



FLAMMABLE LIQUIDS



Examples: Ethanol, Isopropanol, Methanol, Acetone, n-Hexane, Pentane

What is a flammable Liquid?

- ❖ 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.

Selection and Purchase

- ❖ Purchase only what you need, do not hoard flammables or any other chemical.
- ❖ If possible, purchase flammables in shatter-resistant containers (i.e. PVC-coated glass)

Hazards

- ❖ Before using any flammable chemical, read the **Safety Data Sheet (SDS)** for specific hazard information.
- ❖ A **lab-specific Standard Operating Procedure (SOP)** is required for any flammable that is a **Particularly Hazardous Chemical** (i.e. Benzene, Acrolein).
- ❖ Vapors can result in fire and explosion if ignited.
- ❖ Static electricity may ignite vapors.
- ❖ Some flammables can be toxic and/or corrosive.

Storage and Transportation

- ❖ Read the **Safety Data Sheet (SDS)** for specific information about proper storage and incompatible chemicals.
- ❖ Storage in a approved flammables cabinet is preferred.
- ❖ In a lab, no more than 10 gallons can be kept outside a flammables cabinet.
- ❖ If refrigeration is necessary, use refrigerators/freezers that are rated for the storage of flammable chemicals.
- ❖ Transport from room to room by securing in a cart or using a bottle carrier.

Engineering Controls

- ❖ Read the **Safety Data Sheet (SDS)** for specific information about engineering controls.
- ❖ Use a chemical fume hood if:
 - The chemical poses a risk of **explosion, splash hazard or a highly exothermic reaction.**
 - The chemical is hazardous by inhalation and/or irritating to the eyes or respiratory system.
 - More than 500mL of flammable liquids is being used in an experiment.

Administrative Controls / Work Practices

- ❖ Know the location of the nearest fire extinguisher.
- ❖ Use only the amount of chemicals you need to perform your work.
- ❖ **Eliminate sources of ignition** (i.e. open flames, hot plates, etc.) from work areas where flammable liquids are used.
- ❖ Ensure that metal containers are properly grounded when transferring flammable liquids.
- ❖ To prevent vapor escape, close containers when when not in use.

Personal Protective Equipment (PPE)

- ❖ Read the **Safety Data Sheet (SDS)** for specific information about required PPE.
- ❖ **When working with flammables, at the very least wear:**
 - Fastened lab coat
 - ANSI Z87.1-compliant safety glasses or safety goggles.
 - **Nitrile gloves**, consult with the chemical manufacturer to determine if nitrile gloves are sufficient. Some solvents may require **butyl rubber** gloves for skin protection.
- ❖ **When working with large amounts or a risk of splash is possible:**
 - Wear flame resistant lab coat.
 - Wear chemical splash goggles and face shield.
 - Avoid wearing flammable clothing such as many synthetics.

Emergencies, Spill Procedures and Exposures/Unintended Contact

- ❖ **Fire:** Know the location of the nearest fire extinguisher:
 - If fire is larger than a small trash can, **evacuate lab** and **activate building fire alarm** and **call 911**.
 - **ABC** and **CO₂** extinguishers are appropriate for most fires.
- ❖ **Small Chemical spill (<500ml):**
 - Alert people in the lab that a spill has occurred.
 - Put on the proper Personal Protective Equipment (PPE) before beginning cleanup.
 - Use absorbent pads from your spill kit to absorb spilled materials.
 - Place the used spill kit materials in a chemical waste bag, label the bag with a hazardous waste label.
 - Contact EHSRM at 245-3616 to to have used spill kit materials properly disposed.
- ❖ **Large Chemical spill (>500ml):**
 - Alert people in the lab that a spill has occurred.
 - **If safe to do so**, turn off all ignition sources and activate all ventilation devices (i.e. fume hoods).
 - Evacuate lab, if building needs to be evacuated activate building fire alarm.
 - **Call 911** and **EHSRM at 245-3616 (512-738-6650 after hours)**.
 - Stay nearby in a safe area until emergency personnel arrive to provide them information about the spill.
- ❖ **First Aid Procedures:**
 - **Inhalation** - Move to fresh air. If not breathing, give artificial respiration. Get medical attention.
 - **Eye contact** - Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
 - **Skin contact** - Remove contaminated clothing. Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, contact a physician.
 - **Ingestion** - Rinse mouth with water. If symptoms persist, get medical attention.

Waste Disposal

- ❖ **No flammable or combustible liquids (including alcohols) are permitted to be poured down the drain.**
- ❖ Store hazardous waste in closed containers that are properly labeled, and in a designated Satellite Accumulation Area (SAA).
- ❖ Flammable and combustible liquid waste should be segregated from all incompatibles such as oxidizers.
- ❖ Request chemical waste collection from EHSRM by calling 245-3616

Other Safety Considerations

- ❖ Large containers of flammables (20L or greater) should always be grounded, and should be bonded to the receiving container during transfer. .
- ❖ Always transfer flammable chemicals from glass containers to glassware or from glass container/glassware to plastic. Transferring flammables between plastic containers or unbonded metal containers may lead to a fire hazard due to static electricity.

