

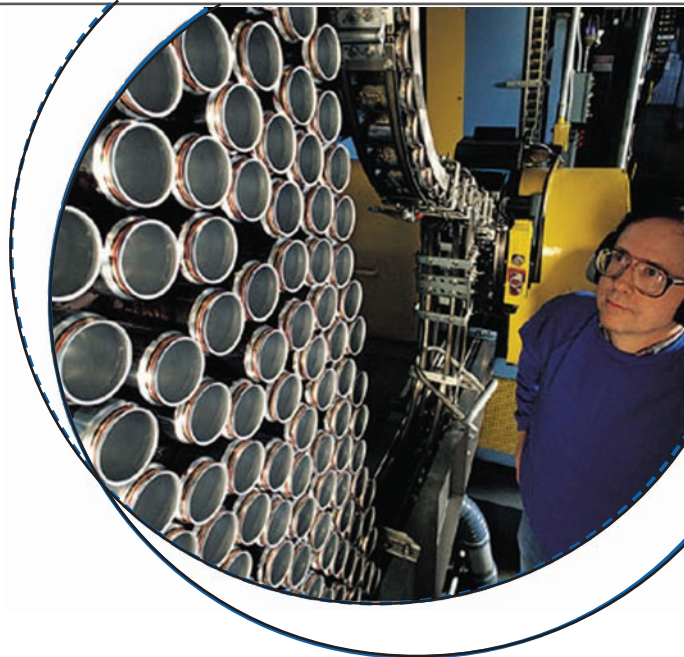
Canning Process Characterization

Applications

- Vegetable
- Fruit
- Fish
- Milk
- Beer

Departments

- Research
- Production
- Quality



Overview

In the canning industry, hermetically sealed cans are subjected to heat in order to kill micro-organisms and ensure a long and stable shelf life. A retort is used to control the heat and pressure around the sealed cans. The amount and duration of the heat treatment must kill the micro-organisms and still guarantee that the food or dairy product is not damaged.

Problem

An automated system is needed to measure and control the amount of heat applied to sealed cans. By adjusting the heat, pressure, and cycle times, an optimum process can be found where micro-organisms are killed, the food product is not damaged, and process time is minimized.

Solution

A VXIbus data acquisition and control system from VXI Technology is ideal for characterizing processes like those used in the canning industry. Temperatures and pressures are accurately measured and controlled with the data acquisition system. Flexibility and expandability give the system the ability to characterize different aspects of the application. A computer in the system ensures that accurate records can be maintained so that an optimum process can be found. Once found, this process can be repeated consistently with the same equipment.

Implementation

Temperatures Monitoring

Thermocouples, thermistors, and RTDs can be used to monitor the temperature of the steam in the retort, of the sealed cans, and of the products inside the cans. Any necessary transducer linearizations can be carried out by either the computer or the instrument.

Application Note

Pressure Monitoring

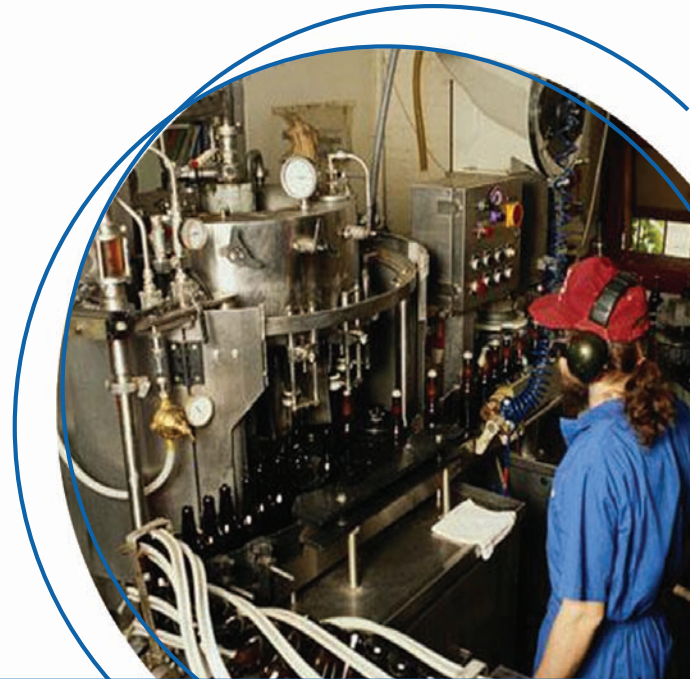
Another important factor in the heat treatment process is the pressure in the retort and in the sealed can. By correlating pressure and temperature, the optimum heat treatment can be applied. Pressure transducers typically output a voltage or current proportional to pressure.

Temperature Control

When an optimal process is found, temperature must be accurately controlled. The data acquisition system can be used to control this temperature using either an actuator to turn heaters on and off or a voltage D/A converter to set the correct temperature level. Using the intelligence of the data acquisition and control system, temperature can be varied under strict control limits.

Pressure control

Pressure can also be controlled with the data acquisition and control system. Digital outputs can control actuators that turn pressure pumps or valves on and off. Voltage or current D/A converters can also be used for positioning of pressure valves. Cycling the pressure can easily be carried out under strict control of the system.



Key System Features

- VXIbus open architecture
- Data Acquisition and Control on a single programmable VXIbus card (VT1419A)
- Graphical programming language (Agilent) VEE or NI Labview)
- Flexibility with deterministic control
- Wide choice of inputs/outputs
- Built-in control algorithms
- Up to 32 user-written "C" code algorithms
- 65,000 reading FIFO buffer
- 500 reading Current ValueTable (CVT)
- All algorithms can write to FIFO/CVT
- Data can be time-stamped

Typical Configuration

Data Acquisition System	Qty
13 Slot Mainframe	1
VT1419A 64 Channel DAC	1
Temperature (VT1508A)	1
Counter Channels (VT1538A)	3-10
Strain Gage Channels(VT1507A)	5-20
Computer/Software	
PC Embedded Controller	
Keyboard, Monitor and Mouse	
Disc Drive, Printer	
Software - DAC Express	