

A U S T R A L I A N

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TRANSMIN
Australian Engineering Worldwide

Removing malt production bottleneck

Muntons Malt has streamlined malt production with an in-line conveying system and bulk bag filler/unloader from Flexicon.

Muntons Malt, a division of Britain's Muntons plc, began manufacturing malt (fermented cereal grains that contain sugars) and liquid malt extracts in 1921 for brewing, distilling and food industries worldwide. The independently owned company currently sell more than 210,000 tonnes of malt annually, and is one of the UK's five major malt producers.

In producing dried malt, a vacuum band dryer converts liquid malt extracts into a coarse powder, which undergoes final granulation in a cone mill.

Originally, the final granulation was fed from the cone mill into 800 kg tote bins stored in a 200-bin capacity holding area, before bagging and shipping. A worker filled orders by lifting a tote bin by fork lift to a mezzanine where a second worker transferred

the bin about 10 m to the tipping unit, which unloaded the malt into the hopper feeding the bagging machine.

Each tote was then cleaned to comply with Muntons' strict hygiene standards. On the bagging line, another operator applied labels to the 25 kg bags and fit each bag to the fill head, after which the bags were sealed, palletized and shipped.

Downtime on the manual bagging line led to bottlenecks on the tote fill line, disrupting product shipment to customers, raising operating costs and adversely affecting operating efficiency. The downtime also threatened to interrupt operation of the band dryer, which would necessitate a costly and time consuming washdown that would vastly increase wastewater treatment and water use.

Muntons replaced the tote bin handling operation with an in-line conveying system in a new, hygienic packaging room built directly beneath the cone mill.

(right) Two flexible screw conveyors transport powdered malt from the cone mill to the bagging line or, in the event of a bagging line shutdown, to a bulk bag filler.



(below) After filling, bulk bags are moved to a storage area or to the bulk bag unloader at the bagging line.



Opening a door on the hopper intake chute of the bulk bag discharger frame exposes the bag spout

In-line conveying system bypasses bottleneck

Muntons replaced the tote bin handling operation with an in-line conveying system in a new, hygienic packaging room built directly beneath the cone mill. The system would ensure an uninterrupted work flow from band dryer to bagging machine resulting in improved reliability, higher throughput and reduced manpower. The bagging line was also automated.

In the in-line system, designed and installed by Flexicon (Europe), the dried malt extract exits the cone mill via two feed chutes into a pneumatically operated wye diverter valve, which allows the operator to direct the flow to the bagging line or, should the bagging line be shut down for service, to a bulk bag filler, which loads the malt into one tonne bags for temporary storage. Muntons can now supply malt in bulk bags as well as 25 kg bags.



This bulk bag discharger with integral flexible screw conveyor moves malt from bulk bags to the bagging line.

Transporting malt to the bagging line and bulk bag filler are two flexible screw conveyors, one 6 m long and the other 4 m long. Both conveyors, at a 45-degree incline, have a flexible, round wire screw rotating in a polymer tube.

The Twin-Centrepost bulk bag filler is mounted on load cells that transmit weight gain information to a controller, which stops the conveyor once the filler has gained a user-selectable weight.

An inflatable inlet seal connects the bag inlet spout, after which a bulk bag liner inflator expands the bag to remove wrinkles prior to filling. An exhaust port allows for dust collection during filling, after which the bag is tied and released from the pneumatically retractable bag hooks.

Bulk bag discharger introduces product to bagging line

When product is needed, a bulk bag is retrieved from storage and positioned in the bulk bag discharger frame. The operator inserts the bag spout through an iris valve, then closes the valve, enabling the bag tie to be untied and the valve opened slowly, reducing the displacement of dust from the hopper. Additionally, a collection plenum, mounted above the iris valve, can reduce the release of dust into the plant environment.

The discharger is equipped with Flow-Flexer bag activators that raise and lower the opposing bottom edges of the bags, promoting material flow from the bulk bag. As the bag empties, the Flow-Flexer stroke increases, raising the bottom of the bag into a steep "V" shape that eliminates dead spots and promotes complete evacuation from the bag. From the hopper beneath the bag, a flexible screw conveyor transports malt powder to the bagging line at a rate of 4.0 cu m/hour.

The powdered malt material, although free-flowing, is hygroscopic and can generate a potentially explosive dust. The in-line equipment meets EU standards for potentially explosive atmospheres, and has product contact surfaces of 304 stainless steel manufactured to a food-grade finish.

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