



**Title: Flammable Liquids Cabinets
Policy and Procedures**

**Issue Date: August 2001
Latest Revision: January 2013**

Policy Statement

Design criteria for flammable storage cabinets are set-forth by the National Fire Protection Association (NFPA). While cabinets may come in a variety of shapes and sizes, the basic design remains the same, and this document addresses the requirements necessary to ensure safety.

Applicable Campus:

All University of Colorado Denver | Anschutz Medical Campus

Purpose

To establish a policy for requirements of Flammable Liquid Cabinets on campus property.

Scope

The policy covers all campus departments and staff.

Procedures

DESIGN

The following lists the main components required for a cabinet to meet the “approved” status.

- ◆ The top, bottom, sides, and door shall be No. 18 gauge sheet steel, and shall be double-walled with 1 ½ inch air space.
- ◆ Joints shall be riveted, welded, or made tight by some equally effective means.
- ◆ The door shall be provided with a three-point latch arrangement. (Basically, the door must have a “positive latch” mechanism, such that the door cannot accidentally open.)
- ◆ The door sill shall be raised at least 2 inches above the bottom of the cabinet to retain spilled liquid within the cabinet.

Additional notations:

- ◆ The cabinet may not have holes drilled, unless the design allows for holes (such as mounting to walls).
- ◆ Newer flammable liquid cabinets will usually have self-closing doors.
- ◆ Many cabinets are labeled as having been tested by FM—Factory Mutual or UL—Underwriters Laboratories.
- ◆ Storage cabinets that are designed and constructed to limit the internal temperature at the center of the cabinet and 1 inch from the top of the cabinet to not more than 325 ° F when exposed to a 10-minute fire test that simulates the fire exposure of a standard time-temperature curve (specified in NFPA 251) shall be considered acceptable.

MARKINGS

Storage cabinets shall be marked in a conspicuous lettering: "**FLAMMABLE—KEEP FIRE AWAY.**" (Older cabinets may simply indicate "Flammable Materials" or some equivalent warning.)

VENTING

Venting of flammables cabinets requires the approval of the campus Fire and Life Safety Officer.

The National Fire Protection Association (NFPA) states, "Storage cabinets shall not be required by the code to be vented for fire protection purposes, and vent openings shall be sealed with the bungs supplied with the cabinet. If the cabinet is vented, it shall be vented directly outdoors in such a manner that will not compromise the specified performance of the cabinet, and in a manner that is acceptable to the authority having jurisdiction."

It is clear that venting of flammable liquid cabinets is not desirable from the fire safety point of view. That being said, there may be valid industrial hygiene concerns, in that venting limits the quantity of vapors that could be inhaled when personnel open the cabinet doors. The Appendix to the NFPA Flammable and Combustible Liquids Code continues:

"Venting of storage cabinets has not been demonstrated to be necessary for fire protection purposes. Additionally, venting a cabinet could compromise the ability of the cabinet to adequately protect its contents from involvement in a fire since cabinets are not generally tested with any venting. Therefore, venting of cabinets is not recommended.

However, it is recognized that some jurisdictions can require storage cabinets to be vented and that venting can be desirable for other reasons, such as air quality. In such cases, the venting system should be installed so as to not affect substantially the desired performance of the cabinet during a fire. Means of accomplishing this can include thermally actuated dampers on the vent openings or sufficiently insulating the vent piping system to prevent the internal temperature of the cabinet from rising above that specified. Any make-up air to the cabinet should also be arranged in a similar manner.

If vented, the cabinet should be vented from the bottom, with make-up air supplied from the top. Also mechanical exhaust ventilation is preferred and should comply with *NFPA 91, Standard for Exhaust Systems for Air Conveying of Materials*. Manifolding the vents of multiple storage cabinets should be avoided." (NFPA 30, Flammable and Combustible Liquids Code)

As to the use of piping material, the editor of the NFPA 30 document has issued a statement that PVC piping would "probably not withstand fire exposure to the same extent as metal piping." It was his personal opinion that, "metal tubing or metal piping should be used for such purposes." At least one manufacture's catalog indicates metal tubing being used as the vent tube.

It is important to differentiate the flammable cabinets from the acid/corrosive cabinets. In the case of corrosive materials, the PVC plastic is more resistant to corrosive effects.

Therefore, acid resistant PVC or stainless steel seems to be acceptable for acid cabinets; however, flammable liquid cabinets are designed to prevent the contents of the cabinet being exposed to high temperatures, and PVC piping is subject to early failure. Therefore, plastic type materials are not to be used for vent piping on flammable cabinets unless documents can be presented indicating that such material meets the manufacturer's specification for the cabinets. Metal piping, wrapped with fireproof insulation, would be acceptable, provided that it can sufficiently limit exposure of the inside of the cabinet to temperatures listed in the cabinet's design criteria.

For further information or guidance, contact the campus Fire & Life Safety Officer at 303 724-0293.

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12/17/2012
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12/18/12
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References:

- 2009 ed. International Fire Code
- Campus Authority having Jurisdiction Policy
- National Fire Protection Agency (NFPA) Standards