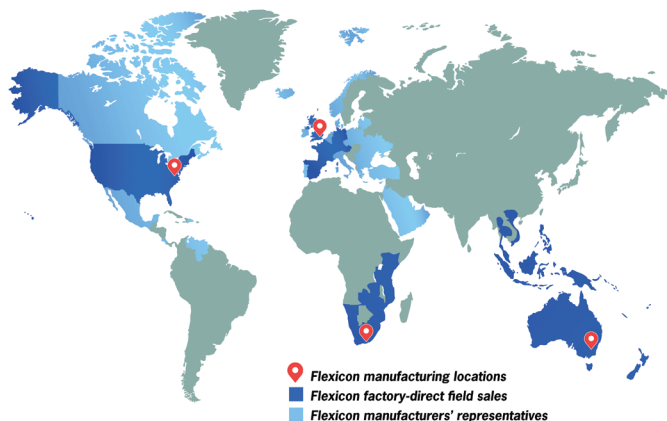




Automated bulk bag weigh batching system consists of 18'4" (550 cm) high discharger frame and 5 ft (150 cm) long flexible screw conveyor. Under loss-of-weight control, the system discharges precise amounts of powder into an auger conveyor that feeds three ribbon blenders.

Automated Powder Unloading System Speeds Blending Process by 25 Percent at Forbes Chocolate

P-0891



● Flexicon manufacturing locations
■ Flexicon factory-direct field sales
■ Flexicon manufacturers' representatives

flexicon®

USA

FLEXICON CORPORATION
Tel: +1 610 814 2400
E-mail: sales@flexicon.com
Web: www.flexicon.com

UK

FLEXICON (EUROPE) LTD
Tel: +44 1227 374710
E-mail: sales@flexicon.co.uk
Web: www.flexicon.co.uk

AUSTRALIA

FLEXICON CORPORATION
(AUSTRALIA) PTY LTD
Tel: +61 7 3879 4180
E-mail: sales@flexicon.com.au
Web: www.flexicon.com.au

SOUTH AFRICA

FLEXICON AFRICA (PTY) LTD
Tel: +27 41 453 1871
E-mail: sales@flexicon.co.za
Web: www.flexicon.co.za

SPAIN

FLEXICON EUROPE SPAIN
Tel: +34 930 020 509
E-mail: ventas@flexicon.es
Web: www.flexicon.es

FRANCE

FLEXICON EUROPE SAS
Tel: +33 7 61 36 56 12
E-mail: ventes@flexicon.fr
Web: www.flexicon.fr

GERMANY

FLEXICON EUROPE GmbH
Tel: +49 173 900 78 76
E-mail: vertrieb@flexiconeurope.de
Web: www.flexicondeutschland.de

SINGAPORE

FLEXICON SINGAPORE PTE LTD
Tel: +65 6778 9225
E-mail: sales@flexicon.com.sg
Web: www.flexicon.com.sg

INDONESIA

FLEXICON SINGAPORE PTE LTD
Tel: +62 81 1103 2400
E-mail: sales@flexicon.co.id
Web: www.flexicon.co.id

Automated Powder Unloading System Speeds Blending Process by 25 Percent at Forbes Chocolate

CLEVELAND, OH — At Forbes Chocolate, an automated bulk bag discharger, under loss-of-weight control, feeding a flexible screw conveyor introduces into three ribbon blenders one-quarter to one-third more main ingredient per shift than previous manual dumping of 50-lb (22.5 kg) bags. This represents a 1500 lb/hour (675 kg/hour) increase with the same number of workers.

Health and safety improve as workers no longer cut open, lift and empty bags into a bag dump station. The work area becomes free of dust as the powder stays enclosed from bulk bag to floor hopper, flexible screw conveyor, and auger conveyor that feeds three ribbon blenders. The powder is likewise protected from contamination.

The automated cocoa powder unloading system consists of an 18'4" (550 cm) high bulk bag discharge frame. A cantilevered I-beam supporting a trolley and electric chain hoist allow loading where a forklift cannot fit. Beneath the discharger frame, a 1 cu ft (0.03 cu m) capacity high-flow hopper connects to a 5-ft long (150 cm) flexible screw conveyor, at a 23 angle, that discharges to the auger conveyor through a transition adapter and 12-in (30 cm) long bellows.

The exact amount of powder flowing from the bulk bag is metered by loss-of-weight control. As the bag discharges, load cells under each leg of the unloader frame transmit weight-loss signals to a controller mounted on the side of the frame. The controller shuts off the flexible screw conveyor once the batch weight has been discharged. The conveyor runs at high speed, then at dribble speed before it stops when the target batch weight has been reached.

"Instead of previously manually weighing, say, 500 pounds (225 kg) of main ingredient, we just push a button," says Keith Geringer, Forbes vice president of manufacturing. "Unloading goes 50% faster."

Fits into Tight Space

The system had to fit into a tight space, for which Flexicon supplied a "push" type flexible screw conveyor that locates the 5-hp drive at the intake rather than at the normal discharge end. The motor pushes rather than pulls the powder through. The low situated drive helps the loss-of-weight control function more effectively by concentrating frame and conveyor weight directly on the load cells.

In operation, the hoist and trolley position the 87-in (220 cm) long bulk bag on the unloader frame. Pneumatically activated FLOW-FLEXER® plates at the bottom of the bag promote flow of the non-free flowing powders by massaging the lower side walls of the bag at pre-set intervals. As the bag empties, the stroke of the plates increases, raising the side walls in a 'V' shape, promoting complete product discharge.



Automated bulk bag weigh batching system consists of 18'4" (550 cm) high discharger frame and 5 ft (150 cm) long flexible screw conveyor. Under loss-of-weight control, the system discharges precise amounts of powder into an auger conveyor that feeds three ribbon blenders.

Dust is suppressed by a 15-in (38 cm) diameter iris flow control valve with a flexible, impermeable diaphragm that allows the operator to pull the tied bulk bag spout into the spout access compartment and close the valve around the spout. The spout is then untied, the compartment's access door closed, and the notched valve released slowly, controlling the rate at which the powder discharges into the hopper to prevent dust from escaping.

The cocoa powder is very fine (200 mesh) and dry (less than 5% moisture), tending to bridge. An agitator at the bottom and a pneumatic vibrator at the top of the hopper promote flow of the 25 lb/cu ft (400 kg/cu m) bulk density powder into the conveyor.

The hopper is designed with a steep back wall, and sidewalls that are skewed outward at divergent angles, reducing the ability of the powder to bridge between the hopper sidewalls, and instead causing it to topple and flow toward and down the backwall.

The food-grade flexible screw conveyor pushes the powder through a 6-5/8-in (16.8 cm) diameter UHMW polyethylene outer tube enclosing a rugged, flexible stainless steel screw. The only moving part contacting the material is the flexible screw. As it rotates in the tube, the screw self-centers to provide clearance between the screw and tube wall for gentle handling of the powder.

Flexicon applied its BEV-CON™ style screw, which reduces compression of the material on all screw surfaces except the top surface that propels material in the desired direction, promoting flow of the difficult-to-handle powder.

As the auger conveyor transports the cocoa powder to the blenders, minor ingredients such as salt, vanilla, carrageenan, are still manually dumped from 50- to 80-lb (22.5 – 36 kg) bags through the original bag dump station.

second chicken nugget line. Bag Filler and flexible screw conveyor operate separately from our 25 kg (55 lb) sack filling system, providing another advantage as we can now do both operations simultaneously, saving time and increasing production. We fill the bulk malt outload silo in the evening when the 25 kg (55 lb) sack line is not running, and then we can pack simultaneously during the day.”

Thomas Fawcett & Sons Ltd is a seventh generation family business that has been manufacturing quality malts for over 200 years on its original site in Castleford, West Yorkshire. The company supports and assists brewers of all traditions and sizes and its customers range from multi-national brewers to the latest start-up micro-breweries.

Considering a Second System

“In the future, we might add another bulk bag unloading system for one of the minor ingredients,” says Geringer.

In selecting the automated powder unloading system, he rejected an automatic bag opener and dumper, concerned about paper pieces and bag surface material contaminating the powder.

This small, 100 year old company supplies chocolate powder to dairies for chocolate milk and ice cream, and to the baking industry for desserts.

Geringer says Forbes Chocolate has grown considerably in the last 15 years, but with the same number of employees. The company has accommodated its rise in output with new packaging and filling equipment and automated systems such as this one for unloading its main ingredient.



USA

FLEXICON CORPORATION
Tel: +1 610 814 2400
E-mail: sales@flexicon.com
Web: www.flexicon.com