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FIBC switch

Nutec Ltd are specialist contract manufacturers and packers of products dedicated to animal nutrition and health. Among the many contracts fulfilled at their Staffordshire based facility is the process of a particular animal feed/medicinal product that involves the measured blending of an additive to raw material and final packaging and despatch. The existing process and packaging procedure had always been handled efficiently, accurately and safely but recent developments required a radical re-think as the raw material was soon to be supplied in 1 tonne FIBCs and not in the usual 20kg bag format.

Previously, pallets of the 20kg bags of raw material were positioned by forklift truck onto a 10ft. high mezzanine floor, adjacent to a receiving hopper into which operatives would split and gravity feed the individual bag contents for conveying to the blender via an existing 6" diameter Flexicon screw conveyor. The product's flow characteristics were very good but each bag could vary in content by up to 0.1kg. This inconsistency in the ratio of raw material to additive was adjusted by the amount of additive in the blender, determined with the use of load cells on the blender. From the blender, the final compound was conveyed to the packaging area where it was packaged into bags varying from 1kg to 25kgs, for final despatch to the client.

With the prospect of receiving bulk product in FIBCs, Nutec Ltd turned to **Flexicon (Europe) Ltd (FEL)**. The requirement for any new system would be fourfold:

1. It should handle FIBCs.
2. It will produce accuracy in weight delivery of raw material.
3. It must be easily cleaned.
4. It must be housed next to the blending process. As this was a fixed, existing line among other pro-

cesses, space had always been at a premium and further upgrades would need to account for this.

After consultation FEL designed and developed a system then ran a pilot line at their Herne Bay facility to prove the system could deliver specification prior to commissioning.

The system comprised:

1. Bulk bag discharge frame.
2. 250kg capacity intermediate hopper.
3. 2m long, round, flexible screw housed in a 4" UHMW polyethylene tube housing.
4. 400kg capacity transfer bin, free standing on a platform scale
5. Dust extraction system
6. A control panel to include a gain-in-weight product transfer program.

In complying with industry standards all contact parts were made in stainless steel finish.

Using a forklift truck, a 1 tonne FIBC attached to a cruciform by four Z clips is raised and secured in position on the bulk bag frame above the receiving hopper. Unlike alternative methods of feeding the bag spout through a traditional iris valve, the bulk bag/hopper interface consists of a manual Spout-Lock® clamp ring positioned above a pneumatically actuated Tele-Tube® telescoping tube. Together, the devices enable an operator to make a quick, dust-tight connection between the bag spout and hopper, and to automatically elongate the bag as it empties to promote flow and evacuation, say FEL.

By push-button control the telescoping tube raises the clamp ring assembly allowing the bag spout to be pulled through the ring. It then lowers and seals the clean side of the bag spout to the clean side of the telescoping tube and continues to

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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. 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.

From the receiving hopper material is gravity fed into the throat of the self-centring flexible screw conveyor where it is conveyed over 2m through 45° for discharge into the transfer bin. A low level warning indicator on the control panel warns the operator of the status. The operator is then able to replenish the raw material supply and continue production of the expected 12

tonnes per day output. During product transfer from the bag to transfer bin, dust within the system is extracted and dispatched via a perimeter wall to an outside-located dust extraction unit.

The control panel features a 2-set point PLC based controller for gain-in-weight accuracy and works in conjunction with the platform scale on which the transfer bin freely sits. As the operator starts the system from the control panel the first set point enables fast flow for rapid fill. When achieved, the second set point enables manual or automatic flow control at dribble feed rate until the accurate batch weight has been achieved within +/- 200grms on 400kg batch. The controller is suited for all filling applications and can be programmed to suit varying strengths of product "potency".

Once the total batch weight has been achieved the hinged lid on the transfer bin is closed, the bin is then removed from the load cells by forklift truck and elevated to the 10ft high mezzanine floor. At the base of the transfer bin is a discharge outlet. When positioned, the butterfly outlet is manually opened to gravity feed the hopper which in turn feeds the mixing vessel, via an existing Flexicon screw conveyor, with the precisely measured batch of raw material for compounding with the additive. This procedure now eliminates the need for bag disposal and reduces operator contact with the product and associated risks of dust inhalation.

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■ **Spiroflow** claim to have made an important advance in static control with the Model T9 FIBC discharging system. The system uses a statically conductive bulk bag and incorporates a static monitoring and dissipation system that operates continuously during emptying to ensure safe usage, even in volatile atmospheres.

As a bulk bag is filled or discharged, a steady accumulation of static electricity within the product being handled can be transferred to the walls of the container. If unchecked, this static could cause spark discharges from the outside surface of the bag, which can ignite the product or the atmosphere and cause an explosion or fire.

Spiroflow's solution to the static risk is widely applicable as the hazard applies in all powder processing plants. Six Model T9 dischargers have been delivered to Ciba Specialty Chemicals plc.

Tel: 01200 422 525

■ **Murray Engineering** are now holding a stock IBC emptying unit at their factory in Braintree to reduce delivery times to the customer. The Bagboy Hygiene unit is the latest specification unit to be manufactured by IBC International of Sweden. IBC International Handling AB are recognised for their design and manufacture of bulk (powder and granules) handling systems; FIBC fillers and dischargers, weighing and dosing systems, sifters, conveyors and bins etc. IBC supply everything from single components to turnkey systems, tailor made to meet their customer's requirements.

To meet with increased environmental demands, IBC developed Bagboy Hygiene for multi-trip bags with completely closed discharging that minimises contamination, but is still fully flexible. Now this discharging unit is hygienically sealed even when removing empty FIBCs.

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