

Safe Use of Flammable and Combustible Liquids

Flammable and combustible liquids are the most common type of hazardous materials stored and used on the Stanford University campus. Improper storage and use of flammable liquids poses a significant hazard and threat of fire.

On average, fire departments respond to more than 150,000 fires where flammable and combustible liquids were listed as the first material ignited. Using and storing flammable and combustible liquids in a safe manner in accordance with the Fire Code will help to reduce the hazard posed by flammable and combustible liquids.

Classification of Flammable and Combustible Liquids		
Classification	Flash Point	Boiling Point
Class IA Flammable Liquid	Below 73° F (23° C)	Below 100° F (38°C)
Class IB Flammable Liquid	Below 73° F (23° C)	At or Above 100° F (38°C)
Class IC Flammable Liquid	At or Above 73° F (23° C) and Below 100° F (38°C)	NA
Class II Combustible Liquid	At or Above 100° F (38°C) and Below 140° F (60°C)	NA
Class IIIA Combustible Liquid	At or Above 140° F (60°C) and Below 200° F (93°C)	NA
Class IIIB Combustible Liquid	At or Above 200° F (93°C)	NA

The following safety guidelines will be help to ensure that flammable and combustible liquids are used and stored in a safe manner:

1. The storage of flammable and combustible liquids shall not exceed the Maximum Allowed Quantity (MAQ) allowed by the Fire Code. **Table 5003.1.1(1) of the 2016 California Fire Code.**
2. Flammable and combustible liquid containers shall be clearly labeled with warning labels and the name of the liquid. **§5703.5 of the 2016 California Fire Code.**
3. A fire extinguisher shall be readily available in areas where flammable and combustible liquids are handled, stored or used. **§906 of the California Fire Code.**
4. When it is necessary to store flammable and combustible liquids in a refrigerator, the refrigerator must be listed or approved for the storage of flammable liquids. **§5003.2.3 of the 2016 California Fire Code.**
5. Equipment utilizing flammable or combustible liquids must be listed and approved for such use. **§5003.2.3 of the 2016 California Fire Code.**
6. Flammable and combustible liquids shall be separated from incompatible materials including strong oxidizers. **§5003.9.8 of the 2016 California Fire Code.**
7. Flammable and combustible liquids should never be heated with an open flame use an approved method such as a water bath or a heating mantles approved for use with flammable liquids.
8. Class IA Flammable liquids shall not be used for cleaning purposes. Class IB, IC and Class II liquids can only be done in rooms that are classified in accordance with the California Building Code as a H2 or H3 based on use, dispensing and mixing of flammable or combustible liquids or in a parts cleaner that is listed and approved for the use of the flammable or combustible liquids. **§5705.3.6.1 of the 2016 California Fire Code.**



9. Dispensing and open use of flammable and combustible liquids shall be in areas with adequate mechanical ventilation. An approved fume hood will safely exhaust flammable vapors.
10. In areas where flammable and combustible liquids are used, handled, dispensed or stored, electrical equipment shall be installed and maintained in accordance with the California Electric Code.

§5705.3.6.1 of the 2016 California Fire Code.

11. An approved self-closing metal container shall be provided and maintained in all rooms or locations where oily rags, oily waste, paint rags or similar materials subject to spontaneous ignition. The containers shall be emptied daily. ***California Code of Regulations, Title 19, Public Safety Code, §3.19(c).***
12. Hot work operations shall not be conducted in areas where flammable liquids in areas where flammable and combustible liquids are used, handled, dispensed or stored. ***§3501.3 of the 2016 California Fire Code.***
13. Flammable and combustible liquid waste is considered Hazardous Waste and shall be disposed of in accordance with all federal, state and local regulations. ***For questions regarding Hazardous Waste call the Hazardous Waste Help Line at 725-7520.***

In the next issue of From the Ground Up, the final part in the series on flammable and combustible liquids will provide information on the safe use and handling of flammable and combustible liquids in laboratories.

If you need any additional information regarding flammable liquids, please contact me at mvonraesfeld@stanford.edu. Working together, we can keep Stanford University fire safe.

