Flammable liquids

By Joe Hammond

Before you begin

- Gather information about the flammable liquids in your facility.
- Review the inventory lists prepared for the Hazard Communication standard requirement.
- Verify storage locations of substances that are used.
- Utilize material safety data sheets (MSDSs) as a useful resource for your discussion.
- Obtain samples of the warning labels you use in your Hazard Communication program.
- Collect safety containers used in your facility for this demonstration.

Begin by asking the group to define flammable liquids. Flammable liquids are those which:

- Vaporize at less than 100 degrees F;
- Can be easily ignited;
- Are capable of burning with great rapidity after the source of ignition is removed as long as conditions remain within combustible limits.

According to OSHA, flammable liquids are liquids with a flash point of less than 100 degrees F. The flash point is the lowest temperature at which a liquid gives off enough vapor to form a flammable mixture with air.

Discuss with the group the two types of labeling systems used to identify flammable liquids.

- The NFPA diamond label. A fire hazard rating of three or four denotes a flammable liquid.
- The HMIS system, which uses a similar color and numbering method. With both systems the color red refers to flammability.
- At this point, show examples of both systems.

The explosive concentration of vapors in air has a lower and upper limit. The lower explosive limit (LEL) is the lowest concentration that will ignite. The upper explosive limit (UEL) is the highest concentration that will ignite. If the vapor concentration is between the LEL and UEL, a fire or explosion will occur if an ignition source is present.

Vapors that are heavier than air will flow from an open container to a lower level. A spark or other ignition source can ignite the vapors.

Ask the group for examples of known ignition sources posing a fire hazard at your site.

Examples may include:

- Smoking;
- Electrical motors or switches;
- Static electricity;
- Heat guns;
- Welding;
- Radiant heat;
- Sparks from hand tools.

The methods we may employ to reduce or eliminate hazards associated with flammable liquids include:

- Substitute a less-hazardous product;
- Maintain only the amount needed to perform the task;
- Remove outdated, unused or waste materials from the premises;
- Control ignition sources;
- Avoid pouring flammable liquids into drains;
- Use safety containers designed specifically for flammable liquids;
- Place containers of flammable liquids, such as spray cans, thinners and solvents in flammable safety cabinets. "Approved Cabinets" need to be properly installed/ventilated and limited to 60 gallons of material;
- Store large containers of flammable liquids, such as drums, in an area specifically designed for them. Often, this is an area separated from ignition sources or in a separate facility. Alternatively, store drum-sized containers in a room with a two-hour fire wall and with one and one-half-hour fire doors. The floor should be diked, and floor drains should not share the common sanitary storm drain. Explosion proof electrical fixtures are to be in place;
- Install automatic alarms and fire supression systems;
- Restrict entry to only authorized persons.

Show the types of safety containers your facility uses. Point out the features they possess and, at the same time, display an appropriate label.

Flammable liquids may present health hazards due to exposure. Check a product's MSDS for its specific permissible exposure limit or threshold limit value. Typical symptoms are:

- Inhalation of flammable liquids can cause irritation to the respiratory passages, nausea, headaches, muscle weakness, drowsiness, loss of coordination, disorientation, confusion, unconsciousness and death;
- Skin contact with flammable liquids can cause the skin's oils to be removed, resulting in irritated, cracked, dry skin, rashes and dermatitis;
- Eye contact with flammable liquids can cause burning, irritation and eye damage;
- Ingestion of flammable liquids can irritate the digestive tract, causing poisoning and death.

Conclusion

The use of flammable liquids is a necessary part of our work. It poses an element of danger to our operation. However, with the proper level of respect and caution we should be able to maintain a safe workplace. Fire and explosions have been a source of personal injury and property damage. Everything that can be done to protect our people and our jobs should be a part of our mutual agenda.

Group actions

Ask all attendees to review their respective areas for containers of flammable liquids. Check to see if the containers are:

- Inventoried;
- Properly labeled;
- Properly stored;
- Maintained away from ignition sources.

Have them bring their findings for discussion at the next meeting.

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We always strive to improve the *Safety Leader's Discussion Guide*. Your feedback can help. Please send your comments via e-mail to Safety@ohiobwc.com.

References

Web sites

- Training materials on flammable and combustible liquids (Occupational Safety and Health Administration): www.osha.gov/dte/library/materials_library.html#flammablecombustibleliquids
- Online Safety Library: Flammable and Combustible Liquids (Oklahoma State University Environmental Health & Safety): www.ehs.okstate.edu/links/flam.htm
- Flammable and Combustible Liquids (Canadian Centre for Occupational Health and Safety): www.ccohs.ca/oshanswers/chemicals/flammable/

Videos

BWC's Division of Safety & Hygiene's video library has a number of videos on flammable and combustible liquids. These are available for loan to Ohio employers. Order a catalog by calling **1-800-OHIOBWC** (ask for the video library), or visit our Web site, **ohiobwc.com**.