# Application Note

**Industry:** Food
**Market Niche:** Bakery
**Product:** DC-F Sanitary Positive Displacement Flowmeters
**Fluid:** Cream Yeast

**Service:** Batching • **Viscosity:** 10 cP

## Overview

Yeast is a fundamental ingredient in most commercial baking processes. Historically yeast was made, shipped, stored and added to baking doughs in dry bulk form. In the last few years a new trend has developed whereby the yeast is now made, shipped, stored and added to doughs in a liquid form. This form of yeast is typically referred to as cream yeast. It has become more popular because the liquid form is easier to transport, store and batch than the dry form. Though the consistency may vary, cream yeasts are typically not viscous. The yeast can be metered either volumetrically or by mass units. The yeast manufacturers indicate that batching by volume is actually preferred because the activation level of the yeast in the dough is a function of its volume rather than its mass. Bakers, however, are typically accustomed to working with mass units. Thus, when using a volumetric flowmeter to make the measurement, it is typically scaled to read out in mass units.

## Situation

A major U.S. manufacturer of yeast entered into a series of contracts to supply approximately 80 commercial bakeries across the U.S. with their cream yeast. As part of the contracts, the supplier agreed to install turnkey cream yeast storage and batch dispensing systems. These systems include a temperature-controlled storage tank, a recirculating flow loop consisting of a pump and piping to each of the yeast drop points by each dough mixer in the bakery, valves, controls and flowmeters. The supplier elected to have the work performed by an outside contractor for all the bakeries.

## System Description

The company selected was a sanitary systems integrator familiar with Flow Technology, as well as a number of other flowmeter companies. The integrator elected to use Flow Technology's DC-F series flowmeters for the project. The reasons cited by the integrator for making this selection included a track record of proven success using the Flow Technology DC-F series on this and other applications such as liquid sugar, chocolate and edible oils. The integrator also liked the ease of installation of the Flow Technology flowmeter which would be a critical factor in retrofitting the delivery systems into existing bakeries. Simple maintenance and the meter's clean-in-place (CIP) capability were also major pluses.

## Analysis

The system design called for the installation of one flowmeter at each drop point in the flow loop recirculating system. Similar recirculating systems have been built in the past using a single flowmeter on cream yeast, but with mixed results. For these systems, the flow of cream yeast in the recirculating system had to be deadheaded prior to initiating a batch at any one of several potential drop points. Cream yeast naturally outgasses carbon dioxide, even when stored in a temperature-controlled, closed-loop system like the ones described herein. When the flow stream is deadheaded to allow all the flow to be metered through a single flowmeter, the gas is compressed in the recirculating flow loop. As a result, errors in measurement can occur when the batch control valve is opened at the dough mixer, as the fluid between the flowmeter, located back near the pump, and the batch control valve expands. Experience had shown this system integrator that individual flowmeters located at each drop point or dough mixer eliminates this problem, since the circulating flow does not have to be stopped. Additionally, the use of individual flowmeters allows the bakery to batch more than one mixer with yeast at the same time. With a single flowmeter serving multiple drop points this is not possible.

## Sales Information

After receiving approval of the overall design from the yeast supplier, the integrator placed their initial order for flowmeters. The first phase of the project was for 20 bakeries and required a total of 105 flowmeters. All meters were delivered on schedule, and installed and commissioned without problems. Additional phases for the balance of the bakeries are forthcoming and on schedule.

## Technical Data

Flowmeter: DC10F-6116-5410-000
Flow Rate: 10 to 20 GPM
Fluid: Cream Yeast, approximately 10 cP

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