Case history

Pneumatic conveyor triples production throughput

A vacuum pneumatic conveying system reduces a pool coating company's lead times and makes blender loading and unloading a breeze.

A start-up manufacturer typically can't afford a completely automated material-handling system, where machines weigh and mix batches and then dispense finished products into packages, sealing and wrapping them for distribution. Instead, newer manufacturers tend to rely heavily on manual processes until production growth is steady, and founding employees often have to wear many hats.

At ecoFINISH, a pool coating and equipment company based in Warminister, Penn., Mike Monti was one such employee. In addition to being business and operations manager, Monti was also the company's product blender, manually loading 160 pounds per batch of raw polymer powder from drums into the 55-gallon rotary drum mixer to blend color recipes for the company's chip-, peel-, and scratch-resistant thermal spray coating, aquaBRIGHT.

Manual loading—time, labor intensive

Manually scooping ingredients into the blender 5 pounds at a time, however, was both time and labor intensive and created dust with each scoop. When nearing the bottom of a drum, Monti had to stand on his toes and stretch to reach the remaining material. Then, after blending the ingredients, Monti had to scoop the final product from the blender into 40-pound boxes for distribution.

"We knew at some point we'd need to mix larger batches because of our rapid growth," says Monti. "To stay ahead of our orders we wanted a large-scale blender, but then we had to come up with a way to load it. There was no way to get six 160-pound drums dumped into a blender 6 or 7 feet up in the air; it had to be done automatically."

The years of building a strong industry presence and global distribution channels had paid off, and the time was right for ecoFINISH to invest in a new blender and automated handling equipment.

Automated system increases production, reduces dust

In addition to loading ingredients into

A vacuum-tight blender cover allows ecoFINISH to use the blender as the pneumatic conveying system's primary receiver.

the blender, the new system needed to be able to unload the blended product from the blender and load it into boxes. After checking out various suppliers, Monti decided to go with VAC-U-MAX, a Belleville, N.J., supplier of pneumatic systems and support equipment for conveying, weighing, and batching dry materials. To ensure the system would work as planned, ecoFINISH sent samples of its materials to the supplier's 6,000-square-foot test facility with full-scale vacuum conveying systems that simulate a customer's site conditions.

Testing made clear that a dual-purpose system that uses the same conveying line to load and unload the blender would be the most economical and efficient option. "Our application is not typical in the industry, but it was similar to something they'd done somewhere else," Monti says. "The knowledge they brought from the other project saved us quite a bit of money."

The company chose to use the supplier's direct charge blender loading, which is designed specifically for loading a blender, mixer, reactor, or any vessel capable of withstanding a vacuum. The system has a 3-horsepower motor, a vacuum-tight blender, flexible input and output pipes, a wand for loading ingredients, scales, and a wall-mounted collection hopper for discharging the finished product.

To begin, an operator places an ingredient drum on a scale and uses the wand to load the amount required by the recipe into the blender. Because the system moves the powder pneumatically from the drums into the blender, there's no dust released into the environment during loading. Once the correct amount of each ingredient is loaded into the blender, the vacuum system is disconnected from the blender, and ingredients are mixed.

After the ingredients are mixed, the conveying line is connected to a discharge at the bottom of the blender, and the finished product is conveyed into a collection hopper. When the material in the hopper reaches a predetermined level, the system stops conveying and the operator manually discharges the material into a box below the hopper. The 3-horsepower motor allows ecoFINISH to load up to 2,000 pounds an hour.

"We knew at some point we'd need to mix larger batches because of our rapid growth."

The new direct charge loading system allows the company to load and unload the blender with one system.

The new vacuum system eliminated the need to manually scoop material from the blender into boxes.

An operator uses a wand to pneumatically pull powder into the blender, eliminating dust being released into the environment during loading.

Single system saves time, money

With the new system, the company is able to mix 1,000 pounds of material at a time. "That would have taken three days to weigh out, blend, package, and get to shelves," Monti says. "Now we can do it all in one day."

"It's a simple system that drastically changed things for the better."

The installation has allowed ecoFINISH to increase production and meet demand with just one new system.

"The need to mix more material at one time was the driving force behind us getting the larger blender, and the new dual-purpose system makes the process more ergonomic, less physically taxing, and cleaner," Monti says. "It's a simple system that drastically changed things for the better." **PBE**

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