Vacuum Conveying Provides Material à la Carte

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The Quicktron OS RH is designed to detect and reject metal contaminants from free-falling bulk materials without interrupting production. It is ideal for powder applications requiring food-grade contact surfaces. It features open framework construction with a round reject mechanism without edges to avoid dust and dirt settlement. The Quick Out system with a removable flap allows production workers to remove the complete separating mechanism for fast cleaning to reduce downtime. The detector is ideal for food manufacturers. All product-contacting parts are made from food-grade materials such as stainless steel, polypropylene, silicone, and Teflon.
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Centrifugal Screeners Boost Powdered Beverage Mix Output and Quality

Federal regulations and consumer fears concerning allergens in food products prompted Compact Industries, a co-packer of powdered beverage mixes, to sanitize its processing equipment more frequently and devise ways to more than compensate for the resulting sacrifice in productivity.

Founded in 1963, the company blends and packages powdered cocoa, cappuccino, spray- and freeze-dried coffees, smoothie mix, nondairy creamers, punch mix, and other powdered drink mixes that sell through retail and foodservice outlets under Sun-Up, Ghirardelli, and other brands. Compact’s marketing slogan, “If it’s powder, we can pack it,” is the guiding principle of the plant, which operates two 10-hour shifts four days a week in its St. Charles, IL, location.

The quick-clean centrifugal screener features a three-bearing shaft that cantilevers on two of the bearings when the “overs” discharge door is opened for cleaning.

Screening after Blending

“Matching powder consistency with product use is central to success in the powdered-beverage business,” explains Steve Metzger, Compact’s maintenance manager. “Consistent powders are not only easier to package, they meet the expectations of consumers who do not want to open a pouch and find a clump. But if the powder is too fine, it’s going to float in water and take longer to dissolve.”

Maintaining tight particle-size control with beverage powders is a challenge, due not only to foreign matter, but also to sugars that agglomerate with friction, heat, or moisture, and fats that tend to clump.

To remove these oversized particles, the company positions a screener below each of its nine blenders. These screeners were all horizontal-bed vibratory type units that rarely kept pace with output requirements—until the increased washdown protocols went into effect.

“Overall plant production was limited to the capacity of our screeners, which were already at 100% utilization,” says Metzger. “So the added downtime for sanitizing incurred unacceptable losses in output. Because bed screeners utilize vibration and gravity, separating oversized particles from on-size particles passing through the screen is a relatively slow process, and the finer the screen mesh, the slower the rate of screening.”

To overcome the bottleneck, the company replaced five of its nine horizontal-bed vibratory screeners with Centri-Sifter centrifugal sifters from Kason Corp. Each of the new screeners doubled the capacity of the one it replaced.

The centrifugal separator contains revolving helical paddles that accelerate and propel powders through the apertures of a horizontally oriented, stationary cylindrical screen. The paddles do not contact the screen, but they propel oversized agglomerates and foreign particles through the open downstream end of the screen cylinder and eject them through a discharge spout.

“The design creates more-dynamic sifting and helps break up agglomerated clumps,” says Larry Lindberg, Compact’s vice president of operations. “The way these units operate has significantly improved our ability to capture ‘overs’—the particles and elements we want filtered out of the powder.”

Between production runs, the wedge wire basket and helical paddle assembly of the screeners are removed, allowing for sanitization of the machine’s internal components and screening chamber interior.

Blenders, Sifters Operate in Concert

All nine of the company’s blenders, which range in capacity from 1750 to 7000 lb, are installed on the second floor of the plant. The centrifugal separators are connected to the bottom outlet of each blender at the ceiling level of the first floor. Each sifter
discharges into a stainless-steel hopper, and from there product feeds by gravity directly into packaging machine fillers. Lindberg says that throughput averages about 20,000 lb/hr, depending on the powder.

"We can use the same mesh screens in the separators for all of our blenders. That’s a big advantage," says Metzger, explaining that the interchangeability means keeping fewer screen sizes on hand. "The No. 8 is the most common mesh size we use, so we have several of those. But we use the No. 4, No. 10, and No. 20 less often and keep just a spare of each." He notes that the stainless wedge wire screening material of the Centri-Sifter units has proven able to handle heavier loads and to last longer than the nylon screening material of the bed-type vibratory separators.

Metzger says the cylindrical screen cylinders of the centrifugal units can be changed more quickly than the flat screens of the vibratory separators. "It’s a matter of undoing a couple of clamps,
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The hinged end cover allows unobstructed access for cleaning. Internal components slide freely from the shaft end.

opening the end bell, and sliding the screen out," he says. "It takes just a couple of minutes. Changing screens in the rectangular bed-style vibratory units requires many clamp rings to be removed. They’re stacked systems so you’ve got to separate the whole assembly for cleaning."

Four of the five centrifugal separators at Compact are quick-clean models. These feature a hinged end cover and three-bearing shaft that cantilevers on two of those bearings when the "overs" discharge door is opened for cleaning. This allows internal components to slide freely from the shaft end.

Sifters Endure Rugged Duty

Over the course of a production shift, Compact moves from the lightest flavors in its product line to the strongest to simplify between-product cleanings. "Our drink mixes have many ingredients in common, the primary differences being the proportions of primary ingredients and the addition of powdered flavors," says Metzger. "Between production runs of similar products we do a sugar wash, which means taking some clean sugar and distributing it around the blender to get any remnants of the previous batch out. The sugar is an abrasive and works well for this kind of simple cleaning."

Between production runs of products with significantly different flavor profiles, different colors, or—most importantly—different formulations that may contain a potential allergen, Metzger’s crew gives the equipment a full wet washdown. The ease with which the screens of these separators can be removed for washdowns allows workers to focus on sanitation rather than on complicated disassembly. The units are fabricated to 2B sanitary finish with continuous welds.

"What’s hardest on screens is carelessness—how people handle them. The heavy-duty wedge wire screen cylinders perform efficiently for up to two years. We’ve been getting good life out of them," he says.

With increasingly stringent food-processing regulations incurring production setbacks, bringing an operation back up to speed as quickly as possible is critical to success. "The screening aspect of our operation is no longer a bottleneck, due to the increased capacity and cleanliness of our centrifugal screeners, particularly the quick-clean cantilevered shaft models," says Metzger.

Kason Corp. (Millburn, NJ) is a manufacturer of vibratory, centrifugal, and static screening equipment for solids/solids and liquid/solids separations, in addition to circular vibratory fluid bed dryers, coolers, and moisturizers. For more information, visit www.kason.com.