCare™ Support Agreement:

- Extended Warranty (two or four years depending on the chosen agreement)
- Regular maintenance; the instrument is diagnosed, cleaned, adjusted, tested, fine tuned and recalibrated
- Minimal downtime from replacing components before they are worn out
- Consistent, accurate and reliable results you can always trust
- Preventative maintenance visits when it suits you (your business)
- 24/7 phone support - no need to worry about closing hours or PO
- Low, fixed service budget prevents unexpected expenses
- Discounts on additional services, spares, training and software upgrades

Contact your local Foss office for more information.

Specifications

Feature	Specification
Dimensions (W x D x H)	16.1 x 18.1 x 16.3 inches
Weight	63 lbs (68 lbs with Test Weight Module)
Voltage	220-240V 50-60Hz or 110-120V
Rated current	1.0A (110-120V) / 0.5A (220-240V)
Spectrometer	Scanning monochrometer
Wavelength range	400 - 1100 nm
Detector	Silicon
Optical bandwidth	7 nm
Number of data points/scan	1404
Mode	Transmittance
Light source	Tungsten halogen lamp
Detector	Silicon
Interface	Ethernet, 3 x USB (full function) including one on the instrument front for easy access
Display	10 inch Capacitive Touch Screen

Sample handling and result presentation	
Analysis time	Less than 60 seconds for 10 sub-samples including test weight analysis and as little as 40 seconds when Dynamic sub-sampling enabled
Path length	Variable cell automatically controlled from 6 - 33 mm
Result report	Presented on the display as default. Can be sent to PC/LIMS and the printer port
Outlier function	Warnings and options for the presentation of the result
Software	Menu driven with touch screen interface
Regression programs	ANN (Artificial Neural Network); PLS (Partial Least Squares)
No. of sub-samples	Between 1 and 30 sub-samples (10 sub-samples standard)

PATENTED METHOD - US PATENTS; US 4,944,589 AND EUROPEAN PATENTS; EP 0 320 477 B1, 8704886-4.

THE EASIEST SOLUTION FOR RELIABLE GRAIN TESTING

- Reduce training and avoid operator error with intuitive user touch screen and software
- Improved sample handling makes cleaning quick and easy
- 30% smaller and lighter, it is transportable and takes up less bench space

INFRATEC ACCURACY UP TO 20% FASTER

- Intelligent handling of sub samples reduces analysis time by up to 20% without loss of accuracy
- 4th generation monochromator with extended wavelength range gives broader options for new parameters and cost-free calibration transfer from earlier versions
- ISO IP54 approval for uptime and minimal maintenance

THE ONLY TRULY NETWORKED GRAIN Analyzer

- True networking and calibration support reduces cost of calibration maintenance
- Global Infratec community of 11,000 Infratec units worldwide avoids claims because others are working from the same data
- The unique ANN calibration based on 30 years of harvest data gives you unbeatable consistency in analysis results even during difficult harvests

FOSS

FOSS
8091 Wallace Road
Eden Prairie, MN 55344

Tel.: +1 800 547 6275
Fax: +1 952 974 9892

info@fossna.com
www.foss.us

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