

DUST DOCTOR

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To-dos for an effective dust capture exhaust system

The design of an effective and safe dust capture exhaust system needs to address many factors. To make sure that occurs, you and your staff need to be very familiar with the production process in your plant. You don't want dust capture hoods capturing your product in addition to the fugitive dust being generated and captured. You also don't want the exhaust system components to interfere with work procedures and maintenance. If the bulk solid being processed is combustible (organic or metallic), the dust capture system design will need to safely address the possible fire and explosion issues. Here are some steps that will help you get an effective dust capture exhaust system up and running on time and on budget.

First things first

Before you begin determining the detailed design and specifications for a system, make sure you review the conceptual design with your plant's production, maintenance, and safety department personnel. Their on-the-job knowledge will be a great help.

The production department will advise you on the latest changes in the process, the raw materials being used, and the dust-related issues that staff would like to see

addressed. Production also can provide information on required process equipment repairs that will seal dust leaks, resulting in dust control without the need for dust capture hoods.

Maintenance staff will advise you on issues that they may have with the existing dust capture exhaust system components such as capture hood interference, ductwork plugging, poor dust collector performance, make-up air needs, and return-air systems.

Safety personnel can advise you on SDS (aka MSDS) information, OSHA requirements, existing airborne dust concentrations at production locations, and the applicable NFPA standards and recommendations. Also be sure to contact your raw material suppliers. They can advise you on dust capture issues that they deal with every day. All this information will provide you with a good basis for design. And don't forget to have respiratory air sampling performed to determine existing dust levels in your production areas before the design process begins. The new system must result in safe dust exposures for personnel per OSHA requirements, and a 50 percent dust level reduction will require a less expensive system than one

that needs to achieve a 90 percent reduction.

Drawings and specifications

Engineering design drawings show where OEM equipment, such as dust collectors and exhaust fans, and custom-fabricated components, such as dust capture hoods and ductwork, are to be installed. The drawings also show the details of construction for the custom-fabricated components. Developing specifications for items such as these provides additional details for what's depicted in the engineering design drawings. How well and how complete these drawings and specifications are prepared will determine how well and how completely your dust capture exhaust system will meet your needs and expectations. Don't leave any detail up to the fabricating contractor's imagination.

Design to-do list

Be project specific. Don't put a requirement in the specification that you don't understand. Using "standard specifications" from a similar project may or may not apply to your project. Unclear specifications will result in various interpretations and can mean a large construction bid spread, missed schedules, added construction costs, and startup problems.

Take responsibility. Don't use the term "component by contractor" or "by others." Don't depend on equipment suppliers and fabricators to design system components without all the requirements clearly spelled out by you. Unfortunately, there are some people who will take on a dust capture project even though they lack sufficient expertise and experience. This is especially true with regard to the design of dust capture hoods and system safety components. The result, again, will be missed sched-

ules, construction extras, startup problems, and possible injury and property damage.

Be detailed. Don't use words to specify a custom-fabricated component when a detailed design drawing would be best. Without the drawing, contractors will provide what they think is best. You may save some time and expense by not providing a drawing, but you most likely won't like the end result.

Require OEM factory testing. Supplied items such as exhaust fans and other components are usually guaranteed to perform, and the manufacturer will repair or replace them as necessary. However, finding out about any problems before shipment will be less expensive and less aggravating. Leak testing and performance testing issues can easily be corrected in the factory. Don't let the manufacturer talk you out of this requirement. When you specify that a particular OEM component must meet certain testing and performance requirements, stipulate in the purchase order that this be checked in the factory before shipment. Specify how long you want the dust collector filters to last before they need to be replaced. A properly selected dust collector filter should last 12 months before replacement is needed. The dust collector manufacturer will need to test your dust to select the proper filters to meet your time requirement. Make sure the dust sample used for this evaluation is a sample of the actual dust that the dust collector filters will be used for and not just a dust sample taken from the raw material as received from your supplier.

Require shop drawings. Shop drawings show the system details before the components are fabricated and installed by your contractor. The contractor makes the shop drawings from field measurements following your design documents.

Review and approve the shop drawings to make sure the components meet your requirements.

Visit your contractor's fabrication shop. Check the components being fabricated by your contractor against your approved shop drawings before any field installation begins. Finding and correcting problems during component fabrication will minimize extra costs and keep the project on schedule.

Visit the job site. Check the components being installed against the approved shop drawings and design documents during installation. These field inspections should be done not just once or twice but routinely. Again, finding and correcting problems during installation will minimize added costs and keep the project on schedule.

For further reading

Find more information on this topic in articles listed under "Dust collection and dust control" in the article archive on *PBE's* website, www.powderbulk.com.

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