

Safety tips for implementing proper storage practices in manufacturing plants

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Measures to augment safe storage practices inside manufacturing plants

Overview



Source: <http://www.abbe.com.au/Processes.aspx>

Many a time, storage protocols are not properly defined and followed in manufacturing plants, leading to unwieldy goods handling and management; and potential hazards which can be disastrous. However, these can be completely avoided through implementing safe storage practices.

We at Liberty Videocon General Insurance value the importance of implementing safe storage practices inside your manufacturing plant premises; and intend to suggest some safety measures for the same. We sincerely hope that the measures suggested in this document will help follow safe storage practices in your manufacturing plant.

Types of Storage

1. Solid Piling: Product stored directly on the floor. It consists of cartons, wooden boxes, bales, bags, barrels, metal drums, etc.
2. Palletized: Products placed on pallets.
3. Shelf Storage: Products placed on solid structures, having up to 30 inches deep shelves, 2 feet apart vertically and separated by 2.5 feet wide aisles.
4. Rack Storage: Storage in racks that have vertical, horizontal and diagonal structural members with or without solid shelves, to support stored material. It can be single rack, double rack or multiple racks.

Case Study

Fire in chemical plant storage at Gajroula, Uttar Pradesh

The Incident

A major fire occurred in a chemical plant storage at Gajroula, Uttar Pradesh, resulting in an estimated loss of Rs. 1 crore. The storage shed was provided with flame proof light fitting, whereas, light fittings of the open shed were of ordinary type. A flammable liquid storage area was also within 10 meters of the chemical storage area. One gas cylinder stored in the shed exploded during firefighting, rocketed out and crashed into the roof of the flammable storage shed. Late detection and lack of hydrant posts around the storage area, probably caused hindrance to fire fighting and enhanced the loss.

Probable Cause

The exact cause of the fire was difficult to ascertain. One probable cause could be electrical fault. However, formation of self-ignitable mixture of leaked-out incompatible chemicals also cannot be ruled out.

Fire in storage area of Mumbai processing unit

The Incident

A fire occurred in the storage area - where loose grey cloth was stored - of a Mumbai based company. Due to the presence of high combustible load, fire spread rapidly and damaged the entire stock of loose cloth stored on the first floor; an estimated loss of Rs. 2.50 crore.

Probable Cause

Radiated heat from 100 watts bulb probably started smouldering fires in the loose grey cloth stacks, which remained unnoticed as the godown was closed. Smouldering fire then burst into flames.

Selection and Design of Storage Place

Storage

- Stacking in racks must be done evenly and in straight direction.
- Heavier loads must be placed on lower or middle shelves of racks.
- Hazardous chemical drums must be stored away from forklift movement area. 
- If fire doors are installed, goods must not obstruct the free movement of fire door.
- Strength of structural members: It must take into account external stresses such as wind forces, concentrated load of the heavy products, stresses that the tipping of a pile of goods which may impose on structure.
- Floor Loading Capacity: It is essential to indicate clearly, the safe loading capacity of each floor of the storage sheds. For instance, the load on upper floors is limited to 1 ton / sq. m.
- Goods if susceptible to water damage should always be stacked on raised shelves, pallets.
- Storage racks or shelves should preferably be non-combustible.
- While stacking, care should be taken to ensure that the identification marks on packages are not concealed by adjacent packages or the ones behind.
- Destacking or unstowing should always be done from top so that stability of the stack is not disturbed.
- The height of the stacks should be kept as small as practicable in the circumstances.
- The storage racks should be firmly secured to the floor, wall and to each other.

Housekeeping Storage Practices

- Floors must be clear of clutter, electrical cords, hoses and spills, which may cause employees to slip or trip. 
- Aisles and passageways must be kept clear.
- Sufficient safe clearances must be maintained for aisles and at loading docks or passages where forklifts are used.

- All combustible waste removed from warehouse must be contained in secure metallic bins.
- A detailed inspection of the warehouse should be completed and logged by responsible persons at the end of each working day and a log book should be maintained.

Hazard Safety

- Where hazardous material are stored such as oxidizing chemical, flammable chemical, Material Safety Data Sheet (MSDS) in local language must be displayed. 
- Hazardous goods should be thoroughly checked on arrival. A segregated holding area should be available to quarantine any defective or damaged container.
- All hazardous material containers must be properly labeled, indicating the chemical's identity and appropriate hazard warnings.
- Where battery operated forklift is used, adequate ventilation to disperse fumes from battery charging area should be provided.

Electrical Safety

- All electrical fitting and fixture must be subject to planned preventive maintenance program. Wiring should be inspected and tested at periodic intervals.
- The circuit(s) inside the warehouse shall be isolated using main control switch located in a convenient position outside of warehouse. 
- Lighting fittings should be positioned directly above aisle space. At least 2 meter clearing distance is advisable.

Fire Safety

- The correct procedure for raising the alarm and summoning fire brigade should be established and published.
- Workers must be aware of uses of suitable fire extinguishers and other emergency equipment to fight fire.

- Emergency exit locations, assembly area and floor evacuation plan must be displayed and understood by all workers. 

Others:

- Storage area should be separated from production areas, if not possible, compartment walls should have 2 hour fire resistance.
- Areas / loading docks which are above 4 feet from a person and could fall, should be chained off, roped off or otherwise blocked.
- All operators must be trained, evaluated and certified to ensure that they can operate forklifts safely.
- Material handler must be sure that he / she can see over the load after lifting.
- Workers performing physical work must have adequate periodic rest breaks to avoid fatigue levels that could result in greater risk of accidents and reduced quality of work.
- Emergency contact details must be displayed outside of warehouse.
- Adequate external lightning must be provided.
- For high security warehouses, perimeter fencing, manned guarding and closed circuit television (CCTV) should be installed. 

To ensure implementation of safe storage practices in manufacturing plants, all the mentioned safety procedures need to be strictly followed onsite.

Storage Rack Arrangement

