
 CSN Procedure	Facilities Management
Category: Environmental Health and Safety	Effective Date: 08/01/2023
<b>Flammable Liquids: Storage, Handling, and Use</b> 	

## I. PURPOSE

The purpose of this procedure is to provide a broad introduction to the techniques that the College of Southern Nevada (CSN) will utilize to ensure the safe storage and handling of flammable and combustible liquids across its various campuses. The main objective of working safely with flammable and combustible liquids is to avoid the accumulation of vapors and to control sources of ignition. These methods will be in line with relevant Federal, State, and local regulations.

## II. SCOPE

This procedure is specifically designed for the safe storage of flammable liquids that are contained within drums or containers, including flammable aerosols, that do not exceed an individual capacity of 60 gallons. It also covers portable tanks that have a liquid capacity of less than 660 gallons, which are intended for use in mobile or temporary locations. Please note that this procedure does not apply to portable tanks that have a capacity of over 60 gallons and are intended for fixed locations.

## III. DEFINITIONS

- **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).
- **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.
- **Flammable Liquid (OSHA Definitions):** Liquids having a flashpoint at or below 93°C (199.4°F). Flammable and combustible liquids are divided into the following four categories:

Type	Category	Flash Point °C (°F)	Boiling Point °C (°F)
Flammable Liquids	Flammable 1	< 23 (73.4)	≤ 35 (95)
	Flammable 2	< 23 (73.4)	> 35 (95)
	Flammable 3	≥ 23 (73.4) and ≤ 60 (140)	
Combustible Liquids	Flammable 4	> 60 (140) and ≤ 93 (199.4)	
	None	≥ 93 (199.4)	

- **Flashpoint:** 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.

- **Grounding and Bonding:** Bonding means connecting two containers, whereas grounding means connecting the containers to a ground wire or cable.
- **Portable Tank:** a closed container having a liquid capacity of 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 Data Sheet (SDS):** a detailed informational document prepared by the manufacturer or importer of a hazardous chemical. It describes the physical and chemical properties of the product.
- **Storage Cabinet:** a metal or wood cabinet used to store flammable liquids that is manufactured to meet the design specifications of the National Fire Protection Association (NFPA) 30.
- **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.

*Note:* The definitions above apply only for use in determining how to safely store and use flammable and combustible liquids. These definitions should not be used when determining if a spent, used, or unwanted flammable or combustible liquid may be regulated as hazardous waste, applicable transportation regulations, etc.

## IV. PROCEDURE

### A. Responsibilities

1. Environmental Health & Safety (EHS)
  - a. Ensure administration of this procedure; conduct periodic reviews and updates.
  - b. Ensure compliance with environmental and safety regulations through the implementation of this procedure.
  - c. Obtain the necessary storage permit(s) to comply with applicable hazardous materials storage regulations.
  - d. Periodically inspect flammable liquids storage areas to ensure compliance with this procedure.
2. Managers and Supervisors.
  - a. Ensure development, communication, implementation, and evaluation of proper work procedures and completion of required training in accordance with the programs identified herein.
3. Employees
  - a. Comply with the program methods described in this procedure and any subsequently developed program(s) and procedure(s).
  - b. Complete assigned safety training courses.

### B. Training

Employees who handle, use, or store flammable liquids must undergo training before being allowed to do so. The CAPE Learning Management System provides specific training on handling and storing flammable liquids, which employees must take annually. New personnel with flammable liquids handling responsibilities will also receive this training before they begin working with flammable liquids.

### C. Procedures

#### 1. General Storage and Handling Precautions:

Unless otherwise specified at the beginning of this procedure, printed copies of this procedure are UNCONTROLLED.  
Always ensure prior to use you are using the most current copy.

- a. Ensure that storage containers for hazardous materials are in good condition to prevent unnecessary exposure.
- b. Containers of flammable and combustible liquids must be tightly closed when not in use.
- c. Whenever possible, store flammable liquids in the original manufacturer's labeled container (e.g., glass, plastic, metal).
- d. Label all flammable and combustible liquid containers with their contents to prevent accidental misuse or mixing of incompatible chemicals.
- e. At a minimum, label secondary containers with the chemical name and physical/health hazards associated with the chemical.
- f. Segregate and store flammable and combustible liquids at least 20 feet away from oxidizers or use separate storage cabinets for incompatible chemicals. Consult the SDS Section 7- Handling and Storage for guidance on potential incompatibilities.
- g. A maximum of 1 gallon of Category 1 flammable liquids or a combination of no more than 10 gallons of Category 1, 2, or 3 per room or area can be stored in normal storage (e.g., shelves, countertops) in common containers (e.g., glass, plastic, metal).
- h. A maximum of 25 gallons of flammable liquids per room can be stored in flammable liquid safety cans.
- i. Store flammable liquids in containers and drums greater than 25 gallons in secondary containment to prevent accidental spills and ignition.
- j. Do not use an open flame to heat flammable liquids.
- k. Avoid storing flammable and combustible liquids above eye level. Use low shelves or cabinets for heavy containers.
- l. Do not store any items closer than 18 inches to the ceiling, which could impede the effectiveness of automatic fire suppression systems.
- m. Do not store flammable liquids on the floor, which could create a tripping hazard or cause a spill.
- n. Do not store flammable liquids in a way that limits the use of exits, stairways, or areas normally used for safe egress of people.
- o. Routinely inspect flammable liquid storage areas and cabinets for hazardous conditions (e.g., leaked, or spilled chemicals, misplaced and incompatible chemicals, loss of container integrity, lack of secondary containment devices, faded or missing labels).
- p. Eliminate ignition sources, such as open flames, hot surfaces, electrical equipment, and static electricity, from areas where flammable liquids are stored.
- q. Open flames and smoking shall not be permitted in flammable liquid storage areas.
- r. Ensure that there is a functional fire extinguisher in the area where flammable or combustible liquids are stored and used. A portable fire extinguisher must be located outside of a storage room, not less than 10 feet, nor more than 25 feet, from the flammable liquids storage area. The fire extinguisher should be classed for type A, B, and C fires.
- s. Post appropriate warning signs at entrances to areas where flammable and combustible liquids are stored to alert emergency responders to the hazards within the room. Room doors must remain closed unless the doors are equipped with automatic hold open/closure devices that release in the event of a fire and air-balancing of the building is not affected by open doors.
- t. Rags, wipes, and waste with ignitable (flammable or combustible) liquid residues shall be kept to a minimum and stored in listed oily waste receptacles.
- u. Refrigerators used for the storage of flammable liquids must be designed/rated for this purpose.
- v. Contact CSN EH&S to determine specific outdoor storage requirements for quantities of flammable and combustible liquids stored in portable tanks that exceed 60 gallons.

## 2. Personal Protective Equipment

When handling flammable liquids, the following personal protective equipment must be worn at a minimum:

- a. Safety glasses, and if there is a risk of splashing, use goggles in combination with a face shield.

- b. A lab coat or a work shirt, long pants, or an equivalent that fully covers the legs and ankles.
- c. Close-toed non-perforated shoes that completely cover the feet.
- d. Appropriate chemical-resistant gloves.

When using flammable liquids in an enclosed area, respiratory protection may be necessary. Please contact CSN EH&S at (702) 651-7445 to perform a respiratory protection assessment.

To determine if additional or specialized personal protective equipment is needed, please refer to Section 8-Exposure Controls/Personal Protection of the SDS specific to the chemical in question.

### 3. Flammable Liquids Cabinets

- a. Flammable liquids cabinets shall be labeled in conspicuous lettering, "Flammable – Keep Fire Away".
- b. Flammable liquids in quantities of up to 25 gallons must be stored in flammable liquids storage cabinets that comply with manufacturing standards.
- c. Flammable liquids cabinets must not contain more than 60-gallons of Category 1, 2, or 3 flammable liquids, or more than 120-gallons of Category 4 flammable liquids.
- d. Only up to three flammable liquids cabinets are allowed to be placed in the same room or area, except in the following circumstances:
  - i. Additional cabinets may be located in the same area if a minimum distance of 100 feet is maintained between each group of three cabinets, or
  - ii. Up to six cabinets can be stored together if the room or area is safeguarded by an automatic sprinkler system.

### 4. Transferring Flammable Liquids

- a. Gasoline and diesel fuel should only be transferred and stored in safety cans that comply with DOT or OSHA flammable liquid safety regulations.
- b. Ensure there is sufficient ventilation when transferring flammable liquids between containers. Do not permit sources of ignition in areas where flammable vapors may travel. Vapors from flammable liquids are denser than air and tend to sink to the floor level where they can spread over a large area.
- c. Grounding and bonding should always be used when transferring flammable liquids:
  - i. Ground and bond containers with more than 4 liters of Category 1 flammable liquids to avoid static electricity ignition. To prevent static electricity build-up while transferring liquids between plastic containers, avoid free-fall and pour carefully in a steady stream down the sides of the container.
  - ii. Ground and bond containers with Category 1 or 2 flammable liquids, or Category 3 flammable liquids with a flashpoint below 100 °F (37.8 °C) during dispensing.
- d. Conduct dispensing/transferring operations of flammable liquids in a manner that limits the accumulation of flammable vapor/air mixtures to less than 25% of the lower explosive limit (LEL). This can typically be achieved by using the smallest container sizes/volumes possible and performing the operation in a fume hood or another mechanically ventilated area.

### 5. First Aid

- a. In case of skin exposure, remove contaminated clothing and wash the affected area thoroughly with soap and water.
- b. If the eyes are exposed, immediately rinse the eyes with water in the eye wash for at least 15 minutes and call University Police Services at (702) 895-3669.
- c. Refer to Section 4 of SDS for First Aid Measures

### 6. Spills and Leaks

- a. If a flammable liquid spill releases fumes that pose a significant health risk, immediately evacuate the area and notify others of the spill. For further assistance, contact CSN EH&S at (702) 651-7445 during business hours or University Police Services at (702) 895-3669, after business hours.

- b. If there is an immediate danger of fire - activate the nearest fire alarm, where equipped, to evacuate the building and call University Police Services at (702) 895-3669.
- c. Large Spills or Leaks (Greater than 5 Liters/1.32 Gallons)
  - i. In the event of a large spill or leak, notify the immediate supervisor and call EH&S at 702-651-7445 or University Police Services (UPD) at 702-895-3669, if after hours.
  - ii. Remain in the immediate vicinity, if safe to do so, until UPD or EH&S personnel arrive on-site and relieve you from duty.
- d. If it is safe to clean up the spill and you have been trained in proper chemical handling procedures and know the identity of the substance – put on appropriate protective gear and use spill cleanup materials to contain and neutralize the spill.
  - i. Review the SDS for the spilled material to assess the hazards and determine the appropriate level of protection.
  - ii. Prevent the product from entering drains to your best ability, if safe to do so.
  - iii. Follow Chemical Spill Response and Clean-up Procedures.
  - iv. Double bag and securely fasten the spill materials and label them as hazardous waste. Contact CSN EH&S (702) 651-7445 for proper disposal procedures.

#### **7. Disposal**

- a. Most flammable liquids are hazardous wastes and must be disposed of in accordance with local, State, and Federal regulations.
- b. Do not dispose of waste by dumping it down a drain or discarding it in regular trash containers.
- c. Contact EHS for proper disposal of flammable liquids.

#### **V. AUTHORITY AND CROSS REFERENCE LINKS**

NFPA 30 - Flammable and Combustible Liquid Code

29 CFR 1910.106 - Flammable and Combustible Liquids

NFPA 45 - Standard on Fire Protection for Laboratories Using Chemicals