My plant will soon be processing a sticky new chemical product. How can I choose the right bag or cartridge filters to handle it?

It depends on the exact material you’re processing, but a pulse-jet baghouse is likely the best option because it can be fitted with various filter media to tolerate sticky and moist dusts. Baghouses can also be equipped with aggressive cleaning systems to remove excessive dust from the filter surfaces. In comparison, cartridge filters have pleats where sticky and non-free-flowing dusts gather and are difficult to clean, causing high pressure drops and ventilation system clogs. Make sure the supplier sizes the baghouse to suit the specific dust you’re dealing with and takes into account the air-to-cloth ratio and interstitial velocities to ensure the best baghouse performance for your application.

Bill Kurz, vice president, SLY, 800-334-2957

Bag or cartridge filters equipped with a cleaning system, including reverse-air, shaker, pulse, or sonic horn systems, won’t perform properly in this application. These types of filters use fabric media, and sticky materials will adhere to any woven, felted, fiberglass, spun-bonded, coated, or other fabric surface. It’s also difficult to maintain proper pressure differentials and airflow production when handling these sticky materials.

In addition, sticky materials are often hygroscopic. When dry, the material will absorb moisture, even at low levels, causing it to become tacky, agglomerate, and adhere to most surfaces. As the agglomerates and mass increases, the material loses transport velocity and deposits within the ductwork. Fabric filters are prone to failure under these conditions and quickly become an operations and maintenance nightmare. You’d be wise to investigate another technology that would provide better process and maintenance reliability than what bag and cartridge filters offer.

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The more important issue is how to keep the bag filters or cartridge filters clean to maintain the required airflow. The best filter media to promote positive dust discharge of sticky materials is media that’s laminated with PTFE membrane. The membrane provides a nonstick surface, comparable to a Teflon frying pan, that’s chemically inert and can be bonded to fibers to withstand your application’s specific chemistry and temperature range.

Ken Burlakoff, president, Fab-Tex Filtration, 905-335-1012

There are a few design aspects to consider when handling sticky materials that can improve your filter unit’s reliability. Minimizing the filter’s dust exposure by lowering the can velocity around the filter elements will help any filter media type. For cartridge filters, a more open pleat design will help release sticky materials during the cleaning cycle. Examining what makes the material sticky will guide you through some of the decision-making process. For example, if the material is sticky because it’s hygroscopic, such as sugar, then a PTFE treatment to the filter element’s surface can be effective. If the material is sticky because it’s oily, then an oleophobic surface treatment or a glazed polypropylene media could be a good choice. A static-dissipating filter media and good grounding can be used when static forces are causing stickiness.

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

Moisture and sticky or tacky chemicals plus dust contaminants can blind or clog most filter media. Typically, it’s advisable to send a sample of your chemical, along with the appropriate MSDS info, to either a testing laboratory or a dust collector manufacturer. The MSDS can reveal significant information about the contaminants to help determine the best solution for your application. If testing isn’t an option, here are three possible filter solutions to address this issue:

- Use high-grade membrane media that’s treated specifically to discourage contaminant buildup. This improves the initial filtering efficiency and makes the filters easier to clean by providing better dust cake release for applications that deal with sticky emissions. Be aware that this could lead to higher initial operational expenses associated with premium filter media. However, in the long run you can save money as a result of extended filter life and less maintenance.

- Use the least expensive media available, which will work but at a subpar collection level, knowing that the filters will most likely need to be changed frequently due to ongoing buildup. While the commodity filter costs will be less than higher quality media, your maintenance expenses might be higher.

- Pre-seed or continuously seed the filter media with a coating of diatomaceous earth, agricultural lime, or other seeding material specifically made for this purpose. Similar to treated high-grade membrane media, seeded filter media can help reduce or prevent premature filter failure by preventing airflow blockage, ultimately resulting in longer filter life.

For all three options, a cartridge filter is a more cost-effective solution than a baghouse because there are typically fewer cartridge filter changes required than bag filter replacements.

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