

PROCESS INSTRUMENTATION

Siemens mass flowmeters improve can coating process at dairy production

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One of the world's largest producers of evaporated milk needed help in producing a working balance between the milk that the farmers are able to supply and what their canning plants can handle. In these plants, approximately seven hundred million (700,000,000) cans of milk are produced a year. These canned milk products are then distributed all over the world.

Challenge

The milk cans are produced out of flat tin plates. These tin plates are initially coated with an epoxy coating to protect the milk products from contact with the tin. The tin plates are cut into can size sections and subsequently bent into a cylinder. The seam of this cylinder is then welded together. Immediately after welding, a small nozzle sprays an epoxy coating over the weld to protect the milk from any metallic contaminants. This automated spray coating system allows for greatly increased production throughput and product uniformity. It is critical to accurately measure how much epoxy coating is used by the system's spray nozzles.

If too much coating is used, costs would increase in both wasted material and time. If too little coating is used, then the metallic contaminants may leach out of the cans from the weld area and contaminate the milk.

For optimal protection, a flow rate of 6.2 lb/hr must be maintained with a minimum allowable flow of 5.8 lb/hr and maximum level of 6.6 lb/hr. The system also requires the capacity to quickly alarm when there are flow problems (e.g., pump fault or valve error). If flow errors are detected too late, due to the speed and the volume of the system, thousands of cans could be affected and require rework, or worse, need to be scrapped. The canning tool producer required their canning system to control how much coating is used and give an alarm immediately when flow irregularities occur. The tool manufacturer was having great difficulty supplying a system that could quickly measure the coating flow with the required array of alarms needed, while delivering the needed accuracy and speed.

The SITRANS F C MASSFLO Meters are both software and hardware user configurable.

The intelligent USM II, (Universal Signal Module), platform allows customers to modify individual functions as required.



Solution

Siemens addressed this flow challenge by installing two SITRANS FC MASSFLO®, MASS 2100 DI 3 Coriolis sensors into the canning tool. One sensor was used to measure the flow to the nozzle, and the other measured the re-circulated flow back to the epoxy coating storage tank. The flow data produced from the Coriolis sensors was monitored and controlled using a Siemens Programmable Logic Controller (PLC). When the sensors detected flow variations, an alarm warned the operator that the system required attention and the system could be shut down if required. The canning equipment is now working to the customer's satisfaction and waste has been significantly reduced.

The SITRANS F C MASSFLO meters are both software and hardware user-configurable. The intelligent Universal Signal Module (USM II) platform allows customers to modify individual functions as required. Once installed, the USM II automatically detects and is programmed to factory settings via the SENSORPROM memory unit. Due to a new, dedicated mass flow EPROM with the latest ASIC technology, the flowmeter has an improved step response which provides the response time needed for high-speed applications. Measurement is virtually unaffected by variations in pressure, temperature, density, electrical conductivity and viscosity.

Many beverage venders use this technique to coat their cans, and Siemens has had other significant successes improving these types of applications.

Benefits

- Cost savings – accurate, fast application and monitoring of epoxy coating saves the customer money by not wasting epoxy, reducing waste from improperly coated

cans and assuring customer satisfaction with the end product.

- Improved process reliability – customers can now rely on accurate epoxy coating to ensure the “up-time” and repeatability of the process.
- Improved quality of finished product – by ensuring the accuracy of the epoxy coating, the canning plant can ensure the quality of the milk containers being delivered to its customers.

Legal Manufacturer

Siemens Industry, Inc.
100 Technology Drive
Alpharetta, GA 30005
United States of America
Telephone: +1 (800) 365-8766
usa.siemens.com/pi
Order No.: PICS-00034-0122

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