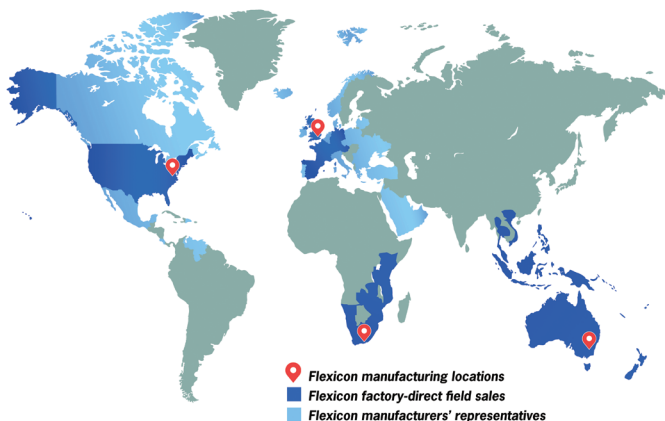




Bulk Handling System Boosts Productivity of Food Mix Producer

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EVESHAM, WORCESTERSHIRE, UK — By optimizing its product flow, weigh batching, and mix handling systems, Dawn Food Products Inc.'s Evesham, U.K., facility decreased the time and labor needed to handle food mixes while containing dust.

Dawn is one of the world's largest producers of food bases, mixes, fillings, toppings and flavorings that are sold to industrial bakeries and used within Dawn's facilities to bake privately-labeled cookies, cakes, donuts, muffins and other food products.

The company originally packaged its mixes in 55 lb (25 kg) bags. By switching to a bulk bag materials handling system, it reduced personnel from seven to four, while speeding production and improving plant safety.

Emptying small bags was labor intensive

Dawn's ingredients go through a dry, then a wet mixing process. Originally, after the dry mixing process, operators were manually emptying 55 lb (25 kg) bags of dry mix to the wet mixing line and final baking. A typical 1.1 st (1 mt) batch of dry mix filled 40 bags. The bags were sent to three destinations: Evesham's in-house bakery to make baked goods; a sister plant in The Netherlands to make baked goods; or to commercial bakeries.

Emptying the 55 lb (25 kg) bags into the 331 lb (150 kg) capacity wet mixing vessels was time consuming and labor 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, Evesham's Dutch sister plant preferred to receive mixes in bulk bags.

Shifting from small bags 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 (Europe) Ltd.

Flexicon conducted trials at its test laboratory in Herne Bay, UK, to evaluate the performance characteristics of muffin powder and chocolate powder mixes, which have bulk densities of 41 lb/cu ft (650 kg/cu m) and 35 lb/cu ft (560 kg/cu m), respectively. Both were semi-free-flowing, having angles of repose between 45 degrees and 60 degrees.

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 1.1 st (1 mt) 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 sister plant. Dawn Foods continues to package a portion of its output in 55 lb (25 kg) bags per the original procedure to sell to commercial bakeries.



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



The SPOUT-LOCK® clamp ring and TELE-TUBE® telescoping tube create a fast, dust-tight connection between the bag spout and receiving hopper.



Control system with full function weighing indicator starts and stops conveyor, and actuates a slide gate.

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 5.3 cu ft (0.13 cu m) receiving hopper with a low level sensor that signals the controller to stop the conveyor when the hopper nears empty.

A 10 ft (3 m) long flexible screw conveyor moves material from the surge hopper to a 5.6 cu ft (0.160 cu m) weigh hopper mounted on load cells, first at high speed, then at a dribble feed rate, stopping once the accurate batch weight has been gained.

The controller then actuates an 8.0 in. (200 mm) 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 McDonalds and J. S. Sainsbury.

The switch from manual dumping of 55 lb (25 kg) bags to automated handling of 1.1 st (1 mt) bulk bags improved speed and efficiency, reduced the number of workers needed and improved safety, while eliminating dusting and improving product quality.



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