

# Understanding and Managing Your Dust Hazard Risks

Take steps to ensure a safe and compliant workplace



The National Fire Protection Association (NFPA) adopted the NFPA 652 Standard on the Fundamentals of Combustible Dust in 2015 to define combustible dust and provide a standard framework to help companies assess their dust hazard risk. NFPA 664: Standard for The Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities has been around for many decades. NFPA 664 continues to evolve and is being aligned with NFPA 652, one of the most important additions to NFPA standards in the prevention of dust explosions.

Here are frequently asked questions about dust hazards:

#### so, what's the big deal about dust?

Dust is often a byproduct of industrial processes. It can be found in food processing, agriculture, metal working, chemical production, plastic manufacturing, and wood manufacturing. Dust can collect on flat surfaces like rafters, roofs, suspended ceilings, ducts, crevices, dust collectors, and other equipment. Most facilities control dust through containment and local ventilation systems; capture devices such as baghouses and cyclones; and housekeeping practices. In many cases it is a combination of two or three of these methods.

#### What are the risks associated with dust?

When combustible dust is allowed to accumulate, there is an increase in the potential for dust to reach a condition where an explosion may occur. Generally, a hazard exists when dust accumulations exceed  $1/16^{\text{th}}$  to  $1/8^{\text{th}}$  inch. Limits for allowable accumulations are based on the combustibility / hazard level of the dust present at your facility. It is important to note an explosion hazard is deemed to exist unless otherwise determined by a dust Hazard Analysis (DHA). When accumulated dust is disturbed under certain circumstances, there is the potential for an explosion to occur. An appropriate goal for most dust producing operations is to keep combustible dust accumulations to less than  $1/32^{\text{nd}}$  to  $1/16^{\text{th}}$  inch over 5% of an area or compartment. An accumulation greater than  $1/16$  inch on upward facing flat surfaces indicates poor housekeeping and should be addressed as quickly as possible.

Workplace dust can also present a long-term health risk to employees who are exposed to the particles. In Canada, these regulations are governed by provincial or territorial agencies in the area where you work. These agencies have enforceable exposure limits concerning the inhalation of generic 'non-descript' total dust, for specific dust compounds, and for the near invisible respirable-sized dust particles. If you are uncertain about whether your workplace dust / air concentrations can affect your employees, we recommend you conduct a comprehensive industrial hygiene assessment.



### How do I know if I have a potentially combustible dust?

A combustible dust is any fine material that can be ignited and explode when mixed with air. A key factor is if the particles are the right 'size' and are suspended in air at the right concentration.

Combustible dusts can come from:

- most solid organic materials (such as sugar, flour, grain, wood, etc.)
- carbonaceous materials (e.g., charcoal, soot)
- textile fibres (e.g., cotton)
- many metals, and
- some nonmetallic inorganic materials.

Some of these materials are not "normally" combustible, but they can burn or explode if the particles are the right size and in the right concentration. Approximately 70% of all dusts can be combustible – if you are looking for more detail visit the Canadian Centre for Occupational Health and Safety (CCOHS) page:

[https://www.ccohs.ca/oshanswers/chemicals/combustible\\_dust.html](https://www.ccohs.ca/oshanswers/chemicals/combustible_dust.html)

The US based Occupational Safety and Health Administration (OSHA) poster summarizes many of the most common combustible dusts:

<https://www.osha.gov/Publications/combustibledustposter.pdf>

### What are my responsibilities?

It is your responsibility to understand your workplace risks and implement processes to control dust. These may include reducing airborne or fugitive dust from source machinery through engineering improvements; installing and maintaining dust collection systems; and conducting appropriate housekeeping measures at a frequency necessary to safely clean up dust. Each of these processes must be performed in accordance with known standards/ codes, provincial requirements, and best practices. It is important to educate your staff on the hazards of combustible dust and the reasons for its stringent control. Visiting provincial health and safety web sites like Work Safe BC or the Canadian Health and Safety web site note above (CCOHS) will help you identify training tools and information.

You can be held accountable for poor control of combustible dust by any or all the following Authorities Having Jurisdiction (AHJs): local fire marshal, building code / fire code inspector, Provincial or Territorial agency, and your insurance company. Your company's reputation can be irrevocably damaged if a catastrophic dust explosion occurs. Public perception is formed by images, video, interviews, and comments on TV and social media platforms — that commentary is likely to blame your organization and its leadership for failure to follow proper safety procedures regarding the management of fine dust and its hazards.



## CHECKLIST:

### Combustible Dust Risk Assessment

- Use an accredited laboratory to test and verify if your dust is combustible as well as determine its explosivity. Costs for the multi-step analysis can run from approximately \$1,000 to \$3,000, depending on the dust complexities.
- Perform an Area Classification as detailed in the Canadian Electrical Code (CEC) and identify your facility's Classification concerning dust in relation to electrical equipment (ignition sources).
- Conduct an NFPA 652 compliant Dust Hazard Assessment (DHA). The focus should be on past and current processes resulting in dust generation, equipment operating in the space, facility ventilation, potential sources of ignition (electrical, gas, heating, mechanical, etc.) and housekeeping. Chapter 7 of NFPA 652 contains an explanation of a comprehensive DHA and key descriptions. Additionally, Annex B of NFPA 652 provides a step-by-step example of how to create a site-specific DHA.

### A Cautionary Tale

A HUB client in the agribusiness industry was visited by their insurance company's loss control representative a few months prior to the renewal of the property insurance. During this visit, the loss control specialist noted a large accumulation of combustible dust near the milling machinery. The client had not gone through the process of identifying the level of hazard, had not performed an area classification or DHA, had not performed appropriate housekeeping, and did not examine the effectiveness of the mechanical and pneumatic controls in place used to capture and transport dust.

As a result, the insurance carrier issued a non-renewal notice on the policy just 60 days prior to renewal. At the eleventh hour, HUB pursued and persuaded an alternative insurance provider to cover this challenging risk, but the client had to pay 2X more than the prior annual premium of \$230,000.

Rising insurance costs, coverage cancellations, and non-renewal are not the only consequence that organizations face when they fail to recognize and appropriately manage dust hazards. Regulatory bodies can issue stop work orders and fines based on provincial and territorial requirements. In a worst-case scenario, owners and senior management can be prosecuted for negligence.

Failure to control dust presents significant risks for your business and employees. **Contact your HUB Risk Services specialist for help in assessing your risks and level of compliance.**

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[hubinternational.com](https://hubinternational.com)

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