Dust Explosion Hazard Management
Requirements of NFPA 652: Standard on the Fundamentals of Combustible Dust

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Background

In any facility where combustible powders are processed or handled there is a risk of flash fires, explosions, or otherwise unplanned loss of containment and release of energy. An explosible atmosphere is typically created when the right amount of a combustible dust is mixed with the right amount of an oxidant, usually the oxygen in air. Ignition of an explosible atmosphere occurs if the energy of the ignition-source exceeds the minimum energy that is required to ignite the mixture at the given process conditions. Table 1 below list potential ignition sources in facilities where combustible powders are processed and/or handled.

Table 1. Potential Ignition Sources

o Lightning strikes	o * Welding [torch or arc]
o * Open flames	o * Cutting
o Hot surfaces	o Grinding
o Electrostatic discharges	o Frictional heating
o * Electric arcs and sparks	o Mechanical impacts
o Exothermic chemical reactions	o Smoking [rule violation]
o Self-heating / decomposition / spontaneous combustion	

**Electrical Classification or Hot-Work Permit required*

As one can consequently imagine, a flash-fire or explosion hazard can exist during the transfer, handling, processing, and packaging of many explosible materials. These events can result in fatalities, injuries, environmental impact, facility damage, and economic losses. Precautions should therefore be taken to prevent the inadvertent ignition of explosible dust clouds and/or protect the people, community, and facility against the effects of flash fires and explosions.