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TITLE: COFL-FF-EP-4.4.6-2 SOP16 Storage of Flammable Liquids in Portable Tanks

System: Storage of Flammable liquids in portable tanks	Procedure No. : SOP 16
Subsystem: Training	Page No. : Page 1 of 4
Person Responsible: Program Manager	Revision No. :
	Revision Date :

Only approved containers and portable tanks shall be used for storage and handling of flammable liquids. Approved safety cans or Department of Transportation approved containers shall be used for the handling and use of flammable liquids in quantities of 5 gallons or less

1. Purpose:

- a. This SOP has been developed to ensure that flammable liquids stored in portable tanks are properly stored at the fleet fenceline reducing the potential for negative environmental impacts.

2. Definitions

There are a number of definitions included in 29 CFR1910.106. These definitions were derived from consensus standards, and were not uniquely developed for OSHA standards. Some of the more important definitions are discussed below.

Aerosol: a material which is dispensed from its container as a mist, spray, or foam by a propellant under pressure.

Approved: approved or listed by a nationally recognized testing laboratory.

Boiling point: the boiling point of a liquid at a pressure of 14.7 pounds per square inch absolute (psia). This pressure is equivalent to 760 millimeters of mercury (760 mm Hg).

At temperatures above the boiling point, the pressure of the atmosphere can no longer hold the liquid in the liquid state and bubbles begin to form. The lower the boiling point, the greater the vapor pressure at normal ambient temperatures and consequently the greater the fire risk.



Container: any can, barrel, or drum.

Closed container: a container so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

Fire area: area of a building separated from the remainder of the building by construction having a fire resistance of at least 1 hour and having all communicating openings properly protected by an assembly having a fire resistance rating of at least 1 hour.

Flash point: the minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. The flash point is normally an indication of susceptibility to ignition.

The flash point is determined by heating the liquid in test equipment and measuring the temperature at which a flash will be obtained when a small flame is introduced in the vapor zone above the surface of the liquid.

A standard closed container is used to determine the closed-cup flash point and a standard open-surface dish for the open-cup flash point temperature, as specified by the American Society for Testing and Materials (ASTM). These methods are referenced in OSHA's 1910.106 standard.

Combustible liquid: any liquid having a flash point at or above 100°F (37.8°C).

Combustible liquids shall be divided into two classes as follows:

1. **Class II liquids** shall include those with flash points at or above 100°F (37.8°C) and below 140°F (60°C), except any mixture having components with flash points of 200°F (93.3°C) or higher, the volume of which make up 99 percent or more of the total volume of the mixture.
2. **Class III liquids** shall include those with flash points at or above 140°F (60°C). Class III liquids are subdivided into two subclasses:
 - **Class IIIA liquids** shall include those with flash points at or above 140°F (60°C) and below 200°F (93.3°C), except any mixture having components with flash points of 200°F (93.3°C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.
 - **Class IIIB liquids** shall include those with flash points at or above 200°F (93.3°C). This section does not regulate Class IIIB liquids. Where the term "Class III liquids" is used in this section, it shall mean only Class IIIA liquids.

When a combustible liquid is heated to within 30°F (16.7°C) of its flash point, it shall be handled in accordance with the requirements for the next lower class of liquids.

Flammable liquid: any liquid having a flash point below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99 percent or more of the total volume of the mixture. Flammable liquids shall be known as Class I liquids. Class I liquids are divided into three classes as follows:

1. **Class IA** shall include liquids having flash points below 73°F (22.8°C) and having a boiling point below 100°F (37.8°C).

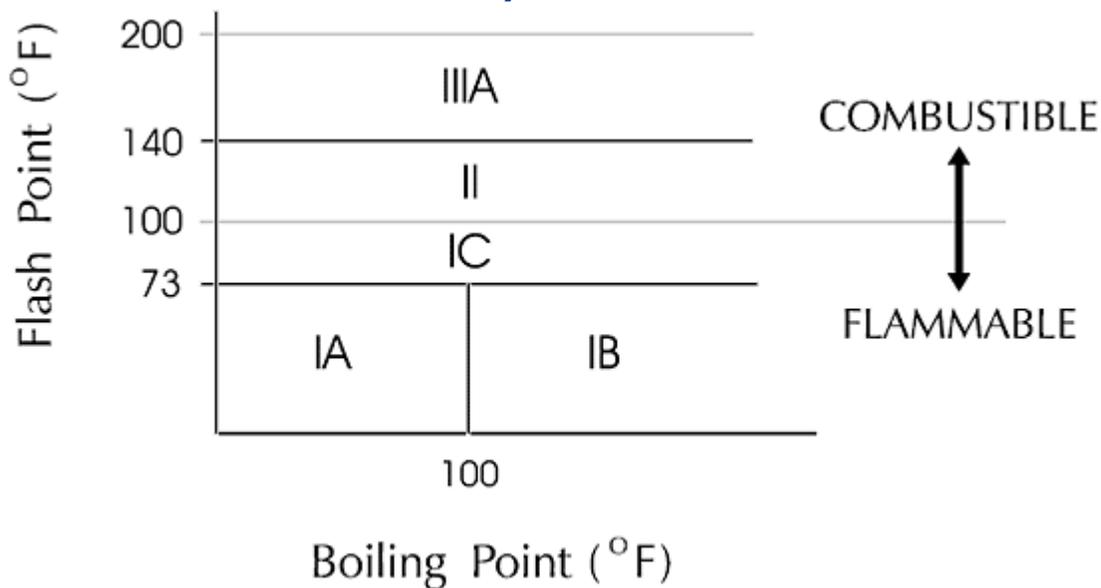


- 2. **Class IB** shall include liquids having flash points below 73°F (22.8°C) and having a boiling point at or above 100°F (37.8°C).
- 3. **Class IC** shall include liquids having flash points at or above 73°F (22.8°C) and below 100°F (37.8°C).

It should be mentioned that flash point was selected as the basis for classification of flammable and combustible liquids because it is directly related to a liquid's ability to generate vapor, i.e., its volatility. Since it is the vapor of the liquid, not the liquid itself that burns, vapor generation becomes the primary factor in determining the fire hazard. The expression "low flash - high hazard" applies. Liquids having flash points below ambient storage temperatures generally display a rapid rate of flame spread over the surface of the liquid, since it is not necessary for the heat of the fire to expend its energy in heating the liquid to generate more vapor.

The above definitions for classification of flammable and combustible liquids are quite complex. The diagram below should aid in their understanding.

Classes of Flammable and Combustible Liquids as Defined by 29 CFR 1910.106



Portable tank: a closed container having a liquid capacity over 60 U.S. gallons and not intended for fixed installation.

Safety can: an approved container, of not more than 5 gallons capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.



Safety Can

Vapor pressure: the pressure, measured in pounds per square inch (absolute) exerted by a volatile liquid as determined by the *Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method)*, American Society for Testing and Materials ASTM D323-68.



Vapor pressure is a measure of a liquid's propensity to evaporate. The higher the vapor pressure, the more volatile the liquid and, thus, the more readily the liquid gives off vapors.

Ventilation as specified in this section is for the prevention of fire and explosion. It is considered adequate if it is sufficient to prevent accumulation of significant quantities of vapor-air mixtures in concentration over one-fourth of the lower flammable limit.

Storage Cabinets

Not more than 60 gallons of Class I and/or Class II liquids, or not more than 120 gallons of Class III liquids may be stored in an individual cabinet

This standard permits both metal and wooden storage cabinets. Storage cabinets shall be designed and constructed to limit the internal temperature to not more than 325°F when subjected to a standardized 10-minute fire test. All joints and seams shall remain tight and the door shall remain securely closed during the fire test. Storage cabinets shall be conspicuously labeled, "Flammable - Keep Fire Away."



Properly labeled storage cabinet

The bottom, top, door, and sides of metal cabinets shall be at least No. 18 gage sheet metal and double walled with 1½-inch air space. The door shall be provided with a three-point lock, and the door sill shall be raised at least 2 inches above the bottom of the cabinet.

3. Scope:

- a. This procedure applies to employees and contractors responsible for storage of flammable liquids stored in portable tanks.

4. Responsibility:

- a. The **Area Supervisors** shall ensure that employees and contractors responsible for storage of flammable liquids stored in portable tanks are properly trained.
- b. Adherence to these written procedures will be the responsibility of City employees and contractors, responsible for storage of flammable liquids stored in portable tanks.

5. Procedure/process:

- a. Flammable liquids shall not be stored in areas used for exits, stairways, or normally used for the safe passage of people.
- b. No more than 25 gallons of flammable liquids shall be stored in a room outside of an approved storage cabinet.
- c. Cabinets shall be labeled in conspicuous lettering, "Flammable-Keep Away from Open Flames."



- d. Not more than 60 gallons of Category 1, 2 and/or 3 flammable liquids or 120 gallons of Category 4 flammable liquids shall be stored in any one storage cabinet. Not more than three such cabinets may be located in a single storage area. Quantities in excess of this shall be stored in an inside storage room.
- e. Materials which will react with water and create a fire hazard shall not be stored in the same room with flammable liquids.
- f. In every inside storage room there shall be maintained one clear aisle at least 3 feet wide. Containers over 30 gallons capacity shall not be stacked one upon the other.
- g. At least one portable fire extinguisher, having a rating of not less than 20-B units shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage of more than 60 gallons of flammable liquids.

6. Training/Education

- a. Employees and contractors responsible for storage of flammable liquids stored in portable tanks must review and fully understand this SOP.
- b. This SOP is reviewed with employees and contractors responsible for storage of flammable liquids stored in portable tanks, and documented in the employee training log.

7. Consequences

Failure to comply with this SOP may:

- Result in fines for non-compliance to environmental laws and regulation relative to the discharge of hazardous waste.
- Violate COFL policy.



RECORDS

Record	Where Filed	Responsible Individual	Indexing Method	Minimum Retention Time

REVISION LOG

Revision No.	Revision Date	Description of Change(s)

AUTHORIZATION

Name	Title	Date