Our dust collection system handles a very fine dust and is having problems with dusting and emissions. What can I do to fix this problem?

Troubleshoot your inefficient dust collection system by leak testing the housing to ensure that all flanged connections are sealed and door gaskets are working. If the system provides pulse-cleaning, check that the compressed-air line is sized properly per the manufacturer’s recommendations. Using pressure that’s lower than suggested will prevent effective filter media cleaning, which reduces the system’s efficiency. Pressure that’s too high can damage the filter media, which also causes ineffective filtering.

Steve Grant, product manager, Hapman, 800-427-6260

An obvious fix is to upgrade to filter media with higher efficiency. There are many good choices available, and a reputable filter supplier will guarantee in writing that the maximum emissions rate will fall below OSHA and EPA threshold limits. In addition, dust collector cartridges with open-pleat media tend to hold more dust between cleaning pulses and release the dust more readily during cleaning than filters with tightly packed media. Most dusting and emissions problems occur during pulsing, so this difference in cartridge construction makes an impact. A good electronic control system that’s programmed to provide on-demand pulsing will also prevent cartridge over-cleaning and reduce dusting. As a side benefit, on-demand cleaning saves on compressed-air and energy costs.

John Dauber, North American sales manager, Camfil Farr APC, 800-479-6801

First, check the filter connection at the tubesheet (the connection between the collector’s clean and dirty side) to ensure the fit is intact and there aren’t leaks. This connection’s integrity is critical in fine dust applications. In a cartridge dust collector, dust can pass through to the clean side because of a filter gasket leak. Gaskets lose their memory or shape over time; since air will find the path of least resistance, the dirty air will pass around the gasket as the pressure drop increases on the pleated filter media. To eliminate this problem, use a high-quality gasket, double gasket rings, or devices that ensure a tight fit with the tubesheet at all times. In a baghouse, it’s vital that the connection between the bag and the tubesheet hole be a perfect fit. Using leak-tracing compound with a black light should aid you in finding leaks caused by poor fits or incorrect bag installation. Also, if the bag spacing is too close or the air pressure too high, emissions generated by a poor cleaning system can become a problem.

Michael Gerardi, general manager, Scientific Dust Collectors, 708-597-7090

The source of the problem is usually located at the filter element. Emissions occur when material passes through a hole in the filter element or tubesheet joint or when it migrates through the filter media. Filter elements must be properly installed or material will pass around the filter media and escape as emissions. Check for loose filter elements and perform a visual inspection inside the plenum to help locate leaks. If the material isn’t passing around the filter media, check if the material is passing through the media. Some filter media need service time to build a proper dust cake for the filter process. During the break-in period, the media is more porous and can have slightly elevated emissions. Make sure the filter media matches your particulate’s characteristics and dust collector’s overall design. Excessive dust and air loadings, material release properties, air patterns that cause the filter elements to sway or abrade the filter, and cleaning cycles should be examined for proper application.

Patrick Mahoney, global systems manager, K-Tron Process Group, 785-825-1611

Here are a few ways to solve your dusting and emissions problem:

• Check for mechanical issues, such as an improperly seated bag snap band, improperly secured cartridge, or bag clamps that aren’t tightened down. Try using a tracing powder to look for specific filters that are leaking. Check the leaking filter for physical damage, such as punctures, tears, or abrasion. Examine your material inlet and look for a distribution baffle, which can help minimize dust impingement on the filters. Empty the clean air plenum and remove any deposited dust caused by leaks.

• Take a filter sample and send it to your equipment or filter supplier and have them run an analysis of both the dust cake and the filter media. They’ll check the dust cake for particle size distribution and dust properties, such as stickiness, abrasiveness, or cohesiveness. They can also look at filter media cross sections to see if the dust is passing through rather than being filtered on the surface dust cake.

• Several filter medias are available with special treatments, such as PTFE membranes and chemical coatings, that can better handle fine particulates. Try precoating or seeding your filters by introducing fine inert materials, such as lime or diatomaceous earth. This builds up the outside dust cake on your filters to provide immediate and sustained fine particulate efficiencies.

• As a last resort, add a HEPA filtering system to the dust collector’s exhaust airstream. These filters have efficiencies of 99.97 percent down to 0.3 micron and will add pressure losses of 1 to 1.5 inches.

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Equipment suppliers are a valuable source of information about equipment and processes. In light of this, we occasionally ask suppliers a question of concern to our readers. Answers reflect the suppliers’ general expertise and don’t promote the suppliers’ equipment. If you have a question you’d like suppliers to answer, send it to Alicia Tynk, Associate Editor, Powder and Bulk Engineering, 1155 Northland Drive, St. Paul, MN 55120; fax 651-287-5650 (atyznk@cspub.com).