



Whitepaper

Bulk Bag Discharging plus Pneumatic Conveying - Enhanced Handling Capacity Boosts Plastic Compounding Productivity

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The recycling and reuse of plastic materials calls for the conversion of scraps into workable raw materials which involves the compounding and pelleting of the scrap materials. The process used by a Spanish manufacturer equires the addition of mineral powder prior to extruding. Replacing the formerly open bag with a big-bag emptying station provided for a more efficient production and a cleaner working environment.



Operator delivers bulk bag, and attaches bag loop straps to the lifting frame. (Pictures: © Flexicon Corporation)

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

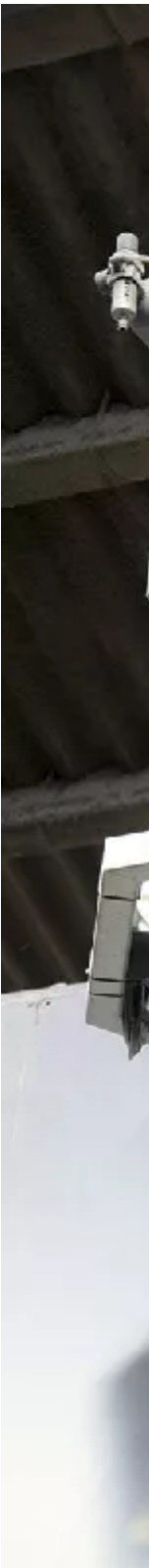
The clean side of the bag spout attaches to the clean side of a telescoping tube by means of Flexicon's clamp ring. The tube maintains constant downward

tension on the bag as it empties and elongates, promoting material flow into the 226 l hopper and containing dust. An 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. The also installed flow-control valve cinches the bag spout concentrically, allowing partially empty bags to be tied off and removed with no leakage.



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

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



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with another material required for producing a different type of plastic pellet.”

Mineral Powder is pneumatically conveyed to Extruder

The 75 mm diameter, 38 m long stainless steel pneumatic conveying line delivers up to 1000 kg/h of the material to a filter-receiver and receiving hopper above the extruder. The mineral powder is separated from the air stream into 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. According to the plant 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. In addition, the bulk bag discharger and pneumatic conveying system have reduced manual handling and helped cleaning up the plant, thus maintaining a safer working environment.