LiV Safe

Liberty Videocon General Insurance®
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Safe Material Handling of Flammable Liquids

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LiVSafe is a conscious safety initiative of Liberty Videocon to help people live safer, secure lives through an education series of proactive and preventative suggestions in the safety arena. This document does not purport to promote any product directly or indirectly.

Measures to ensure safe handling of flammable liquids

Overview

Use of non-water-based chemicals has increased dramatically. Exposure to the hazards associated with these chemicals has also increased. One potential hazard is flammability. To prevent fires, hazardous liquids require special precautions in storage, handling and use.

The choice of a proper container and storage area for flammable and combustible liquids addresses a significant exposure to loss, but it does not address all hazards presented by these liquids. Safe handling, dispensing, and other operating practices are equally important to minimize the potential for a loss. Safe operating practices involving flammable and combustible liquids need to be tailored to the specific occupancy.

We at Liberty Videocon General Insurance understand the importance of ensuring safe handling of flammable liquids in facilities for preventing loss and damages; and intend to suggest some measures in this document that will help in achieving requisite safe handling of flammable materials.

Source: https://www.fireblast.com/wp-content/uploads/sites/53/2014/07/HazMat-Fire-3.jpg

Case Study

A chemical unit involved in the manufacture of raw materials for cosmetics was destroyed in a blaze on 14th May 2016 at Nacharam, Hyderabad. The massive blaze was triggered due to suspected mishandling of chemicals, and raged for nearly eight hours despite firemen reaching the spot within minutes of being informed.

Learning: Proper flammable storage and handling practices could have mitigated the extent of damage.

Safety Tips

Following are a few key practices for ensuring safe handling of flammable liquids in facilities:

Storage Practices

The following general storage practices should be adhered to in all rooms storing flammable and combustible liquids:

- Do not stack containers with capacities of more than 30 gallons.
- Maintain aisles of at least three feet between all storage arrays.
- Construct all racks and shelves of noncombustible materials. (If wood construction is used for shelves, racks, dunnage and/or scuff boards, the wood should be of at least one inch nominal thickness.)

Dispensing

Dispensing flammable and combustible liquids creates unique fire hazards. These liquids can be extremely volatile and must be handled with care. Static electricity and other ignition sources must be carefully controlled to minimize the potential for a fire. Vapours generated during dispensing operations must be minimized to reduce the fuel available for ignition.

Acceptable Dispensing Methods

Dispensing of flammable liquids from shipping or storage containers to smaller containers may be accomplished by one of the following means:

- Pouring freely from one container to another if the original container has a capacity of five gallons or less
- Pouring freely from safety cans
- Transferring fluids through a closed piping system
- Transferring fluids from the top of a portable tank or container using a device that has anti-siphoning protection

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- Transferring fluids by gravity through a UL-listed or approved self-closing valve or self-closing faucet

Pressure and Vacuum Relief

Flammable and combustible liquids under pressure or vacuum need a relief mechanism to maintain the container at or near atmospheric pressures. If a closed container is heated without proper relief, internal pressure can rise to the point of container rupture.

Bonding and Grounding

As mentioned earlier, the flow of fluid as it is being dispensed creates an electric potential or charge within the liquid that can result in a static discharge if the potential is not relieved through proper grounding and bonding. The static discharge could ignite flammable vapours.

Bonding means electrically connecting two or more conductive objects, so that they remain at the same electrical potential.

Grounding, or earthing, is a specific form of bonding in which one or more conductive objects are connected to the ground so that they maintain the same electrical potential as the earth and are thus electrically 'neutral'.

Ventilation

All areas where flammable liquids are handled should be adequately ventilated to dilute any released vapours to a safe level. The ventilation should be sufficient to dilute the amount of vapour released to well below its flammable limit, and below the relevant occupational exposure limit.

Training

When handling flammable liquids, effective training and instruction for the workers is critical to ensure health and safety. A number of issues should be considered while training the personnel working with flammable liquids as listed below.

- Safe handling and standard operating procedures (SOP)
- Consulting the material safety data sheet (MSDS)
- Fire hazards and toxicity
- Personal Protective Equipment (PPE)
- Engineering controls and equipment maintenance
- Emergency procedures
- Waste handling and labeling

Classification of Flammable and Combustible Liquids

Flammable and Combustible Liquid Classes

Liquids Class	Flash Point	Boiling Point
Class I Flammable Liquids Examples include: acetone, isopropyl alcohol, gasoline, toluene, methyl ethyl ketone		
Class IA Liquids	< 73°F (22.8°C)	< 100°F (37.8°C)
Class IB Liquids	< 73°F (22.8°C)	³ 100°F (37.8°C)
Class IC Liquids	³ 73°F (22.8°C) and < 100°F (37.8°C)	
Class II Combustible Liquids Examples include: mineral spirits, naphtha, amyl ether, dichlorobutance		
	³ 100°F (37.8°C) < 140°F (60°C)	
Class IIIA Combustible Liquids Examples include: dichlorobenzene, methyl benzoate, nitrobenzene, toluidine		
	³ 140°F (60°C) and < 200°F (93°C)	
Class IIIB Combustible Liquids Examples include: motor oil, vegetable oil, butylene glycol, ethylene glycol, glycerine, propylene glycol		
	³ 200°F (93°C)	

Flash Point

The minimum temperature of a liquid at which sufficient vapour is given off to form an ignitable mixture with the air.

Boiling Point

The temperature at which the vapour pressure of a liquid equals the surrounding atmospheric pressure.

Trivia

Flammable and combustible liquids themselves do not burn. It is the mixture of their vapours and air that burns. Gasoline, with a flashpoint of -40°C, is a flammable liquid. Even at temperatures as low as -40°C (-40°F), it gives off enough vapour to form a burnable mixture in air. Phenol is a combustible liquid. It has a flashpoint of 79°C (175°F), so it must be heated above that temperature before it can be ignited in air.

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