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POWDER BULK SOLIDS®

The Source for Dry Processing and Bulk Handling Technology

Material Handling Solution Helps Recycle Fabric Waste & Water Bottles into Fiber

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Industry Insight

Mark Jones discusses how the need to store, feed, convey, discharge, and receive bulk particulate solids in an efficient and environmentally sound manner is growing not diminishing.

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Powder Show Canada Preview

PTX/Powder Show Canada offers a full spectrum of process manufacturing technologies. Preview the event, view the exhibitors list, and read about things to do while in Toronto.

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Mechanical Conveying Focus

Powder Process-Solutions offers vibratory conveyor systems that will gently and accurately convey fragile, agglomerated, or instantized powders with low-maintenance operation.

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Rhino Rotary Valve

Aerodyne's Rhino Rotary "R" Valve is a high-capacity, material handling valve that is designed for continuous discharge of dry, free-flowing, low-abrasive solids in gravity-flow or low-pressure systems. It is equipped with six neoprene rubber-tipped rotor vanes, ensuring a superior seal and cost-effective maintenance over steel rotor vanes. Widely used in applications such as the bottom of cyclonic dust collectors and baghouse hoppers, the Rhino Rotary "R" Valve's steel plate construction provides more flexibility and durability than cast valves. Optional urethane-tipped rotor vanes, explosion-proof drive motor, and stainless steel construction are also available upon request.
Aerodyne Environmental Inc., Chagrin Falls, OH
800-358-7546 www.dustcollectorhq.com

Low-Profile Pneumatic Pharmaceutical Conveyors

Volkmann Inc. introduces a new line of low-profile pneumatic pharmaceutical conveyors that is part of the PPCVS series. These new models feature a purpose-designed, low-profile vacuum pump and reverse-jet shock tank, providing a necessary solution for conveying tablets and capsules in restricted height areas. In addition, by adding these models, Volkmann now also offers common sizes throughout its range of products, allowing easy access to spare filters fitting multiple units. Pictured is an ATEX-certified PPC250VS model discharging through a split butterfly valve. It includes a HEPA unit and a mobile trolley with pneumatic height adjustment.
Volkmann Inc., Hainesport, NJ 609-265-0101
www.VolkmannUSA.com

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Material Handling Solution Helps Recycle Fabric Waste & Water Bottles into Fiber

Spiroflow Systems, a leader in the bulk handling industry, recently worked on a project to help recycle waste materials, including recycled plastic water bottles, into first quality recycled polyester fiber.

Spiroflow worked on this material handling project with Unifi Inc., a leading producer of polyester and nylon yarns. Unifi developed Repreve, a recycled fiber made from pre-consumer waste and recycled water bottles that can be used just like fiber made from virgin materials. Repreve is a recycled ingredient that makes consumer products sustainable, and can be found in many products such as clothing, auto interiors, tote bags, and home furnishings. Repreve is used by some of the world's leading brands like Ford, The North Face, Patagonia, and Haggar.

Unifi built a new recycling center in Yadkinville, NC in 2010, to recycle pre-consumer waste, bottles, fabrics, and garments. They had three requirements for the material handling of plastic flakes from recycled bottles. These requirements included:

1. Fill: Fill mixing silos with plastic flake from Gaylords and from bulk bags
2. Re-circulate: Re-circulate plastic flake material within each of two silos and re-circulate material between these two silos
3. Deliver: Deliver material to the next manufacturing process step.

Spiroflow bulk bag discharger, flexible screw conveyor and aero mechanical conveyor fill a Unifi silo with plastic flake from used water bottles.

Spiroflow Solution

To meet the customer's three requirements, Spiroflow Systems provided a material handling system that included one box dumper, two bulk bag dischargers, five flexible screw conveyors, one hopper, four aeromechanical conveyors, and one comprehensive custom control panel with an HMI (Human Machine Interface).

The process steps for filling mixing silos are as follows:

1. Plastic flake material arrives in Gaylords and each

Spiroflow Systems Gaylord box dumper and two bulk bag dischargers provide Unifi with two methods to deliver flake material into mixing silos.

Spiroflow flexible screw and aero mechanical conveyors allow Unifi to easily blend and re-circulate material within a silo or from one silo to another.

Gaylord is placed in the custom-built box dumper. The box dumper empties plastic flake material into the live bottom bulk bag discharging system. Alternatively, flake material arrives in bulk bags. Full bulk bags are placed in one of the two supplied bulk bag dischargers and the flake material is discharged from bulk bags.

2. The dual live bottom bulk bag discharging system transports flake material via twin flexible screw conveyors into a hopper.
3. Material is passed through a metal detector where any metal particles are removed.
4. A third flexible screw conveyor transports material to a vertical aeromechanical conveyor.
5. The vertical aeromechanical conveyor transports the material up to a second horizontal aeromechanical conveyor.
6. The horizontal aeromechanical conveyor advances forward to fill silo A or advances in reverse to fill silo B.

This configuration allows flake material to be emptied from bulk bags or Gaylords and fed into either silo, which is the first step in the manufacturing process.

The process steps for re-circulating flake material are as follows: There are two flexible screw conveyors positioned at the bottom of each silo. Each of these flexible screw conveyors transport flake material to a vertical aero mechanical conveyor. The vertical aeromechanical conveyor moves flake material to the top of the silos and into a horizontal aeromechanical conveyor. The horizontal aeromechanical conveyor advances forward to fill silo A or advances in reverse to fill silo B. This configuration allows material to re-circulate within silo A, re-circulate within silo B, re-circulate from silo A to silo B, or re-circulate from silo B to silo A. This is an important requirement as the flake material can have varying properties that are considered in the manufacturing process.

The process steps for delivering flake material to the next process are as follows: The same two flexible screw conveyors positioned at the bottom of each silo can also discharge into a provided hopper.

Spiroflow recommended a complex but 'clean' and well-designed solution to meet all of the requirements to fill, blend, and re-circulate plastic flake with different and varying properties.

Spiroflow Systems live bottom bulk bag discharging system with dual flexible screw conveyors.

Material from this hopper is conveyed to processing with fabric cut-waste.

This final step allows for the introduction of flake material into the initial manufacturing process. Spiroflow recommended a complex but 'clean' and well-designed solution to meet all of the requirements to fill, blend, and re-circulate plastic flake with different and varying properties.

"Extensive material testing was required, but was important in verifying that our solution would operate as expected, at the rates we promised."

Repreve recycled fiber

The Spiroflow tests clearly demonstrated that their aeromechanical conveyors could convey plastic flake better and faster than other methods. Plus, their mechanical conveying solution offered significant energy savings over pneumatic equipment, which was recommended by other vendors. Mathias Lee, Spiroflow Systems vice president of sales, acknowledged that, "Extensive material testing was required, but was important in verifying that our solution would operate as expected, at the rates we promised. We highly recommend material testing to all of our customers."

Spiroflow (Monroe, NC) offers a wide range of standard and custom options for both small and large volume users. Products include bulk bag dischargers and fillers, flexible screw, aeromechanical, tubular cable drag, tubular chain drag and pneumatic conveyors, box, sack, and drum dump stations, and the Facepacker range of automatic packing, pick, and place, and robotic palletizing solutions. For more information on Spiroflow, visit www.spiroflowsystems.com, email info@spiroflowsystem.com, or call 704-246-0900.

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