Data recording in flash pasteurisation applications
Accurate and reliable pasteurisation records

Measurement made easy

Complies with traceability requirements.

Introduction

Pasteurisation is a key stage in the production of a wide range of food and beverage goods, including milk, dairy products, beers, juices and even water. During pasteurisation, products must be treated according to strict international hygiene standards before they can be declared fit for human consumption. The onus is therefore on manufacturers of food and beverage products to demonstrate that the pasteurisation process has been effectively carried out and that the product is safe to place on the market.

There are broadly two main types of pasteurisation process. High Temperature Short Time (HTST) involves products being heated, typically, to 72°C (161°F) for 15-20 seconds. Ultra Heat Treatment (UHT) is most often used on milk and sees products being treated at temperatures of 135°C (275°F) for at least one second.

This short term heating kills the majority of harmful spoilage organisms and pathogens harmful to human health and prolongs the storage capabilities of the product, making it safe to consume within the use by dates.

The relevant standards for pasteurisation processes, particularly milk, are set out by various national food safety agencies, such as the United States Department of Agriculture (USDA) with their Pasteurised Milk Ordinance (PMO), the MVO in Germany and the Food Standards Agency (FSA) in the UK. Similar standards apply throughout the world.

Throughout Europe and the majority of the rest of the world, it is a legal requirement for companies to record the pasteurisation process of any products.

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ABB

The application

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During a continuous pasteurisation process, raw material is pumped at a fixed flow rate from storage tanks through a pasteuriser where it is heated to the required specific temperature for the product being produced.

Once heated it is passed through a 'holding tube' which retains the product, at temperature, for the required time period, before being passed through for rapid cooling and final packaging. If the appropriate pasteurisation temperature has not been maintained at the outlet of the holding tube then a divert valve operates to pass the product back for reprocessing. Only safe, correctly treated product is allowed through the divert valve for final packaging. Note: it is important to monitor and record the actual divert valve position, not the demand to it.

To comply with traceability requirements, a data recorder is used to independently record the temperature of the pasteurized product and the divert valve position as a minimum. Typically the temperature of the hot product, the cold product and the divert valve position is recorded. The operation of the divert valve is often triggered from the recorder itself.

The challenge

Accurate and reliable recording of the pasteurisation process is one of the largest challenges facing a processor. This is the primary record proving that product has been processed appropriately and is the record used to prove pasteurisation to the authorities. It is important to record the temperature of the product as it leaves the holding tube and the divert valve position as a minimum. Many modern systems also record cold product temperature, product flow rate and differential pressures checking for heat exchanger faults.

The solution

ABB has a number of solutions for process control and recording on pasteuriser plant that meets standards around the world for independent monitoring and recording. These include traditional paper as well as paperless solutions. Many locations in the world prefer to use traditional, circular paper charts with inbuilt control, such as ABB's C1950 series of pasteuriser recorder/controllers, whose details can be found in a separate note.

For many users the control system is provided by PLC's with a separate recorder for operator visualisation and recording. For example, ABB's SM500F videographic recorder is fully environmentally sealed and can easily cope with the demands of recording all parameters asked by today's pasteuriser, operator and auditors.

A typically recorder configuration might cover the following parameters:

– Input 1: Hot product temperature (with alarm triggering divert valve relay)
– Input 2: Cold product temperature
– Input 3: Divert valve position

What can ABB offer?

ABB's ScreenMaster paperless recorders are widely used in pasteurisation applications. They measure and display the process signals and store them in a secure tamperproof format. Advanced features allow for remote viewing using a webserver or notification by email if an alarm condition occurs. Once recorded, the data can then be transferred to remote servers where a long term data storage procedure can be implemented. Using the ABB DataManager Pro software analysis tool, the original data can be verified as intact and can be analyzed on a PC.

What can ABB offer?

SM500F

The SM500F is the world's first field mountable paperless data recorder. Featuring seven channels and available with wall, panel and pipe mounting options, it provides a truly simple recording solution that can be used anywhere, anyhow and by anyone. Its fully sealed IP66 and NEMA 4X enclosure means it is ideal for use in even the most hostile environments, including hosedown and dusty applications.


SM500F Videographic recorder

DataManager Pro

ABB's new DataManager Pro analysis software offers a powerful tool for reviewing recorded data. Using the software, operators can review data from multiple recorders. Functions include the ability to compile graphical charts comparing multiple parameters, plus a dual cursor function enabling operators to review data for specific periods of time and specific recorders.

ABB's ScreenMaster series videographic recorders feature Ethernet communications, allowing users to access the recorders from any web browser. Information can be automatically retrieved and placed in DataManagerPro for further analysis.

DataManager Pro also offers a range of presentation possibilities, including the ability to annotate specific alarms and present recorded data as a combined graph accompanied by tables and statistics.
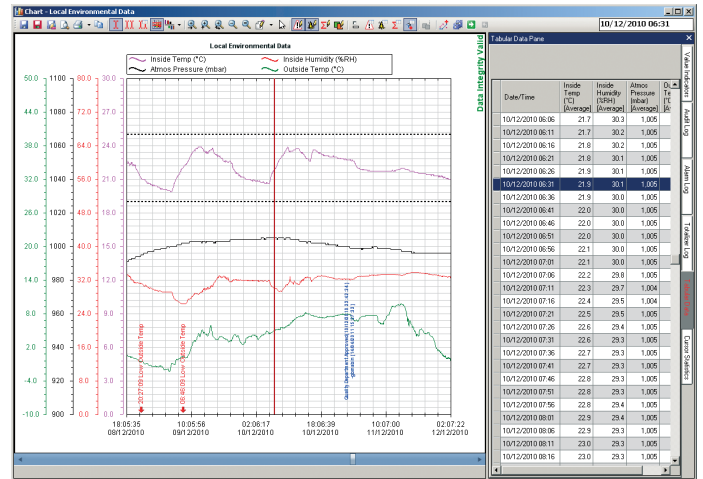
DataManager Pro analysis software offers a powerful tool for reviewing recorded data

Find out more

For more information about ABB's products for pasteurisation applications, please email: **moreinstrumentation@gb.abb.com** ref 'pasteurisation'.

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