



A Summary of the Reissued OSHA Combustible Dust NEP

An ioMosaic Corporation
Whitepaper



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OSHA Announces Combustible Dust National Emphasis Program under CPL 03-00-008

On October 18, 2007, OSHA published a directive for inspection of workplaces that create or handle combustible dusts. On March 3, 2008, OSHA reissued this directive “to increase its enforcement activities and to focus on specific industry groups that have experienced either frequent combustible dust incidents or combustible dust incidents with catastrophic consequences.”

Click on this link to download the Reissued Directive: [CPL-03-00-008 Combustible Dust National Emphasis Program \(Reissued\)](#).

The new directive increases activities in outreach, training, the creation and dissemination of guidance and educational materials and cooperative ventures, as well as enhancing its enforcement activities.

The Combustible Dust National Emphasis Program directive applies to OSHA covered facilities that generate or handle combustible dusts. Combustible dusts are defined as combustible particulate solids that pose a deflagration or other hazard when suspended in air or other oxidizing medium. This includes, but is not limited to:

- Metal Dusts such as Aluminum and Magnesium
- Wood Dust
- Coal and Other Carbon Dusts
- Plastic Dust and Additives
- Biosolids
- Organic Dusts such as Sugar, Paper, Soap and Dried Blood
- Certain Textile Dusts

Facilities will be chosen at random for inspection from a list prepared by the Office of Statistical Analysis (OSA) and adjusted by the Area Offices. The OSA will prepare a master list from the most recent Dun and Bradstreet employer list of SIC/NAICS codes that correspond to facilities with an inspection history of combustible dust hazards. This list will then be added to or deleted from by each jurisdiction’s Area Office. Each Area Office must conduct at least three NEP inspections from the list of facilities in the high hazard group and one from the potential hazard group each year. In addition, complaints and accidents will also result in inspections under this program. OSHA divided affected industries into two lists by the level of hazard present; Appendix D-1 includes those with higher hazards and Appendix D-2 those with potential hazards.

OSHA Compliance Safety and Health Officers (CSHOs) will be inspecting facilities to see if conditions for deflagrations or explosions exist. They will check to see if the basic requirements for a deflagration exist: combustibility of dust, dispersion in air or other oxidant and presence of an ignition source. They will also check for the additional requirements of confinement for an explosion. In determining the existence of hazards, CSHOs are to review plant histories of fires and MSDSs as well as observe dust

accumulations. NFPA 654 is to be relied on when observing dust layer characterization and protections. Once potential combustible dust hazards are found, dust samples are to be collected and sent to the Salt Lake Technical Center (SLTC) to determine the explosibility and combustibility parameters of the dusts. Potential tests to be conducted are listed in Table 1.

Table 1: List of Tests Which May be Performed on Submitted Dust Samples

Test	Result
Percent Through 40 Mesh	% Less Than 40 Mesh
Percent Moisture Content	Moisture Content
Percent Combustible Material	% Combustible Material
Percent Combustible Dust	% Combustible Dust
Metal Dusts will Include Resistivity	Resistivity
Minimum Explosive Concentration	MEC
Minimum Ignition Energy	MIE
Class II Test	Hazardous Classification
Sample Weight	Sample Weight
Maximum Normalized Rate of Pressure Rise (dP/dt) _{max} – K _{st} Test	Explosion Severity, P _{max} , (dP/dt) _{max} , K _{st}
Minimum Ignition Temperature	MIT

Once a potential dust hazard is indicated, CSHOs will be looking for:

- A sound ignition control program that prevents introduction of ignition sources into dust collectors, ductwork and other containers, as well as efficient operation of dust collectors between 3 – 5 inches of water pressure drop
- Hot work permit system addressing hot work on and around collection points and ductwork or in areas where hazardous levels of dust accumulations may occur
- The employer’s efforts to abate the combustible dust hazards. Looking at dust collectors, ductwork, associated equipment and containers like mixers and storage bins for the following:
 - Explosion prevention and mitigation controls such as isolation or segregation of dust-generating equipment, building damage-limiting construction, explosion venting for dust-processing areas, process equipment relief (NFPA 68) and process isolation and explosion suppression (NFPA 69)
 - The dimensions of the room as well as the areas of the dust accumulations of greater than 1/32-inch depth
 - The design information, model numbers and serial numbers on the dust collection systems

- Volume of dust collectors
- Warning signs or alerts on the equipment referencing combustible dust
- Any sources of ignition in the area
- Classification of electrical equipment in the area

Once a potential dust deflagration, other fire or explosion hazard has been identified, a CSHO may cite an establishment against any of the applicable standards, as listed in the table below.

Table 2: List of Potential Citations from a Combustible Dust NEP Inspection

OSHA Reference	Citation
29 CFR 1910.272	Grain Handling Standard Violations
29 CFR 1910.94	Ventilation Standard Violations
29 CFR 1910.22	Housekeeping Violations (for non-grain handling facilities) when surface dust accumulations present a fire hazard
29 CFR 1910.176(c)	Housekeeping Violations in Storage Areas when the surface dust accumulations present a fire hazard
Section 5(a)(1) of the OSH Act	General Duty Clause Violations. These are to be issued for deflagration, explosion or other fire hazards that may be caused from combustible dust within a dust collection system or other containers, such as mixers. (Such violations may only be issued if all elements of a 5(a) (1) violation can be documented, i.e., K_{st} values greater than zero (deflagration and explosion hazards) or SLTC determination of combustible dust and heat and ignition sources.) Here NFPA standards are to be consulted
29 CFR 1910.263(k)(2)	Bakery Equipment Violations for Hazards in Sugar and Spice Pulverizers
29 CFR 1910.265(c)(20)(i)	Explosion Hazards From Blower Collection And Exhaust Systems In Sawmill Operations
29 CFR 1910.269(v)(11)(xii)	Violations Associated with Dust Accumulations that create a combustible atmosphere in coal-handling operations where sources of ignition are not controlled or eliminated
29 CFR 1910.132(a)	Personal Protective Equipment Violations
29 CFR 1910.119	Process Safety Management Violations when a highly hazardous chemical is present in a quantity greater than or equal to the listed threshold
29 CFR 1910.307	Electrical Violations when a tested dust meets the criteria for Class II

OSHA Reference	Citation
29 CFR 1910.399	Electrical Violations when a tested dust meets the criteria for Class I or III
29 CFR 1910.178(c)(2)(ii) and (vi)-(ix) and 1910.178(m)(11)	Powered Industrial Trucks Violations
29 CFR 1910.252, 253 and 254	Welding, Cutting and Brazing Violations
29 CFR 1910.145(c)(3)	Warning Sign Violations
29 CFR 1910.1200	Hazard Communication Violations
29 CFR 1910.33-37	Egress Violations
29 CFR 1910.156	Fire Protection Violations for Fire Brigades
29 CFR 1910.157	Portable Fire Extinguishers for Employee Use
29 CFR 1910.265(c)(20)(i)	Sawmill Violations for Defects in Blower Collecting and Exhaust Systems
29 CFR 1928.21	Agriculture Violations Related to Hazard Communications and the General Duty Clause

Some sample citations provided in the NEP are listed below along with possible explanations:

Citation	Possible Explanation
There was a dust collector located at the number 1 conveyor system which was located inside the SMK building. [Section 5(a)(1), General Duty Clause]	The combustible dust hazard in the dust collector was not abated by any of the acceptable means, such as relocation to outside.
Grinding and Polishing Area – Explosive dust was on floor of the area where aluminum polishing and grinding were performed on or about May 7, 200X. [29 CFR 1910.22(a)(2)]	Surface accumulations of explosive dusts greater than 1/32 of an inch are considered hazardous.
Mixing Department - A vacuum used in a Class II, Division 1 location was not intrinsically safe, approved for a Class II, Division I, location, or safe for a Class II, Division 1, location [29 CFR 1910.307(c)]	All electrical equipment used in a classified area must meet the requirements of that classification.

About the Author:

Ms. Michelle Murphy is a partner at ioMosaic Corporation. Prior to joining ioMosaic, Ms. Murphy was a manager at Arthur D. Little, Inc. where she worked for 10 years in their process safety consulting business. Since joining ioMosaic, she has been involved in chemical reactivity studies, dust explosion hazard evaluations and emergency relief system designs.

Her wide variety of experience includes all aspects of process safety and risk management, including process safety program development, thermal hazard analysis, dust explosion testing and hazard identification, emergency relief system design, process hazard analyses, and process safety management and environmental, health and safety audits. Her safety work has been conducted for many different chemical and oil production facilities, including pharmaceutical, specialty chemical, plastics, oil production and refining and pulp and paper facilities.

Before joining Arthur D. Little, she worked as an Engineer in the Butyl Polymers Technology Group of Exxon Chemical Company. While at Exxon, she was involved in the operation of a pilot plant facility used for process development and production of new products for customer trials.

Ms. Murphy has a B.S. in Chemistry from the University of Massachusetts, Dartmouth and an M.S. in Chemical Engineering from Clarkson University. She is a member of the American Institute of Chemical Engineers.

About ioMosaic Combustible Dust Services

ioMosaic has the experience and expertise to assist with management of your combustible dust hazards. Our Services begin with a review and assessment of potential dust hazards and are supported by testing, analysis, and Code and OSHA compliance reviews for facilities and/or unit operations.

ioMosaic has provided assistance with development of dust characterization plans, testing, hazard analysis, and explosion relief sizing; as well as on-site facility auditing for clients to ensure they are incorporating current-day best practices for addressing dust handling hazards.

ioMosaic has software solutions including the popular HAZOptimizer™ PHA software tool, which includes pre-populated checklists for review of unit operations; as well as documentation of the required Process Hazard Analysis prior to start up of a new or significantly modified operation. A second software solution, ioXpress™ can help clients manage all dust data as well as to provide an electronic workflow solution for Management of Change and centralized Action Item Management System.