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Plant Operations



Centrifugal Sifter Beats the Heat in High-Volume Powder Process

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Wedco Processing Services, a division of ICO Polymers North America, specializes in size-reducing thermoplastics and other materials into custom powders that are

specified for numerous applications. Based in Asbury, NJ, the company uses its particle-size-reduction processes to produce granular to sub-micron particles from an array of materials, in lab-size volume to thousands of tons per year. Wedco has a long history of size-reducing polyolefins, engineering resins, fluoropolymers, and waxes, among other organic and inorganic materials.

Wedco's capabilities not only include production scale ambient and cryogenic mechanical grinding and jet pulverizing, but also batch and continuous blending, product testing and analysis, and research and product development. To maintain flexibility to address many types of



The 'Polisher' feeds material in-line to Centri-Sifter MO centrifugal screener that separates on-size particles from oversize agglomerates.



Polisher (center) is a continuous inline mixer that improves the flow properties of materials. After mixing and surface-smoothing, particles are transferred to a Centri-Sifter MO screener (right) for scalping of agglomerates.



On-size particles are gravity discharged through the main outlet, while agglomerates propelled through the end of the cylindrical screen are discharged through a smaller end spout.

custom processing requirements, Wedco employs proprietary equipment as well as equipment sourced from suppliers. In one line, the company integrated a continuous heat treater/mixer of its own design called the "Wedco Polisher" in-line with a "Centri-Sifter MO" centrifugal screener from Kason Corporation. The polisher controls the level of heat and energy imparted to a powder to yield uniform flow and moisture properties. It is also used to mix in performance-enhancing additives on a continuous or batch basis. The Centri-Sifter unit not only screens particles to size but discharges any agglomerates generated by the process. Its ability to work efficiently within demanding production environments contributes to the quality of powder processed on the line.

One notable application of the line improved the flow properties of a new powder grade. This began with a customer that was using a polypropylene powder cryogenically ground by Wedco for a fluid-bed dip process. In this technique, hot parts are dipped in a powdered fluid bed. The powder melts when it comes in contact with the part, coating it. During process improvement efforts, the

customer reported inconsistencies in powder flow properties, which affected the quality of the coating, says Craig Davis, vice president of sales and marketing for ICO Polymers North America. Wedco analyzed the powder and determined that the particle shape might be contributing to the variability in flow, and decided to run it through the Polisher to improve flow characteristics.

The Polisher's high-speed mixing action smoothed particle surfaces (hence the term "polisher"), which improved both bulk density and flowability. This resulted in improved performance in the fluid bed process.

Screener Achieves High Level of Sizing Accuracy

The Centri-Sifter MO screener has a number of features that were beneficial to this job and to other inline operations. It handled the process heat from the Wedco Polisher,



Cylindrical screen and helical paddles slide out of the Centri-Sifter MO screener end for thorough washdown and rapid screen changes.



Screening chamber door of the Centri-Sifter MO screener provides quick access for cleaning, inspection.

which can range from 125 to 450°F (52 to 233°C), met throughput needs of up to 1000 lb (453 kg)/hr, and importantly, sized 97 to 99% of the powder it screened. Due to the process heat, some of the polypropylene powder melted and formed large particles. The screener was able to break up the softer agglomerates for sizing and eject large pieces through a discharge spout. The company also benefited from the unit's rapid, thorough cleaning that prevents contamination after a material change, and fast screen changes that minimize downtime.

The screener's high rate of particle-sizing accuracy stems from its internal design. Powder is screw-fed into the unit's horizontally oriented, cylindrical screening chamber, where a series of rotating helical paddles create centrifugal force that accelerates the flow of particles through apertures in the screen.

Davis explains that metal or nylon screens with apertures ranging in size from 6 mesh down to 200 mesh can be used in conjunction with the polishing process, depending on the powder being processed. The average particle size of the polypropylene powder was approximately 150 microns. He says, "The screener is a significant part of Wedco's unique heat treater system, meeting the company's process needs with ease."

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