Flammables — Combustible Dust

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Combustible dust is defined as a solid material composed of distinct particles which present a fire hazard when suspended in air. A dust explosion can cause catastrophic loss of life, injuries, and destruction of property.

Characteristics of a dust explosion:

- **Definition:** A dust explosion can be defined as a rapid release of high pressure gas into the environment.
- **Process:**
  - It commonly begins with the ignition of a fuel, such as a combustible dust, that burns very rapidly.
  - It produces a large and sudden release of gas and does not necessarily involve a fire.
  - There are often more serious secondary explosions that result from an initiating explosion which dislodges loose particulates.
- **Five criteria that must be present for dust explosion conditions:**
  - Fuel, i.e., combustible dust
  - Heat or an ignition source
  - Oxygen, which may be in the form of an oxidizer chemical
  - Dispersion of dust particles of a certain concentration and quantity
  - A confined dust cloud

Examples of industries where combustible dusts are common:

- Grain handling
- Flour production
- Industries using wood
- Sugar manufacturing
- Certain types of plastic

Coal handling

- Textile industries using cotton, nylon, etc.
- Metal production such as aluminum, sodium, and potassium

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Fighting dust accumulation:

Assure that dust-containing systems, ducts, and dust collectors are designed in a manner that prevents fugitive dusts from accumulating in the work area. This includes proper air velocity and enough volume in the dust collectors for the various applications.

- Assure that the working surfaces are designed in a manner to minimize dust accumulation and to facilitate cleaning.
- Accumulations on overhead beams, joists, ducts, the tops of equipment, and other surfaces must be included when assessing dust concentrations.
- Your facility must have a housekeeping program with regular cleaning frequencies established for floors and horizontal surfaces, including ducts, pipes, hoods, ledges, and beams, to minimize dust accumulation within operating areas of the facility.
- Housekeeping practices must include immediate cleaning whenever a dust layer of 1/32-inch thickness accumulates over a surface area of 5% or more of the floor area of the facility or any given room.
  - If the floor area exceeds 20,000 ft^2, a dust layer must not exceed a 1,000 ft^2 floor area.

Controlling heat and ignition sources:

- Electrical equipment must meet Class II requirements for explosion proof control. This includes electrically-powered cleaning devices such as vacuum cleaners.
- An effective ignition control program must be in place.
  - Include in the program such elements as grounding and bonding, metal detection, preventive maintenance programs, and other methods.
  - An effective program will dissipate any sparks or electrostatic charge that could be generated where a combustible atmosphere may exist (e.g., in ductwork).
- Implement a hot work permit program.
- Post and enforce no smoking areas.
- Assure that duct systems, dust collectors, and dust-producing machinery are bonded and grounded to minimize accumulation of static electrical charge and equipped with spark detection and arrest systems.
- Use industrial trucks, machinery, and electrical equipment that are approved for Class II combustible dust locations.

Follow these control measures to avoid dust build-up and prevent dust explosions.

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This form documents that the training specified above was presented to the listed participants. By signing below, each participant acknowledges receiving this training.

Organization:_____ Date: _____

Trainer:_____ Trainer's Signature: _____

Class Participants:

Name:_____ Signature:_____

Name:_____ Signature:_____

Name:_____ Signature:_____

Name:_____ Signature:_____

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