

Minimizing the Impact of Dust Filter Explosions



Not long ago, a line of severe thunderstorms rolled through the town where one of our customers has a plant. There was lots of lightning with this storm and the dust filter took a direct hit. The lightning strike ignited the highly combustible dust in the filter, creating a mini explosion within the filter. It's not the kind of thing that happens every day.

Fortunately, this customer was prepared and the Puhl system's dust filter was protected with an explosion vent. When the dust in the filter exploded, the explosion vent activated, the vent burst and the filter structure suffered no damage. Using spare parts and a set of extra cartridges kept on hand by a forward-thinking maintenance manager, the crew was able to close the explosion vent with a temporary repair and was back up and running in a couple of hours.

If the filter had been installed without explosion venting and if the company hadn't had spare parts on hand, the explosion would have permanently damaged the filter and the system would have been down for weeks while waiting for a new filter to be built and installed.

Trim system filter explosions are rare and are a lot like a catastrophic illness. No one believes it will happen to them. Until it does.

If you have an air-conveyed dust or trim collection system, dust deflagrations (low speed explosions) are a real risk. An explosion vent is your insurance policy when the unthinkable happens. There's a reason why the National Fire Protection Association and OSHA require explosion venting in order for air-conveyed scrap systems to be up to code.

Not everyone takes this seriously. If a company is trying to reduce the cost of their trim system, there are more than a handful of air system vendors who are willing to install filters that aren't explosion vented. An explosion vent can add from \$3,000 to \$30,000 to a system depending on the design requirements and system size. Cost-conscious business leaders are often tempted to look the other way. Omitting these crucial safeguards can cause problems including fires, injuries, OSHA citations, and downtime.

A lightning strike isn't the only thing that can cause a deflagration in a dust filter. A blower bearing can fail, creating a duct fire. An employee accidentally drops a metal object like a nut or bolt into a duct that can create a spark. Operations that use heat or grinding processes, like glue pots, shredding, or book binding, can create fires that can lead to filter explosions.

It's important to remember that a dust filter isn't explosive until the filter pulses. When it pulses, a combustible cloud is created inside the filter. If that dust cloud happens to occur at the same time as an ignition source, you have an explosion. Timing is everything.

Combustible dust in a dust filter is a lot like the gasoline engine in your car. Gasoline if not managed correctly can be very dangerous, but if it is designed to codes and operated as designed it is very safe.

These three tips will help you avoid downtime created by dust deflagrations (low speed explosions)

1. Always follow current NFPA codes. Make sure your trim collection and dust collect vendor designs systems in compliance with up-to-date NFPA & OSHA codes. Avoid vendors whose quotes omit this critical safeguard.
2. Train employees. Provide regular training on the use of your trim collection system in general, and fire/explosion prevention in particular. Make sure they know not to feed metal into a paper or dust collection system. Make it a point to remind operators of binding equipment to avoid actions that can create friction fires, like stopping books in a production line on top of still-rotating mill when going on break or lunch.
3. Prepare for recovery. If a system is designed to handle a potential explosion, having key spare parts on hand will keep downtime to a minimum.

Dust deflagrations are very rare, but when they do happen, you want to be prepared so that in the long run, your operation is safe and the downtime is manageable when the unthinkable (like a lightning strike) happens.

If you want to make sure that your operation isn't vulnerable to the catastrophic consequences of dust filter explosions, G.F. Puhl can help. Call 615.230.9855 or [email](#) us to set up a consultation.