

Application Spotlight

Air Flow Control in Ice Cream Manufacturing

Repeatability & Stability for Improved Quality

Air Flow Control in Ice Cream Manufacturing

What makes a good ice cream? Besides fresh ingredients and dedicated specialists, the secret lies in the air: In the production process air must feed into the paste at a specified proportion. Controlling the ratio of paste and air by the flow controller is very critical for ice cream quality and consistency.

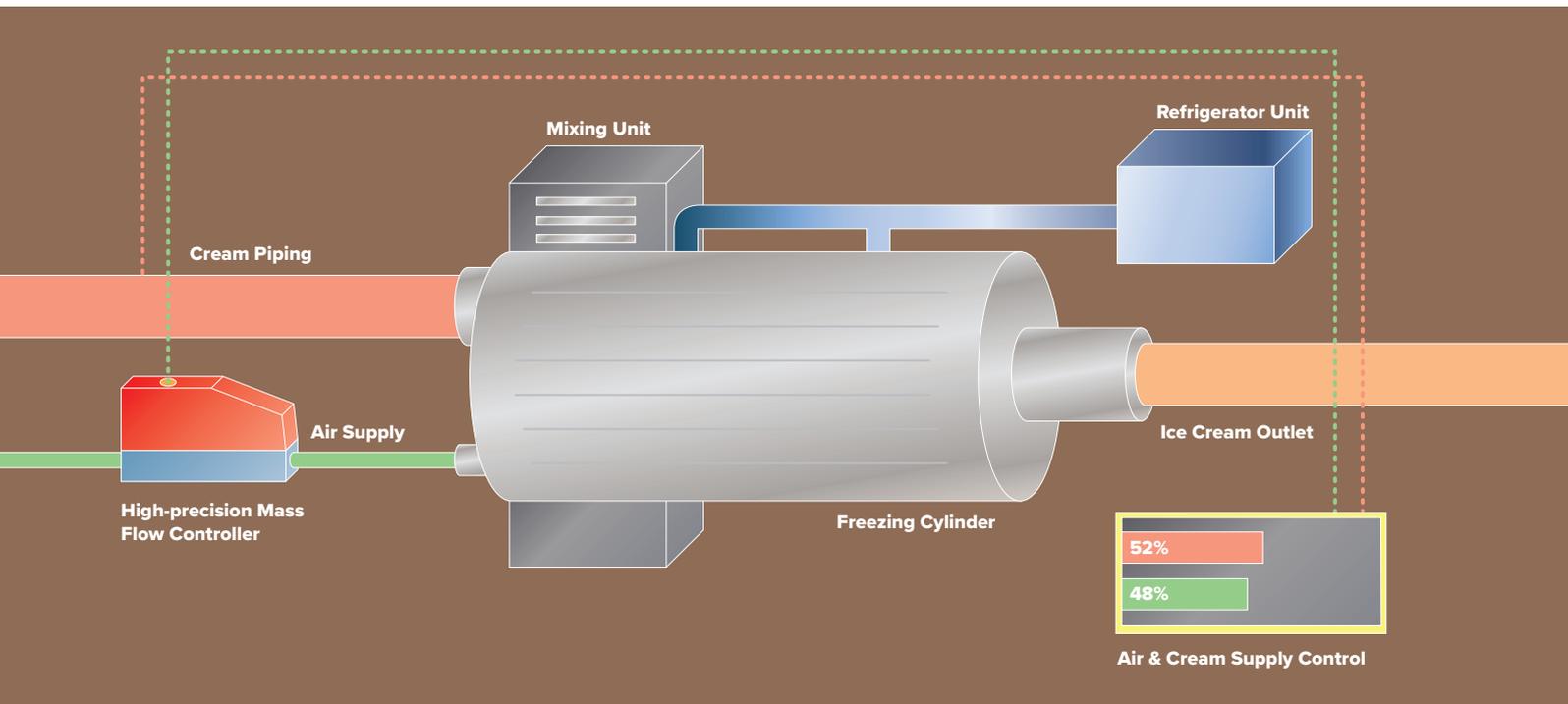


Fig. 1 Functional process scheme of ice cream manufacturing

Application

During ice cream manufacturing, a mixture of paste and air is fed into a freezing cylinder then blended by a scraper. Simultaneously, a cooler on the freezing cylinder wall freezes the paste.

Blades on the scraper rake frozen paste off the cylinder wall. In this process, the paste is continuously frozen, scraped, and mixed with the air to create ice cream.

To produce good-tasting ice cream, the process must feed air into the paste at a specified proportion (mostly 50%). Controlling the ratio of paste and air by the flow controller is very critical for ice cream quality and consistency.



Fig. 2 High quality ice cream manufacturing require measurement accuracy, with respect to pressure and temperature independence, which cannot be achieved with conventional variable area flowmeters. Alongside the advantages of the variable area flowmeters, the electronic massflow instruments offer extremely precise and rapid measurement with digital CMOS sensors.

Challenge

Too much or too little air could jeopardize ice cream quality. The process must feed paste and air at a constant ratio and rate for consistent results.

Solution

MEMS technique of the MFCs provides for a 350ms rapid response. Plug-and-play functionality and no warm-up periods improve user productivity.

Vögtlin Mass Flow Controllers have a unique way of compensating for changes in ambient and gas temperature, which strongly improves the repeatability. The MEMS technology insures a long-term stability without any drift as long as the gas supply is clean and dry.

Dual temperature calibration avoids error caused by ambient and gas temperature better than alternative mass flow controllers.



Fig. 3 **Vögtlin offers modular MFC systems based on your demands and requirements.**



Key Features

- ★ High repeatability & reliability
- ★ No zero shift
- ★ Long-term stability
- ★ Short response time
- ★ Safe and fast control
- ★ Compact unit with high-quality components

Interfaces

- ★ Analog
- ★ Modbus RTU
- ★ Profibus DP-V0/DP-V1
- ★ Profinet
- ★ EtherCAT

About Vögtlin Instruments GmbH

Established in 1986, Vögtlin Instruments GmbH is a Swiss designer of precision flow instrumentation. Vögtlin became a member of the TASI group in 2011. The division TASI Flow delivers flow meter, flow control and dispensing solutions. TASI Flow products are developed, customized and serviced through technical centers in the US (Wisconsin), in Europe (Germany, Switzerland and the UK) and China (Beijing and Shanghai).

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