Application Note: dairy/02/1225

Hygienic, Accurate, Reliable – The Sweet Science of Flow Measurement.

What is Ice Cream Mix?

Ice cream production involves processing different conductive liquids such as milk, cream, sugar solutions, pre-freezing ice cream mix, and CIP (Clean-in-Place) fluids.
These fluids are critical for taste, consistency, and hygiene in the final product. Measuring and controlling their flow precisely ensures consistent quality and efficient operation.

Characteristics & Challenges

Property / Challenge	Details
Viscosity & Entrained Air	Ice cream mixes are viscous and may contain air, leading to unstable readings.
Low Conductivity	Dilute solutions during certain stages can fall below the ideal conductivity range.
Temperature & Cleaning	Exposure to hot water, steam, and strong CIP chemicals can damage instruments.
Hygiene Compliance	Dairy industry demands sanitary, contamination-free design with easy cleaning.
Coating or Scaling	Milk solids and sugar crystallization may coat sensors and reduce accuracy.

Why Electromagnetic Flow Meters for Ice Cream Production?

Electromagnetic Flow Meters (Mag Meters) are ideal for ice cream processing because they can measure viscous, aerated, and conductive fluids accurately. They have no moving parts, cause negligible pressure drop, and meet stringent food-industry hygiene requirements.

Advantages of Manas Electromagnetic Flow Meters

- Accurate flow measurement of milk, cream, sugar solution, and CIP fluids
- Stable operation even with viscous, aerated liquids
- Wide conductivity range (≥20 µS/cm)
- PTFE/PFA linings resistant to scaling, milk solids, and cleaning chemicals
- Sanitary Tri-Clamp connections for easy removal and cleaning
- Robust stainless-steel electrodes for long life in harsh conditions
- Inbuilt diagnostics and flow verification for preventive maintenance

The solution that worked

A leading ice cream manufacturer faced fluctuating readings in their ice cream mix line due to high viscosity and entrained air. After switching to Manas electromagnetic flow meters with optimized electrode design and Tri-Clamp connections, the plant achieved:

- Consistent flow measurement even with aerated and viscous fluids.
- Reduced downtime during cleaning and CIP cycles.
- Improved product quality with precise ingredient ratios.
- Long-term reliability with minimal scaling or coating.

Ice cream manufacturing presents unique challenges such as viscosity, aeration, low conductivity, and strict hygiene demands. Manas Electromagnetic Flow Meters are designed to handle these conditions effectively, delivering accurate, hygienic, and reliable flow measurement throughout the production cycle – from raw milk handling to final product preparation.

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