**Case study: Flow and Pasteurization control in fruit puree application**    **FOOD**



# Fruit slurry for the perfect smoothie

Peak Foods is a joint venture between Interstate Food Processing Corporation and Lakeside Foods. They are specialized in whipped topping products for the retail, foodservice and industrial sectors. For a new business line, ingredients for smoothies of its own brand Blendtopia, Peak Foods utilized some experience from dairy production, but also had to implement new innovative processes. In High Temperature Short Time (HTST) pasteurization, the highly viscous consistency of fruit purees presented a particular challenge. With the IZMAG flowmeter, the process now can be controlled with the highest precision. Using the PPR (Paperless Process Recorder) allows Peak Foods to monitor and easily log the critical pasteurization step.

## The application

For its new Blendtopia brand, Peak Foods develops and produces ingredient concentrates that allow end customers to easily and quickly prepare themselves healthy smoothies. These concentrates are primarily fruit slurries, such as banana or strawberry purees, and are characterized by a very low water content but a high percentage of fruit chunk.

The special production process, developed for perfect product consistency, results in high demands on the manufacturing equipment. The very high viscosity of up to about 4000 Cp, the very low flow rate of about 1.5 gal/min (5.7 l/min) and the low production temperature of 42-46 °F (5-8°C) were a challenge especially for the flow measurement. However, for evidence of pasteurization, flow control needs to be highly accurate and reliable.

## Magnetic-inductive flow measurement with highest precision

Prior to the startup of the new facility, high pressure pasteurization was performed by a third-party vendor. According to Rich Griffin, engineering manager at Peak Foods,

❝ This process was tedious, caused time delays and increased costs. ❞

## Advantages in the application

» High-precision flow measurement even at very low flow velocity and highly viscous consistency

» High level of product safety thanks to continuously monitored HTST pasteurization with the digital PPR (Paperless Process Recorder)

» Less product loss during phase transition due to turbidity monitoring with the ITM-51

» Help with sensor selection, configuration and design by the Anderson-Negele Support team

However, to bring production in-house, the experience gained from dairy production was not enough, new processes had to be tested and fine-tuned.

After initially considering a Coriolis mass flowmeter to monitor the HTST pasteurization system, OCS Process Systems helped to review specifications and clarified best practice solutions with the Anderson-Negele Technical Support team. OCS recommended the IZMAG electromagnetic flowmeter. With the small pipe diameters in the facility, this technology

promised higher measurement accuracy on paper. Therefore, during commissioning, extensive tests were run with the most extreme requirement, i.e. the thickest fruit puree.

" These tests were a pure success story. We were able to prove that the measurement accuracy fully met expectations. In addition, an IZMAG is significantly more cost-effective than a comparable Coriolis Meter, so that we can now use the best technical solution at the most favorable price " concludes Rich Griffin.

### Process control with the Digital Recorder System PPR & Legendary™

To ensure maximum product quality and safety, the entire HTST pasteurization process is monitored and automatically recorded with the new, digital PPR process recorder. Paper handling problems and cumbersome approval workflows as with conventional paper chart recorders found on most HTSTs in North America are now a thing of the past.

With the PPR, all process data from up to 4 connected sensors is recorded and can be annotated and approved by operators on an electronic touch screen.

The Legendary™ software enables FDA-compliant (21 CFR Part 11) data sharing and even remote State Inspector review. PPR is the first digital process recorder system for which the FDA has issued an M-b (Memorandum-b) lending it well to use in dairy pasteurization as well as this fruit slurry application.

### Significant cost savings thanks to resource control through turbidity measurement

In CIP systems, time control is often used for phase transition. To be sure that a media has been completely pushed out, buffer times are embedded into the control system. Peak Foods uses an ITM-51 turbidimeter, which measures the change of media in real time and enables valve control without loss of production time.

" Compared to classic phase separation, we can regain large amounts of our valuable product and save costs " explains Rich Griffin.

An experience that numerous users can confirm: In many applications, an ITM turbidimeter pays for itself within a few weeks only.

### Sensors used in this application

| Electromagnetic Flow Meter IZMAG | Process Control PPR Paperless Process Recorder | Turbidity Control ITM-51 |
|---|---|---|

**Examples for Viscosity Cp values**

| Product | Viscosity Cp |
|---|---|
| **Milk** | 1.0 to 2.0 |
| **Cream 50% fat** | 55 to 112 |
| **Edible oil** | 65 |
| **Fruit Juice** | 55-75 |
| **Slurries in this application** | 3,000 to 4,000 |

**Advantages**

· Measuring range 30 l/h to 640,000 l/h (8 gal/hr to 169,000 gal/hr)
· Measuring accuracy up to ±0.2 % ±1 mm/s outperforms the competition at low flow rates
· Process temperature up to 165 °C / 325 °F (remote)
· Drop in replacement lengths for competitors flow meters available

**Advantages**

· PMO compliant audit ready digital records
· Easy annotations and approval by touchscreen
· Supervisors, quality team and PCQI can remotely review and approve records
· Secure storage and access of all historical records for authorized users

**Advantages**

· Front-flush design with backscatter light technology
· Easy installation due to screw or clamp connection
· Measuring range: 50...75,000 EBC
· High safety and durability due to glass-free sapphire optics

⬙ = IO-Link available

⬙ = Remote version available