Combustible Dust



WHO HAS A COMBUSTIBLE DUST PROBLEM?

Many employers are unaware of a potential explosive dust hazard in their workplace. By identifying and controlling dust explosion hazards, injuries, deaths, and costly damage can be prevented. Some of the industries that could have a combustible dust hazard include:

- Agriculture
- Chemical
- Forest and furniture products
- Metal processing (e.g. aluminum, magnesium, zinc)
- Organic dust producers or users (e.g. working with fine dusts of candy, dried blood, paper, pulp, soap, spices, starch, sugar, flour, and feed)
- Paper products manufacturers
- Pharmaceuticals
- Plastics
- Producers or users of coal or other carbon dusts
- Recycling operations (e.g. metal, paper, and plastic recycling operations)
- Tire and rubber
- Textile
- Wastewater treatment (biosolids)
- Wood dust producers

What Makes Combustible Dust an Explosion Hazard?

Combustible dusts become an explosion hazard when they are suspended in the air in the proper concentration in a confined space or semi-confined vessel, area or building.

With the oxygen present in the air, all that is needed is an ignition source for an explosion to occur.

Many variables can affect the explosibility of a dust. To fully assess the risk of a dust explosion, it may be necessary to have the materials involved tested by a specialized lab.

PRIMARY AND SECONDARY DUST EXPLOSIONS

An initial or primary dust explosion can lead to one or more secondary dust explosions within a facility. This can occur when the initial dust explosion in the processing equipment or vessel ruptures the enclosure and ignites settled dust in a nearby area. Such explosions have destroyed buildings, killed 119 workers and injured 718 workers since 1980.1 In many of these cases, the employers involved were unaware of the hazard.

OSHA NATIONAL EMPHASIS PROGRAM

The Occupational Safety and Health Administration (OSHA) issued a directive (CPL 03-00-008) effective 3/11/08 initiating a Combustible Dust National Emphasis Program (NEP). This program requires OSHA offices to specifically target businesses with dust explosion hazards.

Catastrophic Fires have Occurred with the Following Kinds of Dusts

- Coal dust
- Nylon fiber
- Phenolic resin dust
- Plastic (polyethylene) dust
- Resin for fiberglass
- Rubber dust

The National Fire Protection Association (NFPA) states, “Any industrial process that produces a combustible material and some normally noncombustible materials in a finely divided state present a potential for a serious fire or explosion.”

CONDUCT A HAZARD ANALYSIS

You may have to seek professional help with the following:

- Recognize that you may have a combustible dust hazard.
- Look for processes that use, consume, or produce fine dusts.
- Look for accumulations of fine dust, including in hidden areas (such as inside ductwork or over suspended ceilings).
- Look for ways dusts can become dispersed in the air.
- Consider dust collectors, hoppers, and other equipment that can confine a dust cloud.
- Investigate the thermal stability of stored products.

CONTROL – THE MAIN CONTROL METHODS

- Prevent dust accumulations.
- Install special electrical equipment in areas with potential for explosive concentrations of combustible dust (Class II locations).
- Select and use industrial trucks properly.
- Implement proper procedures for the maintenance of ovens and process equipment.
- Select and install equipment safety devices.
- Install explosion relief venting devices.
- Design buildings, equipment, and ventilation systems properly (including bonding and grounding).

SAFETY MANAGEMENT

- Investigate fires and incidents.
- Train employees on Hazard Communication (including combustible dust hazards).
- Implement Process Safety Management.