



Deadly Dust

Dust: To some it's just a nuisance. To others it can be a dangerous safety risk, especially when it is considered "combustible dust."

Just what is combustible dust and why is it so dangerous?

Any combustible material (and some materials normally considered noncombustible) can burn rapidly when in a finely divided form. If such a dust is suspended in air in the right concentration, it can become explosive. The force from such an explosion can cause employee deaths, injuries, and destruction of entire buildings. Since 1980, more than 130 workers have been killed and more than 780 injured in combustible dust explosions in the U.S.

Materials that may form combustible dust include metals (such as aluminum and magnesium), wood, coal, plastics, biosolids, sugar, paper, soap, dried blood and certain textiles. In many accidents, employers and employees were unaware that a hazard even existed.

While OSHA is currently developing a proposed standard for combustible dust, the following OSHA Requirements are presently applicable:

- §1910.22 Housekeeping
- §1910.307 Hazardous Locations
- §1910.1200 Hazard Communication
- §Electric Power Generation, Transmission and Distribution (coal handling)
- §Grain Handling Facilities
- General Duty Clause, Section 5(a)(1) of the Occupational Safety and Health Act (Employers must keep workplaces free from recognized hazards likely to cause death or serious physical harm)

Prevention of Dust Explosions

OSHA recommends workplaces conduct a thorough hazard assessment to identify factors that may contribute to a combustible dust explosion. The agency offers further guidance for workplaces looking to control dust, ignition sources, and injury/damage relating to combustible dust.

Dust Control Recommendations:

- Implement a hazardous dust inspection, testing, housekeeping, and control program.
- Use proper dust collection systems and filters.
- Minimize the escape of dust from process equipment or ventilation systems.
- Use surfaces that minimize dust accumulation and facilitate cleaning.
- Provide access to all hidden areas to permit inspection.
- Inspect for dust residues in open and hidden areas at regular intervals.
- If ignition sources are present, use cleaning methods that do not generate dust clouds.

- Use only vacuum cleaners approved for dust collection.
- Locate relief valves away from dust deposits.

Ignition Control Recommendations:

- Use appropriate electrical equipment and wiring methods.
- Control static electricity, including bonding of equipment to ground.
- Control smoking, open flames, and sparks.
- Control mechanical sparks and friction.
- Use separator devices to remove foreign materials capable of igniting combustibles from process materials.
- Separate heated surfaces from dusts.
- Separate heating systems from dusts.
- Select and use industrial trucks properly.
- Use cartridge activated tools properly.
- Use an equipment preventive maintenance program.

Injury and Damage Control Methods:

- Separation of the hazard (isolate with distance).
- Segregation of the hazard (isolate with a barrier).
- Deflagration isolation/venting.
- Pressure relief venting for equipment.
- Direct vents away from work areas.
- Specialized fire suppression systems.
- Explosion protection systems.
- Spark/ember detection for suppression activation.
- Develop an emergency action plan.
- Maintain emergency exit routes.

Source: United States Department of Labor, Occupational Safety & Health Administration