

# Application News

## *Positive Displacement Flow Meters Used in Manufacturing Ice Cream*

**Industry:** Food & Beverage

**Service:** Flow Rate/Total

**Fluid:** Sucrose and Glucose

### **Overview**

Over the years, ice cream has come a long way from the standard vanilla, strawberry and chocolate varieties. Although hundreds of different flavors have been invented, there are three basic categories of ingredients in the ice cream mix: dairy, sweeteners and additives. Milk, cream, and non-fat milk solids make up the dairy portion of ice cream. Sucrose or Splenda® is used to sweeten the mix, and stabilizers and emulsifiers are added to give the ice cream the desired body and mouth feel. Air is also present in finished ice cream.

### **Situation**

A catastrophic fire recently destroyed the facilities of Canada's largest independent ice cream manufacturer. Prior to this event, the company had utilized Flow Technology's Decathlon Series positive displacement (PD) flow meters on glucose, sucrose and liquid chocolate lines employed in its ice cream manufacturing process. The first glucose flow meter had been in continuous service for 20 years until the fire occurred. Subsequent PD flow meters were installed as the plant increased in capacity.



The sucrose application requires a flow meter able to handle 110cP fluid at 80 GPM and provide a square-wave pulse output to a Programmable Logic Controller (PLC) for controlling the flow. The glucose application requires a flow meter able to measure 10,000cP fluid at 50 GPM, and also provide a square-wave pulse output to the PLC.

### **Solution**

After rebuilding its plant, the decision concerning what flow meters to use was obvious. No other technology worked as well as the Decathlon Series flow meters on their sucrose and glucose lines. These rugged meters were chosen for the new facility based on their exceptional performance and reliability in the original installation. The customer found the PD meters delivered the best value over the life of the equipment, and continued to operate virtually maintenance free.

The DC-F Series sanitary PD meter has a bearingless design with only two moving parts. The meter handles viscosities up to 1,000,000 cP, as well as operating temperatures up to 400° F (204° C). It also provides up to 1000:1 turndown.

### **System Description**

The flow meters were being used for batch control to multiple mixing tanks. The flow meters would accurately measure the flow of the sucrose and glucose and provide a square-wave pulse output to their PLCs, which would control the batch size to each tank. The customer required flow meters with sanitary tri-clamp connections, which allow service to be performed on a "Clean in Place" (CIP) basis. Since the original meters worked so well, the customer once again specified the DC-F Series Sanitary PD meters for sucrose and glucose measurement. The DC-F meters were paired with Hall Effect sensors in both applications.

The patented design of Flow Technology's PD meters, which features "loose geometry" thermoplastic impellers, proved ideal for measuring thick fluids in the ice cream process. The impellers provide lower pressure drop across the flow meter than typical positive displacement meters, and can also be cleaned in place without removing the device from service. Another benefit is that if foreign material becomes caught in the impellers, it is easy to remove the flow meter cover plate for cleaning. This provides significant times savings for maintenance personnel. Best of all, the Decathlon Series meters last forever!

### **Technical Information**

Flow Meters: DC30F-6113-5430000, DC40F-6113-5440000

Electronics: IS160-01 Hall Effect Sensor, 19-94506-01 sensor cable

Flow Rate: 50–80 GPM

Fluids: Sucrose and Glucose



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