

WHITE PAPER

Combustible Dust: OSHA's Standard and How You Can Avoid Dust-Related Explosions



The heat of summer kind of makes you think about dry, dusty conditions and how to prevent them, but dusty conditions are something everyone should think about throughout the year. OSHA has been talking about Combustible Dust Hazards for several years and has implemented a Combustible Dust National Emphasis Program. Even the US Chemical Safety Board has investigated several dust

explosions and put together a video showing the hazards, causes, and what to do to prevent them. (See the video [Combustible Dust: An Insidious Hazard](#) on the CSB webpage located at www.csb.gov .)

Everyone knows about the fire triangle: fires require fuel, oxygen, and heat. Remove one of these and there is no more fire. Dust fires and explosions operate on the same principle, only they work like a pentagon. They need fuel, oxygen, and heat too, but they also require dispersion of dust particles and confinement of the dust cloud. These dust particles are often items that are not commonly thought of as being able to burn, such as starch, sugar, flour, wood/paper, rubber, metals, plastics and resins. When these and other items like them get divided into fine enough particles, they present a very real hazard of igniting. If these materials are left to build up around a facility either on elevated flat surfaces such as roof trusses or on top of suspended ceilings where they cannot be seen, they can become ignited and cause an initial explosion. This can then shake more dust loose, increasing the amount of suspended dust in the air and creating a second explosion that can continue to propagate throughout a facility unchecked until there is either no more dust to fuel the explosion or until the walls of the facility have been blown out and can no longer confine the dust cloud. Either of these situations is unacceptable.

Several things can be done to prevent this situation from happening in your facility. First, clean up. Remove any dust left lying around the facility and the sooner the better. You must be careful though in your housekeeping methods so as not to create a large dust cloud by blowing dust around with compressed air or sweeping fine dust up into the air. Vacuuming is preferred with some type of HEPA¹ filter on the vacuum. Second, set up a Combustible Dust Control Program to evaluate and control the hazard. This should include a plan to periodically inspect and clean out-of-the-way places such as truss beams, office roof tops, pipe and conduit runs, and staircases. It should also include a review of any hot work that is preformed in the suspect area, signage, and training for proper handling and cleaning techniques.

¹ HEPA = High Efficiency Particulate Air

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For more information contact Keith Reissig, Industrial Hygienist at **iSi**, (888) 264-7050 or kreissig@iSienvironmental.com. The OSHA website located at www.OSHA.gov has a great resource: [Safety and Health Information Bulletin \(SHIB\) \(07-31-2005\) Combustible dust in Industry: Preventing and Mitigating the Effects of Fires and Explosions](#). You may also want to review the National Fire Protection Association's consensus standards; they are listed below and can be found at www.nfpa.org.

- NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
- NFPA 61, Standard for the Prevention of Fires and dust Explosions in Agricultural and Food Processing Facilities
- NFPA 484, Standard for Combustible Metals
- NFPA 664, Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities
- NFPA 655, Standard for the Prevention of Sulfur Fires and Explosions

