Safety Guidelines for Flammable Storage Cabinets

A. Scope

This document supplements the TAMU & TEES Safety Manuals and provides a basic guideline for laboratory and non-laboratory areas.

B. Definitions

Flammable liquid: those liquids having a flash point below 100 degrees F. and a vapor pressure not to exceed 40 psia at 100 degrees F. All flammable liquids are classified as Class I liquids.

Combustible liquid: Those liquids having a flash point above 100 degrees F. Combustible liquids are subdivided as follows:

Class II	Liquids with flash points at or above 100 degrees F. and below 140 degrees F
Class IIIA	Liquids with flash points at or above 140 degrees F. and below 200 degrees F
Class IIIB	Liquids with flash points above 200 degrees F

C. Need for a Flammable Storage Cabinet

The need for a Flammable Storage Cabinet is driven by the class of flammable or combustible liquid present as well as the total quantity and location of these liquids. The total amount of flammable and combustible liquids allowed shall be in accordance with the amount shown in the applicable table below.

Table 1: Maximum Quantities of Flammable and Combustible Liquids in Non-Sprinklered Labs

Flammable or Combustible Liquid Class	Maximum Quantity per (100 sq. ft.), not stored in a Cabinet	Maximum Quantity per Laboratory, not stored in a Cabinet	Maximum Quantity per (100 sq. ft.), including that stored in a Cabinet	Maximum Quantity per Laboratory, including that stored in a Cabinet
I*	7.5L (2 gal)	284 L (75 gal)	15 L (4 gal)	570 L (150 gal)
I*, II and IIIA	15 L (4 gal)	380 L (100 gal)	30 L (8 gal)	760 L (200 gal)

*This category includes Class I flammable liquids and liquefied flammable gases.

Table 2: Maximum Quantities of Flammable and Combustible Liquids in Sprinklered Labs

Flammable or Combustible Liquid Class	Maximum Quantity per (100 sq. ft.), not stored in a Cabinet	Maximum Quantity per Laboratory, not stored in a Cabinet	Maximum Quantity per (100 sq. ft.), including that stored in a Cabinet	Maximum Quantity per Laboratory, including that stored in a Cabinet
I*	7.5 L (2 gal)	570 L (150 gal)	15 L (4 gal)	1136 L (300 gal)
I*, II and IIIA	15 L (4 gal)	757 L (200 gal)	30 L (8 gal)	1515 L (400 gal)

*This category includes Class I flammable liquids and liquefied flammable gases.

D. Venting Flammable Storage Cabinets

Venting of flammable storage cabinets is not recommended due to the fact that it could reduce the fire protection effectiveness of the cabinet. It is recognized that some individuals and departments may want to vent these cabinets to reduce odorous vapors emanating from the cabinet. This is particularly true when the cabinet is located in an occupied area. To minimize the affect on the fire resistance of the cabinet the following criteria should be followed:

- Mechanical exhaust ventilation shall be utilized. Exhaust shall be discharged above the roof using an existing lab exhaust system or as an independent system.

- The cabinet shall be vented from the bottom with fresh air being supplied from the top. The flame arrestor shall remain in both the lower and upper bungholes. The bungholes should be regularly inspected and cleaned to prevent them from becoming blocked.
- The exhaust duct provided shall be a material of equivalent strength (or better) as the material used for the cabinet's construction (a minimum of 18 gauge sheet steel). The exhaust duct shall also be a material compatible with the liquids stored inside the cabinet.
- The exhaust duct shall be welded. The use of stovepipe, dryer vent and PVC is prohibited.

E. Other considerations concerning Flammable Storage Cabinets

- Never locate the flammable storage cabinet by an exit door.
- Flammable Storage Cabinets must be listed by Factory Mutual, Underwriter's Laboratory or other qualified testing agency.
- Materials stored inside of the Flammable Storage Cabinet should be compatible with the cabinet's design and construction.
- The Flammable Storage Cabinet must be clearly labeled with a sign, which reads: "Flammable - Keep Fire Away."
- Acids should generally not be stored in a flammable storage cabinet due to the corrosion of the cabinet and incompatibility with organic solvents. Recommendation: Store acids in a labeled “Acid Cabinet.”

References:

- National Fire Protection Association. **NFPA-30: Flammable and Combustible Liquids Code.** Batterymarch, PA: NFPA, http://www.nfpa.org/
- National Fire Protection Association, **NFPA-45: Fire Protection for Laboratories Using Chemicals.** Batterymarch, PA: NFPA, http://www.nfpa.org/
- OSHA. General Industry Safety and Health Standards, 29 CFR 1910.106. Washington D.C.: Bureau of National Affairs, Inc. http://www.osha.gov/
- Laboratory Safety Institute. http://www.labsafety.org/