

ASU Laboratory Standard and Design Guide

Section 4.0: Flammable liquid storage cabinet requirements

Table of Contents

References, regulations and standards.....	2
Flammable liquid storage requirements	2
Cabinet design	2
Labeling	3
Construction	3
Location	3
Venting guidelines.....	3
Hazardous material storage cabinets.....	3
Corrosive cabinets	4
Gas cabinets	5

The Laboratory Standard and Design Guide applies to all Arizona State University facilities, including leased properties. It covers the design, construction and installation of flammable liquid storage cabinets. The guide does not address the proper use of flammable liquid storage cabinets.

Environmental Health and Safety must review and approve deviations from the Laboratory Standard and Design Guide. The guide does not relinquish the owner or contractor from the following:

- Adhering to all applicable codes and standards for their project.
- Following EHS requirements or requirements outlined in this guide.

References, regulations and standards

Please reference the following regulations and standards to ensure your flammable liquid storage cabinet aligns with the International Fire Code, National Fire Protection Associate or state of Arizona statute standards:

- Any applicable references from all IFC, NFPA or state of Arizona statutes.
- IFC chapter 50 and chapter 57, 2012 edition.
- NFPA code 30 and code 99.

Flammable liquid storage requirements

EHS intends for flammable liquid storage cabinets to store flammable and combustible liquids.

Flammable liquid storage cabinets must have the following:

- ASU fire marshal review and approval to ensure compliance with exposure control, installation, ventilation, usage, and maximum allowable quantities control per control zone and physical and health hazard categories.
- EHS approval ensures a minimum quality level consistent with code and university requirements.
- UL-listing certification.

Cabinet design

Flammable liquid storage cabinets should not be designed to exceed 120 gallons for the combined total quantity of all liquids, such as classes one, two and three.

EHS requires one or more flammable liquid storage cabinets for laboratories that handle, store or use 10 or more gallons of flammable or combustible liquids.

Labeling

Flammable liquid storage cabinets must be conspicuously labeled red on a contrasting background: “**FLAMMABLE: KEEP FIRE AWAY.**” The ASU fire marshal must review and approve any signage.

When flammable or combustible liquids present multiple hazards, the laboratory design must address the storage requirements for each hazard. EHS and the ASU fire marshal must review and approve requirements with any stipulations to meet university specifications for storage and use.

Construction

New flammable liquid storage cabinets must be constructed of steel. Wood cabinets are not [UL listing certified](#) or EHS-approved. Flammable liquid storage cabinets must be constructed as follows:

- Double-walled construction with a minimum air gap of 1 1/2 inches between the walls, including the door, top, bottom and sides.
- Liquid-tight bottom with a door sill of at least 2 inches.
- Minimum wall thickness of 0.044 inches — 18 gauge.
- Three-point latch on doors.
- Tight-fitting joints, welded or riveted.

Location

Flammable liquid storage cabinets **cannot be located or mounted** in the following areas or ways:

- Around an open flame or other ignition source.
- Near exit doorways, stairways or in a location that would impede egress.
On a wall-mount, as wall-mounted cabinets are not [UL listing certified](#) or ASU fire marshal-approved.

Venting guidelines

Hazardous material storage cabinets

Combustible or flammable storage cabinets store flammable or combustible liquids exceeding the maximum allowable quantity for laboratory occupancy or not stored in a specific type of container within the lab. These cabinets must be designed following the recognized and generally accepted good engineering practices, [adopted International Fire Codes](#) and the authority having jurisdiction.

Please adhere to the following standards when venting hazardous material storage cabinets:

- Avoid compromising the specified performance of the cabinet if a flammable liquid storage cabinet is ventilated.
- Design and fabricate piping, valves, fittings and related components intended for use with flammable and combustible liquids with suitable materials having adequate strength and durability.
 - The design should be able to withstand the pressures, structural stressors and exposures to which it could be subjected.
 - The equipment should follow the recognized and generally accepted good engineering practices, [adopted International Fire Codes](#) and the authority having jurisdiction.
- Ensure exhaust vent materials are compatible with the contents of the cabinets. Construction of the venting duct should be equal to the cabinet's rating.
- Guarantee that vent materials for flammable liquid storage cabinets are resistant to high temperatures generated in a fire.
 - Stainless steel, hard-soldered copper and carbon steel are appropriate vent materials for flammable storage cabinets if the material is compatible with the intended services.
 - Do not use the non-metallic duct to vent flammable storage cabinets.
- Include recessed flooring for spill retention, appropriate internal lining and ventilated exhaust under the fume hood storage intended for hazardous materials to maintain containment of materials.
 - The equipment should follow the recognized and generally accepted good engineering practices, [adopted International Fire Codes](#) and the authority having jurisdiction.
- Refrain from manifolding vent piping from multiple cabinets.
- Seal the cabinet with the bungs supplied or specified by the manufacturer if the cabinet is not vented.
- Ventilate the interior of cabinets for health and safety considerations, such as odor control and control of potentially hazardous vapors. All toxic material storage cabinets must be vented.

Corrosive cabinets

Corrosive cabinets store corrosive liquids capable of corroding steel at a rate of more than 0.250 inches per year at a test temperature of 55 degrees Celsius.

The corrosive cabinet must be vented to the fume hood or lab exhaust systems as appropriate per the [National Institutes of Health standards](#). Corrosive cabinets should follow the recognized and generally accepted good engineering practices, [adopted International Fire Codes](#) and the authority having jurisdiction.

Gas cabinets

EHS requires gas cabinets to store all flammable, corrosive and toxic compressed gas containers. These cabinets should follow the recognized and generally accepted good engineering practices, [adopted International Fire Codes](#) and the authority having jurisdiction.

Gas cabinets require a connection to an exhaust system. The manufacturer determines the local exhaust ventilation needed to operate the cabinet. [Refer to the EHS Compressed Gas Safety Program](#) for guidelines on pressure vessels and compressed gas cylinders.