

**POLICY 1.34 – Storage and Dispensing of Flammable and Combustible Liquids in Laboratories**

**Policy Category:** General

**Effective Date:** June 24, 2003

**Supersedes:** (NEW)

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**PURPOSE**

1.00 The purpose of the Storage and Dispensing of Flammable and Combustible Liquids in Laboratories policy is to ensure that flammable and combustible liquids are used in a safe manner in laboratories at The University of Western Ontario.

**ACCOUNTABILITY**

2.00 Those who use flammable and combustible liquids, and their supervisors, are accountable under this policy. Deans, Chairs and Researchers must ensure that all users of flammable and combustible liquids in their respective areas have attended both the Laboratory Safety Workshop and the Environmental and Waste Management Session and have taken the online WHMIS training at the beginning of their employment. Deans, Chairs and Researchers are accountable for monitoring the storage and handling of all flammable and combustible liquids in their laboratories.

**APPLICABLE LEGISLATION**

3.00 The following pieces of legislation are directly applicable:

- (a) The Ontario Fire Code (O. Reg. 388/97), Part 4
- (b) Occupational Health and Safety Act, R.S.O. 1990, c. O.1, Regulation 851, Amended to O. Reg. 488/01
- (c) The Transportation of Dangerous Goods Act (Canada)

4.00 **DEFINITIONS**

4.01 **Combustible Liquid (Class II & III)**

Any liquid which has a flash point of between 37.8°C and 93°C.

4.02 **Dispensing**

Means the transfer of flammable or combustible liquid from the manufacturer's container to a use-container.

4.03 **Fire Separation**

Means a wall, floor or ceiling material or assembly that acts as a barrier against the spread of fire. For laboratories in existing buildings, fire separation consisting of masonry or lath and plaster or drywall is deemed to be in compliance with 1 hr. fire resistance rating required for laboratory fire separation. This may be one laboratory or "laboratory unit" that may include offices and other rooms used by lab personnel.

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It may include an entire floor but maximums of flammable and combustible liquids within a fire separation cannot exceed limits for immediate use quantities or storage cabinets' quantities. The appropriate personnel in the Division of Facilities Management will make determinations of fire separations.

### **4.04 Flammable Liquid (Class I)**

Means any liquid which has a flash point of less than 37.8°C.

### **4.05 Flammable Liquid Storage Cabinet**

For the purposes of this policy, an approved flammable liquid storage cabinet will be a metal cabinet designed for the storage of flammable and combustible liquid carrying the approval of one of the following testing laboratories:

- (a) Factory Mutual (FM)
- (b) Underwriters Laboratories (UL)
- (c) Underwriters Laboratories of Canada (ULC)

### **4.06 Flash Point**

The lowest temperature at which a flammable liquid gives off enough vapour to form a flammable or ignitable mixture with air near the surface of the liquid or within the container used.

### **4.07 Immediate-Use Quantity**

For storage outside of an approved flammable liquid storage cabinet, immediate use quantities are defined as:

Maximum quantities of immediate use flammable and combustible liquids in a Laboratory fire separation cannot exceed 300 litres of which 50 litres can be Class I flammable.

### **4.08 Sealed Container**

A container closed by a lid or other device from which neither liquid nor vapour will escape at normal room temperature and which has not been opened since it was filled and sealed by the supplier.

### **4.09 Safety Can**

A container, approved by the Underwriters Laboratories of Canada, Factory Mutual, or other acceptable testing laboratory, of not over 23 L capacity and having every opening closed tightly by a spring actuated lid and a flash arrester. Note that in laboratories (see below) the maximum container size permitted is 5 litres.

## **PROCEDURES**

- 5.00 Only immediate use quantities of flammable and combustible liquids will be stored outside of an approved flammable liquid storage cabinet. Containers for flammable and combustible liquids shall be built in conformance with the Transportation of Dangerous Goods Regulations, unless the maximum size is not more than one litre for Class I (flammables) or five litres for Class II & III (combustibles).
- 6.00 Glass containers are acceptable in a laboratory only where the use of metal cans would create purity problems. Maximum container size must not exceed five litres.
- 7.00 A maximum of 1500 litres of flammable and combustible liquids (of which a maximum 750 litres may be Class 1) can be stored in (the TOTAL of all) flammable storage cabinets within a fire separation. Flammable storage cabinets must not be vented and the bungs must be left in place.

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- 8.00 A maximum of 500 litres of flammable and combustible liquids can be stored in each flammable storage cabinet (of which maximum 250 litres may be Class 1). There is no limit on the number of flammable storage cabinets per fire separation as long as the 1500 litre limit is not exceeded.
- 9.00 A maximum of 10,000 L of flammable and combustible liquids in sealed containers may be stored in a specially constructed and Facilities Management Fire Prevention approved, 2-hour fire separated room if it has:
- A drain to dry sump or holding tank,
  - Liquid tight seals between interior walls and floor and a liquid tight ramped sill at any door opening which is not an exterior wall,
  - An egress door which opens outward,
  - Two egress doors if the travel distance to the exit exceeds 4.5 metres,
  - Ventilation which complies with both the requirements of Part 4 of the Ontario Fire Code and the Building Code,
  - A spill containment system designed to prevent the spilled flammable and combustible liquids and any water used for fire fighting purposes from reaching water ways, sewers or potable water sources,
  - One metre wide aisles, and
  - Explosion venting to the outdoors in conformance to the requirements of Part 4 of the Ontario Fire Code.
- The above quantity may be doubled if the room is equipped with a fire suppression system.
- 10.00 Flammable liquids in glass bottles must be carried through public corridors in approved carriers, to help prevent accidental breakage and contain the contents in the case of accidental breakage (such as the Nalgene carrier for solvents).
- 11.00 Fuel for internal combustion engines must be stored in a portable container consistent with the requirements of the Gasoline Handling Act and have a certification from CSA (Canadian Standards Association) or ULC.
- 12.00 Refrigerated storage used for storage of flammable or combustible liquids shall be identified as such and all electrical equipment within the refrigerator must conform to the Electrical Safety Code made under the Electricity Act.
- 13.00 All dispensing and collection of flammable and combustible liquids in a laboratory must be conducted in a functioning fumehood.

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- 14.00 A spill control plan must be developed and implemented for any area where flammable and combustible liquids are used or stored. The spill control plan must include:
- (a) Spill control kits suitable for cleaning up spills of flammable and combustible liquids available wherever flammable and combustible liquids are used or stored; and
  - (b) Training on the plan and the use of the spill kit. New personnel must be trained within 3 months of date of hire. Experienced personnel must be trained every 6 months. Occupational Health and Safety will provide training.