



CoAguLite™

Cutting Time Control Technology

- ❖ **Delivers reliable cutting time predictions**
- ❖ **Alerts for non-standard vats**
- ❖ **Alerts that enzyme was added**
- ❖ **Reduces whey fat losses**
- ❖ **Improves moisture control**
- ❖ **Reduces fines losses**
- ❖ **Assist with enzyme reactivity changes**
- ❖ **Assist with recipe calibration**

Technology

The CoAguLite Cutting Time Control Technology measures the enzymatic coagulation of milk for cheese making and can automate the cutting time selection to the cheesemaker's desired gel firmness. The uniqueness of the technology is that it measures the enzymatic reaction rate and translates this information into a simple algorithm for predicting a cutting time. Because the technology measures the enzyme reaction rate, it automatically adjusts for changes in temperature, pH, enzyme reactivity, enzyme concentration, as well as other factors that affect the coagulation reactions. The algorithm contains an option to adjust for protein concentration. The automatic cutting time selection results in a more consistent cheese product, improved moisture control, reduced whey fat losses, improved yields, and a reduced reliance on skilled labor.

History

The CoAguLite sensor, first introduced in 1993 and with over 500 units installed, has a history of providing cheese makers with a tool for both monitoring the status of the coagulation process as well as automation of the cutting time selection.

Process Monitoring Features

The process monitoring features provides a confirmation that enzyme was added (avoiding the loss of a vat of milk), alerts to slow coagulating batches, provides a countdown to predicted cutting time, and gives a visual display of the milk coagulation progress. These process monitoring features provide the operator with the coagulation status and ability to control the process.

Desired Gel Firmness Calibration

The CoAguLite sensor technology is calibrated to replicate the cheesemaker's desired gel firmness. It is calibrated by simply dividing the operator selected cutting time by the CoAguLite time parameter, Tmax, for 5 to 10 vats. The ratio is a recipe-specific value, Beta. A history table programmed into the PLC assists the cheesemaker in making this calibration.

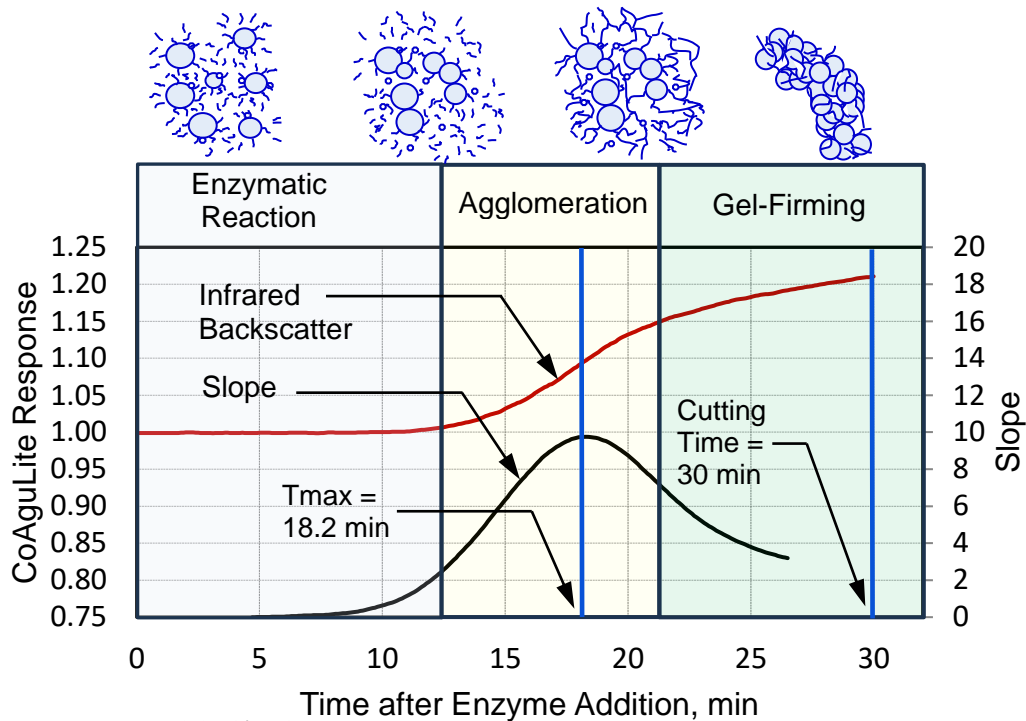
Installation

The CoAguLite technology installation is simple and efficiently uses the existing plant PLC and HMI hardware. The optical sensor is installed into a ferrule welded into the cheese vat. There are no moving parts, no consumables required – just a sanitary, CIP cleanable, inline optical sensor, that almost never needs repair. The sensor lifetime is expected to exceed 10 years with no repairs.

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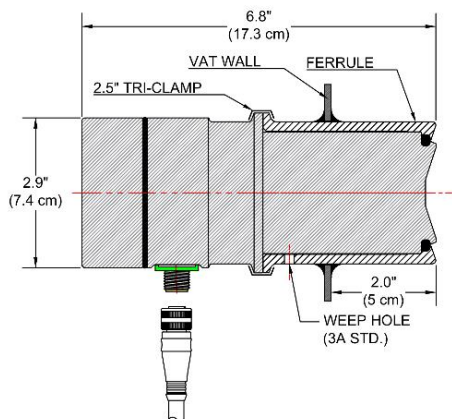
Coagulation Measurements

The CoAguLite sensor directs infrared light into the coagulating milk and measures infrared light backscatter which increases during the agglomeration and gel firming phases as shown in the graph below. The slope of the measured infrared light backscatter is calculated by an algorithm in the PLC and the time of the peak slope, T_{max}, determined.



2025 03 06 CoAguLite Standard Graph for Brochure

T_{max} is directly proportional to the enzymatic reaction time. The cutting time is determined by multiplying T_{max} by a Beta factor (Cutting time = Beta * T_{max}) which is 1.65 for the above example, thus: Cutting time = 1.65 * 18.2 = 30 min.



Cross sectional view of vat mounted installation



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CoAguLite Model 7 sensor with a vat ferrule and 2.5" Tri-Clamp connector.