Flammable Liquids

Last Updated: September 2022

A flammable liquid is defined by the National Fire Protection Agency (NFPA) as having a flashpoint below 100°F (37.8°C). The flashpoint is the lowest temperature at which a material can form an ignitable mixture with air and produce a flame when an ignition source is present. The lower the flashpoint, the more easily the liquid can be ignited.

Chemicals covered by this SOP may have additional hazardous properties (such as corrosivity or toxicity). For information specific to other hazards, please reference SOPs for Corrosives or Poisons/Toxins

Personal Protective Equipment & Personnel Monitoring

Lab Coat

Standard lab coats are required. Flame resistant lab coats should be considered when handling flammable liquids and other hazardous materials that are easily ignited. A chemical-resistant apron over the lab coat is recommended when working with large volumes of this particular hazard class.

Gloves

Nitrile or neoprene gloves typically provide adequate protection against minor splashes. Consult with your PI or supervisor to determine whether any materials involved in your process require alternative hand protection.

Eye Protection

ANSI Z87.1 - Compliant safety glasses or safety goggles if a splash hazard is present.

Labeling & Storage

Flammable liquids should be stored in a flammable storage cabinet with self-closing hinges or in a refrigerator/freezer rated for flammable storage. These refrigerators and freezers have a spark-proof interior that separates the contents from the compressor and motor, preventing ignition of flammable vapors inside the storage compartment. Storage of flammable liquids in refrigerators/freezers not specifically designed and approved for that use shall be strictly prohibited.

Flammable liquids should be kept away from oxidizers, and incompatible corrosives.

It is recommended the total amount of flammable and combustible liquids, including waste, in research laboratories shall not exceed the quantities presented below:

- 20 gallons of flammable liquids per 100 ft^2 of laboratory unit.

- 120 gallons of flammable liquids in a single laboratory unit.
- Up to 35 gallons of flammable liquids outside flammable storage cabinet. Of this amount, 25 gallons must be contained in 2 gallon or smaller approved safety cans. Chemical quantities outside of storage shall be maintained at the lowest possible level necessary for the work performed.
- Quantities recommended within an instructional laboratory unit shall be limited to 50% of the quantities recommended for research laboratory units.

These limitations are meant to serve as a general guide. Actual limitations vary based on many different factors. For an assessment, please contact the Office of Research Safety or the Environmental Safety Division.

Engineering Controls, Equipment & Materials

Fume Hood	Use a fume hood to keep exposure to this hazard class as low as possible. If the use of a fume hood is impossible or impractical, please contact the Office of Research Safety (ORS) to determine whether additional respiratory protection is required. Keep the fume hood clear of other potentially combustible or flammable materials. Keeping clutter to a minimum will lessen the hazard in the event of a small fire.

Cautions & Considerations

Static Electricity	When transferring flammable liquids between containers greater than 4L (1 gallon) containers should be grounded, and the source container should be bonded to the receiving container during transfer. If possible, transfer flammable chemicals from glass containers to glassware or from glass container/glassware to plastic. Transferring these types of chemicals between plastic containers or unbonded metal containers may lead to a fire due to the buildup of static electricity.

Housekeeping

Spills	Notify others in the area of the spill, including your supervisor. Remove sources of ignition if possible. Laboratory personnel should refer to the Spill Control Guidelines for additional information.
Decontamination	Decontamination methods vary based on the materials handled and equipment being used. Please review the chemical Safety Data Sheet for guidance on cleaning materials or contact the Office of Research Safety.

Waste	Any waste from this chemical class should be disposed of through the UGA Hazardous Waste Program. For assistance with arranging a waste pickup, you may contact the Environmental Safety Division (ESD) at 706-542-5801. Prior to pickup, any container used to hold hazardous waste should be labeled with the following: - "Hazardous Waste" - Chemical contents: Enough detail should be provided so that the full contents of the container are readily apparent. Labeling may include any of the following: • Percentages (Ex: 70% water, 30% hydrochloric acid) • Volumes (Ex: 1L of acetone, 500mL of water) • Chemical classes (Ex: halogenated solvents) • Method (Ex: EPA 515.1 Herbicide Extraction Solvent Waste) • Referenced Log (Ex: See Laboratory Waste Log, Volume 2) • Utilizing Chematix waste profiles • Any other labeling method providing enough detail to accomplish this requirement - One or more of the following waste characteristics recognized by EPA: Ignitable, Corrosive, Reactive, or Toxic.

First Aid & Emergencies

Fire	Use a dry chemical or CO_2 extinguisher (ABC or BC) to put out a small fire.
Skin | Eye Contact	Remove contaminated clothing and accessories; flush affected area with water. If symptoms persist, get medical attention.
Inhalation	Move person into fresh air. If symptoms persist, get medical attention.
Ingestion	Rinse mouth with water. If symptoms persist, get medical attention.

References

Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards, National Research Council, 2011

NFPA 45: Standard on Fire Protection for Laboratories, National Fire Protection Agency, 2015

UC Center for Laboratory Safety

Contacts

Office of Research Safety: 706-542-5288
Environmental Safety Division: 706-542-5801