

Application Melted cheese manufacturing



Targets: Dairy industries, cheese manufacturers, melted cheese producers

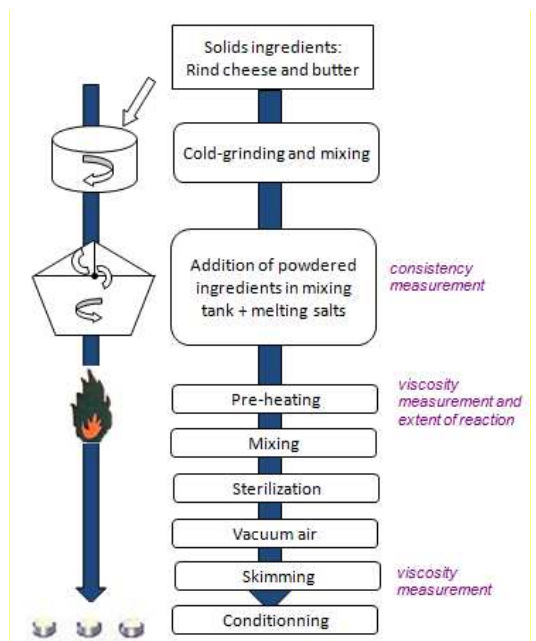
Application

Dairy products as raw materials are inconsistent and supply variations must be taken into account and corrected. Current dairy manufacturing processes are completely automated systems and controls are indispensable and facilitate the finest quality cheese moving from pipeline to packaging.

Melted cheese manufacturing is realized from matured (ripened) cheese. The main steps of a manufactured batch include a cold-grinding and mixing of basic ingredients (matured cheese, butter), transfer to large mixing tanks where pulverulent ingredients are added (casein, milk powder, citric acid), and melting / emulsifying salts (polyphosphates). Melting salts provide a homogeneous texture to the emulsion. During the cooking phase and mixing mode, speed and duration must be highly exact. **In order to achieve compatible viscosity and the final desired texture**, the preparation is pre-heated, brewed, sterilized, vacuumed, and skimmed.

The final texture of these kinds of dairy products is critical in the conditioning phase of manufacturing and plays a large part in consumer-driven demands.

Simplified flow chart for melted cheese



Challenges

In the mixing process, where melting salts are added to the other ingredients, melted cheese consistency can vary.

- If the consistency is too thick or too thin, the final product quality is not met, customer complaints increase, and sales decrease.
- The manufacturing process faces frequent breakdowns due to unpredictable product variations.
- When frequent maintenance occurs, the conditioning lines are slowed down or stopped due to consistency problems.

These problems reappear in the final cooking steps where final quality is achieved due to a specific chemical reaction that takes place during the maturation phase. The reaction end-point must be precise in order to obtain the perfect consistency and quality.

Melted cheese is produced in batches, and cleaning happens several times per day. A cleaning solution pushes melted cheese residue and raw ingredients through the pipes and into a recycling chamber.

In the past, density measurement was used to differentiate between raw materials, melted cheese residue, and the cleaning solution. Since many fluids present similar densities, density as a parameter is inefficient. Viscosity control, however, is very reliable.

Solution

The installation of the process viscometer – **Sofraser MIVI sensor** - and associated electronic controller easily controls the melted cheese during the manufacturing and maturation processes by determining its physical characteristics and correlating them directly to viscosity.

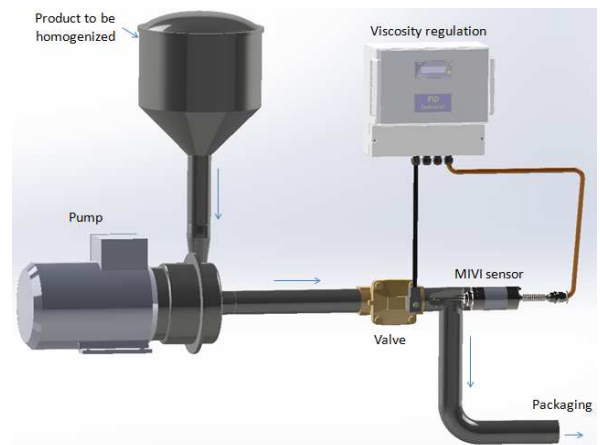
Installation

The MIVI process viscometer can be fitted:

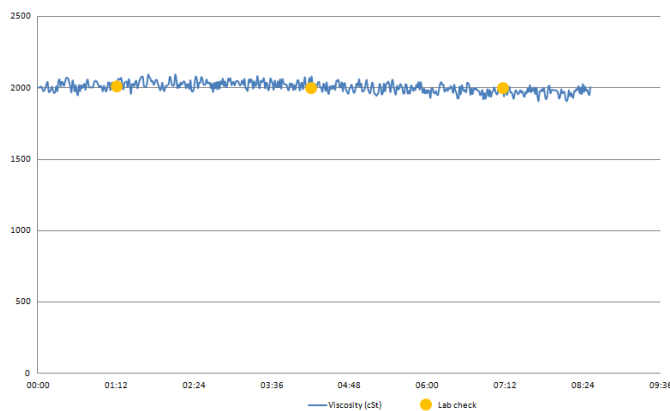
- on the mixing tank during the mixing process
- after the valve
- on the main pipe before conditioning lines, just after the skimming step

It continuously delivers viscosity and temperature information to the electronic processor. The electronic provides the consistency information to the operators who can, in real time, optimize the process.

Operation diagram



Melted cheese viscosity records



Onsite installation



Key product characteristics

- 3A design sanitary mounting - no bacteria proliferation
- Small sensor size and weight
- Easily fitted at side wall, tank floor, or in an immersion chamber
- Robust over time, no moving parts, no maintenance
- Can clean in place – no need to uninstall the sensor