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Bulk Handling System Ups Efficiency, Sanitation and Quality for Dry Milk Solids Producer



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WASHINGTON, NJ — Franklin Farms East (www.franklinfarmseast.com) is a major east coast producer of dry milk and non-dairy food products used in the production of commercial baked goods, ice creams and confectionary products. In 2008, the company partnered with The Flexicon Corporation to enhance their production capabilities. Flexicon designed and supplied a bulk bag discharging system and bag dump station to improve the cleanliness and increase output of its increasingly diversified product line while simultaneously elevating product quality.

A family owned and operated business since 1983, Franklin Farms East was founded as a distributor of dry milk products, which it purchased in bulk from dairy cooperatives and other wholesalers. Franklin Farms then hired contract manufacturers to blend and repackage the final mixes, which it sold to customers ranging from "Mom and Pop" operations to high volume commercial bakeries, ice cream producers and confectionary firms.

"Our nonfat dry milk is a wholesome dairy product made from the freshest liquid milk," says Jonathan Riggs, Franklin Farms East Vice President of Production. "Only the cream and water are removed. It still contains all the calcium and other minerals, vitamins, natural sugar and high quality proteins that make liquid milk such a valuable food but it is easier to work with, does not need to be refrigerated, has a much longer shelf life than fluid milk, and takes far less inventory space."

In 1997, as business continued to grow, the company decided to build its own processing and repackaging facility, in Frostburg, MD. With its own in-house blending capabilities, the company could expand its product line beyond dairy products like buttermilk and whey to include formulations based on corn and wheat flour such as non-dairy coffee creamers and lactose-free products. Since then, sales have grown from 44,000 lb (20,000 kg) per month to over 1 million lb (454,000 kg) per month today as the company has expanded into new markets such as ice cream mixes, gelato and yogurt. The plant runs two shifts a day, five days a week, with a crew of 12 people to meet the increased demand.

New plant focuses on safety and sanitation

When the new plant first opened, bags of powdered ingredients from suppliers were cut open and emptied manually into a hopper that feeds the ribbon blender. This resulted in dust in the air, wasting product and creating a potentially hazardous environment. "This was common practice in the industry at the time," explains Riggs. "During the early 2000's, however, the US Department of Agriculture (USDA) and the Food & Drug Administration (FDA) began strictly enforcing sanitary and safety regulations, including third party inspections. Contact with and possible contamination of food products was strictly prohibited, and a clean work environment was absolutely required. Our customers also began asking for verification of sanitary conditions in our production facilities."

To comply with government requirements and customer demands, and to eliminate waste, Franklin Farms East installed a bulk bag discharging system from Flexicon Corporation. The system consists of a forklift-loaded model BFF-C-X split-frame BULK-OUT® bulk bag discharger, with an 8 cu ft (226 l) capacity sanitary stainless steel hopper, and a manual bag dump station,



By blending in-house, Franklin Farms East can meet increased demand and expand its product line. The flexible screw conveyor transports minor ingredients being emptied at the bag dump station to the blender in background.



Dust accumulated on cartridge filters is dislodged by pulse jet nozzles and returned to the hopper, eliminating product waste while maintaining a clean working environment.

bag compactor and hopper for adding smaller amounts of ingredients to the blender. Both the bulk bag discharger and bag dump station feed their ingredients to the blender through flexible screw conveyors.

"The ingredient discharge, blending and repackaging process is now totally enclosed and dust-free," says Riggs. "In fact, after their last visit, an inspection team from the audit firm Randolph Associates said that our facility was the cleanest they had ever seen."

Bulk bags unloaded directly from forklift

"We receive our major raw materials in 2000 lb (900 kg) bulk bags," says Riggs. But headroom in the dry blending room is currently limited by the low ceiling. To overcome this limitation, a forklift holds the bulk bag directly over the lower half of the split frame discharger while the bag discharges through a manual SPOUT-LOCK® clamp ring positioned atop a pneumatically actuated TELE-TUBE® telescoping tube. The tube raises the clamp ring for dust tight connection to the bag spout, and then lowers, applying downward tension to keep the spout taut for total evacuation. At the same time, FLOW-FLEXER® bag activators raise and lower the bottom edges of the bag, directing material into the outlet spout and raising the bag into a steep "V" shape to promote total discharge into the floor hopper.

Minor ingredients, in 50 lb (23 kg bags), transfer to the batch blender through the manual bag dump station, hopper and flexible screw conveyor — again, all enclosed for dust-free operation.

Bag dump station designed for dust-free, sanitary operation

A high-velocity vacuum fan activates as the operator opens the hinged lid of the bag dump station. As individual bags are emptied through the hopper screen, airborne dust in the vicinity of the hopper opening is drawn into the dust collector and deposited on the outer surfaces of two cartridge filters. Periodic blasts of compressed plant air blown onto the filters dislodge the dust particles, which fall into the hopper. The process is continuous with compressed air blasts alternating between the two filters.

The operator passes the spent bag through a chute in the sidewall of the hopper hood into the bag compactor. As a pneumatic air cylinder compresses the empty bag into a removable bin, dust generated by compaction is drawn into the dual filters.

Batches blended in 10 minutes

One blended batch, weighing 2500 lb (1134 kg), usually consumes one bulk bag and as many as 25, 50 lb (23 kg) bags of individual ingredients. Each batch requires about 10 minutes for thorough mixing, and the blender can produce 30 to 40 batches per day. The blended batch proceeds through a screener, a metal detector, and then to the bagging machine, which fills 25 to 50 lb (11.4 to 23 kg) bags, at a rate of one bag per minute, and labels them with the name of the blend. The bags are finally loaded onto shipping pallets.

"We try to run similar ingredients one after the other to reduce the need for cleaning between batches," Riggs explains. The system is cleaned according to FDA procedures by brushing, vacuuming and hot washing of product



Limited headroom requires a forklift to suspend bulk bags above the lower half of this split-frame BULK-OUT® bulk bag discharger. Once the room is enlarged with a higher ceiling, bulk bags will be loaded at floor level into the top half of the split-frame, which will then be forklifted with bag intact, onto the lower half of the frame, within inches/centimeters of the ceiling.



A SPOUT-LOCK® clamp ring secures the clean side of the bag spout to the clean side of a TELE-TUBE® telescoping tube, which maintains constant downward tension on the bag as it empties and elongates, promoting complete discharge.

contact surfaces of the screener, hoppers, flexible screw conveyors, and blender. We clean every Friday to allow 72 hours for the components to dry over the weekend."

"We are currently running the blender at maximum capacity, but plan to expand the room to increase production with a larger blender and raising the ceiling," says Riggs. "We will use the entire split-frame discharger by loading the bulk bag in its lifting frame onto the lower half of the discharger. The lower half will be equipped with load cells to control the amount of material transferred through the flexible screw conveyor to the blender by measuring weight loss."

"The expansion will also allow us to continue growing by introducing new products like our instant cheesecake mix, which is so good you have to taste it to believe it."



Franklin Farms East's non-fat dry milk contains all the nutrients of fresh liquid milk, but is easier to work with, needs no refrigeration, has a longer shelf life, and takes less inventory space.

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