



Capacity Limits for Flammable and Combustible Materials in the Laboratory

The amount of combustible/flammable material that can be present in a laboratory depends on its size and the function. Lincoln University has approximately 25 active laboratories here on campus. Slightly more than half of the laboratories here on campus are for graduate level research work and the remaining are considered instructional laboratories. The laboratory sizes range from 532 ft² – 1,160 ft² with average laboratory floor size of about 808 ft². All combustible/flammable materials “*not in use*”¹ shall be placed in appropriate fume hood, flame canisters, and/or flame cabinets.

Definition of Combustible & Flammable Liquids

NFPA has specific definitions of which liquids are considered flammable and combustible liquids. OSHA & NFPA definitions correspond to each other; however RCRA chooses to define the concept of ignitability (*any liquid waste with a flashpoint lower than a Class II combustible liquid*)

[Table 1 “Definitions of Flammable & Combustible Liquids” \(Based on NFPA 30 \(2012 Edition\)](#)

[Table 2 “Container Size Based on Hazard Class” \(Based on NFPA 30 \(2012 Edition\)](#)

[Table 3 “NFPA Ratings for Common Solvents”](#)

Definition of Laboratory Unit

NFPA 45 Chapter 4, Section 4.2 defines a laboratory unit as an enclosed space used for experiments or tests. A laboratory unit can include offices, lavatories, and other incidental contiguous rooms maintained for or used by laboratory personnel, and corridors within the unit. It can contain one or more separate laboratory work areas. It can be an entire building. A laboratory unit is classified as A, B, C, or D in accordance with Section 4.2 of NFPA 45.

Laboratory units shall be classified as a Class A (high fire hazard), Class B (moderate fire hazard), Class C (low fire hazard), or Class D (minimal fire hazard), according to the quantities of flammable and combustible liquids specified in Table 10.1.1(a) and Table 10.1.1(b). Please note that *instructional laboratory unit*² shall be classified as Class C or Class D laboratory units.

[Table 4 “Laboratory Classification Table” \(Based on NFPA 45 \(2011 Edition\)](#)

****Please note that the amount of liquids “in-use” in an open system¹ is limited to 10% of the quantities listed in Table 4***

If you have more than 30 gallons of flammable and combustible material present in your lab please contact Robert Clay for an evaluation at Clayr2@lincolnu.edu or 681-5497. Environmental Health & Safety (EHS) has a complete list of the maximum amount of flammable liquids that can be contained in each laboratory here on campus.



Relevant Definitions

NFPA 1 (2012 Edition)

1. **3.3.264 Use**

To place a material, including solids, liquids, and gases into action

3.3.264.1 Closed System Use

Use of a solid or liquid hazardous material in a closed vessel or system that remains closed during normal operations where vapors emitted by the product are not liberated outside of the vessel or system and the product is not exposed to the atmosphere during normal operations, and all uses of compressed gases.

3.3.264.1 Open System Use

Use of a solid or liquid hazardous material in a vessel or system that is continuously open to the atmosphere during normal operations and where vapors are liberated, or the product is exposed to the atmosphere during normal operations

NFPA 45 (2011 Edition)

2. **3.3.3.1 Instructional Laboratory Unit**

A laboratory unit used for the education past the 12th grade and before post-college graduate-level instruction for the purposes of instruction of six or more persons for four or more hours per day or more than 12 hours per week. Experiments and tests conducted in instructional laboratory units are under direct supervision of an instructor. **Laboratory units used for graduate or post graduate research are not to be considered instructional laboratory units.**

3. **9.2.3.3** Class I flammable liquids and Class II combustible liquids that are *not in use* inside of the laboratory units *shall* be stored in safety cans; in approved storage cabinets constructed in accordance with NFPA 30, *Flammable and Combustible Liquids Code*, and ANSI/UL 1275, *Standards for Flammable Liquid Cabinets*; or in an inside liquid storage room.