



Flammable Liquids Storage: Standard for Storage Cabinets

Many laboratories present a high fire risk caused by the storage of flammable liquids. This risk can be reduced by minimizing the quantities stored in the laboratories and by ensuring that flammable liquids are stored in appropriate storage cabinets. This standard is based on Regulation 851, as amended (Regulation for Industrial Establishments) made under the Occupational Health and Safety Act of Ontario, and Regulation 213/07 (the Fire Code) made under the Fire Protection and Prevention Act.

Note: In this standard, "worker" includes faculty, staff, students, and visitors.

SCOPE:

All laboratories in which flammable liquids that are not required for immediate use are stored.

RESPONSIBILITIES:

Principal investigators/supervisors and all others in authority shall:

- provide storage cabinets for flammable liquids that are stored in the laboratory;
- ensure that flammable storage cabinets under their jurisdiction are in compliance with all requirements of this standard; and
- ensure that workers are informed regarding the proper storage of flammable liquids.

Workers shall:

- store flammable liquids in accordance with this standard

FLAMMABLE LIQUIDS STORAGE CABINETS

Storage cabinets for flammable liquids containers serve a number of purposes:

- protection of flammable liquids against flash fires;
- prevention of excessive internal temperatures in the presence of fire; and
- containment of spilled flammable liquids to prevent the spread of fire.

Following are some important facts regarding flammable liquids storage cabinets:

1) Cabinet Construction

New flammable liquid storage cabinets must conform to ULC or cUL standards or be listed as meeting NFPA 30. Older cabinets certified only to UL can continue to be used but cannot be used for new installations. The cabinets must be made of metal having a double wall construction with a 3-point door latch and a liquid tight door sill raised at least 50 millimetres above the floor.

2) Ventilation of Cabinet

It is not a requirement for flammable storage cabinets to be ventilated. If there are ventilation openings in the cabinet:

- the ventilation opening must be sealed with materials providing fire protection at least equivalent to that for the construction of the cabinet (example the "bung" provided with the cabinet).



If the cabinet is to be vented, it must meet the following requirements:

- the cabinet must be vented outdoors; and
- the fan used to ventilate the cabinet must be rated intrinsically safe (fume hood fans meet this requirement); and
- the piping for the cabinet must be schedule 40 Black Iron piping (0.154 to 0.22 in thickness) or equivalent; and
- flash arrestors must be installed in both openings to the cabinet. One opening should be used for the vent, and the other left open for incoming clean air.

3) **Conspicuous Labelling**

Cabinets must be conspicuously labelled, indicating that the cabinet contains flammables and that open flames and sources of ignition must be kept away.

4) **Maximum Permissible Quantity**

A maximum quantity of 500 litres of flammable and combustible liquids (see definition in appendix below) may be stored in an approved cabinet, of which not more than 250 litres may be Class I liquids. In addition, for laboratories, the total quantity of flammable and combustible liquids stored in all cabinets in a single fire compartment (see definition) may not exceed the maximum quantity permitted for three cabinets (1500 L of flammables and combustibles). Individual containers may not exceed 5 L in volume.

Up to 50 L of flammables and 200 L of combustibles may be stored outside of cabinets.

Good Practices for Storage of Flammable Liquids in Cabinets

- containers shall be kept closed at all times other than when transferring to another container;
- flammables must be stored at least one metre away from incompatible materials;
- do not exceed the permissible storage capacity for the flammable storage cabinet or for the fire compartment in which the cabinet(s) is/are located;
- do not store flammable and combustible materials with non-compatible materials;
- always purchase and store the smallest quantity of flammable liquid necessary for the work to be done;
- do not place cabinets near exits;
- unauthorized individuals must not be allowed access to laboratories containing flammables.

APPENDIX

Definitions

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| 1) | Class I Flammable Liquids: | A liquid, which has a flash point below 37.8°C and a vapour pressure below 275 kPa absolute at 37.8°C. |
| | Class IA Liquids: | Includes those liquids that have flash points below 22.8°C and boiling points below 37.8°C. |
| | Class IB Liquids: | Includes those liquids that have flash points below 22.8°C and boiling points at or above 37.8°C. |
| | Class IC Liquids: | Includes those liquids that have flash points at or above 22.8°C but below 37.8°C. |
| 2) | Class II Combustible Liquids: | A liquid, which has a flash point at or above 37.8°C and below 60°C. |



3) Fire Compartment:

An enclosed space in a building that is separated from all other parts of the building by enclosing construction that provides a fire separation having a required fire-resistance rating.