

SOLIDS & BULK HANDLING



FIBC filling machines from Flomat Bagfilla

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Rising to the challenge

Flexicon bulk handling system gives rise to improved packing for export

The recent introduction of a Flexicon Bulk Bag Discharger and Batch Weighing System at the Evesham production facility of Dawn Foods has enabled the company to transform its food processing and packing line which was initially geared to outputting bakery mix in 25kg bags to one that now has the flexibility to pack in either single 25kg bags or one-tonne bulk bags depending on requirements.

Dawn Food Products Inc is a global company and from their manufacturing and distribution centres around the world supply to the most modest of small family bakeries through to international chains. The Evesham plant produces original US based cake mixes in 25kg bags as well as finished products such as muffins, chocolate cakes etc for external sales to the retail/wholesale market and palletised supplies to its sister company in Holland.

To produce the recipe mix, bulk raw materials (flour – sugar) are blown directly from a combination of five external 40 tonne silos to one of two mixers sited within the Dry Mix Plant; one for chocolate and the other for non-chocolate mixes. The remaining minor ingredients are manually dumped indirectly into the mixer via an adjacent manual dump station; load cells within

the hopper control the amount of additional ingredients. One tonne batches of any recipe are metered by gain-in-weight technology through the transfer of data from load cells located under the mixer.

The recipe is gravity fed from the mixer and weighed into 25kg bags which are stitched, labelled and despatched for external sales, loaded on pallets for shipment to Holland or for delivery to the in-house bakery. For the retail/wholesale trade, ingredients are gravity fed through a sieve into 150kg-capacity mixing vessels where the addition of water creates a final mix to be sent to a depositor in readiness for oven baking in Dawn Foods' own in-house bakery.

For shipment to Holland, working with 25kg bags (40 bags per tonne) represented a major task in terms of production volume and was clearly an issue for review. In addition, the procedure to dispense the mix for the eventual oven process was slow and costly. These areas of production were labour intensive, time consuming and hazardous, therefore Flexicon was given the brief to design and install a more efficient system of bulk bag despatch to Holland and improve the batch process for the depositor line.

The Flexicon approach

While the procedure to bag and despatch for external sales still remains, a bulk handling system has been introduced to the processing line allowing the mixer to discharge into Tote Bins prior to transfer to a loading frame. Here they are held above a 1-tonne FIBC (flexible intermediate bulk container) with a capacity equivalent to 40 x 25kg bags.

With the aid of a fork lift truck, one operative positions the FIBC in front of the bulk bag frame and attaches the carry handles to a cruciform connected to an electrical hoist, enabling precise location of the FIBC onto the frame above the receiving hopper. Having in-put the set points on the control panel for the individual batch, the semi-free-flowing raw material is gravity fed into the inlet of the 3m long Flexible screw conveyor, transferred upwards through 45° for transfer via a transition discharge adapter into the weigh hopper equipped with load cells for gain-in-weight control. Product flows quickly until it slows to trickle speed as the target weight set on the control panel is achieved. Material 'in flight' through the tube is accounted for in the gain-in-weight calculation. When the target weight is achieved the operator manually activates the pneumatically operated butterfly valve by pressing a button on the control panel to release the batch as material flow is simultaneously halted until another batch is called for. Downstream, water is then added to the batch for further mixing in readiness for the depositor and oven bake process.

Controlled release of material to the hopper is achieved with the combination of the Flexicon Spout-Lock clamp ring



Flexicon's Bulk Bag Discharge System made ready to transfer dry recipe into mixer vessels for the depositor line



Spout - Lock and bulk bag spout interface enabling a quick, dust-tight connection between the bag spout and receiving hopper

positioned above a pneumatically actuated telescoping tube. Together, the devices enable an operator to make a quick, dust-tight connection between the bag spout and hopper. By simple, push-button control the telescoping tube raises the Spout-Lock clamp ring assembly allowing the bag spout to be pulled through the ring enabling the operator to seal the clean side of the bag spout to the clean side of the telescoping tube.

It then continues to lower until the bag spout is pulled taut. Once the spout is untied, the telescoping assembly exerts continual downward tension on the spout, elongating the bag as it empties into the receiving hopper, via a hopper screen to filter out foreign bodies, promoting flow and evacuation. The high-integrity, dust-tight seal between bag spout and clamp ring allows full-open discharge from the bag with no risk of dust inhalation by the operative. A low-level sensor informs the operator of the status of the product level in the FIBC.

Results that could be attained with the up-graded processing line were assured following trials conducted at Flexicon's Test Laboratory at the Herne Bay facility to evaluate the performance characteristics of the raw materials, both semi-free-flowing.

The combination of Flexicon bulk-bag dischargers, flexible screw conveyors and hoppers with load-cells data capture have enabled Dawn Foods to create more efficient use of manpower, a significant reduction in manual handling, less wastage by eliminating residues left in bags, increased speed and improved quality control on the depositor line.

For more information contact Flexicon on tel: 01227 374710 or visit: www.flexicon.co.uk

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