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Powder Handling SOLUTIONS

**Knowing the
Powder is Crucial
to a Successful
Startup**

Processing
SOLUTIONS FOR THE PROCESS INDUSTRIES

THE SECRET INGREDIENT

Dust-Tight Bulk Bag Discharger Eliminates Waste, Improves Safety for Ingredient Manufacturer

Danisco A/S, a multinational ingredient manufacturer with operations in 147 locations in 47 countries, prides itself on competitive processing and helping its customers find ways to cut costs. An inefficient production system at the company's food-ingredient plant in Beaminster, Dorset, for nisin, a natural antimicrobial food preservative and shelf-life extender used in cream cheese, liquid egg and many other foods, prodded managers to rethink their system — they needed to streamline flow and reduce material handling to eliminate waste and cut manpower costs. With world food markets increasingly price-sensitive, Danisco's customers demand cost efficiency from suppliers. Even small inefficiencies can mean the difference between staying competitive and losing a market, and since Beaminster is Danisco's only nisin production plant, making the op-

eration as efficient as possible was critical.

The system had 55-pound bags of raw materials forklifted from storage and stacked next to an elevator, which raised the bags to a platform 10-feet above the plant floor. An automatic bag splitter cut open each bag, and a worker emptied the contents into a hopper that gravity-fed the material onto an open conveyor toward processing. Empty bags accumulated quickly, and a worker had to regularly climb the platform to gather and bunch them for disposal.

Despite thorough shaking by an operator, the bags were never fully emptied. The small amount of residual material left in every bag either would be spilled onto the platform, requiring additional clean-up, or simply disposed of with the bag. Plant management estimated that about 0.25 pounds-per-bag was lost, totaling about 176 pounds of lost material per week. The platform and elevator also required regular maintenance.

Go with the Flow

As a solution, Danisco installed a Flexicon bulk bag discharging system that conserved plant floor space and reduced costs, waste and dust, and also improved plant hygiene, worker health and safety.

Prior to designing the system, Flexicon Europe Ltd., lab tested the flow characteristics of each raw material Danisco handles. The materials were found to be hygroscopic — so protecting them from airborne moisture was important. But they were also free-flowing so no mechanical flow assistance was needed. The ingredients were also found to possess similar angles of repose — about 30-45 degrees — which helped determine the hopper wall angles necessary for efficient flow.

With this information in hand, Flexicon Europe designed a bulk solids handling system that uses a bulk bag discharge frame featuring a cantilevered "I" beam from which the bulk bag gravity-feeds ingredients into a receiving hopper that feeds a 14.8-foot-long flexible screw conveyor housed within a polymer tube. A BAG-VAC® dust collection system mounted on the side of the bulk bag frame collects 99.99-percent of particles five-microns or greater in size.

The dust collector produces a vacuum to collapse empty bags prior to bag disconnection, eliminating the need for manual flattening and, thus, reducing the risk of the operator inhaling dust. All ingre-



dient-contact parts are made from type 316 stainless steel with a food-grade finish, meeting the plant's stringent requirements.

Bulk Efficiencies Reduce Costs

The bulk-bag discharger frame enables Danisco to purchase ingredients cost-effectively in bulk bags; the need for 55-pound bags is reduced by about 90 percent, with the smaller bags now used only for minor ingredients. The forklift operator positions a bulk bag in front of the discharger frame and attaches it, via

The Flexicon bulk bag discharging system conserves plant floor space and reduces costs, waste and dust, while improving plant hygiene along with worker health and safety.



Reduce Your Risk

Combustible dust hazards exist in your processing facility. Monitor production equipment for hazardous conditions on:

belt & pneumatic conveyors	cutters
dryers	screening
mixers/blenders	storage bins
hammer mills	silos
extruders	dust collectors
pelletizers	bag houses

- Detect **sparks** and **burning embers**.
- Extinguish before the filter.
- Divert hazardous material flow.
- Detect **heat build up** in silos, bag houses and storage bins.
- Trigger extinguish and deluge valves, abort gates and fire traps, equipment shutdown or PLC actions.

GreCon Spark Detection Systems can reduce your risk of **fires** and **dust explosions** in transport and collection systems as outlined in **NFPA 69 and 654 standards**.

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straps, to an electric hoist that lifts the bag above the receiving hopper. A Spout-Lock® clamp ring positioned above a pneumatically-activated Tele-Tube® telescoping tube enables the operator to make a quick, dust-tight connection between the bag spout and hopper.

With the push of a button, the telescoping tube raises the clamp ring assembly, allowing the bag spout to be pulled through the ring. The operator then lowers the clamp ring, sealing the clean side of the bag spout to the clean side of the telescoping tube.

The bag's spout is then manually untied, with the dust-tight seal allowing full open discharge from the bag without risking particulate inhalation by the operator. The telescoping tube assembly exerts continual downward tension on the spout, elongating the bag as it empties, thus, promoting complete material discharge into the receiving hopper. A side-mounted hopper sensor informs the operator about the status of material flow.

From the receiving hopper, the free-flowing raw material gravity-feeds into the intake adapter of the flexible screw conveyor, which moves the material 14.8 feet at a 45-degree angle, and then down through a discharge adapter that empties into the blender that begins downstream nisin production.

Smaller, Safer and QA-Audited

The new system occupies half the footprint of the old one. It significantly reduces manual bag handling and related injuries, while the dust-tight connections and BAG-VAC dust collector eliminate plant contamination. The bulk bag discharger system also promotes uniform ingredient flow and transfer, giving Dansico greater control over its nisin mixing, while reducing bag waste and ingredient costs.

Finally, the new system meets Danisco's internal and audited quality-assurance programs, which include Health and Safety, Environment, Quality and Food Safety (SHEQ), Preferred Supplier Processes, Hazard Analysis Critical Control Points (HACCP), and Social Responsibilities.

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