

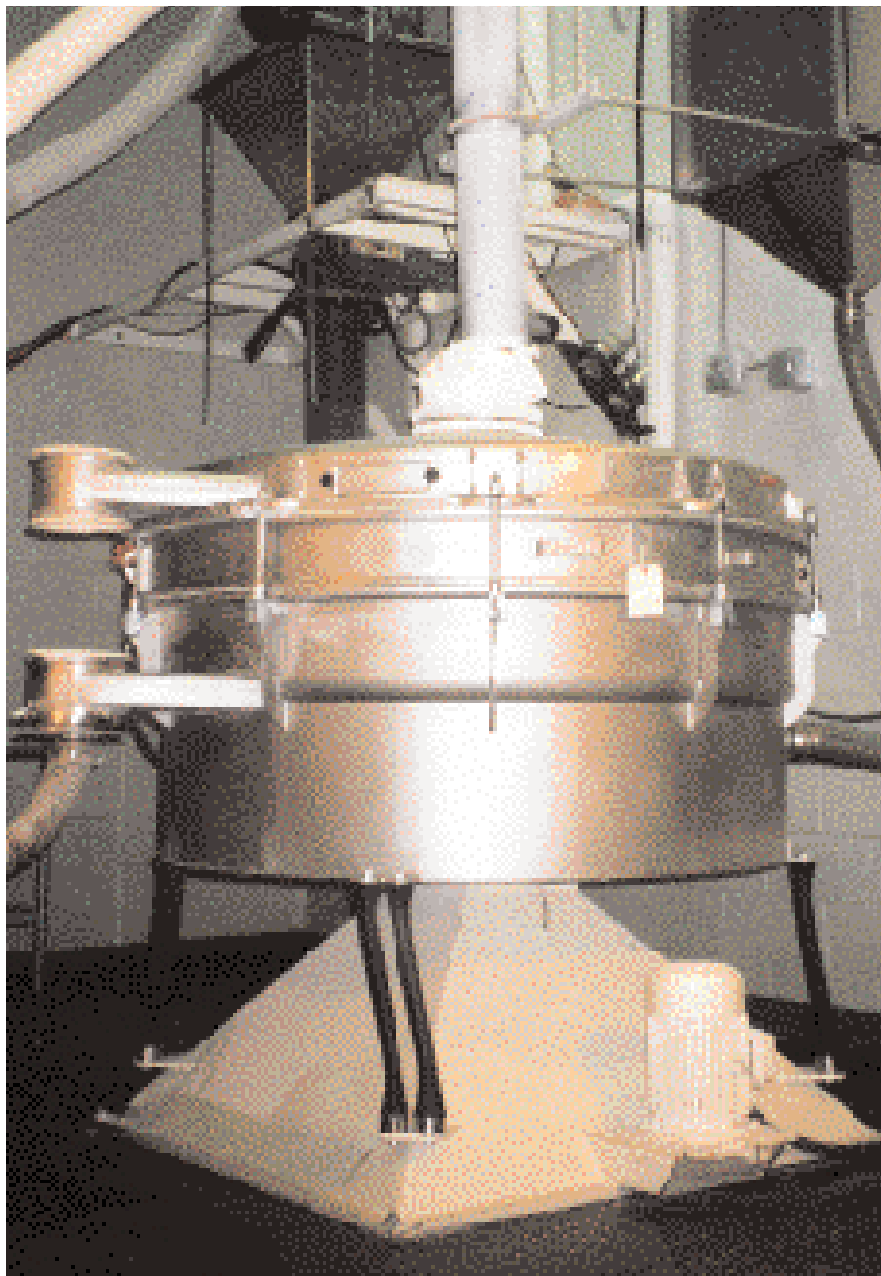
Case history

Screening creates two products from one

A custom processor uses a tumbling screener to classify a customer's product into two size fractions.

To stay ahead of their competitors, custom processors must often offer customers the latest processing technologies. By doing so, they not only can meet a customer's demands, but perhaps can exceed them — as one custom processor did by investing in a new screener.

Materials Processing Technology Inc. (MPT), a custom processor in Paterson, N.J., provides many bulk powder processing services for the food and pharmaceutical industries. Founded in 1978, the company employs 65 people and operates 24 hours a day, 5 days a week.



At MPT, the tumbling screener classifies a pharmaceutical product into two size fractions at a yield of about 98 percent.

MPT's services include separation-classification, agglomeration, and encapsulation using various processing equipment. MPT vice president of sales Bob McCrimlisk said the company's main focus is service.

"Our competition may sell the process equipment and have divisions that offer services similar to ours," he said. "[But] their main thrust is, and always will be, to sell process equipment. Our main thrust has been, and will continue to be, providing high-level service to our customers."

Rather than market specific processing equipment, McCrimlisk said custom processors must focus on providing customers with quality service. Often, this involves investing in the latest processing technology.

"We provide our clients with technical expertise, and we have a strong

bent to customer service," McCrimlisk said. "We haven't advertised heavily in years, yet our business has grown significantly through personal contacts and word of mouth."

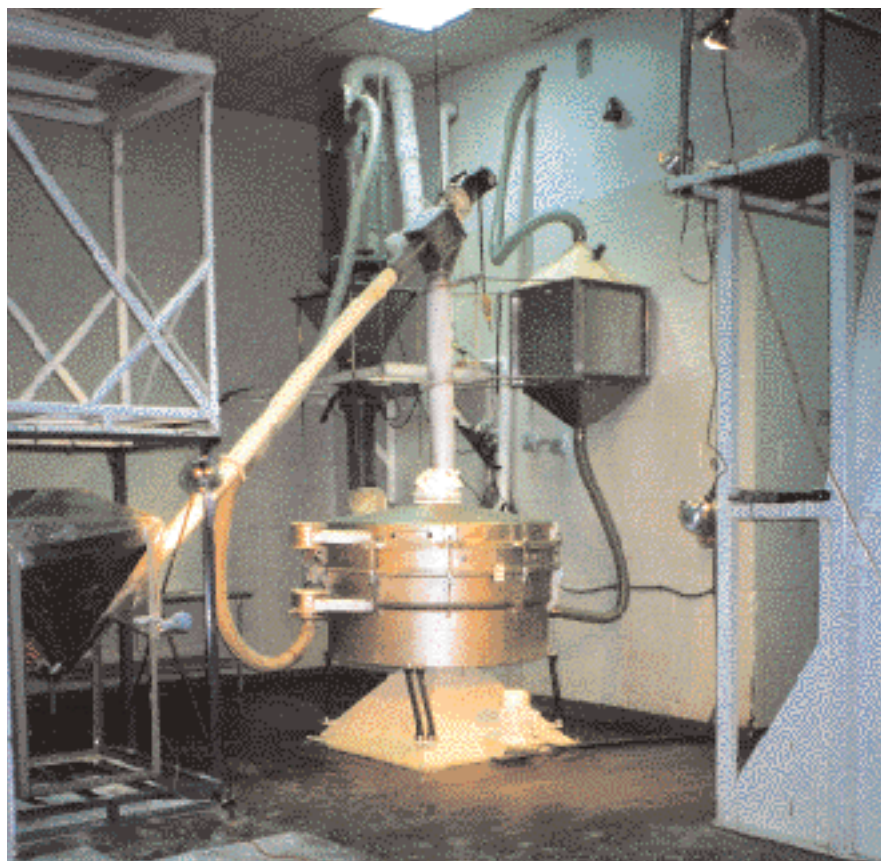
When a producer of a bulk pharmaceutical ingredient used in many over-the-counter drugs sought MPT's service to classify a crystalline product into two fractions, MPT had to upgrade their equipment.

Sieves and various screeners don't meet project requirements

MPT's customer asked for "very tight" size classification of their product, McCrimlisk said. They wanted to separate the desired product — the coarse crystal fraction between 16 and 120 mesh — from the finer crystals (<120 mesh).

MPT agreed to classify the product, and the producer began sending it to

"[This customer's need] was a very significant piece of business with a lot at stake, and we basically hit a wall using the gyratory screeners. We didn't know of other available options."



MPT's screener is fitted with an air cleaning system, which blows air through the bottom of the screen to keep product flowing.

MPT in bulk bags. The bags are emptied onto a belt conveyor, which transports the product to various processing equipment. MPT tried several screening methods to classify the product.

“We tried a number of techniques to separate these two sizes,” McCrimlisk said, “and we were unsuccessful doing it with traditional mechanical sieves.”

Centrifugal and vibratory screeners couldn’t accurately classify the product either. McCrimlisk said MPT also used gyratory screeners, but due to the product’s fragile nature and its varied particle size, the screeners also failed to classify the product.

“We attempted to classify the coarse crystals by putting the product through the traditional gyratory screener,” he said. “But the raw product had a wide particle size range, so the gyratory screener wouldn’t produce a clean cut. The small crystals would cling to the large crystals. Some of the large crystals were breaking down into smaller crystals and you would get a very poor yield.”

In addition to crystals sticking together or abrading, McCrimlisk said needle-shaped fines approximating the screen-aperture size clogged the screener.

“Production would totally stop on that product,” McCrimlisk said. “It was either a go or no-go. We were at a no-go state using the gyratory screener. We were unable to make that product.”

“The unique thing we accomplished was taking this commodity product, which had a wide particle size distribution, and creating two higher value custom sizes of product.”

Although this ongoing effort was made for one pharmaceutical customer on a very specific project, McCrimlisk said MPT needed to find a new classification process.

“It was a very significant piece of business with a lot at stake,” McCrimlisk said, “and we basically hit a wall using the gyratory screeners. We didn’t know of other available options.”

Custom processor searches for a screener

To find classification methods more suited to the pharmaceutical product, MPT’s product development technician attended a pharmaceutical trade show. There, the technician learned of a tumbling screener that gently handles fragile products.

Following the trade show, MPT contacted the manufacturer and sent a product sample to the manufacturer’s test facility in New York.

“[The manufacturer] provided us an opportunity to run product trials on their equipment,” McCrimlisk said. “And those trials were extremely encouraging.”

In the initial tests, the tumbling screener removed between 92 and 94 percent of the smaller crystals from the coarse crystals. The manufacturer then adjusted the screener’s three-dimensional motion, which guided the needle-shaped fines through the apertures. The adjustments allowed the screener to achieve 98 percent yields. In addition, the screener’s gentle motion reduced abrading of larger crystals.

MPT sent material to two other screener manufacturers for testing on similar equipment, but the results weren’t as promising. In those tests, McCrimlisk said fines would continue to cling to the coarse particles, and the screeners weren’t able to provide a clean cut.

“We tested their separation units,” McCrimlisk said. “But [only the initial manufacturer] offered us very encouraging results in a short time. There was a higher throughput of in-spec material without the particle abrasion.”

McCrimlisk said other factors influencing the decision to choose the tumbling screener manufacturer included location proximity, willingness to work together to achieve the desired specifications, and written test results.

“They really worked with us to help achieve our goal,” McCrimlisk said.

Custom processor installs tumbling screener

In 1996, MPT installed a Minox/Elcan MTS 1600 Tumbler Screener with optional air cleaning system. The custom processor added the screener to their existing line of screening equipment. McCrimlisk said startup occurred with few hassles and the screener was ready for full production within 2 months.

“It went surprisingly well,” McCrimlisk said. “We looked to start earlier, but we were a couple of weeks behind. We were running at peak efficiency in a very short period of time.”

The screener can accommodate up to five screen decks. The screener’s motion is similar to that of a gyratory screener except that it moves in three dimensions, transferring product across the screen without forcing it into the apertures. The screener’s horizontal and vertical movement can be adjusted, allowing the product to move over the screen at any set rate and speed.

MPT’s screener came fitted with the air cleaning system, which blows air through the bottom of the screen to keep product flowing. The screener can also be fitted with roller brushes

under the screen, a combination of roller brushes and air, a bouncing ball system that uses abrasion-resistant spheres to free screen buildup, and a straining attachment that can break large particles by pushing them through the screen.

McCrimlisk said the product characteristics and screen size determine the throughput rates on their screener. "Let's say you put a 40-mesh screen in it. Well, you could do 40,000 lb/h on it. If you have a 100-mesh screen you might be able to do 5,000 lb/h. All products are going to run somewhat differently."

Two for one

By installing the screener, MPT could continue work for the pharmaceutical customer. "If we weren't able to find screening equipment to do the job," McCrimlisk said, "we would not have accommodated our customer's requirements and would have missed an opportunity to run that project."

"We were measuring the yields we should get if the separation was clean, and the [screener] allowed us to get to that 97 or 98 percent clean-cut separa-

tion of product through a 120-mesh screen," McCrimlisk said. "It has increased our capabilities and flexibility to provide additional powder processing services to our customers. The tumbling screener has a great deal of utility for the right kinds of products."

"It has increased our capabilities and flexibility to provide additional powder processing services to our customers. The tumbling screener has a great deal of utility for the right kinds of products."

The pharmaceutical product can now be efficiently classified into the two fractions: 16 to 120 mesh and -120 mesh. An unexpected benefit from using the new screener is that the fine crystals have since become a valuable product.

"They wanted the product separated into two [fractions]," McCrimlisk said, "but they didn't realize there was a market for the finer crystals until [after the new screener was operating at MPT]."

By adding equipment, McCrimlisk said MPT not only kept an important customer, they also surpassed processing expectations by creating two marketable products.

"The unique thing we accomplished was taking this commodity product, which had a wide particle size distribution, and creating two higher value custom streams of product," he said. "We created a coarse crystal that had a higher value than the basic commodity. And we created a fine crystal, which also had a higher value than the basic commodity."

McCrimlisk said MPT is pleased with the screener. "We're extremely satisfied. It is a money-making operation for our company," he said. "The screener does exactly what [the manufacturer] said it could do." **PBE**

**Minox/Elcan, New Rochelle, NY
914/235-0161**