Protect the Environment…
Save the World

Dust Explosion

PV Vacuum Engineering Pte Ltd
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Good Housekeeping a Key to avoid Dust Explosion

The first documented dust explosion occurred in Turin, Italy, bakery in 1785. The explosion was caused by the ignition of flour dust by a lamp in a bakery storeroom.

The Most Recent unfortunate event that received international coverage is the China Car Parts in the city of Kunshan, in Jianhsu province.

Preliminary investigation as reported by Xinhua said the blast was likely a dust explosion.

The explosion occurred at 7.37 am at a workshop in the factory, which polishes wheel hubs. Rescuers recovered 44 bodies, while 25 others died at a hospital. At least 187 people were injured.

Such dust explosions have been blamed for other deadly fires. In 2012, a dust explosion in an aluminium lock polishing workshop in Wenzhou killed 13 people and injured another 15. In 2009, aluminum powder exploded in a temporary housing in Danyang, killing 11 people and injuring another 20.

Dust Explosion is a Rare Event, but Catastrophic when it happens!

Housekeeping

Housekeeping is a crucial key to the reduction of fires and explosions in additional to hazards. Research has shown that facilities that are well maintained experience fewer fires, explosions and other accidents.

In fact it is listed in OSHA-USA training for Combustible Dust Control as One of the key for Explosion Safeguards beside Fire Prevention & Protection and Dust Control.

NFPA (USA) 654-contains comprehensive guidance and clean dust residues at regular intervals is one of them.

Dust clouds surface shall be cleaned in a manner that minimizes the generation of dust clouds.

Vigorous sweeping or blowing down with steam or compressed air produces dust clouds.

Any present of a loose electrical connection, static electricity discharge, hot surfaces capable of igniting a dust cloud or layer will or can be in the unfortunate situation trigger a Dust Explosion.

NFAP (USD)-654 stresses that cleaning method use should not generate dust clouds within the close proximity of where it is cleaning.

Central Housekeeping Vacuum System does just that. It does not generate dust clouds when it clean.

Unlike Portable Vacuum Cleaner (Domestic Or Industrial), Central Housekeeping Vacuum System pick up the dust and dirty air during cleaning, remove it from the factory, store the dust remotely and discharge the exhaust out at remote location after thorough filtering.

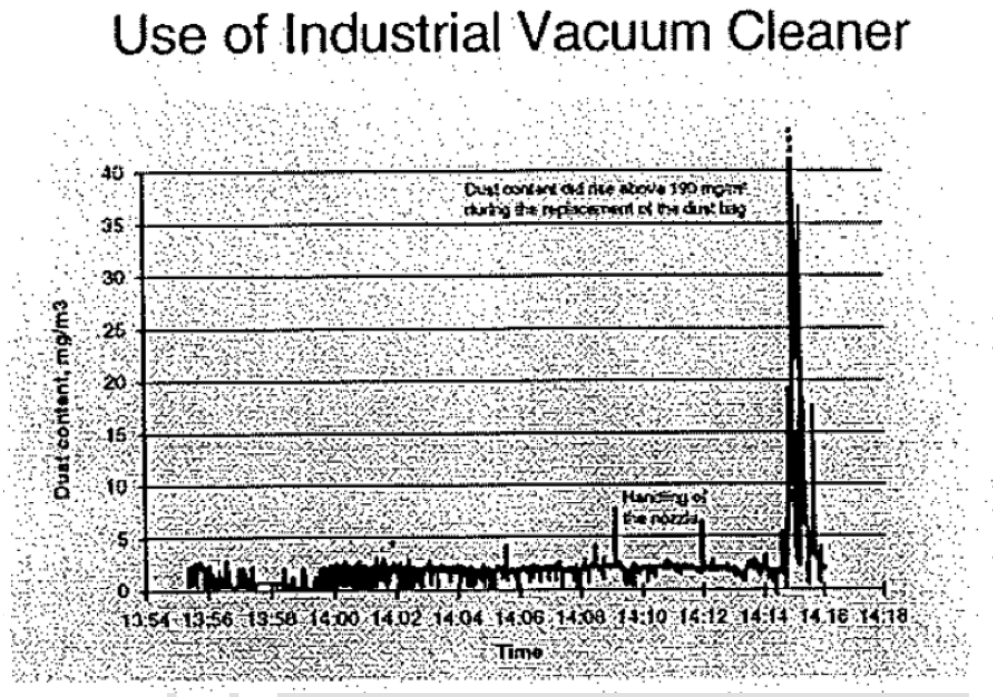
In fact, the removal of dust bag from domestic or industrial portable vacuum cleaner used in a factory environment is usually another source of danger.

Generally, the performance of a Portable Vacuum Cleaners is highly affected by the condition of it dust bag. A full dust bag will have a big influence on the Portable Vacuum Cleaner ability to clean.

Hence, dust bag is generally replaced close to the point of work, which is the problem!

The removal or change of dust bag of a Portable Vacuum Cleaner generate a Dust Cloud which will spread to the working environment.

The below is the extracted finding from Technical Research Centre of Finland on this:



To be considered explosion proof, portable vacuums “must have a ‘dirty side’ volume less than eight cubic feet too,” otherwise the vacuum must be equipped with explosion venting or chemical suppression as per NFPA standards. Hence, eliminating the possibility of portable vacuum cleaner being used widely in such environment productively.

Hayes Lemmerz International's dust explosion is a classic example that inadequate / improper housekeeping can lead to unsafe accumulations of combustible dust that result in catastrophic industrial accident

Type of Facilities that generate dust

Reducing dust accumulations is a major concern for facilities that produces dust.

A Good housekeeping program depends upon a combination of methods to control dust. **Having the Correct Resources or Tool Or System is always the first step in the correct direction.**

The below is a quick list of some industries with dust…

- Corn Milling, Wet: Establishments primarily engaged in milling corn or sorghum grain (milo).
- Electric Generation: Transmission, and or distribution of electric energy.
- Flour and other Grain Mill Products-except rice.
- Reconstituted Wood Products: Hardboard, particleboard, insulation board, and many similar products.
- Chemicals and Chemicals Preparations: NOC fatty acids, essential oils, gelatin (except vegetable), many other materials.
- Prepared Foods: Various Food items-dry, powdered foods.
- Electroplating: Plating, Polishing, Anodizing, and Colouring (polishing & Tumbling).
- Pharmaceutical Preparations.
- Wood Products.
- Sawmills and Planing Mills.
- Cane Sugar Refining.
- Beet Sugar Manufacturing.
- Mechanical Rubber Goods-Molded, Extruded and Lathe-Cut.

- Motor Vehicle Parts and Accessories: Numerous items including wheels and transmission housings.
- Crop preparation for market except cotton gins (cleaning, shelling, delinting).
- Dry Bakery Products-Cookies, crackers, pretzels and similar.
- Flavoring extracts, syrups, powders and related.
- Fabric mills, broadwoven manmade fibres and silk (weaving fabrics>12 inches wide).
- Fabric Finishers, broadwoven manmade fibres and silk (includes napping, sueding, teaseling).
- Textile goods (many materials including waste, kapok, felt, recovered fiber).
- Millwork.
- Wood kitchen cabinets.
- Structural wood members.
- Prefabricated wood buildings and components.
- Wood household furniture, except upholstered.
- Window blinds and shade and drapery hardware.
- Industrial inorganic chemcials.
- Plastics, synthetic resins, and elastomers (nonvulcanizable).
- Cellulosic manmade fibers.
- Soap and Detergents, except specialty cleaners.
- Paints, vatnishes, lacquers, enamels, and allied products.
- Manufacturing Industries:-includes many products such as matches, candles; lamp shades; feathers; artificial trees and flowers.
- Farm product warehousing and storage.
- Sanitary treatment facilities.
- Refuse systems.
- Scrap and waste materials recycling.
- Plastic Materials and basic forms and shapes.

Information in this article is Extract From Occupational Safety and Health Administration – USA (OSHA) on Combustible Dust Training Programs.

NFPA: National Fire Protection Agency - USA