



Understanding Combustible Dust Hazards

Jason Reason, CIH, CSP, CHMM
Director of Combustible Dust Services



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Jason Reason, CIH, CSP, CHMM

- ▶ 12.5 years as OSHA Compliance Officer
- ▶ Performed hundreds of DHAs and Design Reviews in myriad of industries
- ▶ Worked with several equipment manufacturers to mitigate dust hazards
- ▶ Assisted in developing existing and new requirements for NFPA 660, 2021 IFC, and other standards
- ▶ 2019 ASSP Fire Practice Specialty Safety Professional of the Year



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Jason Reason, CIH, CSP, CHMM

- ▶ NFPA Technical Committees
 - Chair of Committee for Wood and Cellulosic Materials (**NFPA 664**)
 - Committee for Fundamentals of Combustible Dusts (**NFPA 652**)
 - Committee for Combustible Metals and Metal Dusts (**NFPA 484**) - **AM Task Group Chair**
 - Committee for Handling & Conveying of Dusts, Vapors and Gases (**NFPA 91, 654, and 655**)
 - Correlating Committee for Combustible Dusts (**Over all NFPA combustible dust committees**)



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Dust vs. Particulate Solid



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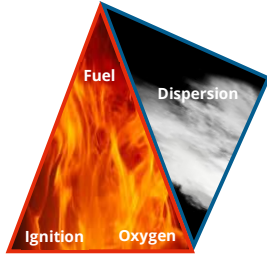
Combustible Dust Hazards



Dust Fire

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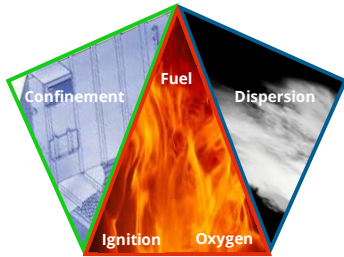
Combustible Dust Hazards



Flash Fire or Deflagration

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Combustible Dust Hazards



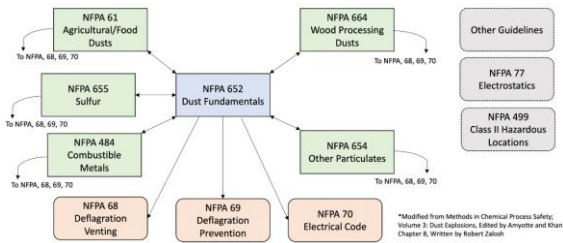
Dust Explosion

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**HOW MANY
STANDARDS ADDRESS
COMBUSTIBLE DUST
HAZARDS?**

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Existing Dust Standard Framework



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Combustible Dust Hazard Mitigation Process



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To Test or Not To Test?

- ▶ Actual test data will result in the most accurate results for the DHA, performance-based design, and hazard mitigation controls
- ▶ Testing may not be required where reliable, in-house material-specific testing data or published data of **representative** samples are available
- ▶ Testing “as received” vs. milling
- ▶ Raw materials vs. mixtures
- ▶ “Hard to Ignite” ≠ Nonexplosible



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DHA shall determine...
Determined by the DHA...
Documented by the DHA...



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Signs of "Bad" DHAs

- ▶ Checklist or similar rigid analysis method used
- ▶ Low cost
- ▶ Length and style of report
- ▶ Lack of hazard risk evaluation
- ▶ Repeating rather than interpreting standards
- ▶ Non-actionable and vague recommendations
- ▶ Overreliance on prescriptive controls rather than performance-based design alternatives

Significantly Increase Mitigation Costs



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Effective DHA Process





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Anatomy of An Effective DHA

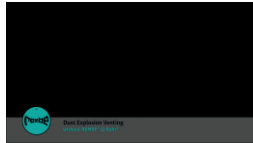
- › Ignition Sources
- › Processes and Equipment
- › Dust Collection
- › EHS Programs/Policies
- › Housekeeping
- › Cleaning Methods
- › Contractors
- › Electrical Classification
- › Explosion Protection and Isolation Systems
- › Fire Protection Systems
- › Maintenance Programs
- › Building Construction
- › Dust Testing
- › Dust Reactivity
- › Flame-Resistant Garments (FRGs)



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Common Engineering Controls

- › Sprinkler/Deluge Systems
- › Deflagration Venting
- › Deflagration Suppression and Chemical Isolation Systems
- › Backdraft Dampers



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The Truth About Housekeeping

- › Good housekeeping alone WILL NOT prevent an incident
- › Large accumulations are a secondary explosion hazard
- › Cleaning methods associated with housekeeping can introduce hazards



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Combustible Dust Action Plan

1. Do not use SDSs, testing data, or equipment manufacturer assessments as only sources for determining hazards or controls
2. Perform a DHA by an independent qualified person with documented expertise
3. Work with this person and equipment manufacturers to implement DHA recommendations
4. Use MOC and update DHA as conditions change



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Questions???

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