FOSS

Analytical solutions for the grain industry

Dedicated Analytical Solutions

We help you to secure the best raw material

Plant breeding

The super grain that will save the world's food problems – unlikely to be found, but ongoing research in plant breeding is leading to higher yields and disease and pest resistance.

FOSS analytical solutions provide convenient routine analysis options with either near infrared (NIR) or automated chemical analysis for reference analysis.

On Farm

What is the crop really worth? Should I segregate and blend before delivery? Where should we start harvesting and when? If it can't be measured it can't be managed.

On farm testing with FOSS equipment gives accurate measurements in line with those at the receival site used for grower payments.

Receival

Grains, oilseeds and pulses – they can all be tested quickly, easily and accurately for payment and segregation. Most grains, oilseeds and pulses can be analysed directly without any sample preparation and, thanks to technology developed by FOSS, you get correct results whatever the weather.

Today, over 10,000 FOSS analysers are in use for testing grain at receival sites. The Infratec™ grain analyser is the official system used for payment by grain handlers around the world and has approvals for trade purposes in most grain producing nations.

and put it to the best possible use

Intake

At intake to crushing or milling virtually instant measurements of key parameters such as moisture and protein/oil content allow you to decide how to store and use raw material.

In production

In the process, continuous measurements keep you in the picture avoiding nasty surprises and helping to streamline your production for optimal results.

Final products

At product release, rapid, reliable tests allow you to release shipments with confidence.

Plant breeding with near infrared (NIR) or automated chemical analysis for reference analysis

FOSS solutions include the ability to present small and delicate samples without destroying the sample. In addition to protein, moisture and oil in grain, other ready-to-use application models are available such as extract for beer production and moisture in green malt.
For the many additional applications, users can develop their own calibrations using FOSS calibration development software, just one example currently in use is the analysis of nitrogen in rice leaves as the taste of rice is deeply related to its protein content.
The high transferability of calibrations and the ability to link instruments in a network allow instruments and result data to be coordinated from a central location, to guarantee identical results in all locations.

Reference analysis
Despite the obvious advantage of indirect NIR methods; robust, reliable reference methods are required to develop the calibrations or equations upon which such analysers depend. For today's busy laboratory automated testing systems that generate rapid and well-documented results are essential for quality environmental management. Automated Chemical Analysis (CA) systems address the needs of these laboratories with a wide range of tried and tested solutions covering the so-called compositional or proximates testing.

In addition, a significant volume of analyses remain within the laboratory environment for QC/QA, labelling and product development purposes. To support your compliance with governmental bodies and Quality Assurance program, FOSS offers documentation for equipment qualification covering installation and operational qualification (IQ/OQ) as well as performance qualification (PQ).

Solutions to consider: Infratec™ NOVA with sample transport module for a variety of samples. Automated chemical analysis with the Kjeltec™ solution for nitrogen analysis including high sample throughput using the Kjeltec Auto Samples in the micro Kjeldahl mode.

Infratec™ NOVA with sample transport module
The sample transport module consists of an elevator unit that is installed in the instrument itself, and sample cuvettes that can be filled with the sample to be analysed. It enables you to measure cooked rice, green malt, plant tissue and beer. A single ear of grain can be measured without destroying the sample.

Calibration development software
WinISI™ is a comprehensive chemometric package for developing powerful calibrations for near infrared based instruments. It makes it possible for anybody with a minimum of chemometric knowledge to make sophisticated calibration models.


Over 25 years of
calibration development

On farm analysis with aligned near infrared

The idea of giving farmers a portable instrument to measure grain in the field is nothing new, but until recently, getting the measurements in line with the measurements at the receival site has been problematic.

On farm measurements with FOSS equipment (Infratec™ Sofia) are fully aligned with the results given by payment analysis at the receiving station (Infratec NOVA or Infratec Sofia). The Infratec NOVA has a number of approvals for trade purposes and is the official system used for payment by bulk grain handlers around the world.

Deliveries can be made safe in the knowledge that they won't be rejected for excess moisture. And grain can be segregated and blended on farm for optimal price according to market demands, for instance, in some years and markets, a difference of just 0.1% in protein can mean the difference between high and low premium payment.

Keeping it all up to date
FOSS solutions can be connected to the internet, so even though a farmer testing grain in a field miles from the nearest town may appear to be a long way from the bustle of international grain markets, he is still, in fact, an integrated part of the supply chain.

With a web-based update system keeping his grain analyser up to date for example, with adjustments and improvements to calibrations according to seasonal changes, the measurements are as reliable as any made on the journey from the field to the table.

Solutions to consider: Infratec™ Sofia

Ready to go
In the harvester, in the tractor or in your car, Infratec™ Sofia goes where you go. Mobile, rugged, and designed for operation in harsh conditions, Infratec Sofia is ready for use wherever you are.

New calibrations? No problem
Initially programmed for the measurement of protein and moisture in wheat and barley, Infratec Sofia is easily upgraded with additional commodity calibrations. They are simply downloaded via the internet and transferred to your unit at the click of a button.

Receival and trade with rock solid near infrared analysis

Rapid analysis at the weighbridge has become indispensible for modern grain receival. Today, over 10,000 Infratec™ grain analysers are in use for testing grain at receival sites. The Infratec is the official system used for payment by bulk grain handlers around the world and has a number of approvals for trade purposes.

Grains, oilseeds and pulses can all be tested quickly, easily and accurately for payment and segregation. Most can be analysed directly without any sample preparation and, thanks to the Infratec stabilising technique patented by FOSS, you get correct results whatever the weather.

The huge Infratec database comprises over 50,000 cross checked samples, PLS and robust ANN-based calibrations building on a wide sample range from many years of harvests. This gives a level of accuracy and stability that enables Infratec to test even the most unusual samples.

Solutions to consider:
Infratec™ NOVA, Infratec™ Sofia, Alphatec™ FN

Some of the main commodities that can be measured quickly and accurately at receival

Grains: Wheat, durum wheat, barley, corn, oats, rye, triticale, sorghum/milo, rough rice

Oilseeds: Soybean, rapeseed/canola, sunflower, cotton, peanuts

Pulses: Lentils, faba beans, chick peas, green peas, lupins

A Test Weight Module allows rapid and accurate volume weight determination of the grain for milling potential and efficient silo management.

Networked instruments
Payment analysis must deliver unquestionable reliability and uniformity, regardless of location and operating conditions – a requirement that networked Infratec instruments have effectively addressed by giving identical measurements, wherever they are located. All major grain producing countries now use FOSS ANN calibrations and the Infratec system.

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.

Smaller grain receival sites
Knowing the quality of your grain is just as important for smaller, low infrastructure sites for segregation and marketing of grain. The Infratec Sofia is a low-cost analyser offering reliable measurements aligned with the Infratec grain analyser.

Infratec Sofia measurements are based on the same comprehensive data used to calibrate Infratec instruments. As new calibrations are released, they are simply downloaded via the internet and transferred to the Infratec Sofia unit ensuring that your results are always accurate and reliable.

Falling number analysis with Alphatec™ FNº

At grain receival, the standard falling number is an important test for measuring the soundness of traded grain. The test is based on the alpha-amylase enzyme activity in grains which helps to spot sprouting damage. It is also important for optimising flour enzyme activity to ensure final product quality of bread, pasta, noodles and malt.

The new Alphatec™ FNº from FOSS is a modern instrument for falling number analysis with innovative features such as:

- Cooling lid minimises rush of steam when loading samples, helping avoid potential injury
- Insulated sample bath avoids hot surfaces and reduces risk of inadvertent burns
- Overflow direct into waste eliminates hot water spillage
- User friendly interface and touch screen reduces training cost by allowing rapid, error-free use by anyone

Global calibrations

Grain processing is truly a global industry with raw materials being traded in international markets.

FOSS global calibrations are developed using data obtained from all over the world with data from over 50,000 samples from more than 20 harvests. Calibrations have been developed in collaboration with regulatory authorities and customers around the world.

The unique development of Artificial Neural Networks (ANN) has created large calibration models that cover multiple products. Calibrations are continuously being expanded with new raw materials and updated with new data to ensure the latest crops and varieties are covered.

Stable

Advances in NIR analysis are built on a well-proven technology base. The table shows protein % of wheat samples measured across a broad temperature range.

PROTEIN %						
						REFERENCE
WHEAT SAMPLE	INFRATEC™ NOVA					
	- 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

Ash is cash: new levels of accuracy provided by new NIR technology is helping millers to save thousands of Euros through better yield.

Flour milling intake and processing

FOSS solutions add significant value when acquiring grain for milling wheat flour, semolina, soy meal, ground wheat, middles, rice meal, corn meal, etc.

Moisture and protein in entire batches of whole grain are measured as they arrive at the flour mill. This allows the perfect blend of grain for consistent quality products downstream in the milling process. It also helps to improve the tempering process by allowing the right timing, use of energy and water according to the exact nature of the grain.

Bench top analysis at intake with volume/weight determination
Robust, easy to use, bench top solutions can be positioned at the weighbridge for a virtually instant test. In addition to testing moisture and protein, a bench top solution can measure Test Weight for an accurate volume weight determination of the grain. Test Weight is a widely recognised 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 optimise the storage space in the silo.

Process analysis of grain intake
Recently, the concept of using near infrared analysis for periodic testing of grain deliveries has been taken a step further by FOSS with the ProFoss™ whole grain analyser. This system can measure entire batches of grain using a specially designed sample interface that analyses the grain as it is conveyed in a standard pipe or transport system without the need for sample diverters. It then feeds a continuous stream of analysis data back to a computer in your control room.

Solutions to consider: Infratec™ NOVA, ProFoss™ whole grain analyser, NIRS™ DS2500, NIRS™ DA1650, Alphatec™ FN

Efficient milling with rapid NIR analysis in the process

Rapid, routine analysis with FOSS instruments gives a higher level of knowledge in milling and is setting new standards for quality control in the ancient art of producing flour.

With reliable information about moisture, protein, ash, gluten, water absorption and other key parameters, you can improve the consistency of end products and the entire milling process. For instance, new levels of accuracy in measuring critical parameters such as ash offers improved yield. The instruments are also highly robust complying with ISO 12099 standards. NIR instruments are tailor made for routine analysis in a laboratory or close to the production line.

In the laboratory or control room
Bench top analysis can be performed quickly and easily by anyone working in the plant, for example, with the latest NIR technology, the sample is just poured into a cup and placed in the instrument. Results are displayed on a screen within a minute. When controlling processes, bench top solutions can control multiple process streams at once.

An eye in the process
In addition to bench top analysers, NIR analysis can be applied directly in the process stream. Taking measurements every few seconds, solutions such as ProFoss™ provide critical information about your process 24/7 for optimal quality products and improved profitability in flour analysis.

Monitoring process variations using a trend chart and a moving average function enables the detection of process variations that are significantly smaller than the standard error of prediction (SEP) of a laboratory analyser. Even if one result is wrong for some reason, this has no influence on the overall result because a new result will be generated a few seconds later.

Oilseed intake and crushing

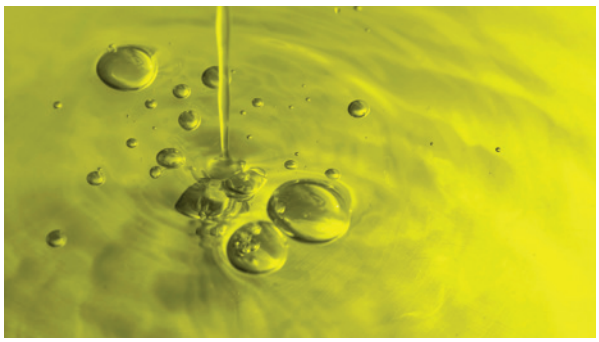
Take control
Whether you work in oil-seed trading, crushing and refining, meal production or with traditional production of olive oil, reliable measurement results delivered in a simple, timely way give you more power to control production for optimal quality and profit. Analysis results for key control parameters are delivered in a fast, convenient way to help you simplify lab operations, avoid rework in production, ensure end-product quality and get the very best out of valuable raw material.

The key to oil crushing starts by controlling the quality of the raw material at the intake. Throughout the subsequent production cycle, FOSS dedicated analytical solutions deliver rapid reliable information in a simple and convenient way to help you to improve your profitability.

Just one example is in oil crushing where FOSS solutions help to control the quality of the oil seeds at the intake so that you pay for what's really important - the oil content. Another example can be taken from vegetable oil refinery. As much as 25 tonnes or so of edible oil can flow through a typical vegetable oil plant every hour. The removal of Free Fatty Acids (FFA) relies on the correct amount of inputs, too little and you don't remove all the FFAs, too much and you waste good materials. Reliable and frequent information from FOSS solutions provides more power to control production, reduce the risk of rework and ultimately, improve profit.

Solutions to consider: Infratec™ NOVA, NIRS™ DA1650 Oilseed Crush Analyser, NIRS™ DS2500, ProFoss™ Soya, Olivia™, XDS™ Rapid Liquid Analyser.

Typical applications for FOSS solutions



All in one, soy bean analysis
The Infratec™ NOVA can be used to control soy beans for oils and moisture at intake. And with the sample transport module option you can use the same unit to test soy meal for moisture, fat, protein and fibre at the end of the process.

Rapid analysis of oil composition
Using rapid near infrared solutions such as the FOSS XDS™ Rapid Liquid Analyser you can analyse virtually any liquid or viscous suspension in both laboratory and at-line situations. Determination of FFA, moisture, Phosphorous, IV, K232, K270 and PV in less than a minute allows full and rapid control of the vegetable oil refinery process or olive oil segregation.

Improving yield in olive oil production
Rapid analysis of fat and moisture in olive paste and pomace with the smart, easy to use Olivia™ analyser is an obvious way to improve yield, for example, by ensuring the pressing process is as efficient as possible.

Optimal process control with inline NIR
Continuous measurements of moisture, protein and oil content in soya meal directly from the production process helps you to improve efficiency while also improving quality and profit.

Nine good reasons to consider FOSS solutions for the oilseed crushing and edible oil industry

1. Raw material at the right price - Pay the right price for oil seeds on an objective measurement of oil content and moisture.

2. Quality in, quality out - Make fast and accurate spot checks on crude oil before it enters your refining process or check the oil content of seeds before they enter the crushing process.

3. Avoid re-work - Continuous information about key parameters of the oil flowing through your production lets you get production right first time.

4. Segregate for profit - A fast and accurate indication of how your olive oil matches-up to IOOC standards allows you to segregate batches for maximum profit.

5. Effective lab work - Take advantage of fast and safe methods of conducting standard wet chemistry analysis.

6. Act now - Key information delivered just when you need it gives you the power to spot problems and act promptly.

7. Improve operations with automatic control - Integrate a FOSS process control solution into your production and enjoy hands-free monitoring/control 24hours a day.

8. Your own on-site laboratory - Practical and simple to use FOSS solutions avoid waiting for results from an external laboratory.

9. Enhance your reputation with consistent products - Check finished batches and prove to customers that products match required specifications.

Technology overview

Near infrared reflectance and transmittance

FOSS solutions use either near infrared transmittance or near infrared reflectance technology all according to the job to be done. When measuring whole grain for instance, near infrared transmittance used in the Infratec™ NOVA grain analyser offers superior performance. Measurements are made in a lower wavelength range, 850 – 1050 nm. The higher energy level of the light in the lower range allows for deeper penetration into the grain kernels, so not only the surface, but also the inner part of the kernel is measured, giving a superior representation of the sample analysed.

In contrast, for measuring samples such as flour, near infrared reflectance across a broad wavelength from 1100 nm up to 2500 nm is ideal for testing parameters such as ash and other key parameters such as moisture, protein and colour. FOSS solutions such as the NIRS™ DS2500 have a unique signal-to-noise ratio giving an ultimate measure of ash and other low level parameters in need of accuracy. In addition, a combination of cup rotation and sub-scans measures different points in the sample for accurate results.

Near infrared in the process

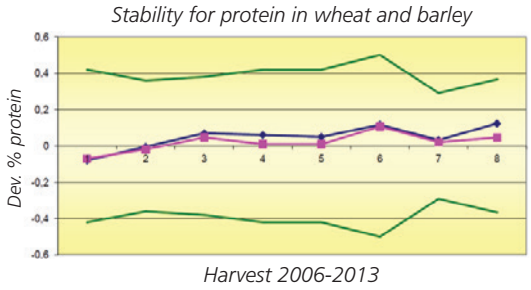
Near Infrared can also be applied directly in the process flow with the ProFoss™ analyser. For instance, in flour milling, the ProFoss can be mounted directly in the milling process where it measures the flour as it flows through the pipes for moisture, protein and ash every few seconds. The results are fed back to a computer in the mill control room and displayed on an intuitive graphical interface.

Measurements are made using a high-intensity dual-lamp light source that illuminates the sample directly or through an optical fibre. The light interacts with the sample and the reflected or transmitted light is measured by the diode array sensor. The complete wavelength range is measured instantaneously enabling measurements to be accurately carried out even on fast moving samples. Calibrations are transferable between units and integration to process regulations systems can be performed through the FOSS OPC interface or through an analogue signal.

Networking options

Mosaic™ is a networking solution that remotely manages, configures and calibrates all your analytical instruments.

A network comprises a group of standardised 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. Calibration costs are reduced, administrative routines are simplified, and duplication of effort is eliminated.



The robustness of the ANN calibration manifests in its long term stability as shown in this Figure. Average deviations of predicted protein results from the best estimate of the true value during the past five years, pink = global ANN and dark blue = local ANN.

Calibrations and transferability

A key principle behind FOSS analytical instruments is that it should be simple for any business to take advantage off. In relation to near infrared instruments, ready-to-use Artificial Neural Network (ANN) calibrations are a key part of the FOSS solution. Robust, stable and based on 25 years of data collection reflecting seasonal and geographic variations, the calibration has achieved a unique position as a platform for advanced grain analysis operations. The Infratec™ NIR calibration is now a European standard for measuring protein and moisture in whole grain of wheat and barley.

New instruments are backwards-compatible with the older calibration databases. In this way, databases have continuously been expanded and today the largest ones contain more than 50,000 samples. Continuous design improvements over successive generations of instruments have also improved the stability and uniformity of individual instruments leading to excellent calibration transferability across populations of instruments with very little calibration adjustment required.

Imaging technology – the new frontier

Revolutionary image analysis developed by FOSS and used in the EyeFoss™ analyser gives grain receivers the world's first objective assessment of grain quality. It performs an objective assessment of a grain sample using imaging technology as an alternative to quality checks by human eye. The technology classifies 10,000 single seeds for 10-15 defects in around three minutes with respect to foreign objects and malformed/damaged objects (for example, pre-germinated, frost-damaged, mould and discoloured kernels). The algorithmic part is based on decision trees in combination with simple logic decisions and complex neural network model decisions based on around 140 features extracted from the images.

Automated laboratory methods

Standard methods such as Kjeldahl and Dumas are not always the most convenient tests to perform, but are nonetheless essential for reference and labelling purposes while the standard falling number test remains the only effective way to test for weather damage at grain receival.

FOSS automated laboratory solutions include many innovative features designed to make these ubiquitous tests as fast, cost-effective and safe as possible. The cooling lid on the Alphatec™ FN^{Ω} analyser for example, helps avoid a rush of hot steam when loading samples. For Kjeldahl, batch handling automation offered by the Kjeltec™ improves throughput of samples and for Dumas, the software system with the Dumatec™ 8000 makes it easy to control the combustion with great precision for minimal consumption of oxygen and helium.

Infratec™ NOVA

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 recognise a normal sample and handle it more quickly, whereas unusual samples are given more sub-sampling for greater confidence. In addition, 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 while the solution also offers a wide range of ready-to-use applications covering all steps in the agricultural handling chain.

Parameters: Moisture, protein, oil, test weight and many more
For use by: Grain producers and traders
Technology: Near infrared analysis (NIR)
Samples:
Grains: Wheat, durum wheat, barley, corn, malt, green malt, oats, rye, triticale, sorghum/milo, rough rice, brown rice, milled rice
Oilseeds: Soybean, rapeseed/canola, sunflower, cotton, peanuts
Beans & Pulses: Lentils, faba beans, chick peas, green peas, lupines
Flour & meals: Wheat flour, semolina, soy meal, rice meal, sunflower meal
Other: dried distillers grain, beer, whiskey, spirits, wort

Infratec™ Sofia

The fully portable Infratec™ Sofia whole grain analyser measures protein, moisture and oil in the field or at smaller receival sites. It is pre-calibrated for wheat, barley and canola and calibrations are based on those of the Infratec grain analyser, officially approved and widely used at receiving stations.

Parameters: Moisture, protein, oil
For use by: Large-scale farming operations
Technology: Near Infared Transmission
Measuring speed: Results within three minutes, no sample preparation
Samples: Wheat, barley, rapeseed, triticale, rye, oats, durum

ProFoss™

Profoss™ is an in-line process analysis solution employing high-resolution technology for accurate monitoring of your production process. Advantages include improved yield and profit achieved through savings in raw materials and consistent product quality.

A number of solutions are available including:

- ProFoss for whole grain analysis, based on continuous measurements of grain in transport system at intake
- ProFoss for flour milling based on continuous measurements of flour directly in the process pipe
- ProFoss for soya based on continuous measurements of soy meal at the end of the process

Parameters: Protein, moisture, ash and oil, depending on application
For use by: Grain and soya millers
Technology: Near Infrared Reflectance
Measuring speed: Measurement results every few seconds
Samples: Whole grain, flour, soya

XDS™ Rapid Content and Rapid Liquid Analysers

The XDS™ Rapid Content and Rapid liquid Analysers provide rapid nondestructive analysis of virtually any solid, viscous and liquid samples making it ideal for research laboratories. Advanced NIR technology and a full spectrum, 400-2500 nm, research grade spectrometer gives you maximum performance and full flexibility in your choice of analytical parameters.
The autosampler option for the XDS Rapid Content Analyser allows you to load multiple samples and walk away. Non-stop analysis of up to 50 samples can be performed for increased throughput and effectiveness in the laboratory.

Parameters: Multi-parameter including protein, fat, moisture, fibre, starch, amino acids and more, depending on application
For use by: Laboratories, food and feed producers
Technology: Near Infared Transmission, Near Infrared Reflectance
Measuring speed: Results within three minutes, no sample preparation
Samples: Multiple applications - virtually any solids analysis from fine powders to coarse granular materials, pellets and flakes, as well as liquids and slurrys in transflectance mode using reflectors

NIRS™ DS2500

The NIRS™ DS2500 analyser helps millers to boost yield by giving not only an accurate measurement of protein in flour, but unique accuracy regarding ash. Robustness coupled with groundbreaking performance in near infrared (NIR) guarantees highly accurate ash measurements by anyone, anywhere, at any time.

The DS2500 has a wavelength range between 400-2500 nm. It has two detectors; one in the wavelength range 400-1100 nm made of silicon and one made of Lead Sulfide between 1100-2500 nm. The Spectral resolution is 0.5 nm resulting in 4200 data points/variables.

Parameters: Multi-parameter such as protein, ash, moisture, colour and more depending on application
For use by: Flour millers and oil seed crushers
Technology: Near infrared analysis (NIR)
Measuring speed: Results within a minute, little or no sample preparation
Samples: Wheat, flour, oilseeds and oilseed products

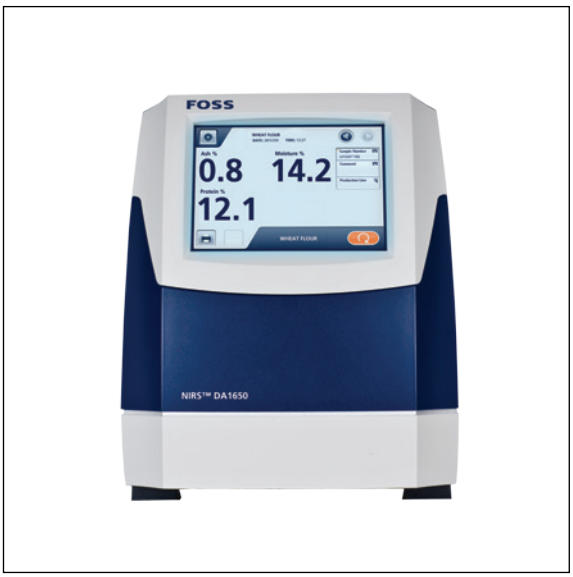
NIRS™ DA1650 Flour / Oilseed Crush Analyser

The NIRS™ DA1650 Flour Analyser gives flour millers a robust, purpose-built quality control tool, ready-to-use for many flour types and with future-proof features for a lasting return on investment.

For oilseed crushing, the dedicated NIRS DA1650 Oilseed Crush Analyser allows anyone to get reliable measurements for whole seeds, cake, flakes, meals and oils while true networking capability and simple touch-screen operation keep running costs lower than other NIR solutions.

Both models are ISO 12099 compliant and IP65 certified to withstand dust and moisture making them ideal for accurate routine analysis either in the laboratory or close to the production line.

Parameters: Multi-parameter such as protein, ash, moisture colour and more depending on application
For use by: Flour millers and oil seed crushers
Technology: Near infrared analysis (NIR)
Measuring speed: Results within a minute, little or no sample preparation
Samples: Wheat, flour, oilseeds and oilseed products

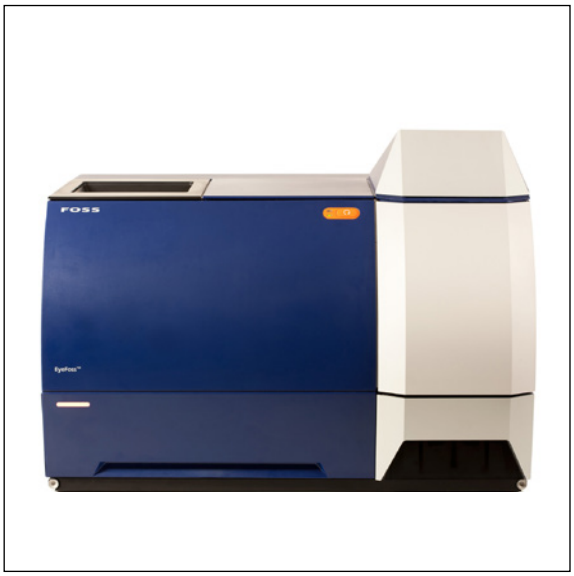


EyeFoss™

The world's first image analysis instrument suitable for the objective quality assessment of whole grain helps you to assess incoming grain quickly with greater consistency and with less strain on operations during the busy harvest season. Assess grain quality objectively at the press of a button and monitor your grain receival network from anywhere at any time.

The EyeFoss™ is currently calibrated to provide results for the following tests in wheat and barley:

Wheat:
Un-millable material, small foreign seeds, stained grain, pink grains, frosted and sprouted grains
Type 7B seeds (barley, oats, wild oats, saia oats, triticale, cereal rye, bindweed, turnip seed, speargrass)
Barley:
Small foreign seeds, radish pods, spotted mould affected, germ end stained, skinned, distorted
Type 6 seeds (wheat, triticale, cereal rye)
Type 7A seeds (oats, wild oats, black/brown oats, speargrass)



Alphatec™ FNº

Alphatec™ FNº, is a modern and safe way to perform the standard test used to check sprouting damage in grain and enzyme-activity in flour before baking, malting etc.

A safe and userfriendly solution, it offers a new alternative for testing the standard AACC Method AACC 56-81B 'Determination of falling number'. Alphatec FNº includes a specially designed cooling lid that minimises the rush of steam when loading samples, helping avoid potential serious injury. A fully insulated sample bath avoids hot scalding external surfaces and reduces risk of inadvertent burns. An overflow directly into waste stops hot water spillage on the bench or near the work area. A touch screen interface reduces training costs by allowing rapid, error-free use by anyone.

Parameters: Weather damage and alpha-amylase and related enzyme activity in grain and flour
Samples: Whole wheat

Patented techniques for accurate, safe and reliable laboratory testing

In the field of wet chemistry, FOSS provides solutions designed to simplify routine laboratory analysis. Our radically improved Kjeldahl, Soxhlet, Weende and van Soest wet chemistry reference methods meet the most exacting standards and dramatically reduce laboratory time and costs.

Fibertec™ Systems

The Fibertec™ 8000 is a fully-automated solution for unattended determination of crude and detergent fibre, with innovative features that ensure maximum safety in the laboratory. The Fibertec 8000 offers the lowest operator time of any fibre solution and can handle up to six samples simultaneously.

Kjeltec™ System

The Kjeltec™ 8000 series consists of three models: 8100, 8200, and 8400, for simple and safe distillations with different levels of automation. The Kjeltec 8400, in combination with 8420 or 8460 sampler and Tecator AutoLift digestors, provides the ultimate in automated Kjeldahl analysis. Approved by AOAC and ISO.

Soxtec™ Systems

FOSS Soxtec™ systems offer fast and safe fat analysis with varying levels of automation. The Soxtec 8000 range, consisting of an extraction unit, a hydrolysis unit, and a single filter that is common to both units, allows you to perform acid hydrolysis and Soxhlet analysis in one integrated action.

Digestion Systems

Digestion systems, with integrated programmable controllers, provide economical and efficient digestion for Kjeldahl analysis. A number of units can be combined to match individual needs, from units capable of handling just a few samples a day up to fully automated systems for high sample throughput.

Dumas method

The Dumatec™ 8000 performs rapid and convenient nitrogen/protein analysis according to the Dumas method, giving busy laboratories reliable results in just three minutes at a low cost per sample. Innovative features reduce start-up time while extending consumable lifetime and software functions allow desktop-operation and traceability.

Sample Mills

FOSS provides tailored sample preparation equipment for all types of samples analysed in the grain production chain.

Mosaic™

Mosaic™ is a networking solution that remotely manages, configures and calibrates all your analytical instruments. Our specialist NIR team carries out all updates and calibrations centrally for improved instrument performance. Not only does this save you time, but it has also been shown to significantly reduce costs.

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, reagents, consumables and software upgrades

Centralised calibration, management and configuration of instruments

For grain and milling companies, and particularly the ones with multiple sites, our sophisticated networking tools enable internet-based remote instrument monitoring and diagnostics. With this software, internal or external experts can precisely configure and monitor FOSS instruments regardless of their location. Calibration updates and bias corrections are easily and safely handled centrally through the network and the system can be monitored on a daily basis.

"Because the machine has the ability to link directly to FOSS via the internet, and receive and transmit data, I have confidence of ongoing back-up support for the machine"

"… Networking with FOSS first of all provides us with "peace of mind" as we know there is a FOSS specialist managing and doing surveillance on our instrument. We have outsourced all complexity related to running our instrument, calibrations, diagnostics, etc. Networking makes sure that the performance of our entire setup is optimized at all times hereby allowing us to focus on our real business."

"… Adjusting slope/intercept, etc. is surely not my expertise so it is valuable having FOSS do this."

"… Having a large population of instruments the central security and management aspect of networking is extremely important. Operating our instruments is no longer dependent on having on-site specialists as all complexity is handled by our contact at FOSS."

True value – the essential role of analysis in global grain and milling

Today, routine analytical instruments are so stable that they can measure grain to within 0.1% protein in temperatures ranging from -5 ˚C to + 45 ˚C. In fact, measurements with instruments like the FOSS Infratec™ grain analyser are based on a calibration database that includes tens of thousands of samples from all corners of the grain growing world.

With a unique technology platform established over decades of work with the grain industry, FOSS can offer the most comprehensive and future-proof analytical solutions to help you improve your grain and milling operations. Opportunities for improving our grain supply abound at all stages of the quality control chain.

FOSS is a privately-owned company employing over 1200 worldwide. FOSS has manufacturing, research and development facilities in Denmark and China. Solutions are sold and supported through FOSS sales and service companies in 25 countries and by more than 70 dedicated distributors.

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