

SAFETY MEMO

April 19th, 2021 – Combustible Dust



Did you know?

Combustible Dust

Many of the materials identified as combustible dust are not likely to ignite or explode in domestic use situations.

The Occupational Safety and Health Administration (OSHA) has compiled an exhaustive list of materials with explosive power in the form of powder or dust¹.

It includes materials from various origins:

- **Agricultural:** flour, sugars, oats, hops.
- **Chemicals:** dextrin, vitamin C, charcoal.
- **Metals:** aluminum, zinc, magnesium.

When mixed with air, they form all seemingly harmless examples which, under the right conditions, can be the source of tragic events. These necessary conditions are described by the explosion pentagon (Figure 1) which adds to the fire triangle (Heat, Fuel, Oxidizer) the elements of dispersion and containment of powders.

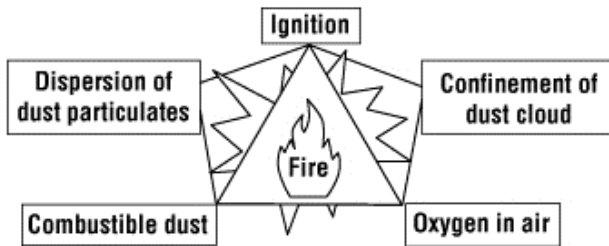


Figure 1 - The dust explosion pentagon.

https://www.cchst.ca/oshanswers/chemicals/combustible_dust.html

Overview of Incident Data

The Dust Safety Science website compiles in a biannual report most of the information available in the global public domain on combustible dust incidents. This report presents, among other things, an analysis of the materials, industries and equipment involved. (Table 1)².

In the first half of 2020, 100% of deaths recorded in industries where combustible dust was present occurred due to a dust explosion.

Combustible Dust	Type	Location	Equipment
Grain	Fire	ND, USA	Dryer
Fishmeal	Fire	PA, USA	Unknown
Sugar	Fire	CA, USA	Conveyor belt
Grain	Explosion	NC, USA	Welding machine
Grain	Fire	IA, USA	Grain elevator
Grain	Fire	NC, USA	Hopper
Malt	Fire	UK	Dryer
Peanut	Fire	KY, USA	Unknown
Sugar	Explosion	India	Dust collector

Table 1: Combustible dust incidents in the food processing sector in 2020 (January to June).

From January to June 2020, there were 94 fires involving combustible dust around the world. Food products represent 41% of total fires and combustible dust explosions recorded.

	Fires	Exp.	Injured	Deaths
Wood	34	11	6	0
Food	41	8	11	0
Metals	10	4	9	1
Coal	3	0	0	0
Paper	3	0	0	0
Plastic	0	1	0	0
Sulfur	1	0	0	0
Other/Unknown	2	2	3	3
Total	94	26	29	4

Figure 2: Explosion incidents around the world (January to June 2020) by Dust Safety Science.

Recommendations

- Ensure that all projects involving combustible dust or the potential for combustible dust have identified and addressed fire and explosion hazards.
- Raise awareness of combustible dust hazards and an understanding of the risks associated.
- Always ensure proper housekeeping to avoid the accumulation of combustible dust.

¹United States Department of Labour, Occupational Health and Safety (n.d). https://www.osha.gov/sites/default/files/publications/combustible_dust_poster.pdf

² 2020 mid-year Combustible Dust Incident Report, [Dustsafetyscience.com](https://www.dustsafetyscience.com),

