

APPLICATIONS

Minimizing Minus No. 200 Mesh

A Texas-based contractor turns de-dusting into dollars via an innovative air classifier.

by Carol Wasson

Allan Cowan shares an all-too-familiar fact when he says that “each time you handle limestone, you’re producing fines — from the stockpile, to the bins, to the drum.”

He stresses that minimizing minus No. 200 mesh material is a huge issue. “It absorbs a large percentage of your asphalt content,” Cowan says. “Bottom line, the more minus No. 200 mesh you separate out, the less asphalt is required. That’s less in costs per ton, and more in profit.”

Cowan is crusher superintendent for Odessa, Texas-based Jones Bros. Dirt & Paving Contractors, Inc. With more than 50 years in business and up to 300 employees during its prime season, the company operates three hot-mix plants and five crushing operations.

Minimizing minus No. 200 mesh helps Odessa, Texas-based Jones Bros. Dirt & Paving Contractors, Inc. to lower its per-ton costs and increase profits.

Echoing the thoughts of many other industry veterans, Cowan says that today’s tough specifications create a vicious cycle. “You face the tightening of specs on the aggregate end, which means more crushing is needed to get the desired quality, which then creates more minus No. 200 mesh that you have to take out to meet the spec,” he points out. “On top of that, asphalt costs continue to rise with no peak in sight.”



Meeting specific challenges

To nail these specification needs, Cowan turned to Sturtevant, Inc., a family-owned manufacturer with more than a century of service in the powder processing industry. A pioneer in air classification technology since the 1920s, the company continues its innovations in high-performance equipment designed for applications requiring particle classification through air separation.

After trying out another company’s mobile air classifier, Cowan determined it was too small to handle his full range of feed capacities. Alternatively, he found that Sturtevant offers a full range of models, from small-capacity units to those that effectively de-dust at up to 1,000-ton-per-hour production rates.

Cowan consulted with Sturtevant engineers regarding his material characteristics and goals. He needed an air classifier that would remove fines (in varying percentages depending upon the mix design) from limestone screenings fed at rates ranging from 60 to 120 tons per hour. Screened at minus No. 4 mesh, his material contains approximately 16 percent minus No. 200 mesh. No more than 7 to 10 percent is acceptable to comply with any number of mix specifications. A dry method of fines removal, versus a traditional water wash method, is required due to the site’s updated asphalt plant technology and U.S. Environmental Protection Agency (EPA) regulations.

Customized and cost effective

To meet Cowan’s criteria, Sturtevant recommended a 16-foot Whirlwind Air Classifier, which allows precise product definition and sizing. As outlined by its engineers, the Whirlwind is a mechanical, centrifugal air classifier that uses a single motor to drive three rotating components: a distributor plate, selector blades, and fan blades. Airflow through the classifier is self-contained and recycled by return air vanes. It differs from gravitational inertia classifiers in that it requires no cyclones,

dedicated baghouses, airlocks, external fans, or ductwork. Users such as Cowan say they have seen a lower capital investment, plus ongoing operating expense savings due to minimized energy consumption and maintenance needs. Cowan says that maintenance costs have not exceeded \$900 since the unit was installed in August of 2004.

Low capital and maintenance costs have helped the contractor to quickly recoup its equipment investment.

“Units are sized for a specific application on the basis of approximately one horsepower of motor power per each ton per hour of feed rate,” says Sturtevant Product Manager Joe Muscolino, who further explains that the Whirlwind features an internal fan that lifts the minus No. 200-mesh fines out of the feed.



Selector blades within the machine control the amount of fines to be removed. Fewer selector blades allow a greater quantity of fines removal from the crushed stone feed. Muscolino says that once the optimum number of selector blades is established for a given application, the air classifier produces a consistent gradation every day and rarely needs to be adjusted.

Cowan says he likes the unit’s accuracy in a specific application. “After I gave the engineers my material gradations, they knew exactly what blade configuration I would need,” he says. “They hit it right on the money. I know just how many blades to run to get however much minus No. 200-mesh percentage I need for a given mix. I can add or remove blades depending upon the material I’m running.” He adds that pre-existing moisture is critical to the process. “Your feed moisture is a big factor in knowing how many blades to run,” Cowan explains. “Fortunately for us, moisture is not that big of an issue in West Texas. We rarely have to alter the blade configuration.”

A quick return on investment

Getting a return on investment — and doing so quickly — is paramount, Cowan says. And he says that his air classifier has delivered a speedy return on investment. “At the end of the day, it’s all about dollars,” he says. “Above all, the biggest issue is asphalt absorption. The more minus No. 200 mesh you have, the more absorbent it is with the high-dollar asphalt.”

The per-ton cost of asphalt has risen by up to \$15 since the unit was installed. “In our area, the current price per ton of raw asphalt is as high as \$200,” Cowan points out. “The higher that asphalt rises in price, the quicker the machine pays for itself.” If you’re running 5.5 percent asphalt and you can cut it back to an even 5 percent due to fines removal, that’s a huge reduction in costs per ton, he says.

Another key issue for Cowan is controlling the amount of fines in the mix, and knowing how that will affect his prices. “There are mixes that require more minus No. 200 mesh,” Cowan says. “With the air classifier, you can literally dial that amount in. That gives you the ability to adjust your price per ton accordingly. Otherwise, you are just shooting from the hip.”

As to additional advantages, Cowan points to how efficient fines removal by the air classifier prevents any choking within the asphalt plant. The majority of today’s asphalt plants are equipped with baghouse collections systems (versus traditional wet wash systems) to capture fines emitted from the asphalt plant exhaust gases, thereby meeting EPA air emissions regulations. These baghouses contain fabric filters that collect this dust during the operation of the asphalt plant. “Importantly, if you air classify your virgin material before it gets to the hot-mix plant, the baghouse has to work less, which gives you more production,” Cowan says. “The baghouse acts as the filter for your plant. If you’ve got a high minus No. 200 mesh going in, it chokes the plant.”

Sturtevant’s 16-foot Whirlwind Air Classifier (pictured here) has an internal fan and does not require cyclones, dedicated baghouses, airlocks, external fans, or ductwork.

Cowan stresses that new technology and strict EPA rules have changed asphalt production methods. “Asphalt plants used to be a wet wash application that sprayed moisture through the exhaust to take the minus No. 200 mesh to a collecting pond,” he says. “Now, with air classification, we remove the fines upfront.”



A reliable, long-term solution

Air classification is arguably one of the most effective means to achieve efficient de-dusting — plus increased productivity. With proper maintenance, Sturtevant engineers say that their units can provide a 40- to 50-year service life, and even beyond.

Their construction is simple, yet heavy-duty, and comprised of highly wear-resistant components.

Cowan sums it all up when he says, “This air classifier is virtually hands free. There is really no maintenance. You never have to work on it. It’s there when we need it, and we need it every day. It takes the load off the baghouse. It allows less asphalt in the mix, and that is the bottom dollar.”

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