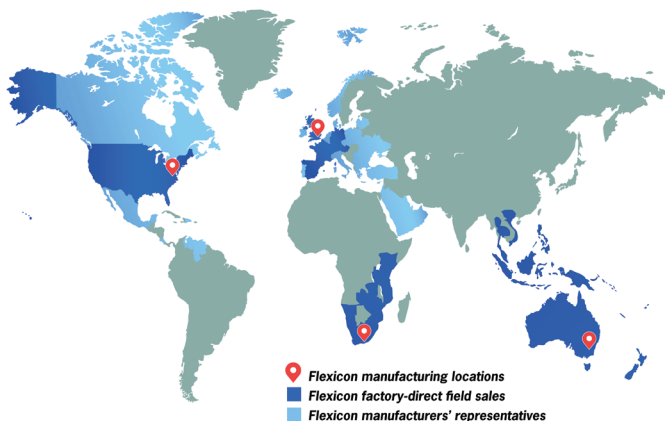




Bulk Bag Discharging, Pneumatic Conveying Boost Plastic Compounding Productivity

EE-0662



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CATALONIA, SPAIN — A Spanish plastics company collects, sorts and recycles plastic scrap, which involves compounding and pelletising of resins using a mineral additive in powder form.

Previously, operators manually dumped 25 kg sacks of the mineral powder (particle size of 10 µm) into a hopper from which the material gravity fed into an extruder along with the recycled material. The process was slow, labourious and dusty.

Now, the powder is discharged automatically from 700 kg bulk bags and conveyed to the extruder pneumatically at high rates, with less labour and little or no dust using a bulk bag discharger and a pneumatic conveying system from Flexicon.

The company engineer in charge says, “Manual handling has been greatly reduced with operators changing bulk bags only once or twice per shift, freeing workers for higher-value tasks.”

Bulk bag discharger speeds operation

Once a forklift positions a bulk bag alongside the Bulk-Out® model BFH-C-X bulk bag discharger, a hoist and trolley suspended from a cantilevered I-beam lift the bag into position on the discharger frame.

The clean side of the bag spout attaches to the clean side of a Tele-Tube® telescoping tube by means of a Spout-Lock® clamp ring. The tube maintains constant downward tension on the bag as it empties and elongates, promoting material flow into the 226 L hopper and containing dust.

A Flow Flexer® agitation device raises and lowers edges of the bulk bag to promote the flow of mineral powder into the hopper, which is fitted with an agitator to promote the flow of material into a rotary valve at the pneumatic conveyor's inlet.

A Power-Cincher® flow-control valve cinches the bag spout concentrically, allowing partially empty bags to be tied off and removed with no leakage.

The engineer says, “The flow-control valve allows us to be more flexible with our production, as we can now remove a partially emptied bulk bag and replace it with another material required for producing a different type of plastic pellet.”

Pneumatic conveyor transports mineral powder to extruder

The 75 mm diameter, 38 m long stainless steel conveying line of the Pneumati-Con® pneumatic system delivers up to 1,000 kg/h of the material to a filter-receiver and receiving hopper above the extruder.



Operator delivers bulk bag, and attaches bag loop straps to the lifting frame.



The cantilevered hoist and trolley position the bag for discharge into the 226 L hopper and through a rotary valve into the pneumatic line.



The operator pulls the bag spout through the Power Cincher® flow control valve which prevents product leakage and facilitates tying off a partially-empty bag.

The mineral powder is separated from the air stream by a filter-receiver that includes a 220 L capacity receiving hopper. Four air-jet fluidisers in the bottom of the hopper promote the flow of material as a volumetric feeder meters it into the extruder.

System operation is under PLC control, including timed filter cleaning, starting and stopping the pneumatic conveyor based on level sensor readings, and opening and closing of valves.

The conveyor was purchased through Flexicon's QUICK-SHIP program, which Wernig says performed as advertised. "I was informed when it was shipping, it arrived on time, and the instructions for installation were clear."

"This is a brand-new process for us," Wernig explains. "Before, we were using an old hops dryer that we had purchased from a European harvester, and a much slower conveyor. Back then, we could process 700 to 800 pounds (315-360 kg) of hemp into product per day. With the new dryer and BEV-CON conveyor, we now do that in an hour."

Discharger, pneumatic conveyor reduce manual handling

"The bulk bag discharger and pneumatic conveying system have reduced the manual handling that our workers have to do and have helped us to clean up the plant," commented the engineer. "The equipment has improved efficiency, because when the hopper above the extruder runs low, the controller alerts the operators, who then load another bulk bag, thereby reducing downtime."



From the pneumatic line, the filter-receiver separates the mineral powder from the air stream before discharging the powder into the extruder. System operation is under PLC control.



Next he connects the spout to a Spout-Lock® clamp ring, which is mounted on a Tele-Tube telescoping tube that promotes material flow and eliminates dust.



The powder flows dust-free into the hopper and into the 38 m long pneumatic transfer line.

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