FOSS

Infratec 1241
Grain Analyser for grain and flour

The Infratec™ 1241 is a whole grain analyser using near-infared transmittance technology to test multiple parameters (moisture, protein, oil, starch etc) in a broad range of grain and oilseed commodities. Rapid, reliable and easy to use, it is the official system used for payment by bulk grain handlers around the world and has a number of approvals for trade purposes. Renowned instrument performance coupled with a unique calibration based a vast amount of data make it a highly versatile and powerful analysis unit. 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 analysed directly without any grinding or sample preparation	Moisture, protein, oil, test weight and many more

Dedicated Analytical Solutions




Unrivalled accuracy and simplicity for any type of business

The principle behind the Infratec is that it should be simple for any business to take advantage of rapid reliable NIT analysis – a goal achieved with the ready-to-use ANN calibrations, simplicity of use and availability of qualified local support staff. The seamless transferability between units also makes it simple to establish a network of instruments for optimal quality assurance. In summary, Infratec stands for:

- Rapid, easy whole grain analysis with no sample preparation
- Accurate analysis under a variety of conditions
- Transferability of calibrations and networking potential

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, starch extraction:

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

Fast and Flexible

Virtually anyone can make accurate measurements with Infratec™ 1241. Pour the sample into the hopper, press the analyse key and read the result in less than a minute. It is easy to switch between small and large kernels, for example, from rapeseed to barley. Infratec is self-adjusting according to the selected commodity type.

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.

Unaffected by temperature

Grain analysis takes place during widely varying conditions, from hot summer days during harvest to cold winter deliveries. With Infratec's patented stabilising technique, you get correct results whatever the weather, for instance, protein is predictable to within 0.1%, and it can be measured in temperatures ranging from -4 to +40 C.

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 analyse 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 50000 samples.

Expand capabilities with additional modules

The Infratec™ 1241 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 liquids.

Officially approved

Infratec™ is officially approved and established worldwide as a standard for determining Protein, Moisture, Oil and Starch in wheat, barley and other grains and oilseeds.
FOSS is the leading supplier of NIR/NIT analysis technology with acceptance and approvals from a wide range of commercial and governmental authorities.

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 by giving identical measurements, wherever they are located.

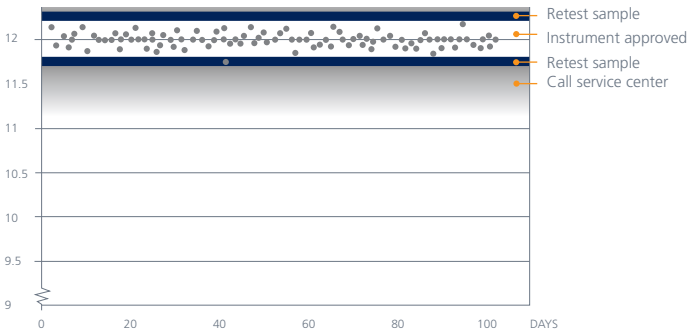
Individual Infratec units can be linked in a network and controlled from a Network Administration Centre ensuring that all units will give the same performance wherever they are and whoever is using them. Calibration costs are reduced, administrative routines are simplified, and duplication of effort is eliminated.

Infratec networks have been recognised by both commercial and governmental authorities from the introduction of the first network in 1991, and today more than 7000 Infratec instruments are linked in global networks.

Long term instrument and calibration stability

Infratec™ gives accurate results over many years of use.

Other analysers need frequent re-adjustments in order to keep their accuracy level. Not so with the Infratec 1241. At the heart of the analyser 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.

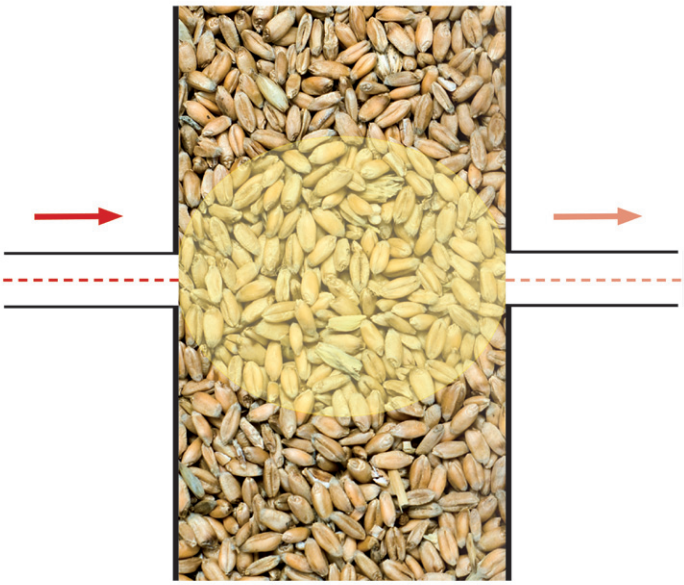


Proven instrument stability during 100 days of operation, with no adjustments made.

Technology

The power of Infratec™ 1241 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, 570 – 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 analysed.



Advantages include:

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

Measurement procedure

Analysing 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.

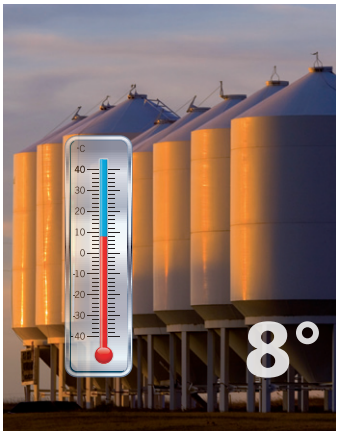
ANN calibrations

The introduction of ANN (Artificial Neural Network) calibration technology has revolution-ized grain testing by delivering simplicity of use in combination with unsurpassed accuracy. FOSS global ANN calibration models are today used 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.

1. Just pour the sample into the hopper.

2. Press the analyse button.

3. Read the result in less than one minute.



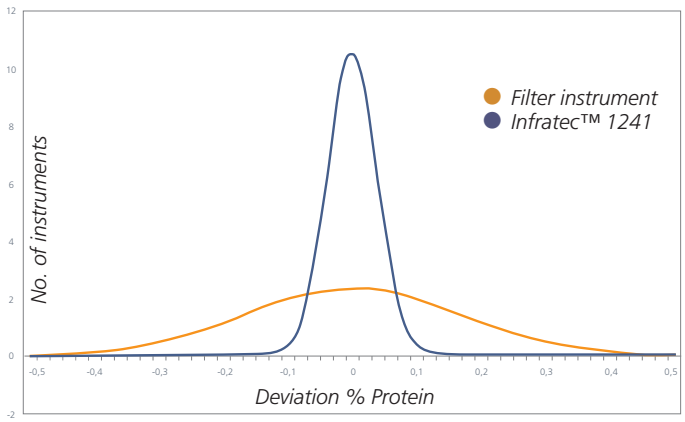
Stabilising technique

Regardless of conditions you can plug the Infratec 1241 unit in, turn it on and after a short selftest you'll be producing accurate results. The accuracy is unaffected by sample and ambient temperature changes. Thank's to a stabilising technique, that was patented by FOSS, you get correct results under all conditions.

PROTEIN %						REFERENCE
WHEAT SAMPLE	INFRATEC™ 1241					
	- 5°C	+5°C	+24°C	+40°C	+45°C	
1	10.5	10.5	10.6	10.7	10.8	10.7
2	11.5	11.4	11.4	11.3	11.3	11.5
3	12.5	12.4	12.3	12.2	12.3	12.5
4	13.5	13.4	13.3	13.2	13.4	13.4
5	15.4	15.4	15.4	15.3	15.5	15.4

Transferability from instrument to instrument

Infratec 1241 delivers true transparency between instruments. All instruments are supplied with an 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, soymeal 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 your 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 analysing finished soymeal.

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 1241 Grain Analyser 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 Datalogger and Datalink software packages.

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 centralised 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 optimised at a level of detail and accuracy not previously possible.

Networked: More than 7.000 Infratec instruments are linked in global networks

Specifications

Feature	Specification
Dimensions (W x D x H)	500 × 570 × 400 mm
Weight	30 kg
Voltage	220-240V 50-60Hz or 110-120V
Rated current:	1.0A (110-120V) / 0.5A (220-240V)
Spectrometer	Scanning monochrometer
Wavelength range	570 - 1100 nm
Detector	Silicon
Optical bandwidth	7 nm
Number of data points/scan:	265
Mode:	Transmittance
Light source:	Tungsten halogen lamp
Detector:	Silicon
Storage Media:	Flash disk, USB memory stick
Display:	640 × 480 TFT LCD

Sample handling and result presentation	
Analysis time:	50 seconds for 10 sub-samples
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
Regression programs:	ANN (Artificial Neural Network); PLS (Partial Least Squares)
No. of sub-samples	1 - 20

Operation Data	
Software:	Menu driven
Regression programs:	ANN (Artificial Neural Network); PLS (Partial Least Squares)
No. of sub-samples	1 - 20

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

Optional Modules

- Flour Module
- Test Weight Module
- Sample Transport Module

Support Software

- Infratec™ File Tool, 1241
- WinISI™ 4, Calibration Development Software
- Infratec Scan Predictor
- Infratec DataLogger (included with instrument)
- FOSS DataLink
- MOSAIC internet network software

For support and administration of Infratec systems operated in networks, contact FOSS Analytical for further information.

Interface

Printer:	25 pin parallel port
Modem:	9 pin serial port
External PC:	9 pin serial port
LAN:	RJ45
Keyboard/Barcode:	PS/2
USB Ports:	2 pcs
Remote I/O:	15-pin High Density DSUB
Diagnostics:	Self tests for internal communication, monochromator and detector (offset, gain and noise)
System protection:	Dust and humidity protected

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