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FOOD & BEVERAGE Reporter

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SUNNINGDALE REVITALISES BORDER-TRANSKEI DAIRY INDUSTRY

BULK HANDLING SYSTEM BOOSTS PRODUCTIVITY OF FOOD MIX PRODUCER

Dawn is one of the world's largest producers of food bases, mixes, fillings, toppings and flavourings. These are sold to industrial bakeries and used within Dawn's facilities to bake private label cookies, cakes, doughnuts, muffins and other food products.

The company originally packaged its mixes in 25kg bags, before switching to a bulk bag materials handling system at its Evensham (Britain) facility. This switch helped it to reduce personnel from seven to four, speed up production, improve plant safety and product quality, and eliminate fine dust.

Emptying small bags was labour intensive

Dawn's ingredients go through a dry and wet mixing process. Originally, after the dry mixing process, operators were manually emptying 25kg bags of dry mix to the wet mixing line and final baking. A typical 1t batch of dry mix filled 40 bags. The bags were sent to three destinations: Evensham's in-house bakery to make baked goods; a sister plant in The Netherlands to make baked goods; or to commercial bakeries.

Emptying the 25kg bags into the 150kg-capacity wet mixing vessels was time-consuming and labour-intensive. Each bag had to be handled and split separately. In addition, the fine dust created by manually opening and emptying bags was difficult to contain. Furthermore, Evensham's Dutch sister plant preferred to receive mixes in bulk bags.

Shifting to bulk bags

The company invested in a new bulk solids handling system, including a sanitary stainless steel bulk bag discharger, weigh-batching system and flexible screw conveyor, from Flexicon.

Flexicon conducted trials at its test laboratory in Herne Bay in Britain to evaluate the performance characteristics of muffin powder and chocolate powder mixes, which have bulk densities of 650kg/cu metre and 560kg/cu metre, respectively. Both were semi-free-flowing, having angles of repose between 45° and 60°.

With the new system, a dedicated tote bin is filled from either of the two dry mixers and transferred to a loading frame above a 1t bulk bag. The bin's contents are discharged into bulk bags, which are used internally to feed the wet mixing line, or shipped to The Netherlands plant.

Dawn Foods continues to package a portion of its output in 25kg bags per the original procedure to sell to commercial bakeries.

Bulk bag unloader automates flow

Filled bulk bags intended for the wet mixing line are placed on the plant floor in front of the Flexicon Model BFC bulk bag discharger, which is equipped with a cantilevered I-beam and electric hoist and trolley that raise and position the bag.

A manual Spout-Lock™ clamp ring that sits atop a pneumatically-actuated Tele-Tube™ telescoping tube, allows secure, dust-tight connections to the bag

spout, and maintains constant downward tension on the spout, elongating the bag as it empties to promote flow.

Dual pneumatically-actuated Flow-Flexer™ flow promotion devices raise and lower opposite bottom edges of the bag into a steep V-shape to direct material towards the outlet spout and promote total evacuation.

The bag discharges into a 0.13cu metre receiving hopper with a low-level sensor that signals the controller to stop the conveyor when the hopper nears empty.

A 3-metre long flexible screw conveyor moves material from the surge hopper to a 0.160cu metre weigh hopper mounted on load cells, first at high speed, then at a dribble feed rate, stopping once the accurate batch weight has been reached.

The controller then actuates a 200mm pneumatic butterfly valve, discharging the mixture into one of the wet mixing vessels, which blends it with water. The wet mix is then discharged into a depositor that applies the dough to trays for in-house baking. Dawn ships the muffins, chocolate cakes, cookies, and other finished products to such well-known customers as McDonald's and JS Sainsbury.

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The bulk bag weigh-batching system conveys dry ingredients from the bulk bag to a gain-in-weight hopper that discharges it into mobile wet mixing vessels.