

OSC | 11
Ohio Safety Congress & Expo



#115 – Combustible dust and explosion prevention

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2:15 to 3:15 p.m.



Combustible Dust and Explosion Prevention

AWARENESS LEVEL 101

This presentation is the property of Captain David Toresell and Andy Bauer

OBJECTIVES

- Participants shall be able to define Combustible Dust
- Participants shall understand the causes of dust explosions and prevention activities to limit the potential for an incident
- Participants shall be aware of the hazards related to dust explosions
- Participants shall understand the 2ndary impacts of explosions.

What is combustible dust?

OBJECTIVE #1

- OSHA says it is a combustible particulate solid that presents a fire or deflagration hazard when suspended in air or some other oxidizing medium over a range of concentrations, regardless of particle size or shape.
- NFPA says the same thing.

How the explosion works

The explosion pentagon represents the five ingredients needed to have an explosion.

1. Heat or ignition source
2. Oxygen or other oxidizing atmosphere
3. Fuel which is the combustible dust
4. A process that places the dust in suspension
5. CONFINEMENT

* Remove any one of the five and there is no explosion

CAUSES of EXPLOSIONS

OBJECTIVE #2

- Lack of understanding of the problem
- Complacent opinions of the volatility of the products (if you have labs use them to the fullest of their capabilities!)
- Lack of accountable housekeeping practices
- No or minimal, risk/management programs to determine the danger areas.
- Employees not made aware that problems exist

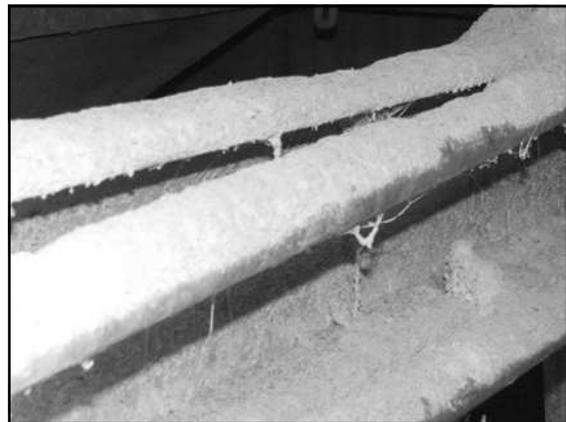
What can you do to prevent an explosion from blowing the *&#! out of your facility?

- Have a complete understanding of the environment where you work!
- If your facility produces a dust of any type, know if it has a LEL and UEL. If it does, it can go boom!
- Constant housekeeping (inspecting) is essential
Inspect all surfaces where dust can build up
Avoid creating new flat surfaces when possible



Prevention continued

- Avoid practices that create “clouds”
Do not clean with compressed air and avoid heavy mechanical or manual sweeping
- Machines used to pick-up combustible dusts should meet all electrical requirements for explosive atmospheres and should be as close to the dust creation as feasible.



Hazards Related to Dust Explosions

OBJECTIVE #3

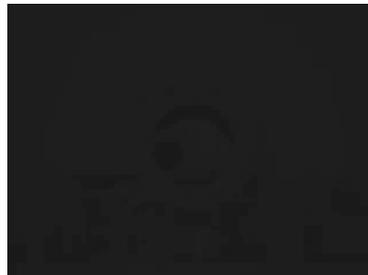
- Dust explosions happen in the blink of an eye
- Many times they produce a second, even **more violent**, explosion than the first
- They produce a shock wave that can kill or injure anyone in its path.
- Explosions damage facilities, delay and even end operations. (cost MONEY,MONEY,MONEY)







Imperial Sugar Dust Explosion



Secondary Impacts

OBJECTIVE #4

- Loss of production time and product
- Facility closure
- Loss of jobs
- Strong impact on local economy
- Possible multi-business closure due to exposures
- Investigation and Inspection findings (fines \$)

Codes, Standards and Directives You may want to review

- OSHA's Combustible Dust National Emphasis Program
- NFPA 61- Prevention in Ag and Food Processing
- NFPA 68- Guide for Venting of Deflagrations
- NFPA 69- Standard on Explosion Prevention Systems
- NFPA 70- National Electrical Code

And some more, to name just a few

- NFPA 77- Recommended Practice on Static Electricity
- NFPA 120- Standard for Prevention and Control in coal mines.
- NFPA 484- Standard for Combustible Metals
- NFPA 499- Recommended Practice for Classification of Combustible Dust and of Hazardous locations for Electrical Installations.





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