

Fossomatic™ FC Somatic cell counting for raw milk testing



Fossomatic™ FC performs accurate milk analysis using somatic cell counting. It is a high capacity analyser (up to 600 samples per hour) that meets the demands of farmers in need of fast and reliable payment and Dairy Herd Improvement (DHI) results. Fossomatic™ FC is based on flow cytometry technology that counts somatic cells in compliance with ISO/IDF and FDA/NCIMS standards.

Fossomatic™ FC somatic cell counter can be integrated with the MilkoScan FT+ to form a CombiFoss™ FT+. Supported by a dedicated Foss Integrator™ software, which provides a wide range of quality assurance and GLP features. Foss Integrator shares the same interface for all CMT instruments.

Sample	Parameters
Milk types: Raw milk from cow, sheep, goat and buffalo	Total Somatic Cell Count



Precision to match your standards

Do not accept dictated instrument settings. With the Fossomatic FC you can decide thresholds according to local requirements for payment and herd improvement.

In many countries the average cell count is falling as dairy herd health improves. This has led to even lower payment limits as well as bonus agreements for milk with an SCC below lower limits. With the dynamic precision system of the Fossomatic FC you have the power to do things your way.

Improved flow of reliable, traceable measurements

The Fossomatic FC offers unique performance with the ability to measure up to 600 samples an hour.

This speed gives you a good, profitable flow of samples through your laboratory, more unique features such as the FMA test makes it simple to monitor the performance of the instrument. The FMA test allows rapid and convenient instrument standardization according to the direct cell count reference method.

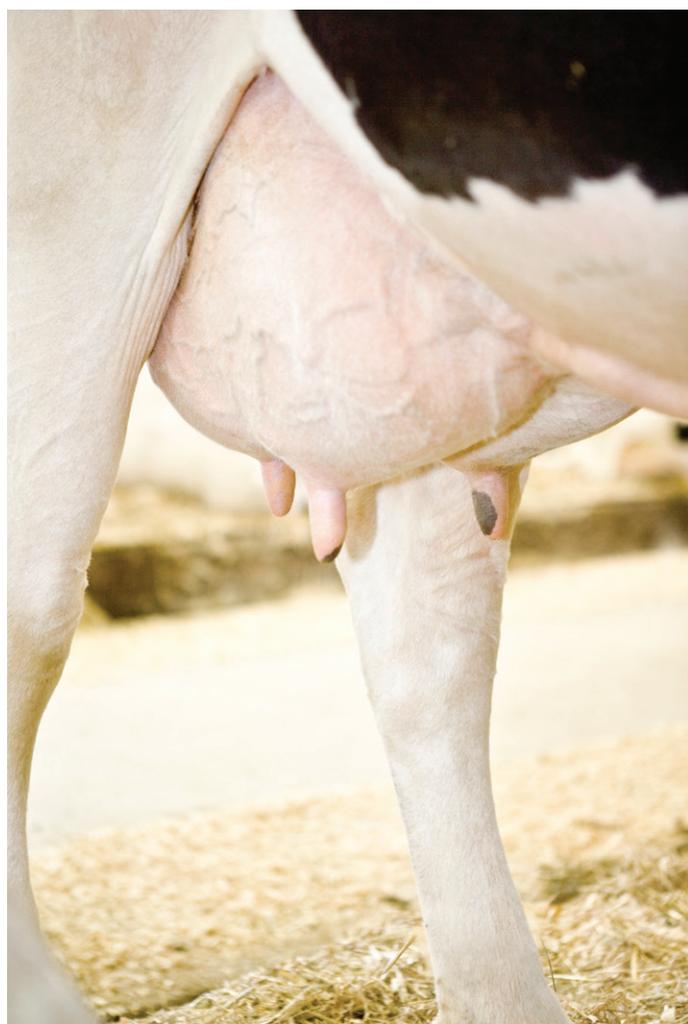
Safe and effective handling of dyes and reagents

Waste liquid is split into milk, high and low concentrated waste, helping you to dispose of waste in a safe and effective way. An automatic rinsing function keeps the instrument clean to ensure optimal performance. It is quick to load reagents and operators can avoid contact with dye using the enclosed dye bag system.

Versatile options

With the ability to measure up to 10 million cells per millimetre, you can test a range of samples from cows, goats, sheep or buffalo.

The Fossomatic™ somatic cell counter can be integrated with the MilkoScan™ FT + to form a CombiFoss™ FT+.



Technology

Accurate somatic cell analysis with flow cytometry

The measuring principle is flow cytometry which complies with IDF and FDA/NCIMS requirements for somatic cell counting. Flow Cytometry is a technique used for counting and characterization of particles and cells. It can be directly translated as “the measurement of cells while they are flowing”.

Patented dynamic precision

Until the late 1990's all somatic cell counting (SCC) equipment had been pre-set to count on the same fixed amount of milk sample, typically from 1 µl up to 10 µl (depending on the instrument).

Naturally, the smaller the milk sample counted, the larger the statistical errors in the result. Poisson-statistics can be applied to the counting of milk cells, i.e. the larger the sample, the better the precision, as described by the rule of repeatability: relative repeatability [in percent] = 100/square root of counted cells. The average SCC of two or more measurements is more accurate than a single measurement, but performing two measurements on the same sample means doubling the analysis time. That is where dynamic precision comes in.

If you take a large portion of stained milk cells and keep analysing this for an extended period, the results will give an increasingly accurate average cell count and a better precision as the analysis progresses. If after 2 seconds, 3,3 µl have been analysed, 6,6 µl will have been analysed after 4 seconds, and so on. But how do you find out when to stop?

With a fast computer you can calculate the SCC as often as necessary and to stop the analysis as soon as the result has reached the required precision. In this way dynamic precision satisfies the requirements for both accuracy and speed in somatic cell counting.

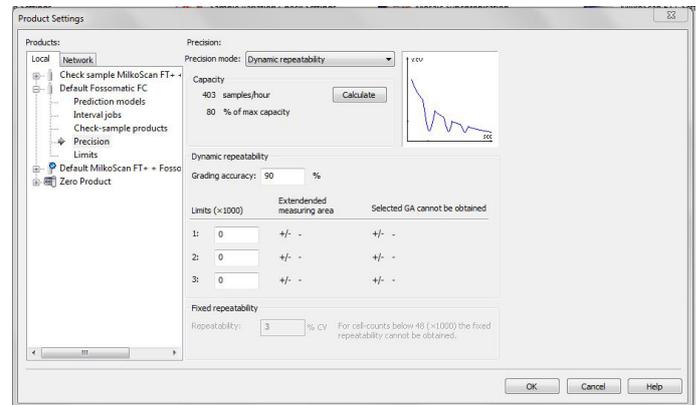
Working Factor (WF)

The working factor refers to the volume of milk sample in which the somatic cells are counted.

Repeatability

The repeatability (CV) expresses to which degree the analyser is capable of counting the same amount of somatic cells in the same milk sample.

The higher the SCC, the better the CV. The lower the WF, the better the CV.



Precision Set-up

The Precision Set-up software feature allows the Fossomatic™ to run milk samples at a higher precision in certain areas, for example around grading limits, without significant loss of capacity.

The Precision Set-up offers three options:

- Standard precision set-up
- Fixed Repeatability
- Dynamic Repeatability

Standard Precision Set-up

This set-up refers to the default way of analysing. The working factor is fixed, giving a better coefficient of Variation (CV), as the SCC gets higher.

Fixed Repeatability

This set-up is used if a better repeatability (lower CV) is needed in the low SCC area. All samples analysed in the SCC area where the CV is kept fixed, are measured at a lower working factor than in the Standard Set-up, and therefore time per analysis increases.

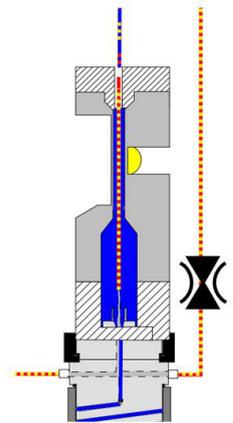
Dynamic Repeatability

When selecting Dynamic Repeatability, it is possible to define up to three SCC areas, with a higher precision (lower working factor) than offered by the Standard Set-up. This is used to give an even better precision around grading limits.

How Fossomatic™ FC works

The Fossomatic FC counts somatic cells based on recognition of DNA from the cells. A mixture of milk and staining solution is surrounded by a sheath liquid and passed through a flow cell. In the flow cell, the stained somatic cells are exposed to light of a specific wavelength. The cells then emit fluorescent light pulses at a different wavelength, the pulses are counted and displayed.

The design of the flow cell ensures that only one somatic cell is detected at a time. Higher precision can be obtained at grading limits using precision set-up feature.



Universal software

The Windows-based Foss Integrator software platform eases operations. A PHA diagram helps the operator make a fast and accurate evaluation. Radio Frequency ID (RFID) tags provide modern sample identification. Automatic Job Control helps reduce the operator workload. Perform calculations on results in your own Excel spreadsheet, and return data to the Integrator platform.

Reagent concept

All Fossomatic reagents are certified, an important feature for laboratories operating according to ISO /IEC 17025:2005, and are handled in a closed system that protects the operator. Waste is split into fractions to reduce the cost of waste disposal.

Quality assurance

The Fossomatic™ Adjustment Sample (FMA) and the Quality Check Application is a combination of applied chemistry and computer software that allows detailed monitoring of Fossomatic performance. Well-defined artificial particles in a liquid suspension can be stained and measured just like somatic cells in milk, allowing you to adjust the instrument for optimum performance.

With the FMA Sample and Fossomatic Quality Check Application you get:

- Easy routine instrument check
- Performance documentation
- Early detection of potential measurement problems
- Suggested corrective actions



Best of the new

To match the increasing demands of the modern laboratory Fossomatic FC includes a number of new features that optimise laboratory efficiency and keep costs down:

- Higher speed, up to 600 samples per hour
- Improved rinse system prevents blockage and reduces down-time
- Improved reliability/accessibility of flow system parts - keeps maintenance down
- All liquids are temperature-controlled to optimise the staining and cleaning
- Universal software platform (Foss Integrator) with improved data handling and integrated help system makes it easy to handle all FOSS CMT analysers
- Not only for cow's milk, also milk from other species such as sheep and goats



Conveyor system with in-built Sample ID

You have a choice of a few automation solutions for the FOSS analysers to match your needs best. Two impressive, and highly appreciated by our customers, standard conveyor systems are available: Conveyor 4000 and Conveyor Basic. They are intelligent units with a built-in microprocessor, controlled by the analyser and providing at minimum:

- Rack advance and positioning of sample bottles under the stirrer and pipette
- Sample identification for the "ladder" position of the bar codes*
- Automatic detection of check-samples

Conveyor 4000 is the advanced and most flexible solution with many additional useful functions like:

- Automatic rewind of racks with samples to be re-tested
- Sample identification for bar codes of all positions, as well as 2D and RF-tags*
- Unique bottle rotation mechanism, for fully automated sample identification*
- Sample temperature conservation
- Extensions for creating more space for the bottle racks*
- Sample buffering*

A semi-automatic option ideal for milk-testing laboratories with a lower sample throughput is also available. In this version, a plate is placed instead of the conveyor.

*Optional

CombiFoss™

The Fossomatic™ FC can be integrated with a MilkoScan FT+ multi-component analyser to form a CombiFoss™ FT+, without reducing sample capacity and at the same time promoting operational effectiveness by sharing the Foss Integrator software platform.



Fossomatic FC in a CombiFoss™ configuration

The Fossomatic™ FC gives you the analysis performance you need to meet new demands for analysis efficiency, and it offers you exciting new business opportunities at the leading edge of milk analysis.

Specifications

Performance	
Measuring range	0 – 10 mill cells/ml
Performance range	0.1 – 1.5 mill
Repeatability*	CV < 6% 100-299k SCC/ml CV < 4% 300-499k SCC/ml CV < 3% 500-1500k SCC/ml
Repeatability with precision setup in use	CV < 3.5% 100-299k SCC/ml CV < 2.5% 300-499k SCC/ml CV < 2% 500-1500k SCC/ml
Accuracy	< 10% relative mean diff. from DMSCC (Direct Microscopic Somatic Cell Count)
Carry-over	< 1% relative usually below 0.4%
Sample types	Cow's, goat's, sheep's milk and other

*CV = Coefficient of variation (STDev/AVG) x 100. (STDev = Standard deviation. AVG = Average)

Installation requirements	Fossomatic FC	Conveyor
Dimensions	(HxWxD) 63 x 85 x 68 cm	72-95 x 230 x 28 cm
Weight	100 kg	57 kg
Power supply	100 - 240 VAC, 50/60 Hz	115/230 VAC, 50/60 Hz
Power consumption	Max. 800 VA	Max. 500 VA
Compressed air	None	4.0 – 7.2 bar
Air consumption	-	0.2 N litre per minute
Ambient temperature	15 - 33°C	15 - 33°C
Noise level	< 70 dB(A)	

Application data

Analysis Capacity*	100, 200, 300, 400, 500 or 600 samples per hour
Sample intake	2.5 ml (programmable 2.0 – 5.0 ml)
Required sample temperature	30 - 42 °C (86-107.6 F)
Working factor	300 or better

*The Fossomatic FC is also available in a semiautomatic version without automatic sample conveyor.

Data output

Real-time display/print-out, storage on hard disk.
Host transmission (RS232) and PC network transmission (TCP/IP).
Data export using CSV files, CS83 protocol or XML.

Standard equipment

Basic analyser incl. table and reagent containers, PC, software.

Optional equipment

Conveyor 4000 or Conveyor Basic, extra containers for reagents, bar code readers, 2D reader, RFID reader, system for sample bottle rotation, extensions for the Conveyor 4000, bottle rack output buffer for the Conveyor 4000, racks for sample bottles, printer.

Standards and approvals

Fossomatic™ FC is CE-labelled and complies with the following directives and regulations:

- EMC (ElectroMagnetic Compatibility) Directive 2004/108/EC
- LVD (Low Voltage) Directive 2006/95/EC
- Machinery Safety Directive 2006/42/EC
- Regulation (EC) 1272/2008 on classification, labelling and packaging of substances and mixture, CLP (EC)
- WEEE Directive 2002/96/EC
- Packaging and packaging waste Directive 94/62/EC
- REACH 1907/2006/EC

Fossomatic technology complies with:

- AOAC
- ISO 13366-2 / IDF 148-2:2006
- Laser approval (FDA), IEC 60825-1

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