Polytec

Inline quality control
of milk
Application note

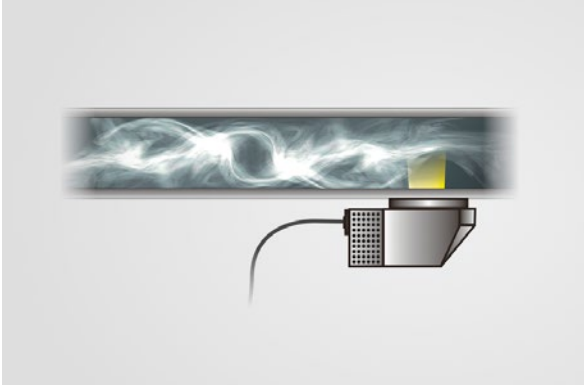
Inline quality control of milk

Liquid milk and cream are the initial products of any dairy production. Due to their sensitivity to separation effects, milk and cream require constant and reliable control in each of the production processes. Milk and cream are special products because they are a suspension of water and fat. These characteristics and the milk composition change from season to season, country to country and even from cow to cow. Thus, a comprehensive quality control is required for subsequently producing high-quality dairy products.

The advantage of inline analytics is the automated control of production processes. In addition enabling consistent product quality check, the production process is continuously monitored. This leads to a faster return on investment and helps the producer continuously improve the operating processes.

The method is applied at several levels of the production chain, such as incoming goods inspection goods inspection, process control and final product classification. Users can derive many parameters relevant to product quality from a single measurement.

Polytec's inline near infrared (NIR) spectrometers enable permanent analysis of common parameters in milk such as fat, protein, lactose or dry matter content (FFDN) and continuously provide accurate measurements within seconds. With real-time trends, displayed in the control room, users can react immediately to process deviations, avoiding time-consuming sampling, waiting times for laboratory analysis and the use of environmentally harmful chemicals and solvents.

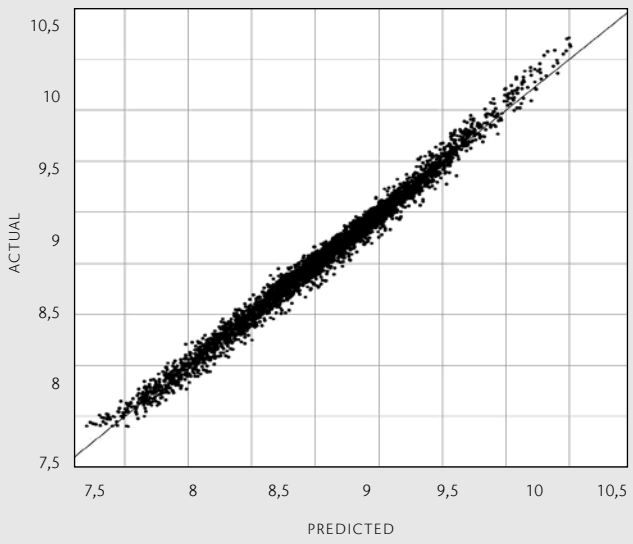


Optimized inline process head.

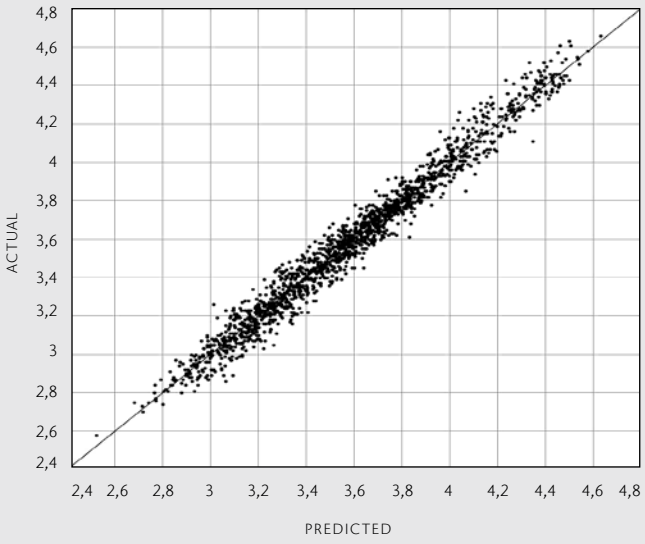
The analyses are carried out using a highly sensitive reflective probe that is adopted into the process via sapphire window. This enables non-contact measurement of the milk via a certified measuring point.

Due to its small sample diameter, the probe can be attached to pipelines and storage tanks. The measurement is carried out according to and in compliance with ISO21543 / IDF201.

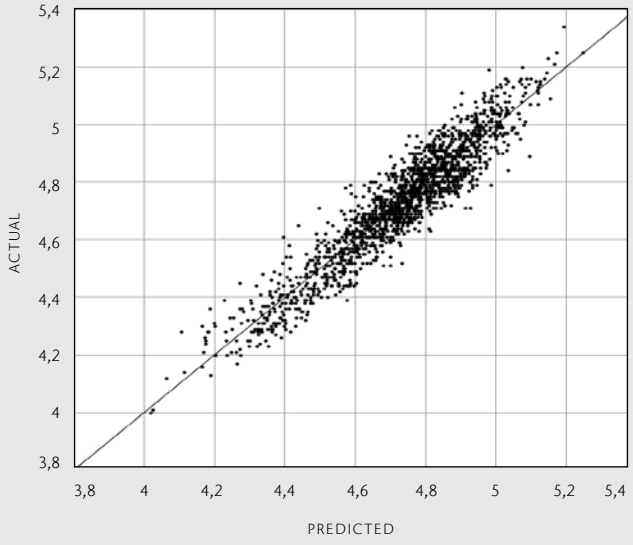
Fat in Milk



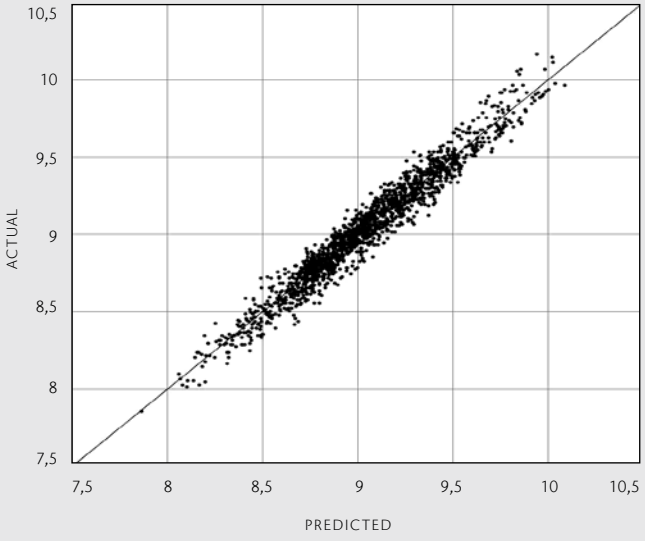
Protein in Milk



Lactose in Milk



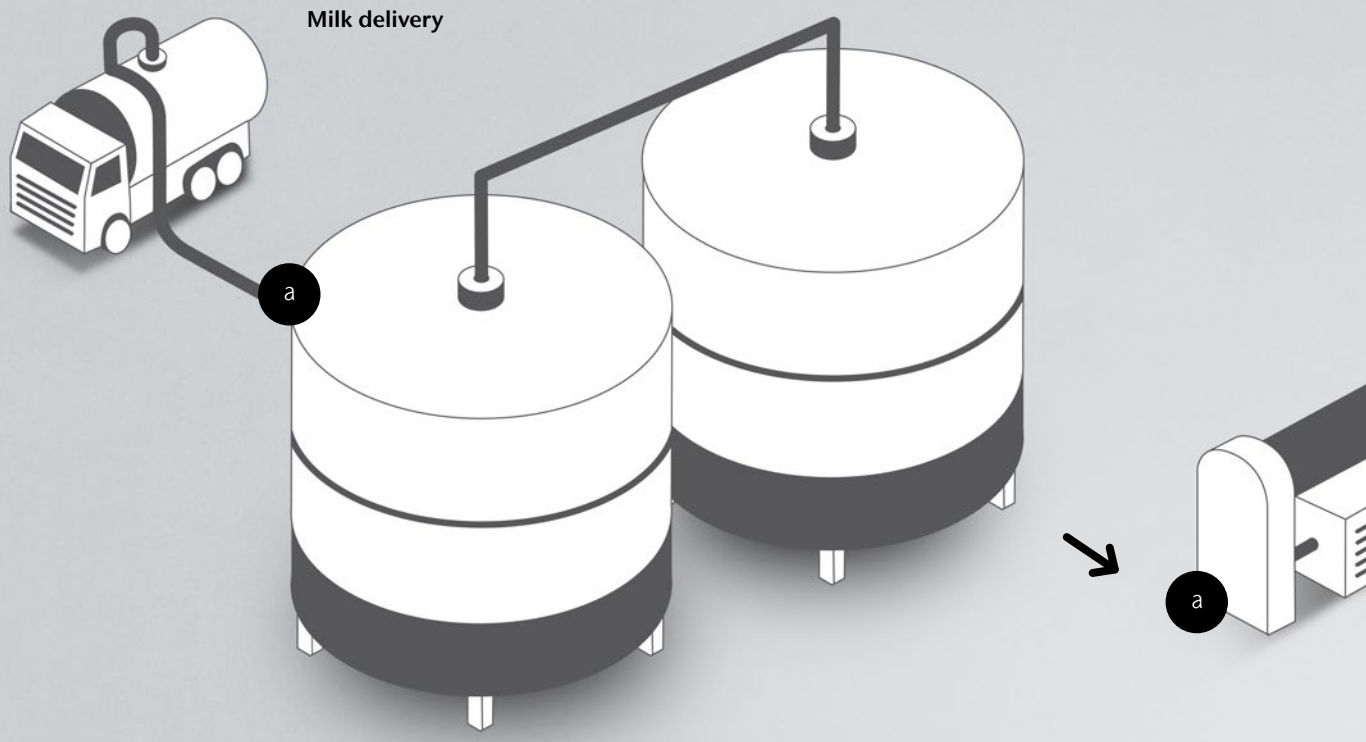
FFDM in Milk



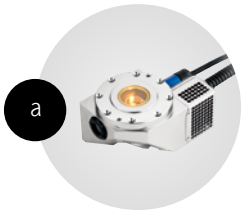
Calibration Parameter

	Min (%)	Max (%)	RMSECV
Fat	0,8	8,1	0.125
Protein	2,4	7,7	0.073
Lactose	4,0	5,3	0.076
*FFDM	7,2	10,2	0.087

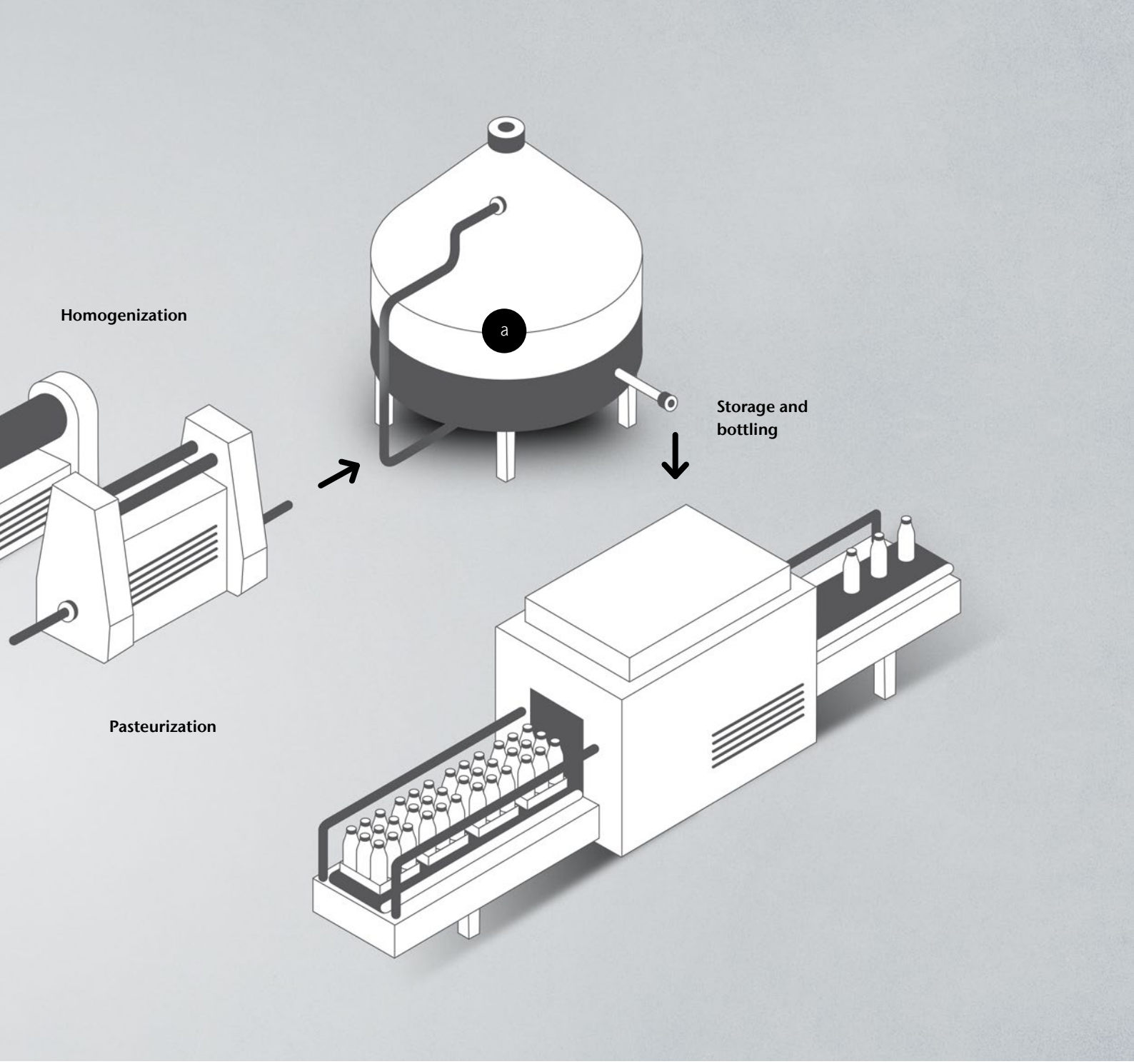
*Free Fatty Dry Matter
Min: Minimum reference value in the calibration data sets.
Max: Maximum reference value in the calibration data sets.
RMSECV: Root mean square error of the cross-validation for the calibration data set.



Summary



Owing to the Polytec NIR spectrometers direct use in the corresponding production steps of the milk processing industry, it is possible to perform fast, cost-effective and efficient quality control. With Polytec´s NIR spectrometers and expandable multiplexer technology, up to six measuring probes can be installed at the different production points with merely one spectrometer. This technology enables our customers to monitor the entire production process from milk delivery, storage, homogenization and pasteurization to subsequent processing or filling without any restrictions.

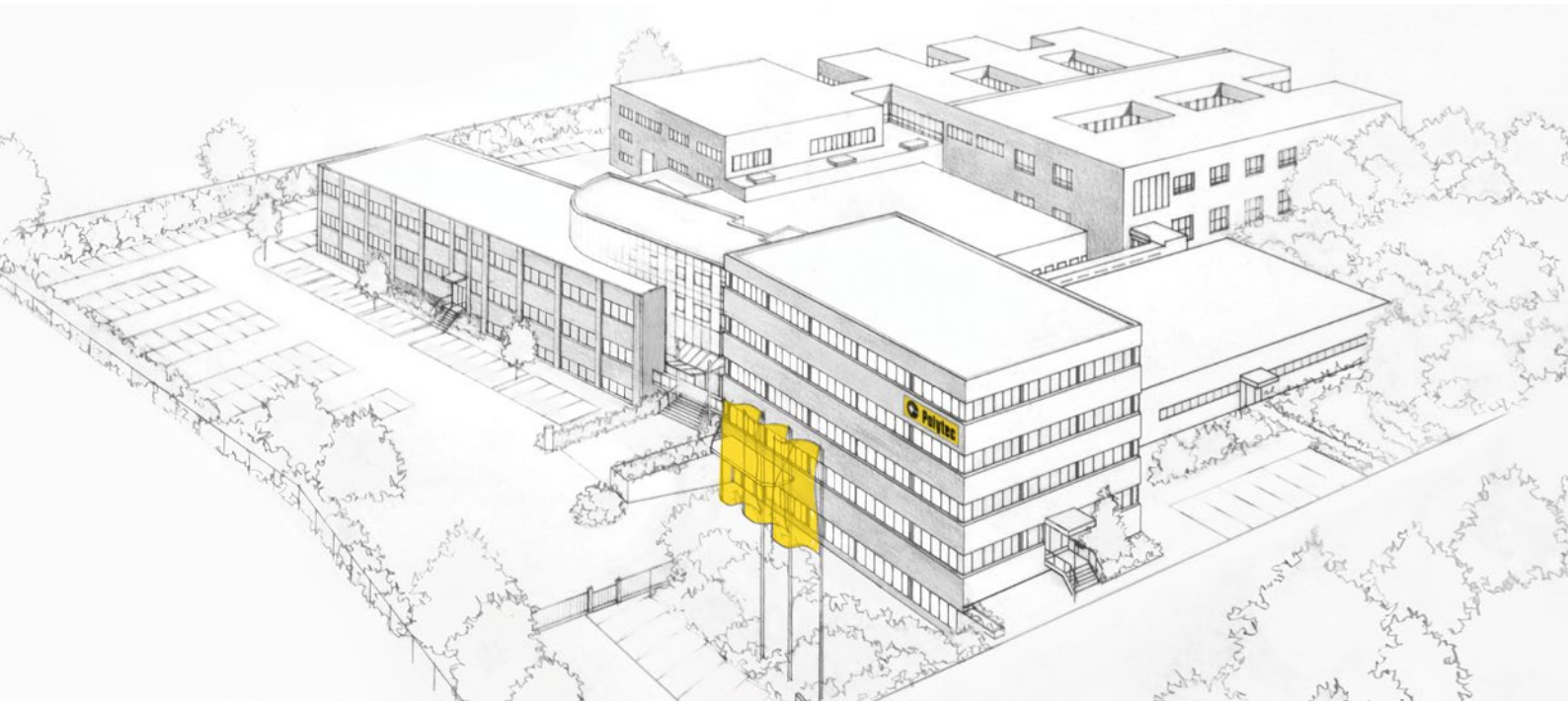


Application and calibration support

Polytec's application team has extensive knowledge of measurement equipment and applications. Our specialists can assist you with method development either remotely or in your production area.

Service and maintenance

With many years of experience in NIR spectroscopy, Polytec's online spectrometer series is designed to provide years of trouble-free operation. However, should a problem arise, a worldwide network of Polytec companies and representatives is at the ready to address your needs. Professional installations and excellent service after delivery are commitments Polytec makes to all customers.



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