

Your guide to... Dust filtration systems

You work hard to build and maintain your business. That's why it's important to protect it from all potential hazards, especially when they're avoidable.

Combustible dust explosions are a risk in many areas of a facility, but one of the most common locations is the dust filtration system. Without the proper safety precautions in place, dust filtration systems can cause a fire or explosion, resulting in operational downtime, property damage and even injury.

It's important to know if your business or facility is at risk, and be aware of the conditions that can cause a fire or explosion. Here's what you need to know:

Hazardous surface dust is defined as any dust layer of 1/32 inch (0.8 mm) or more as per NFPA654.

The 'dust explosion pentagon'

The dust explosion pentagon is made up of these five elements. When all five elements are present, a fire or explosion can occur.

1. combustible dust
2. an ignition source
3. oxygen
4. dispersion of highly-concentrated dust
5. containment

All five of these elements must be present at the same time for an explosion to occur. If there's no containment, a flash fire can still occur if all the other conditions are present.

Facilities where dust filtration systems are often present:

- ✓ woodworking facilities for both raw and finished products
- ✓ sawmills
- ✓ mining and coring facilities
- ✓ grain, agricultural and feed handling facilities
- ✓ plastic manufacturing facilities
- ✓ food processing facilities



Take the proper safety precautions

Here's what you can do to prevent a fire or explosion at your facility:

1. Eliminate ignition sources

- Ground any equipment that dissipates static electricity.
- To prevent metal from entering the dust filtration system, ensure that there are no floor sweeps connected to it.

2. Isolate the dust filtration system

- Keep the dust filtration system outside in an open area.
- Ensure that there is properly designed explosion ventilation.
- Ensure that the explosion ventilation is directed away from the building.
- Properly install fire dampers or high speed abort gates on the duct work to minimize the risk of flames entering the building during a fire.

3. Protection

- Dust filtration units should have sprinklers located above and below the bags to extinguish fires.
- If a sprinkler system is not available, fire department pumper connections should be installed with an open sprinkler head above the bags.

4. Detection

- Heat detection should be installed above the bags with interlocks to shut down all of the equipment connected to the dust filtration unit.

5. Prevention

- Document your preventative maintenance and include all protection features.
- Have your dust filtration system inspected semi-annually.
- Review the condition of the bags and keep spare bags on site if possible.

Summary

The proper installation of your dust filtration system will reduce the possibility of fires, explosions, equipment damage, property damage, injuries and operational downtime occurring at your facility.

Resources

NFPA 68 – Standard on Explosion Protection by Deflagration Venting

NFPA 69 – Standard on Explosion Venting Systems

NFPA 654 – Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling Combustible Particulate Solids

NFPA 664 – Standard for Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities



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