

MIOSHA Fact Sheet



Combustible Dust Hazards

Combustible dusts can fuel a flash fire or explosion when dispersed in a dust cloud. When airborne combustible dust is ignited by an ignition source and confined by an enclosure, such as a building, room, vessel, or process equipment, the resulting pressure rise may cause an explosion. To identify factors that may contribute to a fire or explosion, it is recommended that a thorough hazard assessment be conducted.

How Dust Explosions Occur

Five factors [oxygen, heat, fuel (dust), dispersion, and confinement] are known as the “Dust Explosion Pentagon.” If one element of the pentagon is missing, an explosion cannot occur. An initial explosion in processing equipment or in an area where fugitive dust has accumulated, may dislodge more accumulated dust into the air. If ignited, the additional dust dispersed into the air may cause secondary explosions. These can be far more destructive than a primary explosion due to the increased quantity and concentration of dispersed combustible dust. Many deaths in past incidents, as well as substantial amounts of structural damage to process equipment, have been caused by secondary explosions.

Industries at Risk

Combustible dust explosion hazards exist in a variety of industries including agriculture, synthetic manufacturing, woodworking, metal processing, and recycling facilities. These industries, along with others, are exposed when they have materials that can, in dust form, contribute to explosion hazards like cellulose, sugar, tobacco, wood, flour, charcoal, aluminum, iron, epoxy resin, and rubbers. Some materials, in their pure chemical state will not form combustible dust, including cement, gypsum, limestone, and salt.

Key Responsibilities to Keep Workers Safe

Employers should determine whether dusts present in the workplace are explosible. If so, they must take proper precautions to protect workers against flash fires and explosions. Part of an employer’s assessment includes conducting a Dust Hazard Analysis (DHA). A DHA is a systematic hazard analysis performed to identify and evaluate the potential fire, flash fire, and explosion hazards associated with the presence of combustible dust in a process or facility and provides recommendations.

Control the Fuel (Dust) and Avoid Incidents

Capture dust before it escapes into a work area by using properly designed, installed, approved, and maintained dust collection systems. Clean work areas, overhead surfaces, and concealed spaces frequently and thoroughly using safe housekeeping methods to remove combustible dusts not captured or contained.

Resources

- Agency Instruction MIOSHA-COM-16-7, [Combustible Dust National Emphasis Program](#), as amended
- OSHA CPL 03-00-008 - [Revised Combustible Dust National Emphasis Program](#)
- Safety and Health Information Bulletin (SHIB) (07-31-2005) [Combustible Dust in Industry: Preventing and Mitigating the Effects of Fires and Explosions](#)
- [OSHA National Emphasis Webpage](#)

MIOSHA’s Consultation Education and Training (CET) Division can provide and assist with more information on combustible dust as well as safety and health training. You may contact the CET Division at 517-284-7720 or online at www.michigan.gov/cet. CET may also be available to employee groups and other organizations. Call to request help.

LEO is an equal opportunity employer/program.



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