

FLAMMABLE STORAGE CABINETS

Consult the *Ontario Occupational Health and Safety Act* and its regulations for additional information on the duties of workplace parties.

The storage of flammable liquids presents an elevated hazard for laboratories and workshops. Limiting stored flammable materials can reduce the risk of injury and property damage; however it is recognized that this is not always feasible. As a result, the proper use and storage of such materials is of the utmost importance. The information contained within this document is derived from the *Ontario Occupational Health and Safety Act*, *Ontario Fire Code*, *NFPA 30*, *NFPA 45*, *Workplace Safety and Prevention Services* and applicable uOttawa Guidelines. Additional information is available from the Health, Safety and Risk Manager and/or the Office of Risk Management.

A *flammable liquid* is defined as a liquid having a flash point below 37.8°C. Flammable products with low flash / boiling points are more hazardous. For example:

- Class IA – flashpoint below 22.8°C; boiling point below 37.8°C (i.e. ethylene oxide, methyl chloride, and pentane).
- Class IB – flashpoint below 22.8°C; boiling point at/above 37.8°C (i.e. acetone, benzene, ethyl alcohol, gasoline, and isopropyl alcohol).
- Class IC – flashpoint at/above 22.8°C but below 37.8°C (i.e. butyl alcohol, diethyl glycol, styrene and turpentine).

A *combustible liquid* is defined as a liquid having a flash point at or above 37.8°C and below 93.3°C. These materials are divided into classes II and IIIA.

A *fire compartment* is defined as 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.

Cabinet Construction and Identification

Flammable storage cabinets are used to serve as a means of containment for flammable liquids within a laboratory (or other) space and may be of varying size. Cabinets must:

- Conform to ULC standards, either:
 - ULC-C1275 Storage Cabinets for Flammable Liquid Containers, or
 - ULI 1275 Flammable Liquid Storage Cabinets;
- Be FM Approved by FM Global; or
- Be listed as meeting NFPA 30 – Flammable and Combustible Liquids Code.

The cabinets must be of double-walled steel construction with a 3-point door latch and a liquid tight door sill at least fifty millimeters (50 mm) above the floor, which is intended to contain spilled liquid within the cabinet. A cabinet must be conspicuously labeled, indicating that:

- The contents of the cabinet are flammable; and

- Open flames and sources of ignition must be kept away.

All containers stored within a flammable storage cabinet still require appropriate labeling in accordance with WHMIS legislation and workplace practices (i.e. logged in the uOttawa chemical inventory and barcoded).

Ventilation

Flammable storage cabinets typically do not require additional venting. Although cabinets are equipped with openings for ventilation purposes, they are typically sealed with “bungs” made of material intended to provide equivalent fire protection. **If the cabinet is not vented, ensure that these openings are sealed.**

If the cabinet is, or will be, vented (as a result of the materials stored therein), the cabinet must be vented outdoors and be equipped with an intrinsically safe-rated fan. The ducting for the cabinet must be of suitable design (including thickness) and must be equipped with flash arrestors at both openings of the cabinet. The cabinet is to be exhausted from the bottom. Venting must be in accordance with NFPA 91.

Maximum Allowable Quantity

- *Per cabinet (small quantities)* – an approved flammable storage cabinet may be used to store up to 500 litres of flammable and combustible liquids in closed containers. Of this, no more than 250 litres may be Class I liquids.
- *Per fire compartment (larger quantities)* – approved flammable storage cabinets may be used to store up to 1500 litres of flammable and combustible liquids in closed containers. Of this, no more than 750 litres may be Class I liquids. Cabinets may be arranged in groups of cabinets, provided that:
 - The total quantity stored in a group of cabinets is not more than the quantity permitted for three cabinets, and
 - The groups of flammable storage cabinets are separated by a minimum of 30 meters.

Contact the local Health, Safety and Risk Manager and/or the Office of Risk Management for configurations of multiple flammable storage cabinets.

Storing Flammable Materials

- Containers must be kept closed at all times other than when transferring the material to another container.
- Containers between 5L and 25L must meet ULC/ORD-C30 “Safety Containers”.
- Laboratory flammable materials not in use are to be properly stored. Flammable materials exempt are still recommended to be stored inside a flammable storage cabinet.
- Storage areas must be cool, dry and away from sources of ignition (heat, flame, welding operations, etc.).

- Materials must be properly segregated according to hazard class; non-compatible materials must not be stored together.
- If flammable materials require refrigeration, they must be stored in an approved refrigerator.
- Allowable storage criteria must not be exceeded for the fire compartment in which the cabinet(s) is/are located.
- Cabinets must not be placed in, or obstruct egress routes or access to emergency equipment.

General Flammable Material Use Requirements

- Always purchase and store the smallest quantity of flammable liquid necessary for the work.
- Provide secondary containment for liquid containers. Anticipate and prepare for potential spills that may occur. Develop, implement and practice spill response procedures for flammable materials.
- Ensure the area is equipped with suitable fire extinguishing media.
- Consult the product SDS for additional information on the product.
- Transport flammable liquids within buildings (i.e. lab-to-lab) using approved containers and secondary containment.
- The dispensing of flammable liquids must be done with grounded and/or bonded containers.

Additional Resources

- [Ontario Fire Code – Part 4 – Flammable and Combustible Liquids](#)
- [Regulation 851 – Industrial Establishments](#)
- [Workplace Safety and Prevention Services – Fire Protection](#)
- NFPA 30 – Flammable and Combustible Liquids Code
- NFPA 45 – Standard on Fire Protection for Laboratories Using Chemicals
- NFPA 91 – Standard for Exhaust Systems for Air Conveying of Vapours, Gases, Mists and Particulate Solids

For additional information on flammable storage cabinets, please contact your local [Health, Safety and Risk Manager](#), or the [Office of Risk Management](#).