

Case history

Cleaning house

A large food manufacturer adds portable industrial vacuums to improve plant sanitation and safety.

According to a recent study by Eastern Research Group,¹ poor plant and equipment sanitation ranks among the top food safety issues in food manufacturing. In fact, according to a report by Swiss Re², the number of food product recalls has doubled since 2002. Regulations, such as the FDA's 21 CFR 110 *Current Good Manufacturing Practice in Manufacturing, Packing, or Holding Human Food*, have tried to address the growing issue. In 2012, 27 percent of the 23,847 FDA citations for food processors fell under 21 CFR 110.

Because of 21 CFR 110 and other regulations, sanitation must become a way of life for food manufacturers to

prevent costly fines or, even more costly, product recalls. Realizing the increased need for a clean facility, J.R. Short Milling, Kankakee, Ill., decided to add new equipment to remove fugitive dust and material after a product changeover.

Cleaning or moving

Founded in 1910, J.R. Short is a global manufacturer of grain-based intermediate foods, which are foods that must be expanded by deep-frying, air-popping, or pressure-puffing to become a finished product. These extruded intermediates are then processed by customers and expanded to turn into snacks and other food products. With multiple production



J.R. Short Milling uses portable vacuums for rapid cleanup of fugitive dust from floors, walls, and machine surfaces.

lines running nearly constantly, the company processes hundreds of thousands of pounds of raw materials each week, including flour, corn, chia, kale, fiber, and proteins. Each material needs to be handled separately to avoid product contamination. “We produce a lot of non-GMO, gluten-free and organic products, as well,” says Nick Ladin, vice president of operations for J.R. Short.

The company uses pneumatic conveying systems to convey raw materials to machines that mix, cook, and extrude its pellet products. Because the pneumatic conveying system is completely enclosed, there is minimal risk of product loss or contamination during conveying. However, it doesn’t take much dust during loading, unloading, and

conveying to create a problem. “When moving flour around, you can have a sealed system, but you still get a bit of leakage here and there,” Ladin says.

J.R. Short had been using a combination of brooms and compressed air to clean up any fugitive dust that escaped the system and after a shutdown and changeover. “The compressed air caused excessive dust movement,” Ladin says. “It was more relocation of the dust versus real removal. I’ve seen where it’s standard in some flour milling plants to use an air wand for cleaning surfaces — taking dust from one area and just transferring it somewhere else. But if you vacuum it, you eliminate it. I know that sounds like a no-brainer, but it is amazing how people don’t always understand that.”



The vacuum can be used by an operator up to 50 feet away from the unit.

A portable solution

In order to improve plant sanitation and safety, J.R. Short decided to install a vacuum system. Stationary central vacuum systems are ideal for environments requiring continuous operation and the simultaneous use of up to 20 pickup points. The systems employ powerful vacuum cleaners that use piping throughout the facility to connect to a central line. However, since there are so many different lines and areas with access challenges at J.R. Short, a central system wasn’t an economical solution.

To find a solution, the company contacted Vac-U-Max, an industrial vacuum cleaning and pneumatic conveying supplier based in Belleville, N.J. The supplier recommended several portable MFS-5HP industrial vacuum cleaners for combustible dust that could be moved around the plant. “We looked at a variety of different vacuum systems, including portable brands and permanent, larger systems,” Ladin says. “We’d had a portable vacuum system from the supplier for several years and it was very reliable.”

The portable vacuum system uses a PTFE static-conductive leaf type filter rated at 99.9 percent efficiency at 1.0 micron particle size. The filter is accessible from the top of the unit and uses manual shaker cleaning. The filter can be washed, cleaned, and reused several times before requiring replacement. The vacuum has a maximum airflow of 230 cfm and a 2-inch vacuum hose connection. The 5-horsepower motor is designed for Class II, Division 2 areas.

The equipment is designed for easy maneuvering and can be used by an operator up to 50 feet away from the vacuum unit. “The sanitation and operations teams liked that it was much easier and faster than sweeping,” Ladin says. “The units themselves are pretty simple to use. They’re plugged in and all you have to do is turn on the switch and clean up the mess.”

In addition to using the units for general housekeeping, the company uses the portable vacuum cleaners in the dry phase of clean up during product changeovers. “It’s a lot cleaner, easier, and faster to manage it that way,” Ladin says.

A clean and safe facility

The new portable vacuum cleaners enhance J.R. Short’s stringent sanitation protocols by increasing the availability of dust removal units throughout the plant. Moving away from sweeping and compressed air provides the company with complete dust removal instead of relocation.

“The supplier’s units add to keeping our plant very clean,” Ladin says. “Whenever we have small spills or leakage, it’s very easy to grab the vacuum, turn it on, and clean it up right away so it doesn’t get tracked around at all.” **PBE**

References

1. U.S. Food and Drug Administration, “Good Manufacturing Practices (GMPs) for the 21st Century,” www.fda.gov/Food/GuidanceRegulation/CGMP/ucm110877.htm.
2. Swiss Re, “Number of Food Recalls and Their Costs Are Rising,” www.swissre.com/media/news_releases/nr_20150715_foodrecall.html.

Note: Find more information on this topic in articles listed under “Vacuum cleaning” in *Powder and Bulk Engineering*’s article index in the December 2015 issue or the Article Archive on *PBE*’s website, www.powderbulk.com. (All articles listed in the archive are available for free download to registered users.)

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