

Combustible Dust Technical Bulletin

Fact: According to OSHA, since 1980, almost 150 workers have been killed and more than 850 injured due to combustible dust explosions.



What is combustible dust?

Combustible dust is defined as a “solid particle generated by handling, crushing, grinding, rapid impact and detonation of organic or inorganic material.” Combustible dust can occur from various types of industries or materials. Some common industries with combustible dust are food manufactures, wood, textiles, plastics, metal, feed mills, rubber, paper, and pharmaceuticals. According to National Fire Protection Agency (NFPA), “Any dust accumulation over 1/32 of an inch or greater than 5% of the floor area can be a significant explosion risk.”

Is there too much dust in your building?

Find out by asking:

- Can you write your initials in the dust?
- Do you leave footprints on the floor from the dust?
- Can you see the color of the surface under the dust?

What elements are needed to create a dust explosion?

A dust explosion requires these elements:

- Fuel source (*combustible dust*);
- Ignition source (*for instance, welding slag, flame, electrostatic discharge, electric current, glowing ember, or hot surface*);
- Oxidizer (*oxygen in the air*);
- Dispersion of dust particles to form a dust cloud; and
- Confinement of dust cloud in a vessel area, building, room, or equipment.

If these conditions are in place simultaneously, an explosion can occur. Once the dust is ignited, there’s typically a secondary explosion which is more severe and potentially catastrophic.

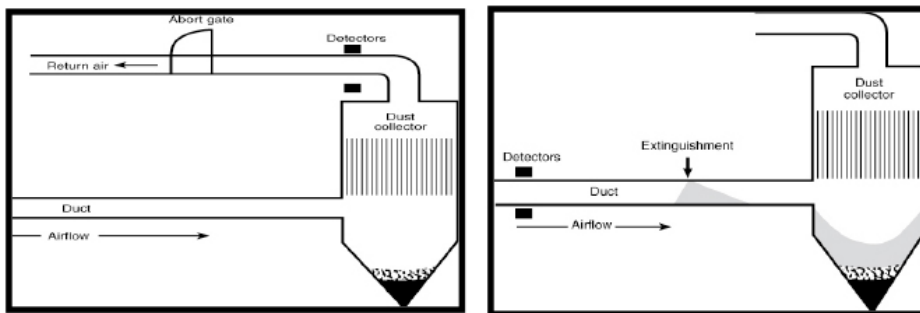
How can you control dust?

These controls will help keep your employees and your operation safe:

- Equipment that produces dust should have a dust collection system.
- A preventative maintenance program will minimize the release of fugitive dust particles.

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- Dust collectors should be kept clean and in good condition.
- A housekeeping log and program should be established.
- Cleaning methods should not include dry sweeping or compressed air.
- A UL- or FM-listed vacuum cleaner should be used to vacuum dust.
- Hidden areas should be inspected and cleaned to ensure no dust accumulation.
- Smoking should not be allowed in the building.
- Only forklifts approved for combustible dust areas should be used.
- Proper grounding and bonding should be in place for equipment and dust collection to minimize static charge.
- An emergency action plan should be in place.
- Employees should be trained on explosion hazards and proper protection equipment should be used.
- Emergency exit routes should be maintained.
- Separating or segregating the combustible dust hazard will help control the exposures.
- Room or enclosures should have explosion relief venting directed away from employees.
- Specialized suppression or sprinkler systems can be installed to control ignition. Extinguishing systems should be connected to a fire detection local alarm control panel.
- Spark detection should be installed in duct work (*see diagram below*).



When reviewing your operation and the potential for a dust explosion, ask yourself these questions to determine if you have proper controls in place:

- Are the combustion properties of the dust understood by all?
- Has a risk assessment of the process been completed from start to finish?
- Has a training program been established and documented to inform employees about combustible dust?
- Have safety measures, both prevention and protection, been identified and implemented?
- Has a maintenance and inspection program been established and documented to control combustible dust?
- Has a written emergency response plan been established?

