

Flammable Storage Cabinets

Overview

Flammable storage cabinets are important safety features which prevent the contents from catching fire or exploding for a period of time in case of fire in the lab. The NIH Design Requirements Manual (DRM) requires flammable storage cabinets listed by the Underwriters Laboratories (UL) in all wet labs, and safety procedures require that all flammable liquids be safely sealed and stored when not in use. The Occupational Safety and Health Administration (OSHA) Flammable Liquids standard 29 CFR 1910 requires a flammable storage cabinet to be designed and constructed to limit the internal temperature to no more than 325 degrees Fahrenheit from the center of the cabinet to within 1 inch of the top of the cabinet when subjected to a 10-minute fire test¹.

The National Fire Protection Association (NFPA) defines a flammable liquid as any liquid that has a closed-cap flash point below 100 degrees Fahrenheit². Flammable liquids are divided into categories based on flashpoint threshold, which is a measure of hazard. A variety of flammable liquids are used routinely in laboratory work and must be safely handled and stored.

Construction Requirements

NFPA and OSHA require flammable cabinets to be designed and constructed to specific requirements. The OSHA Flammable Liquids standard 29 CFR 1910 required that flammable cabinets are constructed as follows³:

- Bottom, top and sides shall be at least 10 gauge sheet steel.
- Cabinets shall be double-walled with 1 1/2" air space.
- Joints shall be riveted, welded or made tight by some equally effective means.
- Doors shall have a 3-point latch.
- Door sill shall be raised at least 2" above the cabinet to retain spillage within the cabinet.
- Cabinet shall be have 'FLAMMABLE – KEEP FIRE AWAY' signage.

Placement and Installation Requirements

Flammable storage cabinets shall be sized for the anticipated usage in a particular lab. Additional flammable storage cabinets shall be provided per NFPA 45 (Standard on Fire Protection for Laboratories Using Chemicals). Due to the potentially hazardous

nature, the DRM and good lab practice requires safe placement of flammable storage cabinets.

Flammable storage cabinets:

- Shall not be located in corridors.
- Shall be located as remotely as possible from lab entrances.
- Shall not be located under fume hoods.
- Shall be located as far as possible from solvent storage.

Many flammable storage cabinets are manufactured with plugged vents to allow for natural or mechanical ventilation. The DRM requires that vents remain plugged, and does not allow for cabinet ventilation. The intention of this prohibition is to contain hazardous vapors in the cabinet, and limit their spread into the laboratory or the mechanical systems.

Figure 1: Undercounter Flammable Storage Cabinets



Conclusion

Flammable storage cabinets are an important component of laboratory design, and shall be carefully specified and located within the lab to

address safety and regulatory requirements.

References

- (1) Occupational Safety and Health Administration Regulation 29 CFR 1910.106(d)(3)(ii)
- (2) NFPA 1, Section 3.3.165.2
- (3) Occupational Safety and Health Administration Regulation 29 CFR 1910.106(d)(3)(ii)(a)

Further Information

NFPA 1, Sections 34.4.4 Flammable and Combustible Liquids

NFPA 1, Section 66.9.5 Flammable Liquid Storage Cabinets



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