Imagine increasing your screening rate from 4,000 lb/h to 4,000 pounds per 12 minutes by replacing just one piece of equipment in your processing line. Castek Inc., Berwick, Pa., did just that, increasing its process efficiency by 75 percent and solving a processing problem at the same time.

Castek, a subsidiary of Transpo Industries Inc., New York, produces 35- to 75-pound bags of high-compressive-strength polymer concrete for patching and concrete rehabilitation of roads, bridges, airport runways, and parking decks. To produce the polymer concrete, the company combines fine, abrasive silica sand with a liquid plasticizer to form a semisticky powder, which has a tendency to form lumps. The raw sand consists of unevenly shaped free-flowing granules ranging from fine to 3/16 inch. The sand is stored in computer-controlled storage silos, from which it's pneumatically conveyed into a 7,000-pound-capacity pneumatic blender located on top of a 20-foot-tall mezzanine. Inside the blender, a liquid plasticizer is sprayed onto the sand to create the semisticky powder that can sometimes have soft lumps as large as 2 inches. The blended material drops into a boot located at the blender's bottom and discharges via a 10-inch pipe outlet with a butterfly valve. A manually operated slide-gate valve in the pipe controls the material flowrate.

In the past, the semisticky powder discharged directly from the blender to a ground-level pneumatic bagging machine that can bag a 4,000-pound batch in 15 minutes. In 2000, the company installed a rectangular vibrating screener between the blender and the bagging machine to produce a more uniform, lump-free product. The screener was located on the narrow mezzanine and discharged the powder into a 7,000-pound-capacity surge tank that feeds the bagging machine.

Unfortunately, the company encountered problems with the screener. It wouldn’t screen large lumps or break them up into smaller lumps. The powder also smeared and blinded the screens, which led to frequent screen failure and increased cleaning and maintenance costs.

A company replaces a rectangular vibrating screener with a centrifugal screener to eliminate material lumps and increase its polymer concrete production.

The centrifugal screener’s easy-access door allows quick inspection, cleaning, or screen changing.
maintenance time and costs. Another concern was the time involved in the screening process. The screener could only screen 4,000 pounds of powder per hour, while the bagging machine could handle the powder at a much higher rate. The company began to look for alternatives to the screener.

Searching for change

During its search, the company contacted several suppliers and read various trade magazines looking for an answer to its problem. “We tried delumping the powder with a lump crushe and shredder,” says Tony Krisanda, Castek plant manager. “But it didn’t get the lumps small enough for what we needed, and the sticky powder lodged in the unit’s revolving fingers. Also, it was too large for the limited space on the mezzanine, so we would have had to change our process line and spend more money to make this option work.” Krisanda also rejected a circular vibratory separator because it wouldn’t fit on the mezzanine.

In early 2001, the company received a call from Chris Dugan, a manufacturer’s representative from Kason Corp., Millburn, N.J. Kason manufactures various types and sizes of circular vibratory screeners, centrifugal separators, agglomerators, powder coaters, and other equipment.

The pneumatic blender (top) sprays liquid plasticizer on 4,000 pounds of silica sand, which the centrifugal screener (bottom left) delumps and screens in 12 minutes.
New Ribbon Blenders priced 30% less.
World’s #1 manufacturer!
- All stainless, highest quality!
- Sizes 1-500 cu.ft.
- Dozens available for immediate delivery!

www.ribbonblenders.com

Ross
1-800-243-ROSS

A 4,000-pound batch of polymer concrete is bagged in 15 minutes.

Dugan met with Krisanda at the plant several times and decided that with the limited space available, only one screener would work perfectly for the company’s needs. Based on Dugan’s recommendation, the company sent material samples to the supplier’s laboratory for testing. The supplier successfully screened the company’s materials at the desired production rate. Happy with the results and the supplier’s performance warranty, the company decided to purchase the supplier’s Centri-Sifter centrifugal screener.

In April 2001 the screener was delivered to the plant. To install it, the company simply removed the old screener and set the new one in place, then hooked up the motor and power line to electricity.

The new centrifugal screener
The Centri-Sifter centrifugal screener sits on the mezzanine below the pneumatic blender. Its 3-foot-wide frame only takes up 22 inches of overall headroom from inlet to outlet. The powder gravity-feeds from the blender into the totally enclosed screener via a feed inlet, where an auger, or feed screw, feeds the material into a cylindrical screening chamber. In the chamber, rotating helical paddles impart centrifugal force to the moist particles, propelling them continuously against and through a 5-mesh perforated-plate cylindrical screen. The paddles never make contact with the screen, but when they hit a lump, they break it up and force it through the screen. The onsize delumped powder falls through the
screener’s conical bottom section and into the surge tank. Anything that can’t be delumped or is considered true oversize is ejected through the oversize discharge outlet, where it’s sent back to the storage silo to be rescreened.

The screener is dust-tight, and the screens remain clear during operation and require minimal cleaning. Maintenance procedures are simple: An operator simply has to change the replaceable screens as needed. An easy-access door with quick-release clamps allows quick inspection, cleaning, and screen changing. “The material is very abrasive so the screens do need to be replaced often,” says Krisanda, “but it only takes a few minutes to change them, so replacing them is no big deal.”

Increased efficiency, production rate

The company’s production rates increased 75 percent after installing the new screener, drastically improving the company’s capabilities. And, since all particles are eventually screened, the company has eliminated waste. “The new screener sifts 4,000 pounds of material in twelve minutes, whereas the old screener could only screen 4,000 pounds in one hour. That’s a major difference,” says Krisanda. “We run the screener intermittently according to customer orders, but if we were using it full time, the screener would’ve paid for itself in less than three months.”

The company is happy with the centrifugal screener and hasn’t had to upgrade or replace any major components since the initial purchase.

Note: To find other articles on this topic, go to www.powderbulk.com, click on “Article Index,” and look under the subject heading “Screening and classifying,” or see Powder and Bulk Engineering’s comprehensive “Index to articles” in the December 2004 issue.