

# Combustible Dust in Industry: Preventing and Mitigating the Effects of Fire and Explosions - Technical Engineering References for Instrument and Fire & Gas Design Engineers

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## **Spark Detection**

[Safety for your Production - Bob Barnum](#) - eliminate personnel injuries, equipment damage and loss of production from fires and explosions. In any type of production facility, fire control encompasses a wide range of equipment or systems from building sprinklers to plant site fire departments. A spark detection and extinguishing system must be thought of as part of a plant's overall security and safety network. Just as a residential alarm system provides protection to a homeowner, a spark detection system provides preventive protection against potential loss of human life, production facilities, equipment and costly downtime - from GreCon

[Spark Detection Systems-Podcast](#) - John Astad - Spark detection system manufacturers discuss important aspects of spark detection engineering controls in lessening the probability and reducing the severity of combustible dust related fires and explosions at facilities - Combustible Dust Policy Institute

[Ask Joe! Spark Detection & Extinguishment Systems](#) - Sparks are a very common danger. Although they may not be readily apparent, this does not mean that they do not exist. In most cases, close attention is focused on this problem only after it is too late, namely when there has been an explosion or fire - from [www.powderandbulk.com](http://www.powderandbulk.com)

## **The following technical articles are from the Occupational Safety and Health Administration (OSHA)**

[Hazard Communication Guidance for Combustible Dusts](#)- is a new guidance document recently published by the Occupational Safety and Health Administration (OSHA) that assists chemical manufacturers and importers in recognizing the potential for dust explosions, identifying appropriate protective measures and the requirements for disseminating this information on material safety data sheets and labels. The document addresses the combustible dust hazards in relation to the Hazard Communication Standard, which is

designed to ensure that chemical hazards are evaluated and the information concerning them is transmitted to employers and workers - from OSHA

[Combustible Dust Materials List](#) - Does your company or firm process any of these products or materials in powdered form? If your company or firm processes any of these products or materials, there is potential for a "Combustible Dust" explosion - from OSHA.

[OSHA - Combustible Dust National Emphasis Program](#) - This instruction contains policies and procedures for inspecting workplaces that create or handle combustible dusts. In some circumstances these dusts may cause a deflagration, other fires, or an explosion. These dusts include, but are not limited to: • Metal dust such as aluminum and magnesium. • Wood dust • Coal and other carbon dusts. • Plastic dust and additives • Biosolids • Other organic dust such as sugar, flour, paper, soap, and dried blood. • Certain textile materials

[Combustible Dust in Industry: Preventing and Mitigating the Effects of Fire and Explosions](#) - This Safety and Health Information Bulletin (SHIB) highlights: Hazards associated with combustible dusts; • Work practices and guidelines that reduce the potential for a combustible dust explosion, • or that reduce the danger to employees if such an explosion occurs; and, • Training to protect employees from these hazards.

### **Other Useful Technical Information**

[NFPA 654: Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids](#), 2006 Edition - This standard applies to all phases of the manufacture, processing, blending, pneumatic conveying, repackaging, and handling of combustible particulate solids or hybrid mixtures, regardless of concentration or particle size, where the materials present a fire or explosion hazard. It also applies to systems that convey combustible particulate solids that are produced as a result of a principal or incidental activity, regardless of concentration or particle size, where the materials present a fire or explosion hazard.

[Combustible Dust Policy Institute Blog](#) - The goal of Combustible Dust Policy Institute Group is to minimize the severity and reduce the occurrence of combustible dust related fires and explosions in the global workplace. Through ongoing exchange of best practices and lessons learned of combustible dust related incidents, which identifies and evaluates risk, the group shares risk assessment information that a diverse spectrum of members utilize in effectively controlling combustible dust hazards. There are many useful links here.

[Excuse the Dust](#) - "When shredding electronics, hard drives and some products sparks can be created. If the spark reaches the dust collector, it could ignite a fire or cause an explosion," Dietterich says. "The dust generated from shredding these items has different explosive characteristics than paper dust as measured by the Kst factor of the dust." He adds, "... The conveyance ducting should be equipped with a flame and spark detection and extinguishing system that will detect and extinguish the flame or spark while moving through the ductwork prior to entering the dust collector". - from Recycling Today

[Combustible Dust: An Insidious Hazard](#) - Dust from industrial processes can become the fuel for devastating explosions. Investigation Details: Imperial Sugar Company Dust Explosion and Fire Hayes Lemmerz Dust Explosions and Fire CTA Acoustics Dust Explosion and Fire West Pharmaceutical Services Dust Explosion and Fire - from U.S. Chemical Safety Board

[The Danger of Combustible Dust](#) - Scott Pelley reports on the deaths and property damage caused by dust explosions at American factories, a problem critics say the government needs to do more to prevent - from CBS news

[Combustible Dust Dangers: Too Dangerous for a 'Wait and See' Approach](#) - The list goes on, involving a wide range of industries and types of combustible dust. This is a list your organization never wants to be on, yet OSHA estimates 30,000 U.S. facilities may be at risk for combustible dust incidents. This article provides background on combustible dust issues to help you evaluate whether your organization is doing everything it can to minimize that risk - from ohsonline.com

[Dust -When a Nuisance Becomes Deadly](#) - Many people never knew sugar could explode until February 7, 2008, when an explosion rocked the Imperial Sugar Company in Port Wentworth, Georgia, killing 13 people and injuring 40. Located just outside Savannah, this 91-year-old facility processed granulated and powdered sugar - from NFPA Journal

[Combustible Dust Becomes National Target](#) - Combustible dust, a hazard that has historically received little attention from employers and government agencies alike, is a hidden danger that every company operating a saw should address. Sawdust often goes unnoticed in all manners of nooks and crannies although it poses a major hazard if a secondary explosion occurs - from palletenterprise.com

[Reduce Your Risk of Dust Fires and Explosions](#) - Spark and ember generation is a constant danger in production facilities where combustible materials are being worked, processed, transported, dried, filtered or exhausted. Insurance companies' statistics point out that silos, dust filters, bins, and even complete production lines are the areas of greatest risk - from bulk-online.com

[Ask Dr. Knowledge - What Exactly is a Dust Explosion, and Should I Worry about House Dust?](#) - An explosion is really a kind of build-up of pressure (that's the "bang") and to get that, you usually need a combination of quick burning and something to contain the hot gases released to build up pressure. You might do without the container if the burning is fast enough, but we needn't worry about that for the question you're asking - from [www.boston.com](http://www.boston.com)

[Grain Elevator Dust Explosion Demonstration](#) - During the 2012 Farm Progress Show, Nationwide Agribusiness risk management representative, Brittney Nelson, demonstrates our Grain Bin Explosion Chamber. Brittney shows how a simple spark can react with grain dust and oxygen to create a sudden and deadly grain bin explosion. The dust from grain creates fuel, one of the four elements required for an explosion to occur. The other three elements are typically also present when handling grain: oxygen, confined space and an ignition source. A

simple spark from static electricity, an overheated bearing, or lightning can create a sudden and deadly explosion.

[Reduce Dust Explosions the Inherently Safer Way](#) - Inherent safety is a proactive approach for hazard and risk management during process plant design and operation. Although it offers an attractive and cost-effective methodology for risk reduction, inherent safety has not been used as widely as engineered (add-on) and procedural (administrative) measures. This article is aimed at the development of a framework for dust explosion prevention and mitigation that explicitly incorporates the principles of inherent safety - from [www.aiche.org](http://www.aiche.org)