

A U S T R A L I A N

BULK HANDLING

R E V I E W

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Bulk handling system boosts productivity of food mix producer

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Dawn is one of the world's largest producers of food bases, mixes, fillings, toppings and flavourings 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 25kg bags. By switching to a bulk bag materials handling system it re-

duced personnel from seven to four while speeding production and improving plant safety.

Emptying small bags was labour intensive

Dawn's ingredients go through a dry, then a 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 one tonne 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 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, 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).

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 650kg/cu m and 560kg/cu m respectively. Both were semi-free-flowing, having angles of repose of 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 one-tonne 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 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.



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



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

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 m receiving hopper with a low level sensor that signals the controller to stop the conveyor when the hopper nears empty.

A 3m flexible screw conveyor moves material from the surge hopper to a 0.160cu 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 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 McDonalds and J. S. Sainsbury.

According to Flexicon, the switch from manual dumping of 25kg bags to automated handling of one-tonne bulk bags improved speed and efficiency, reduced the number of workers needed, improved safety, eliminated dusting and improved product quality.

Contact: sales@flexicon.com.au



The Spout-Lock clamp ring and Tele-Tube telescoping tube create a fast, dust-tight connection between the bag spout and receiving hopper.

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