MISSISSIPPI STATE UNIVERSITY EXTENSION

MSU DAWG TRACKS

Several years ago, a series of devastating dust explosions in grain elevators left 59 people dead and 49 injured. Since then, lessons learned can be applied to other areas producing combustible dust. **Combustible dust is basically any fine material that has the ability to catch fire and explode when mixed with air.** While most prevalent in grain elevators, feed mills, flour mills, rice mills, dust pelletizing plants, dry corn mills, facilities with soybean flaking operations, and facilities with dry grinding operations; combustible dust is also in areas of plastics, textiles, sugars, rubber, wood, sawdust, pesticides and some metals.

Why is dust accumulation a concern?
Combustible dust will burn easily and serves as an ignition fuel for fire. It can explode if enough becomes airborne or accumulates on a surface and finds an ignition source (such as a spark, hot bearing, overheated motor, misaligned conveyor belt, welding or cutting operation). It is recognized that a 1/8 inch dust accumulation is more than enough to fuel an incident. Such occurrences are often severe involving loss of life and substantial property damage.

Prevent dust explosions and fires.

- ✓ Develop and implement a housekeeping program to inspect all open and hidden areas (floors, ledges, equipment etc.) at regular intervals, and clean any dust accumulations. Use cleaning methods that do not generate dust clouds. Only use vacuum cleaners approved for dust collection.
- ✓ Implement a preventative maintenance program with regularly scheduled inspections of heat producing equipment such as motors, bearings, belts etc. Controlling mechanical sparks and friction is critical to controlling ignition sources.
- ✓ Minimize ignition sources through controlling hot work (welding, cutting, grinding, brazing or similar spark/flame producing operations).
- ✓ Install wiring and electrical equipment suitable for hazardous locations. Some dusts are electrically conductive and electric current can pass through a layer of such dust under favorable circumstances, causing short circuits or arcs. This is why it is also important to keep covers on and secured to electrical panels and boxes.
- ✓ Design and properly locate dust collection systems. Minimize the escape of dust from process equipment or ventilation systems using the proper filters.
- ✓ Inform contractors at the facility of known potential fire and explosion hazards related to the contractor's work and work area.

Should an incident occur, it is best to have **damage control** already in place to minimize the impact of an explosion or fire.

- ✓ Segregate the hazard - isolate with distance or a physical barrier.
- ✓ Deflagration venting of the building, room, or area.
- ✓ Pressure relief venting for equipment
- ✓ Provision of spark/ember detection within duct work and equipment where possible.
- ✓ Fire suppression systems.

Sources:
https://www.osha.gov/grain-handling
https://www.osha.gov/sites/default/files/publications/shib073105.pdf

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