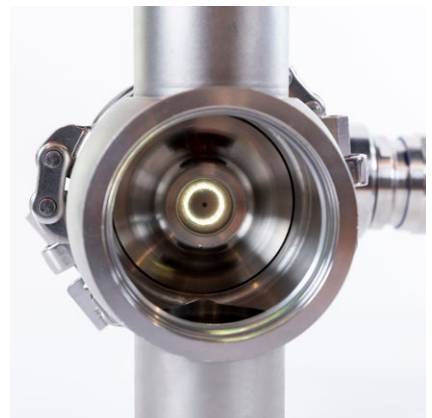


FOSS

PROFOSS™ 2

FRESH CHEESE/STRAINED YOGHURT PROCESS ANALYSIS



ANALYTICS BEYOND MEASURE

OPTIMISE YOUR RAW MATERIAL USAGE

A common goal for dairy producers of fresh cheese/strained yoghurt products such as Greek yoghurt, skyr, quark, labneh and cream cheese is to make the best use of raw materials and ensure that final products are as close to target specifications as possible, in terms of total solids and protein content among other parameters. In this way, yield and profit can be improved with confidence while always meeting quality and legislative requirements.

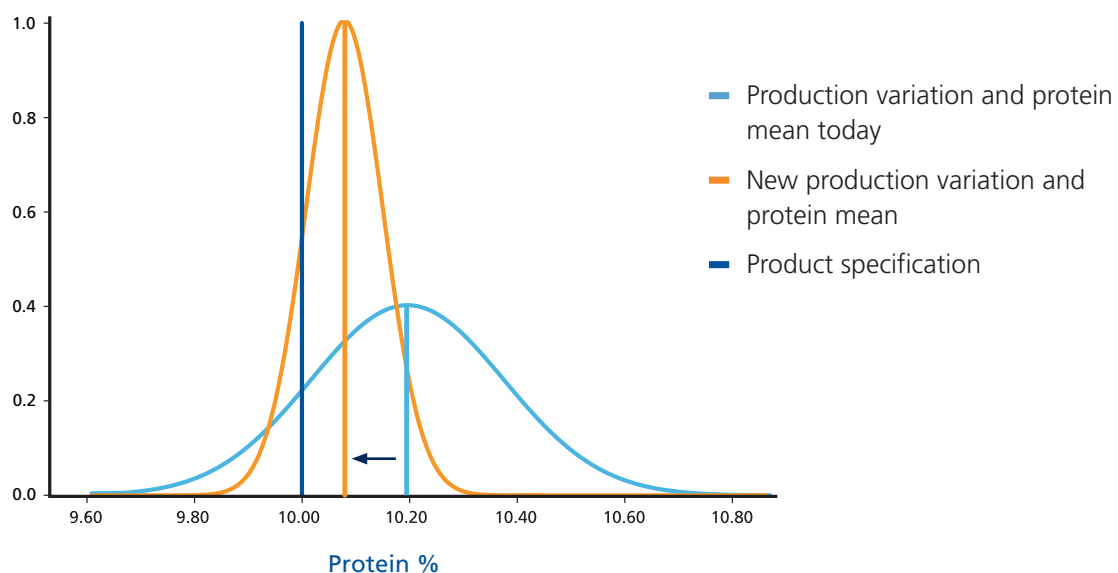
In-line process control allows yet more value to be gained from NIR analytical technology. By measuring directly in the process and getting results every few seconds, process variation of key parameters such as protein and total solids can be more closely monitored. This allows you to make real-time adjustments and bring final products closer to target.

FOSS has pioneered the development of in-line process control solutions. The first ProFoss™ launched in 2009, was revolutionary due to the introduction of the lateral transmittance probe that was specially designed for installation in the process pipe for certain applications, making the ProFoss easy to implement. A true in-line analyser.

PROFIT IMPROVEMENT

Reduce your protein or total solids variation and increase yield and profit.

Composition Frequency



React in real time on process changes and reduce process variations up to 50%.
Move the production target for protein (P) or total solids (TS) in the range of 0,10%-0,20% closer to product specifications and increase yield and profit.
As an example, an annual production of 10

ton can give annual raw material savings up to 400,000 kg and ~70,000 EUR.

Stretch your profit zone:

Production costs can be decreased, and the higher product consistency and quality will increase your competitiveness.



INTRODUCING PROFOSS™ 2: YOUR PASSPORT TO IN-LINE PROCESS CONTROL

The ProFoss™ 2 solution builds on the success of the original ProFoss solution by exploiting the latest advances in analytical technology such as instrument calibration, connectivity for data sharing, probe design, full integration with a benchtop analyser such as FoodScan™ 2 for reference analysis and much more. With ProFoss 2, dairy producers can benefit from in-line NIR process analysis with the highest level of analytical performance across their production and quality laboratory setup.



Achieve complete control of your fresh cheese/strained yoghurt production with a ProFoss 2 in-line sensor installed directly in the process line, after the separator or filtration unit. ProFoss 2 provides a continuous flow of real time results. Optimise the use of raw materials, run production consistently closer to target specifications and make timely adjustments to final products.

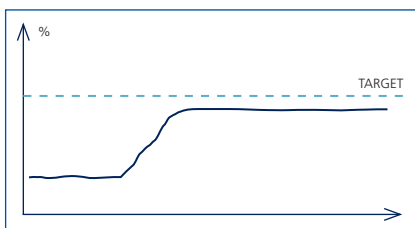


HOW TO IMPROVE YOUR PRODUCTION

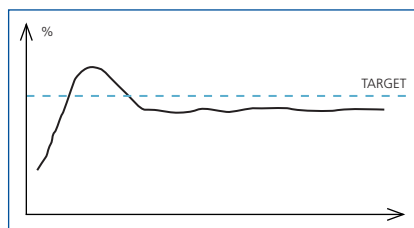
PROCESS ANALYSIS ADVANTAGES

- Production close to target specifications
- Increased yield and profit
- Less rework and start up variation
- Optimised mass-balance
- Real time process control
- Process regulation for short term process changes

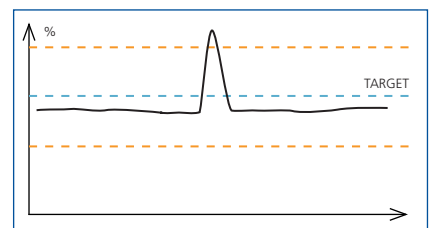
AUTOMATIC PROCESS CONTROL WITH PROFOSS 2:



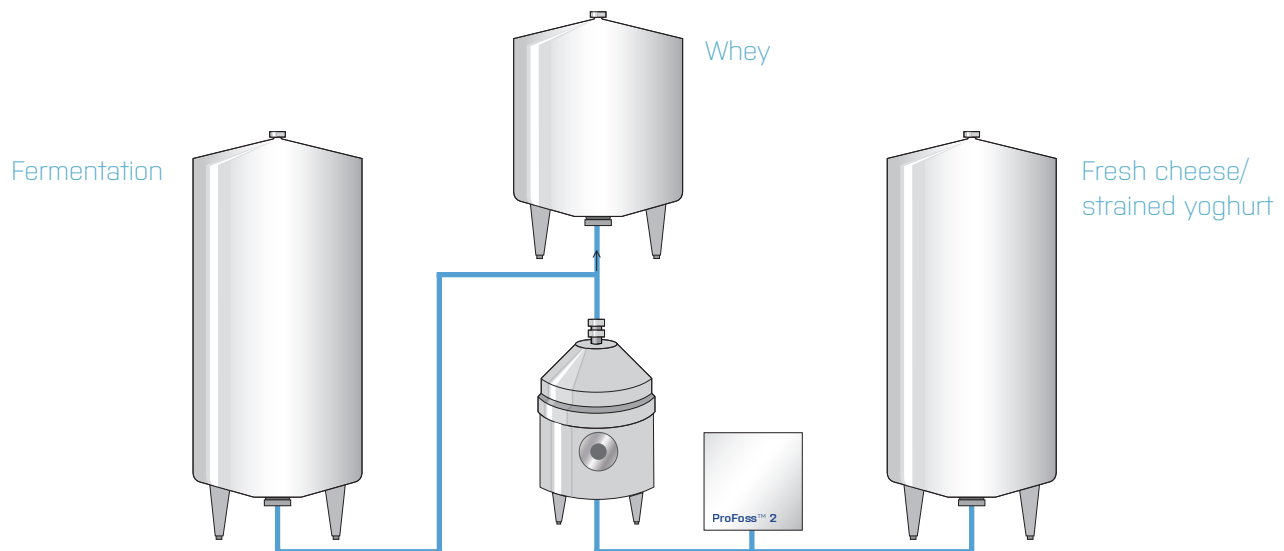
Production closer to target.



Reduce start up variation.



React in real time on results out of spec.



Parameters

- Total solids
- Protein
- Moisture
- Fat

In fresh cheese production the primary profit driver is to optimise total solids or protein levels to increase yield and thereby revenue.

Typical analyser installation point

- Installation after the separator or filtration unit in order to validate and adjust final total solids or protein content
- 3A hygiene certified

Dedicated sample interface

- Lateral transmittance interface connected directly to the pipe
- True in-line – no bypass – no waste
- No moving parts
- No hygiene compromises

ALWAYS KNOW WHAT IS GOING ON IN THE PROCESS WITH REAL-TIME ANALYSIS

ProFoss™ 2 provides real-time analysis results enabling you to react immediately on process changes and reduce process variations by up to 50%. Move total solids or protein targets closer to product specifications and increase yield, profit and quality.

A high frequency of results ensures that nothing gets missed and that you will always have a precise picture of any fluctuations in the process. The ProFoss 2 lateral transmittance probe enables penetration deep into the product, allowing a larger sample presentation to be measured. The latest generation of the lateral transmittance probe gives a significantly increased signal to noise ratio for higher speed and unique accuracy and stability.

At the same time, ready to use calibrations and the consistency of measurements ensures that multiple ProFoss 2 instruments can be relied on to always give the same high-quality measurements.

You can choose to measure at different points in the process line or across different production lines using simple-to-implement multi-point installation options with each installation giving the same high level of measurement performance.

THE LATERAL TRANSMITTANCE PROBE

ProFoss™ 2 uses a lateral transmittance probe to analyse directly in the process pipe.

In concentrated dairy production, it is important for the infrared light to penetrate deep into the sample to obtain a good representative measurement.

The lateral transmittance probe is inserted directly into the pipe to measure a large volume of the material in the process (1.5 cm³). It uses a form of near infrared analysis called transmittance to penetrate deeper into the sample as opposed to so-called near infrared reflectance solutions which measure the surface.

The latest generation of the ProFoss 2 lateral transmittance probe has been developed to yield even more analysis data. It has a higher intensity of light (x25), which gives a better signal and helps to ensure that all ProFoss 2 instruments can be relied on to always give the same high-quality measurements. The frequency of measurements has also been boosted to give a clearer evaluation of fluctuations in protein and total solids in the process, allowing for closer control against production targets.





THE POWER OF IN-LINE: PROFITABLE FRESH CHEESE/STRAINED YOGHURT PRODUCTION BASED ON RELIABLE MEASUREMENTS

The reliability of measurements of protein and total solids across all units and production lines is assured with standardised instruments that all measure the same.

A standardised analyser with transferable calibrations significantly reduces the implementation and maintenance costs for in-line process control.

The high uniformity standards and robust design of the latest generation ProFoss™ 2 solution ensures that the same calibration can be used on multiple instruments which measure the same product. This also ensures that only minimal updates to calibrations are required during the instrument lifetime. In contrast, solutions with lower standards will require separate calibrations for each instrument and more frequent updates.

Administration is easy due to the use of transferable calibrations based on the industry benchmark FoodScan™ 2 benchtop analyser. ProFoss 2 provides facilities to evaluate measurements against the FoodScan 2 on a regular basis. The performance validation procedure is made simple and reliable with automatic data transfer.

PROFOSS™ 2 HIGH RESOLUTION NIR TECHNOLOGY



ProFoss™ 2 is unique in employing a near infrared-based analysis technology known as high resolution diode array analysis. The high resolution technology ensures accuracy and reliability with measurements based on a high density of data points.

PROFOSS™ 2:

- High resolution diode array NIR technology for accurate and continuous analysis
- Built-in instrument standardisation for quick and simple implementation
- Unique lateral transmittance probe interface providing accuracy and rapid implementation
- Quantitative and qualitative data for better in-line process control
- Minimal maintenance with standardised instruments and unmatched transferability
- Interface for integration to control systems enables automatic regulation (Ethernet, 4-20mA, Profibus, etc. communication)



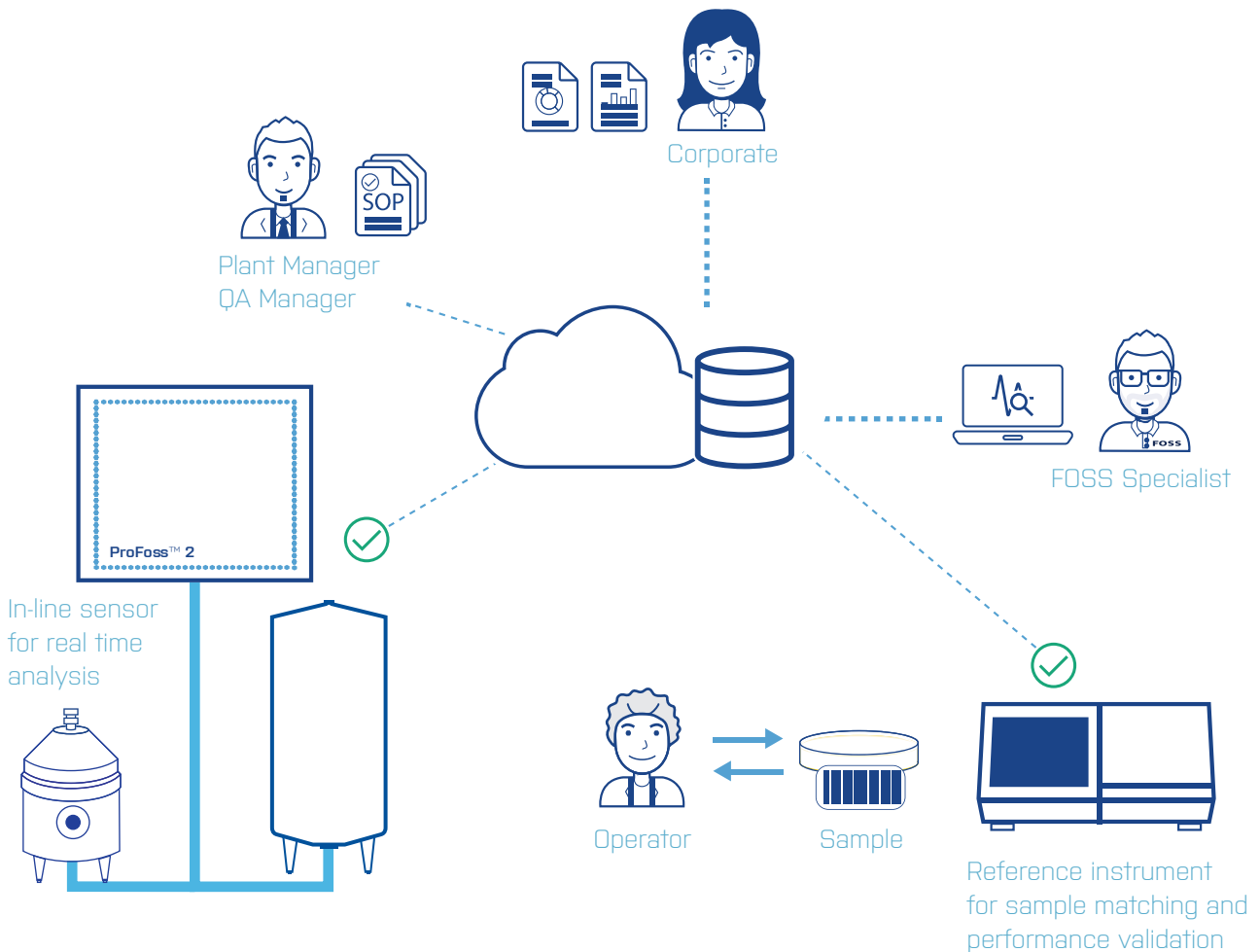
The revolutionary ProFoss™ 2 performance evaluation procedure is used to match in-line results with those from reference benchtop instruments such as the FoodScan™ 2.

FossManager™ software gives a common view of sample identifications and results from both benchtop and in-line sources on one page. The overview facilitates efficient surveillance of calibration performance and any necessary adjustments through pre-planned FossAssure™ services.

HIGHER YIELD ENSURED BY PREDICTABLE PERFORMANCE

The latest technology behind ProFoss™ 2 ensures consistent performance day in, day out and year after year. Building on the reliable measurements delivered by each and every analyser unit, software and digital connectivity services help to maintain stable high performance across whole populations of instruments.

Calibrations can be monitored and adjusted remotely from anywhere. Automatic instrument monitoring and alerts can be set up and maintenance schedules can be proactively planned for optimal up-time.



Software and digital connectivity services contribute to reliable performance across individual or whole populations of instruments. ProFoss 2 units can be monitored and managed from a single desktop, for example, when making calibration adjustments or proactively planning maintenance cycles for optimal uptime. This can be done from anywhere in the world from any PC.



A FAST RETURN ON INVESTMENT

With any process analysis solution, you are effectively putting your production in the hands of technology. FOSS is the right partner to provide a reliable solution with consistently high uptime.

ProFoss™ 2 is simple to install directly in the production line and comes with a total service solution to help protect your investment. SmartCare™ service and support plans offer the option of preventative maintenance for maximum uptime and minimised repair costs

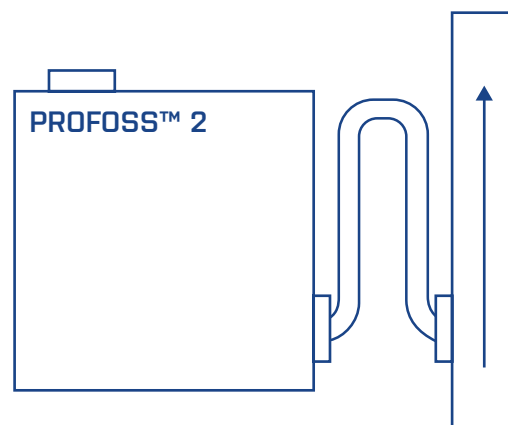
THE NEW PROFOSS™ 2 SOLUTION OFFERS:

- Proven technology for precision and trouble-free operation
- User-friendly interfaces allowing anyone in the plant to contribute to process control
- Service programmes offering a range of options to suit your business
- Service in a timely manner by fully trained local staff onsite and/or remotely through internet

DEDICATED SAMPLE INTERFACE

LATERAL TRANSMITTANCE:

The 3rd generation Lateral Transmittance probe does not restrict the flow rate of the product. It can easily be installed in the production line using a standard Varinline connection for installation in a pipe or by welding an interface flange into the wall of a tank. In combination with the ProFoss™ 2 unit, it is perfect for in-line analysis of fresh cheese and strained yoghurt applications such as Greek yoghurt, skyr, quark, labneh, cream cheese and more.



PROFOSS™ 2, DESIGNED FOR PROCESS ENVIRONMENT AND PROCESS OPTIMISATION:

ProFoss 2 is a flexible and easy-to-implement solution with key food safety certifications. Implementing ProFoss 2 provides insight into the process to help maximise production yield across multiple production lines. ProFoss 2 is supported by a range of digital services.

STANDARDS AND APPROVALS

ProFoss 2 is CE labeled and complies with the following directives:

- 3A hygiene approval
- Low Voltage Directive 2014/35/EU
- EMC (Electro Magnetic Compatibility) Directive 2014/30/EU
- Packaging and Packaging Waste Directive 94/62/EC
- WEEE Directive 2012/19/EU
- RoHS directive 2011/65/EU
- REACH Regulation (EC) No. 1907/2006

Additional for ProFoss™ 2 Ex:

- ATEX & IECEx certified

TECHNICAL SPECIFICATIONS

Measuring technology: Lateral Transmittance	
Analysis frequency	Real time: Average analysis time per result 2 - 3 seconds
Wavelength range	850 - 1050 nm
Detector	Si Diode Array
Spectral dispersion Si Diode Array detector	1.0 nm/pixel
Process line interface	Sapphire, 5 mm thick, with food grade FFPM O-ring seals Fits into standard GEA Tuchenhagen Varinline Access Units with Ø68 mm opening (Type N)
Product temperature	Max 150°C (302°F)
Product pressure	Production pressure < 30 bar (< 435 PSI). Shock pressure < 75 bar (< 1088 PSI). Warning! Varinline access units higher than DN 80 permit a maximum pressure of 10 bar (145 PSI).
Optical fiber protection:	Steel armoured (1, 3, 5 or 10 metres)

Technology	NIR technology	
Software package	ISIScan NOVA™ for instrument control	
Wavelength accuracy	< 0.5 nm	
Wavelength precision	< 0.02 nm	
Wavelength temperature stability	< 0.01 nm/ °C	
Spectral noise	< 60 micro AU	
Vibrations - require optical fiber fixation	Can handle most vibration situations (0.4 Grms)	
Ambient operating temperature	ProFoss™ 2 -5°C to 40°C (23 °F to 104 °F), cooling with a compressed air line allows use up to 65°C (149 °F)	ProFoss™ 2 Ex 0°C to 50 °C (32 °F to 122 °F)
Pressurised air – cooling (Amb. Temp. 40 - 65°C)	Cooling air flow rate minimum 5 l/min, >99.9% water free, >99.9% free of oil and fine particles down to 0.3 µm	
Ambient humidity	< 90% RH	
Dimensions (W x D x H)	w x h x d = 420 x 420 x 135 mm (16.5 x 16.5 x 5.3 inches) + brackets to hold the unit	
Weight	25 kg (20 kg)	
Power supply	1 phase, 100-240 VAC (max ±10% of the rated voltage), max. 40 VA, 50 - 60 Hz	
Cabinet / Housing materials	1.5 mm (lid 2.5mm) Stainless Steel EN 1.4301 (SS2333)	
Mechanical environment	Process control equipment	
Degree of protection	ProFoss™ 2: IP69*	ProFoss™ 2 Ex: IP6X
Approvals	ProFoss™ 2: CE	ProFoss™ 2 Ex: CE, ATEX, IECEx certified (Dust explosion approved)
Hygiene	3A hygiene certified	
Communication	KEPServerEX (Ethernet, Analogue Profibus/Profinet) to PLC/SCADA; FossManager™	
Network	High quality, shielded LAN cable; minimum category 5e. RJ 45 (IP 67) LAN connections	
Operation	Indoor use or outdoor shielded from rain and direct sunlight	

* IP69 is the highest protection for dust entering the unit. IP69 means protected against the effect of high-pressure water and/or steam cleaning high temperature.

FOSS

FOSS
Nils Foss Allé 1
DK-3400 Hilleroed
Denmark

Tel.: +45 7010 3370
Fax: +45 7010 3371

info@foss.dk
www.fossanalytics.com
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