



Tetra Scherping™ CoAguLite

Milk coagulation control technology



Highlights

- Optimizes cutting-time selection
- Reduces cost of failure
- Safeguards coagulation speed
- Decreases weight variation
- Lowers moisture variation
- Repeatable results
- Easy to connect
- Frees operator time



*Tetra Tebel OST curd making vat
with Tetra Scherping CoAguLite*

The easiest way to upgrade your cheese line

Coagulation time is a key factor in curd-making and is constant for each particular cheese type. Studies of processing data from a given day's production tend to reveal processing changes that affect the enzymatic reaction rate, while all controllable variables are constant.

Tetra Scherping CoAguLite milk coagulation control technology replicates the cheese-maker's selection of cutting time while taking into consideration processing effects, e.g. milk age, cream content, changes in enzyme type, culture virulence and other parameters. The results of the measurement can be made available in a plant information system, where this information can be used to find the causes of differences in optimum coagulation times.

Benefits of coagulation measurement

Most steps in the curd-making process are time-based and automatically controlled. At the end of the critical coagulation step, where milk is transformed to curd, it is usually necessary for the operator to intervene. His skills and experience are used to judge the status of the newly formed coagulum. After the operator's confirmation, the coagulum can be released for the next step – cutting.

At this point, the operator's discipline and availability are essential. However, due to shift changes, breaks, disturbances, etc, several batches per year generally fail when no or insufficient rennet is added. By literally giving you insight into the ongoing cheese-making process, the Tetra Scherping CoAguLite sensor can prevent these failed batches.

Payback

The losses that can be avoided by using Tetra Scherping CoAguLite are substantial. Losses in cheese quality, moisture and cheese block weights can be limited. Savings can also be achieved from using the correct amount of rennet.

Moreover, if the Tetra Scherping CoAguLite sensor is used as an automatic start signal for the cutting, valuable operator time is freed for other tasks.

Working principle

The Tetra Scherping CoAguLite sensor measures changes in light backscatter during enzymatic coagulation of milk. Light from an LED is transferred to the milk through a fibre, and the light reflected from the milk is transmitted through an adjacent fibre to an optical detector.

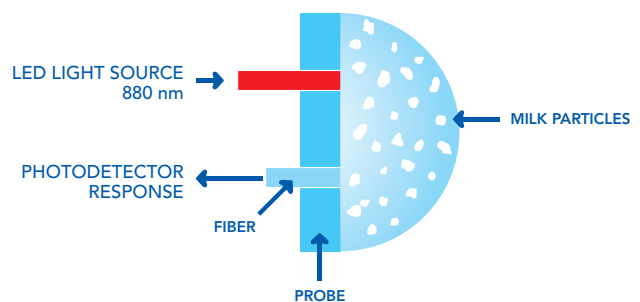
The consistent performance results from the use of the latest optical technology, a robust sensor design and employment of fundamental principles of chemical reaction kinetics. The reflectance signal carries information about changes in the physical size and structure of the casein micelles during enzymatic hydrolysis and coagulation.

During coagulation, the light backscatter follows a consistent pattern. Parameters from this pattern are used in the algorithm to predict the cutting time.

Coagulating milk

Tetra Scherping CoAguLite milk coagulation control technology is based on its ability to precisely measure the enzymatic reaction rates in the vat. It does this by measuring the parameter T1MAX1, which is the time after adding enzyme when the change in light backscatter is at its peak rate. The technology is used to accurately predict the cutting time of the vat according to the formula Predicted Cutting Time (PTCUT) = T1MAX1 x Beta x f(protein). Beta is a parameter selected in the plant by the cheesemakers to replicate their judgment of the optimum cutting point.

The precision of measurement of the technology, as expressed by a coefficient of variance (C_v), has been determined to be between 1.1 and 1.8%. (C_v is calculated by dividing the standard deviation by the mean.) We conservatively selected 1.8% for the precision of PTCUT. This means that if the true cutting time is 30 minutes, the Tetra Scherping CoAguLite milk coagulation control technology can predict it with a standard deviation of 0.54 minutes (32.4 seconds).



Easy to connect

- Socket which must be welded onto the vat wall
- Standard 4-20 mA electrical connection
- All calibrations at one time

Tetra Scherping CoAguLite gives tremendous insight into the coagulation process and offers the possibility to optimize the process conditions. The sensor has been applied successfully for many years in the USA and has also been validated in Semi-hard cheese production at a major cheese producer in The Netherlands.