

Application Example Ice Cream Ingredient Feeding

Background

The ice cream manufacturing industry is highly susceptible to fluctuating costs in value-added ingredient addition, as well as product quality affected by the percentage of these ingredients in the mix. Ingredients added to the semi-frozen ice cream base mix are typically called "inclusions". Inclusions can be comprised of anything from marshmallows to chocolate chips to coconut flakes. By closely monitoring the percentage of these high value inclusions in the mix, the manufacturer is assured of cost control and savings, as well as continued product quality.

Application

In this case a customer was looking to replace existing fruit feeder technology in order to achieve a higher degree of accuracy in the feeding of high quality, costly ice cream ingredients without damage to the individual ingredients. In addition, the design must meet the strictest cleanliness standards of the dairy industry, with minimal downtime for disassembly and cleaning operations. Operation is continuous duty, up to 24 hours per day.

Inclusions are manually dumped into a large hopper from boxes, bags or small drums. The feeder discharges the inclusions directly into an ice cream mix pump line. As materials are discharged gravimetrically from the feeder, they are distributed into the ice cream mix flow and pumped continuously downstream to the packaging line.

Typical Ingredients

Roasted almonds, chocolate chunks, soft chocolate flavored chunks, chocolate fudge cake/shortcake, cookie pieces

(chocolate covered peanut butter, shortbread, chocolate chip, etc.), marshmallows, fruit pieces

Typical Rates/Bulk Densities

Low rate:
35.4 dm³/hr at 1.03 kg/dm³
1.25 ft³/hr at 64 lb/ft³

High rate:
510 dm³/hr at 0.34 kg/dm³
18 ft³/hr at 21 lb/ft³

Desired accuracies:
+/- 0.5% at 2 sigma

NOTE: actual feed rates depend on material characteristics

Feeder Details

- 3A Design S60 feeder with all 316 stainless steel construction, #4 sanitary finish on inside and outside, all welds continuous and smooth
- Specialized portable frame with adjustable height frame to allow for loading of various size containers and boxes at an ergonomic height
- Special 42.5 liter (1.5 ft³) hopper with rounded sanitary lip and specialized safety grid inside hopper
- Round bar stock agitator, to avoid shearing of product
- FDA approved gaskets and seals. Oil-free gear assembly. Minimum depth for O Ring grooves in accordance with 3A standards.
- Electrics and feeder unit all designed for washdown, including NEMA 4X panel enclosure with internal hinge for ease in cleaning. Drive includes stainless steel covers
- Load cells shrouded in stainless steel covers
- Sanitary design casters with specialized mounts to avoid bacterial contamination traps

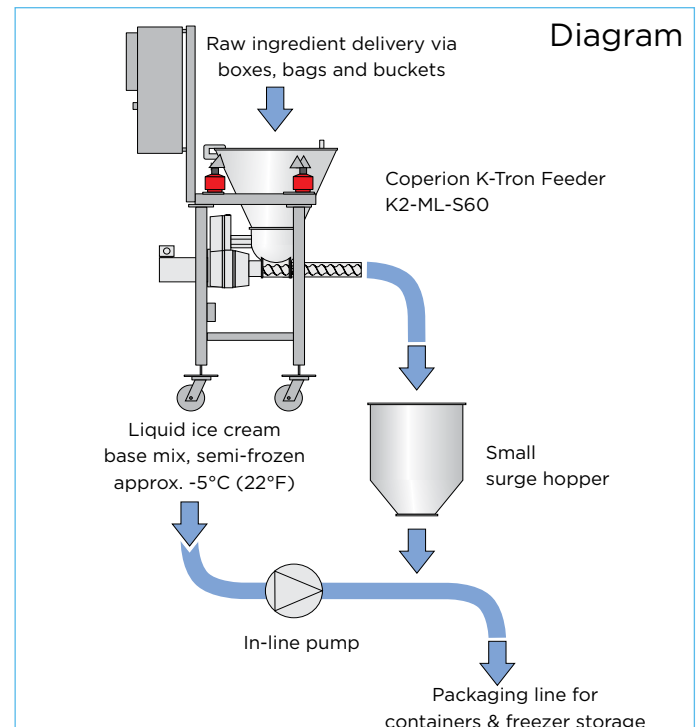
- Frame engineered with minimal external threads
- Control panel special mount to frame to avoid contamination hold up areas
- Complete design engineered with ease of dismantling and cleanability in mind

Coperion K-Tron Advantage

- Coperion K-Tron high accuracy Smart Force Transducer weighing technology gives better results for higher control in ingredient cost and overall product quality
- Coperion K-Tron is able to provide a wide variety of

auger and agitator designs, in order to give best results for the high variety of ingredients

- Refill Array as provided with Coperion K-Tron controller also allows for consistent fill and quality
- Specialized frame is completely portable and adjustable, increasing overall versatility and ability to use throughout the plant on various lines
- Complete unit is design with ease of maintenance, cleaning and operation in mind and conforms to 3A standards.
- Designed for complete wash-down and cleaning



Headquarters

Coperion GmbH | Theodorstrasse 10 | 70469 Stuttgart, Germany
info@coperion.com | www.coperion.com | fhn.coperion.com

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Coperion location

