

DAWG TRACKS SAFETY NEWSLETTER

MS Agricultural & Forestry Experiment Station
MSU Extension Service



Over the past twenty years there have been several news-worthy explosions that resulted from the lack of attention given to combustible dust accumulation. Since then, lessons learned can be applied to other areas producing combustible dust.

What is combustible dust?

Combustible dust is any fine material that could ignite when suspended in the air and exposed to an ignition source. This fire ball is then likely to disperse more dust resulting in **one or more secondary explosions, each more destructive than the primary explosion...** a tragic situation when occurring in a confined area.

Agriculture products occupy the largest segment of processing operations creating these known combustible dust. While prevalent in commercial grain elevators, sawmills, and feed mills; it is also just as present and hazardous in small operations including family farms and research work areas.

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 an electrical spark, hot bearing, overheated motor, misaligned conveyor belt, welding or cutting operation). It is recognized that **an 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.

How to prevent dust explosions and fires.

- ✓ Implement a thorough housekeeping routine including all open and hidden areas (floors, ledges, ceilings, inside 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 & electrical 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 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 workers at the facility of potential fire hazards, the dangers of combustible dust in the area, & the critical importance of good housekeeping and routine maintenance.

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 equipment.

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Sources:

<https://www.osha.gov/grain-handling>

<https://www.osha.gov/sites/default/files/publications/shib073105.pdf>