NEW YORK CITY FIRE DEPARTMENT

Notice of Public Hearing and Opportunity to Comment on Proposed Rule

What are we proposing?  The Fire Department is proposing to amend Fire Department rule 3 RCNY Section 4702-01, entitled “National Fire Protection Association Referenced Standards” by adopting modifications to National Fire Protection Association Standard 45, entitled “Standard on Fire Protection for Laboratories Using Chemicals.”

When and where is the hearing?  The Fire Department will hold a public hearing on the proposed rule. The public hearing will take place at 10:30 a.m. on Thursday, October 15, 2015. The hearing will be held in the Fire Department Auditorium, located at 9 MetroTech Center, Brooklyn, New York 11201.

How do I comment on the proposed rule?  Anyone can comment on the proposed rules by:

- **Website.** You can submit comments to the Fire Department through the NYC rules Web site at [http://rules.cityofnewyork.us](http://rules.cityofnewyork.us), or through the Fire Department’s Web site at [www.nyc.gov/fdny](http://www.nyc.gov/fdny) using the “FDNY Rules” link.

- **Mail.** You can mail written comments to Code Development Unit, Bureau of Fire Prevention, New York City Fire Department, 9 MetroTech Center, Room 3E2, Brooklyn, NY 11201.

- **Speaking at the hearing.** Anyone who wants to comment on the proposed rule at the public hearing must sign up to speak at the hearing. The time that you can speak may be limited.

Is there a deadline to submit written comments?  Yes, you must submit written comments by October 15, 2015.

Do you need assistance to participate in the hearing?  You must notify the Bureau of Fire Prevention if you need a sign language interpreter or other reasonable accommodation for a disability at the hearing. Write to us at the address above or telephone us at (718) 999-2042. You must notify us by October 1, 2015.

Can I review the comments made on the proposed rule?  You can review the comments made online on the proposed rules by going to the website at [http://rules.cityofnewyork.us](http://rules.cityofnewyork.us). A few days after the hearing, a record of the hearing and copies of the written comments will be available to the public at the Bureau of Fire Prevention.

What authorizes the Fire Department to make this rule?  Sections 489 and 1043 of the New York City Charter and Section FC102.6.3 of the New York City Fire Code, Title 29 of Administrative Code of the City of New York, authorize the Fire Department to propose this rule.
**Where can I find the Fire Department rules?** The Fire Department rules are codified in Title 3 of the Rules of the City of New York.

**What rules govern the rulemaking process?** The Fire Department must meet the requirements of Section 1043 of the New York City Charter when creating or changing rules. This notice is made in accordance with the requirements of Section 1043(b) of the New York City Charter.

**Statement of Basis and Purpose of Proposed Rule**

The New York City Fire Code (FC) incorporates by reference a large number of industry standards, including dozens of standards developed and published by the National Fire Protection Association (NFPA). A list of Referenced Standards is included in FC Chapter 45.


The Fire Department proposes to adopt modifications to the Fire Code to incorporate standards, procedures and requirements from the latest (2015) edition of NFPA 45.

The Fire Department proposes these modifications in response to a number of recent fires in school laboratories. The 2015 edition of NFPA 45 addresses a number of concerns associated with those fires. Among the changes proposed to be made by these modifications are the following operational and maintenance requirements:

- Risk assessments for all experiments and demonstrations that use hazardous chemicals;
- Establishment of instructor responsibilities;
- Initial and refresher training on the laboratory’s emergency plan for instructors and students;
- Proper use of fire retardant clothing when pyrophoric reagents (chemicals that spontaneously ignite in air) are used outside the inert atmosphere of a glove box (a sealed enclosure);
- Proper handling and dispensing of pyrophoric reagents and water reactive materials;
- Restrictions on the use of Bunsen burners and other open flames;
- Prohibitions on the use of improperly functioning exhaust hoods; and
- Prohibitions on the handling and use of hazardous materials when laboratory exhaust ventilation is improperly functioning.
The proposed Reference Standard modifications relate solely to operational and maintenance provisions of NFPA 45. The Fire Department is not proposing to replace the 2004 edition of NFPA 45 with the 2015 edition at this time because the New York City Building Code continues to reference the 2004 edition with respect to design and installation requirements, and it is important to coordinate the two codes.

For legal and editorial reasons, Referenced Standard modifications do not appear as revised (combined) text (that is, the text of the NFPA standard with Fire Code modifications) but as deletions, additions and other revisions to the original copyrighted text of NFPA 45. However, in order to make it possible for the public to understand the nature and purpose of the proposed Referenced Standard modifications, revised (combined) text is included as part of this Statement of Basis and Purpose. The revised text included in this Statement of Basis and Purpose is solely for informational purposes in connection with this rulemaking and is not intended for, nor does it authorize, any commercial use.

The actual text of the proposed Referenced Standard modifications immediately follows. An addendum to this Statement of Basis and Purpose includes the text of the NFPA standard with Fire Code amendments.


New material is underlined. Deleted material is in [brackets].

“Shall” and “must” denote mandatory requirements and may be used interchangeably in the rules of this department, unless otherwise specified or unless the context clearly indicates otherwise.

Section 1. Subdivision (b) of §4702-01 of Title 3 of the Rules of the City of New York is proposed to be amended to read as follows:

(b) Referenced Standard Modifications. [Reserved] FC B01.1 is amended to read as follows:

**B01.1. National Fire Protection Association standards.** The provisions of the following National Fire Protection Association (NFPA) standards shall be modified as follows:

**NFPA 45-2004.** The provisions of NFPA 45-2004, Standard on Fire Protection for Laboratories Using Chemicals, are modified as follows:

1. In Section 1.1.1, add “in this standard,” after “defined”. Add a new sentence to the end of the section, to read “This standard shall additionally apply to any non-production laboratory as defined in FC2702.1.”.

2. In Section 1.1.2(1)(b), delete “NFPA 54, National Fuel Gas Code” and replace with “the Fuel Gas Code”. Add an exception to the end of Section 1.1.2(1), to read “This
exception shall not apply to educational laboratory units and instructional laboratory units.”

3. Add a new Section, 1.1.4, to read “1.1.4 The provisions of this standard are adopted only with respect to operational and maintenance requirements. Pursuant to FC102.2, operational and maintenance provisions are applicable to new and existing facilities.”

4. Delete Section 1.4 in its entirety.

5. Delete Section 1.5 in its entirety.

6. In Section 2.2:


7. In Section 2.3.3, delete “ASME Boiler and Pressure Vessel Code, Section VIII, 2004” and replace with “ASME Boiler and Pressure Vessel Code, Section I, II, IV, V, VI and VIII, 2010”.
8. Delete Section 3.2.7 and replace with Section 3.2.7 of NFPA 45-2015.

9. In Section 3.3.14, add “for students” after the word “purposes” and delete “by six or more persons for four or more hours per day or more than 12 hours per week”.

10. Add a new section, 3.3.24.1, by inserting Section 3.3.24 of NFPA 45-2015, which is renumbered for purposes of the Fire Code Referenced Standard as 3.3.24.1.

11. Delete Section 3.3.31 and replace with Section 3.3.31 of NFPA 45-2015, except delete “under the direct supervision of an instructor” and add a sentence to the end, to read “Laboratory units used for graduate or postgraduate research are not considered to be instructional laboratory units.”

12. Add a new section, 3.3.31.1, by inserting the text of Section 3.3.32 of NFPA 45-2015, which is renumbered for purposes of the Fire Code Referenced Standard as 3.3.31.1.

13. Delete Section 3.3.36 and replace with “3.3.36 Laboratory Unit. An enclosed space of a minimum one-hour fire-rated construction, designed or used as a non-production laboratory. Laboratory units may include one or more separate laboratory work areas, and accessory storage rooms or spaces within or contiguous with the laboratory unit, such as offices and lavatories.”

14. Add a new section, 3.3.51.1, by inserting the text of Section 3.3.53 of NFPA 45-2015, which is renumbered for purposes of the Fire Code Referenced Standard as 3.3.51.1.

15. In Section 3.3.57, delete “Section 6.3 of NFPA 30, Flammable and Combustible Liquids Code” and replace with “FC3404.3.2”.

16. Delete Section 4.3.1 and replace with Section 1.1.4 of NFPA 45-2015, which is renumbered for purposes of the Fire Code Referenced Standard as 4.3.1, except:

16.1 In Section 1.1.4, insert “listed below” after the word “concentrations”, and delete “, the following” from the second sentence.

16.2 Insert a semicolon to the end of Sections 1.1.4(1), 1.1.4(2) and 1.1.4(3).

16.3 In Section 1.1.4(4), insert “; and” after “peroxides”.

16.4 Insert a period to the end of Section 1.1.4(5).

16.5 Delete the sentence after Section 1.1.4(5).

17. In Section 5.6, delete “NFPA 70, National Electrical Code” and replace with “the Electrical Code”.

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18. In Section 5.6.2, delete “Article 500 of NFPA 70, National Electrical Code” and replace with “the Electrical Code”.

19. Delete Section 6.6.3.1 and replace with Section 6.5.3.1 of NFPA 45-2015, which is renumbered for purposes of the Fire Code Referenced Standard as 6.6.3.1, except:

19.1. In the section title, delete “Provisions Within the Emergency Action Plan” and replace with “Emergency Plan”.

19.2. Delete the first sentence and replace with “The owner of a chemical laboratory shall cause plans for laboratory emergencies to be prepared.”

19.3. In the second sentence, delete “action” between the words “emergency” and “plan”.

19.4. In Section 6.5.3.1(1), insert a semicolon after “alarm”.

19.5. In Section 6.5.3.1(2), delete “fire department, governmental agencies, or other emergency responders or contacts, as required” and replace with “Fire Department and other emergency response agencies;”.

19.6. In Section 6.5.3.1(3), before “as applicable” insert “including primary and secondary evacuation routes,” and insert a semicolon to the end of the section.

19.7. In Sections 6.5.3.1(4) and 6.5.3.1(7), insert a semicolon to the end of the section.

19.8. In Section 6.5.3.1(5), insert “regular emergency” between the words “conducting” and “drills”, and insert a semicolon to the end of the section.

19.9. In Section 6.5.3.1(6), delete “shutdown” and replace with “shut down”, and insert a semicolon to the end of the section.

19.10. Delete Section 6.5.3.1(8).

19.11. Renumber Section 6.5.3.1(9) as 6.5.3.1(8), and insert a semicolon to the end of the section.

19.12. Renumber Section 6.5.3.1(10) as 6.5.3.1(9), and insert “; and” to the end of the section.

19.13. Renumber Section 6.5.3.1(11) as 6.5.3.1(10), and delete “to be taken”, and insert a period to the end of the section.

20. Add a new section, 6.6.3.3, by inserting the text of Section 6.5.3.3 of NFPA 45-2015, which is renumbered for purposes of the Fire Code Referenced Standard as 6.6.3.3, except move “on the emergency plan” from the end of the sentence to between the
words “trained” and “prior”, and add a sentence to the end, to read “Records for such training shall be maintained in accordance with FC107.7.”

21. Add new sections, 6.7 through 6.7.4, by inserting the text of Sections 6.6, and 6.6.2 through 6.6.5 of NFPA 45-2015. For purposes of the Fire Code Referenced Standard, Section 6.6 is renumbered as 6.7, and Sections 6.6.2, 6.6.3, 6.6.4 and 6.6.5 are renumbered as 6.7.1, 6.7.2, 6.7.3 and 6.7.4 respectively, except:

21.1. In Section 6.6.2, delete “where” and replace with “by any person that uses”, and delete “are used”.

21.2. In Section 6.6.3, insert a comma after the word “worn”, insert “, by any person that uses” after the word “possible”, and delete “are used”.

21.3. In Section 6.6.4, delete “Natural-fiber” and replace with “Any person that uses pyrophoric reagents outside the inert atmosphere of a glovebox shall wear natural-fiber”, delete “shall be worn”, insert “their” after the word “under”, delete “the” after the word “on” and replace with “their”, and delete “where pyrophoric reagents are used outside the inert atmosphere of a glovebox” after the word “feet”.

22. Add a new section, 7.1.3, by inserting the text of Section 7.2.2.1 of NFPA 45-2015, which is renumbered for purposes of the Fire Code Referenced Standard as 7.1.3, except in the first sentence of such section, insert “involving the handling and use of hazardous materials” after the word “operations”, and in the second sentence of such section, delete “in a safe condition” and replace with “safely”, delete “during the time that” and replace with “until”, and delete the word “exists” and replace with “is corrected”.

23. Delete Section 8.13.2 and replace with “All activities inside the hood shall be suspended immediately following the discovery of deficiencies that cause the hood to perform outside of limits established by regulatory authority requirements and/or nationally recognized industry standards”.

24. Delete Section 9.2.3.4 and replace with Sections 8.2.4.4 and 13.4.2 of NFPA 45-2015, which are combined into a single section and renumbered for purposes of the Fire Code Referenced Standard as 9.2.3.4, except:

24.1. In Section 8.2.4.4, delete the words “might”, “(i.e., time sensitive)”, and “, and properly managed”.

24.2. In the first sentence of Section 13.4.2, insert “in unopened containers” after the word “storage”, insert “also” between the words “shall” and “be”, and delete “upon receipt and when first opened to facilitate hazard control” and replace with “when received into the laboratory chemical inventory”.

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24.3. In the second sentence of Section 13.4.2, replace “Materials” with “Such materials”, insert “managed and” before the word “disposed”, insert a comma after the word “date”, and delete “(SDSs)(see 8.2.4.4 and A.8.2.4.4)”.

25. Delete Section 9.2.3.4.1 and replace with Section 8.2.4.4.1 of NFPA 45-2015, which is renumbered for purposes of the Fire Code Referenced Standard as 9.2.3.4.1, except

25.1 In Section 8.2.4.4.1 and (1), delete “shall consist of the following elements” and replace with the word “includes”, insert “-” between the words “time” and “sensitive”, and after the word “sensitive” insert “(materials that become hazardous during prolonged storage);”.

25.2 In Section 8.2.4.4.1(2), insert a semi-colon after the word “frequency”.

25.3 In Section 8.2.4.4.1(3), insert “; and” after the word “material”.

25.4 In Section 8.2.4.4.1($), insert a period after the word “results”.

26. Add a new section, 9.2.3.7, by inserting the text of Section 8.2.4.7 of NFPA 45-2015, which is renumbered for purposes of the Fire Code Referenced Standard as 9.2.3.7, except delete “shall be” and replace with “is”, and add a new sentence to the end, to read “This prohibition does not apply to the storage of chemicals used in a long term experiment or research, chemicals for which special ventilation requirements are recommended based on the unusually hazardous nature of the chemicals, and any other chemical storage approved by the Fire Department.”

27. Delete Sections 9.3, 9.4 and 9.5 in their entirety.

28. Add a new section, 9.3, to read “9.3 Chemicals.” and two new sections, 9.3.1 and 9.3.2, by inserting the text of Sections 8.2.3.6 and 8.2.3.7 of NFPA 45-2015, which are renumbered for purposes of the Fire Code Referenced Standard as 9.3.1 and 9.3.2 respectively, except in Section 8.2.3.7, delete “(SDS)”.

29. Add new sections, 9.4 through 9.4.5, by inserting the text of Sections 8.3, 8.3.2, 8.3.3, 8.3.5, 8.3.4 and 8.3.6 of NFPA 45-2015, which are renumbered for purposes of the Fire Code Referenced Standard as 9.4, 9.4.1, 9.4.2, 9.4.3, 9.4.4 and 9.4.5 respectively, except:

29.1. In Section 8.3.3, replace “with the hazards of the waste chemicals” with “in accordance with the regulations of the New York State Department of Environmental Conservation”.

29.2. In Section 8.3.5, replace “Waste” with “Flammable and combustible liquid waste”, replace “type” with “types”, and replace “9.1.2” with “10.1.4”.

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29.3. In Section 8.3.4, replace “not exceed 20 l (5 gal)” with “that are not required to comply with the requirements of Section 9.4.3 shall be subject to the maximum container sizes and types in accordance with Class II combustible liquids set forth in Table 10.1.4”.

29.4. In Section 8.3.6, replace “subject to” with “included in”.

30. In Section 10.5.1, replace “NFPA 30, Flammable and Combustible Liquids Code” with “FC3404.3.2”.

31. Add new sections, 12.1.7 through 12.1.7.11, by inserting the text of Sections 11.2.6 through 11.2.6.11 of NFPA 45-2015, which are renumbered for purposes of the Fire Code Referenced Standard as 12.1.7 through 12.1.7.11 respectively, except in Section 11.2.6.3, replace “6.6” with “6.7”.

32. Add new sections, 12.1.8 and 12.1.8.1, by inserting the text of Sections 11.2.7 and 11.2.7.1 of NFPA 45-2015, which are renumbered for purposes of the Fire Code Referenced Standard as 12.1.8 and 12.1.8.1 respectively, except:

32.1. In the second sentence of Section 11.2.7.1(2), replace “Tubing” with “Hose/tubing”, replace “clamped” with “gas-tight”, and add a sentence at the end, to read “Prior to each use, all connections shall be verified for tightness.”.

32.2. Add a new Section 11.2.7.1(5), to read “(5) Combustible materials shall be kept at least 0.610 m (2 ft) away from the open flame.”.

33. Add a new section, 12.1.8.2, by inserting the text of Section 11.2.7.2 of NFPA 45-2015, which is renumbered for purposes of the Fire Code Referenced Standard as 12.1.8.2, except:

33.1. In Section 11.2.7.2, replace “11.2.7.1” with “12.1.8.1”.

33.2. In Section 11.2.7.2(1), insert “(0.1 pt)” after “50 ml”.

34. In Section 12.2.1.1, delete “, including NFPA 70, National Electrical Code” and replace with “and the Electrical Code”.

35. In Section 12.2.2.2, delete “Article 501 of NFPA 70, National Electrical Code” and replace with “the Electrical Code”.

36. In Section 12.2.2.2.1(1), delete “Article 501 of NFPA 70, National Electrical Code” and replace with “the Electrical Code”.

37. In Section 12.2.2.3, delete “Article 501 of NFPA 70, National Electrical Code” and replace with “the Electrical Code”.
38. Add a new chapter, 14, by inserting the text of Chapter 12 of NFPA 45-2015, except:

38.1. Chapter 12 is renumbered as 14.

38.2. Section 12.1 is renumbered as 14.1, except delete “new and existing”.

38.3. Add a new section, 14.2, to read “**14.2 Supervision.** Educational laboratory units and instructional laboratory units shall be under the direct supervision of an instructor while the laboratory is in operation.”

38.4. Add a new section, 14.3, to read “**14.3 Hazard Risk Assessment.** Prior to instructors performing demonstrations or students conducting experiments using hazardous chemicals, a documented hazard risk assessment shall be performed. A hazard risk assessment is a written document prepared by a qualified person, and shall include all of the following:

(1) An evaluation of the hazards of the demonstration or experiment;

(2) Appropriate personal protective equipment required;

(3) Safe work procedures;

(4) Emergency procedures; and

(5) Waste disposal procedures.”

38.5. Section 12.2 is renumbered as 14.4 and in such section, replace “Where” with “Whenever”, and replace “required to perform a documented hazard risk assessment, provide a safety briefing to students, provide adequate personal protective equipment (PPE), and place a safety barrier (as required)” with “fully familiar with the hazard risk assessment, provide a safety briefing to students, ensure that adequate personal protective equipment has been provided and is being properly used, and ensure that safety barriers, when required by 14.5.2.1.3, are in place”.

38.6. Section 12.2.1 is renumbered as 14.4.1, except replace “PPE” with “personal protective equipment”.

38.7. Section 12.3 is renumbered as 14.5.

38.8. Section 12.3.1 is renumbered as 14.5.1 and in the first sentence of such section, replace “labs” with “laboratories”, in the second sentence of such section, replace “lab classroom” with “laboratory” and replace “one day’s use, preapportioned to the amount needed for each class session” with “daily use in the laboratory”, and in the last sentence of such section, replace “amount of chemical that is not in use during an individual class session” with “chemicals stored in an educational...
laboratory” and add at the end “, except for the amounts actually in use during an individual class session”.

38.9. Section 12.3.1.1 is renumbered as 14.5.1.1, except replace “9.1.1” with “10.1.1” and replace “fire or building codes” with “the Fire Code and the Building Code”.

38.10. Section 12.3.1.2 is renumbered as 14.5.1.2.

38.11. Section 12.3.1.3 is renumbered as 14.5.1.3.

38.12. Section 12.3.1.4 is renumbered as 14.5.1.4.

38.13. Section 12.3.1.5 is renumbered as 14.5.1.5, except replace “only when” with “while”.

38.14. Section 12.3.2 is renumbered as 14.5.2.

38.15. Section 12.3.2.1 is renumbered as 14.5.2.1, except replace “12.3.2.1.1”, “12.3.2.1.2”, “12.3.2.1.3” and “12.3.2.1.4” with “14.5.2.1.1”, “14.5.2.1.2”, “14.5.2.1.3” and “14.5.2.1.4” respectively.

38.16. Section 12.3.2.1.1 is renumbered as 14.5.2.1.1, except delete “primary”.

38.17. Section 12.3.2.1.2 is renumbered as 14.5.2.1.2, except delete “being evolved” at the end of the first sentence, and delete the last sentence.

38.18. Section 12.3.2.1.3 is renumbered as 14.5.2.1.3, except replace “12.3.2.1.4” with “14.5.2.1.4”.

38.19. Section 12.3.2.1.4 is renumbered as 14.5.2.1.4.

38.20. Section 12.3.2.2 is renumbered as 14.5.2.2.

38.21. Section 12.3.2.3 is renumbered as 14.5.2.3, except replace “In educational and instructional laboratories where experiments are conducted by students, the” with “The”, replace “be responsible for conducting” with “conduct”, and insert “conducted by students” between the words “experiment” and “to”.
Addendum to Statement of Basis and Purpose of Proposed Rule

If adopted, the above Referenced Standards modifications would modify the text of NFPA 45 as follows (added text underlined; deleted text shown with strikethrough and in brackets):

1. Section 1.1.1, as revised by the proposed modification, would read as follows:

1.1.1 This standard shall apply to laboratory buildings, laboratory units, and laboratory work areas whether located above or below grade in which chemicals, as defined in this standard, are handled or stored. This standard shall additionally apply to any non-production laboratory as defined in FC2702.1.

2. Section 1.1.2, as revised by the proposed modification, would read as follows:

1.1.2 This standard shall not apply to the following:

(1) If conditions (a) and (b) exist, this standard shall not apply:

(a) Laboratory units that contain less than or equal to 4 L (1 gal) of flammable or combustible liquid

(b) Laboratory units that contain less than 2.2 standard m³ (75 scf) of flammable gas, not including piped-in low-pressure utility gas installed in accordance with [NFPA 54, National Fuel Gas Code] the Fuel Gas Code

This exception shall not apply to educational laboratory units and instructional laboratory units.

4. Section 1.4, which reads as follows, is proposed to be deleted:

[1.4 Retroactivity. The provisions of this standard reflect a consensus of what is necessary to provide an acceptable degree of protection from the hazards addressed in this standard at the time the standard was issued.

1.4.1 Unless otherwise specified, the provisions of this standard shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the standard. Where specified, the provisions of this standard shall be retroactive.

1.4.2 In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portions of this standard deemed appropriate.

1.4.3 The retroactive requirements of this standard shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction, and only where it is clearly evident that a reasonable degree of safety is provided.]
5. Section 1.5, which reads as follows, is proposed to be deleted:

[1.5 Equivalency. Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

1.5.1 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.5.2 The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.]

6. Section 2.2, as revised by the proposed modification, would read as follows:

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.


[NFPA 70, National Electrical Code, 2005 edition.]


7. Section 2.3.3, as revised by the proposed modification, would read as follows:

2.3.3 ASME Publication. American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990.


8. Section 3.2.7, as revised by the proposed modification, would read as follows:

3.2.7 Standard. A document, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions shall be located in an appendix or annex, footnote, or fine print note and are not to be considered a part of the requirements of a standard.

3.2.7 Standard. An NFPA Standard, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

9. Section 3.3.14, as revised by the proposed modification, would read as follows:

3.3.14 Educational Laboratory Unit. A laboratory unit that is used for educational purposes for students through the twelfth grade [by six or more persons for four or more hours per day or more than 12 hours per week].

10. Section 3.3.24.1, which incorporates the provisions of Section 3.3.24 of the 2015 edition of NFPA 45, would read as follows:

3.3.24.1 Glove Box. A sealed enclosure in which items inside the box are handled exclusively using long gloves sealed to ports in the walls of the enclosure.

11. Section 3.3.31, as revised by the proposed modification, would read as follows:

3.3.31 Instructional Laboratory Unit. A laboratory unit used for 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 the direct supervision of an instructor. Laboratory units used for graduate or post-graduate research are not considered instructional laboratory units.
3.3.31 Instructional Laboratory Unit. A laboratory unit that is used for purposes of instruction for students beyond the twelfth grade. Laboratory units used for graduate or postgraduate research are not considered to be instructional laboratory units.

12. Section 3.3.31.1, as revised by the proposed modification, would read as follows:

3.3.31.1 Instructor. A person whose job includes teaching or instructing students in educational or instructional laboratories. This can include science teachers, professors, assistant professors, associate professors, lecturers, substitute teachers, and teaching assistants.

14. Section 3.3.51.1, as revised by the proposed modification, would read as follows:

3.3.51.1 Pyrophoric Reagent. A solid or liquid substance that ignites at 54°C (130°F) or below on exposure to water vapor in air-producing flammable gas and heat.

15. Section 3.3.57, as revised by the proposed modification, would read as follows:

3.3.57 Storage Cabinet. A cabinet for the storage of flammable and combustible liquids constructed in accordance with Section 6.3 of NFPA 30, Flammable and Combustible Liquids Code.

16. Section 1.1.4, as revised by the proposed modification, would read as follows:

4.3.1 A laboratory work area contains an explosion hazard if an explosion of certain quantities or concentrations listed below of reactive materials could result in serious or fatal injuries to personnel within that laboratory work area. Such quantities or concentrations include, but are not limited to:

1) Storage of more than 0.45 kg (1 lb) of materials with an instability hazard rating of 4 (see B.2.5);

2) Use or formation of more than 0.11 kg (0.25 lb) of materials with an instability hazard rating of 4 (see B.2.5);

3) Presence of highly exothermic reactions in glass or open reaction vessels involving more than 10 g (0.35 oz) of materials such as polymerizations, oxidations, nitrations, peroxidations, hydrogenations, or organo-metallic reactions;

4) Use or formation in glass or open reaction vessels involving more than 10 g (0.35 oz) of materials whose chemical structures indicate a potential hazard, but whose properties have not been established, such as salts of alkenes, triple bonds, epoxy radicals, nitro and nitroso compounds, and peroxides; and

5) Other explosion hazards as determined by a qualified person.
In this case NFPA 45 supplemented by appropriate shielding, handling, and similar protective measures does apply.

17. Section 5.6, as revised by the proposed modification, would read as follows:

**5.6 Electrical Installation.** All electrical installations, including wiring and appurtenances, apparatus, lighting, signal systems, alarm systems, remote control systems, or parts thereof, shall comply with [NFPA 70, National Electrical Code] the Electrical Code.

18. Section 5.6.2, as revised by the proposed modification, would read as follows:

**5.6.2** Laboratory work areas, laboratory units, and chemical fume hood interiors shall be considered as unclassified electrically with respect to [Article 500 of NFPA 70, National Electrical Code] the Electrical Code.

Exception: Under some conditions of hazard, it could be necessary to classify a laboratory work area, or a part thereof, as a hazardous location, for the purpose of designating the electrical installations. See 10.5.5 (electric motors) and 12.2.2.2 (refrigerators).

19. Section 6.6.3.1, as revised by the proposed modification, would read as follows:

**6.6.3.1 Emergency Plan.** The owner of a chemical laboratory shall cause plans for laboratory emergencies to be prepared. The emergency plan shall include the following procedures in the event of a chemical emergency, fire, or explosion:

1. Procedures for sounding the alarm;
2. Procedures for notifying and coordinating with the Fire Department and other emergency response agencies;
3. Procedures for evacuating and accounting for personnel, including primary and secondary evacuation routes, as applicable;
4. Procedures for establishing requirements for rescue and medical duties for those requiring or performing these duties;
5. Procedures and schedules for conducting regular emergency drills;
6. Procedures for shutting down and isolating equipment under emergency conditions to include the assignment of personnel responsible for maintaining critical functions or for shut down of process operations;
7. Appointment and training of personnel to carry out assigned duties, including steps to be taken at the time of initial assignment, as responsibilities or response actions change, and at the time anticipated duties change;
(8) Aisles designated as necessary for movement of personnel and emergency response;

(9) Maintenance of fire protection equipment; and

(10) Safe procedures for startup following the abatement of an emergency.

20. Section 6.6.3.3, as revised by the proposed modification, would read as follows:

6.6.3.3 All laboratory users, including, but not limited to, instructors and students, shall be trained on the emergency plan prior to laboratory use and at least annually thereafter. Records for such training shall be maintained in accordance with FC107.7.

21. Section 6.7, as revised by the proposed modification, would read as follows:

6.7 Fire Retardant Clothing.

6.7.1 Fire-retardant lab coats shall be worn by any person that uses pyrophoric reagents outside the inert atmosphere of a glovebox.

6.7.2 Fire-retardant gloves shall be worn, whenever possible, by any person that uses pyrophoric reagents outside the inert atmosphere of a glovebox.

6.7.3 Any person that uses pyrophoric reagents outside the inert atmosphere of a glovebox shall wear natural-fiber clothing under their fire-retardant lab coats and on their legs and feet.

6.7.4 Fire-retardant clothing shall meet the requirements of NFPA 2112.

22. Section 7.1.3, as revised by the proposed modification, would read as follows:

7.1.3 If laboratory exhaust ventilation is out of service or inoperable, all laboratory operations involving the handling and use of hazardous materials shall be suspended until the deficiency is corrected. All hazardous materials shall be secured safely or removed from the laboratory until the deficiency is corrected.

24. Section 9.2.3.4, as revised by the proposed modification, would read as follows:

9.2.3.4 Containers of materials that become hazardous during prolonged storage shall be dated when first opened. Containers of materials that become hazardous during prolonged storage in unopened containers shall also be dated when received into the laboratory chemical inventory. Such materials shall be properly managed and disposed of according to the expiration date, and recommendations on the label and safety data sheets.

25. Section 9.2.3.4.1, as revised by the proposed modification, would read as follows:

9.2.3.4.1 Proper management includes:
(1) Defining those materials present that are time-sensitive (materials that become hazardous during prolonged storage);

(2) Defining each time-sensitive material’s inspection frequency;

(3) Defining proper or approved inspection methodologies to determine the relative hazard of the time-sensitive material; and

(4) Defining pass/fail criteria for inspection results.

26. Section 9.2.3.7, as revised by the proposed modification, would read as follows:

9.2.3.7 Storage of chemicals in the fume hood is prohibited. This prohibition does not apply to the storage of chemicals used in a long term experiment or research, chemicals for which special ventilation requirements are recommended based on the unusually hazardous nature of the chemicals, and any other chemical storage approved by the Fire Department.

27. Sections 9.3, 9.4 and 9.5, which read as follows, are proposed to be deleted.

9.3.1 The quantity of flammable solids allowed shall be limited to the minimum quantity necessary to perform the work being done.

9.3.2 Handling of the materials shall conform to the manufacturers’ recommendations.

9.4 Oxidizers.

9.4.1 The quantity of solid and liquid oxidizers allowed shall be limited to the minimum quantity necessary to perform the work being done.

9.4.2 Handling of the materials shall conform to the manufacturers’ recommendations.

9.5 Organic Peroxides.

9.5.1 The quantity of peroxides allowed shall be limited to the minimum quantity necessary to perform the work being done.

9.5.2 Handling of the materials shall conform to the manufacturers’ recommendations.

28. Section 9.3, as revised by the proposed modification, would read as follows:

9.3 Chemicals.
9.3.1 Chemical quantities outside of storage shall be maintained at the lowest possible level necessary for the work performed.

9.3.2 Handling and storage of chemicals shall conform to the manufacturers’ recommendations and safety data sheet.

29. Section 9.4, as revised by the proposed modification, would read as follows:

9.4 Waste Handling and Disposal.

9.4.1 Waste chemicals shall not be combined or mixed with other waste chemicals unless they have been evaluated for compatibility by a qualified person.

9.4.2 Chemical waste containers shall be labeled in accordance with the regulations of the New York State Department of Environmental Conservation.

9.4.3 Flammable and combustible liquid waste quantities shall be subject to the maximum container sizes and type types in accordance with Table 10.1.4.

9.4.4 Liquid waste containers stored in laboratory work areas that are not required to comply with the requirements of Section 9.4.3 shall be subject to the maximum container sizes and types in accordance with Class II combustible liquids set forth in Table 10.1.4.

9.4.5 Waste quantities shall be included in the maximum allowable quantity for the laboratory unit.

30. Section 10.5.1, as revised by the proposed modification, would read as follows:

10.5.1 Storage cabinets used for the storage of flammable and combustible liquids shall be constructed in accordance with [NFPA 30, Flammable and Combustible Liquids Code] FC3404.3.2.

31. Section 12.1.7, as revised by the proposed modification, would read as follows:

12.1.7 Pyrophoric Reagent and Water Reactive Material Handling.

12.1.7.1 Pyrophoric reagents and water reactive solids and liquids shall be handled in systems or enclosures that prevent the chemicals from igniting whenever a dry or an inert atmosphere is required by the manufacturer or the safety data sheet.

12.1.7.2 Pyrophoric reagents shall be handled only by those with experience in their hazards and properties or under close, direct supervision by those with experience in their hazards and properties. No one should work alone with pyrophoric reagents during transfer or cleanup operations.

12.1.7.3 Personal protective equipment shall be worn as required in Section 6.7.
12.1.7.4 Pyrophoric liquids dispensed in a chemical fume hood shall be from sure-seal-type bottles with syringes or double-tipped needles in accordance with the manufacturer’s recommendation and nationally established laboratory safety practices.

12.1.7.5 Open dispensing of pyrophoric liquids shall be done inside of an inert atmosphere glove box.

12.1.7.6 Pyrophoric solids shall be handled/dispensed inside of an inert atmosphere glove box.

12.1.7.7 Water reactive solids that are not protected by mineral oil or solvents shall be handled and dispensed inside of an inert atmosphere glove box.

12.1.7.8 Residual moisture and contaminate shall be cleaned from reaction vessels, glassware, needles, and other lab equipment that will be exposed to pyrophoric reagents and water reactive materials. Equipment shall be purged with a high-purity dry inert gas prior to use.

12.1.7.9 The void space at the top of containers of pyrophoric reagents shall be backfilled with a high-purity dry inert gas as the reagent is removed.

12.1.7.10 Needles, spatulas, wipes, and tools that have been in contact with pyrophoric reagents and water reactive materials shall be stored in an inert atmosphere or shall be neutralized in accordance with the manufacturer’s written instructions.

12.1.7.11 Pyrophoric reagents and water reactive materials in glove boxes shall be sealed in airtight containers when the chemicals are not in use.

32. Section 12.1.8, as revised by the proposed modification, would read as follows:

12.1.8 Open Flame Operations.

12.1.8.1 Laboratory operations using open flames shall be performed in accordance with the following requirements:

(1) Whenever possible, alternative methods to the use of open flames, such as heating mantels, hot plates, glass bead sterilizers, or infrared loop sterilizers, shall be used.

(2) Hoses/tubing connecting a gas supply to a torch or Bunsen burner shall be in good condition, compatible with the gas being used, and rated at least 150 percent of working pressure. Hose/tubing connections shall be gas-tight at the gas supply and torch/burner. Prior to each use, all connections shall be verified for tightness.

(3) Open flame equipment with a small gas container attached shall be handheld, clamped, or weighted to prevent equipment from falling over.
If open flame operations are performed outside a hood, operations shall not be conducted under shelves, cabinets, or other overhanging equipment.

Combustible materials shall be kept at least 0.610 m (2 ft) away from the open flame.

Section 12.1.8.2, as revised by the proposed modification, would read as follows:

12.1.8.2 Biological operations using open flames and flammable liquids shall be performed in accordance with 12.1.8.1 and the following requirements:

1. The volume of flammable liquid in use in an open container shall be limited to 50 ml (0.1 pt) or less. The container of flammable liquid shall be glass or metal and shall have a tight fitting, slip-on lid to seal the container when not in use or if the flammable liquid catches on fire.

2. The container of flammable liquid shall be kept as far as possible from the open flame but not less than 0.305 m (12 in.).

3. Flammable liquids and other hazardous materials that are not used for open flame operations shall be placed in storage.

4. Combustible materials shall be kept at least 0.610 m (2 ft) away from the open flame and the container of flammable liquid. Absorbent paper shall not be used under the open flame operation.

Section 12.2.1.1, as revised by the proposed modification, would read as follows:

12.2.1.1 Apparatus shall be installed in compliance with applicable requirements of NFPA standards, including NFPA 70, National Electrical Code, and the Electrical Code.

Section 12.2.2.2, as revised by the proposed modification, would read as follows:

12.2.2.2 Refrigerators, freezers, and other cooling equipment used to store or cool flammable liquids shall be listed special purpose units for use in laboratories in commercial occupancies or units listed for Class I, Division 1 locations, as described in Article 501 of NFPA 70, National Electrical Code, the Electrical Code.

Section 12.2.2.2.1, as revised by the proposed modification, would read as follows:

12.2.2.2.1 Domestic refrigerators, freezers, and other cooling equipment shall be permitted to store or cool flammable liquids if modified as follows:

1. Any electrical equipment located within the outer shell, within the storage compartment, on the door, or on the door frame shall meet the requirements for Class I, Division 1 locations, as described in Article 501 of NFPA 70, National Electrical Code, the Electrical Code.
37. Section 12.2.2.3, as revised by the proposed modification, would read as follows:

12.2.2.3 Refrigerators, freezers, and cooling equipment located in a laboratory work area designated as a Class I location, as specified in the Exception to 5.6.2, shall be approved for Class I, Division 1 or 2 locations and shall be installed in accordance with [Article 501 of NFPA 70, National Electrical Code] the Electrical Code.

38. Chapter 14, as revised by the proposed modification, would read as follows:

Chapter 14 Educational and Instructional Laboratory Operations

14.1 General. This chapter provides fire protection and safety requirements for educational and instructional laboratories where experiments are conducted or demonstrations are performed using hazardous materials.

14.2 Supervision. Educational laboratory units and instructional laboratory units shall be under the direct supervision of an instructor while the laboratory is in operation.

14.3 Hazard Risk Assessment. Prior to instructors performing demonstrations or students conducting experiments using hazardous chemicals, a documented hazard risk assessment shall be performed. A hazard risk assessment is a written document prepared by a qualified person, and shall include all of the following:

(1) An evaluation of the hazards of the demonstration or experiment;
(2) Appropriate personal protective equipment required;
(3) Safe work procedures;
(4) Emergency procedures; and
(5) Waste disposal procedures.

14.4 Instructor Responsibilities. Whenever instructors are performing demonstrations or students are conducting experiments using hazardous materials, the instructor shall be fully familiar with the hazard risk assessment, provide a safety briefing to students, ensure that adequate personal protective equipment has been provided and is being properly used, and ensure that safety barriers, when required by 14.5.2.1.3, are in place between students and the demonstration or experiment to prevent personal injury.

14.4.1 Instructors in teaching laboratories shall be trained and knowledgeable in fire safety procedures, emergency plans, the hazards present in the lab, the appropriate use of personal protective equipment, and how to properly conduct a hazard risk assessment.

14.5 Chemical Storage and Handling.
14.5.1 Bulk quantities of chemicals shall be stored in a locked room outside of the classroom in educational laboratories. Chemicals stored and in use in an educational laboratory shall be limited to the amount needed for daily use in the laboratory. The chemicals stored in an educational laboratory shall be kept in an appropriate, locked cabinet, except for the amounts actually in use during an individual class session.

14.5.1.1 Quantities of chemicals in an instructional lab shall be limited to the lowest possible level necessary and in no case shall exceed the per-laboratory unit quantities specified in 10.1.1 or the maximum allowable quantities specified in the Fire Code and the Building Code.

14.5.1.2 Dispensing of bulk quantities of chemicals for an experiment or demonstration shall be performed in a prep room outside of the classroom.

14.5.1.3 For existing educational and instructional laboratories that do not have a separate preparation room, the dispensing of bulk quantities of chemicals for experiments or demonstrations shall be performed prior to the arrival of the students in the classroom.

14.5.1.4 The minimum amount of chemical(s) needed to perform the experiment or demonstration shall be transferred to a small, appropriately labeled, sealable bottle(s) or dropping bottle(s).

14.5.1.5 Bottles of chemicals shall only be open in the classroom while the experiment or demonstration is being performed.

14.5.2 Performance of Experiments or Demonstrations.

14.5.2.1 Experiments or demonstrations for students involving open flames; fire; or the use of flammable, reactive, toxic or corrosive chemicals shall be performed in accordance with 14.5.2.1.1, and 14.5.2.1.2, 14.5.2.1.3, or 14.5.2.1.4.

14.5.2.1.1 Experiments or demonstrations shall be performed in a location that does not block access to the means of egress from the laboratory work area.

14.5.2.1.2 Experiments or demonstrations that involve or produce hazardous quantities of fumes, vapors, particulates, or gases shall be performed in a chemical fume hood or other ventilation device adequate to capture the materials.

14.5.2.1.3 Experiments or demonstrations involving chemicals that are performed outside a fume hood where the separation distance in 14.5.2.1.4 is not possible shall be performed behind an impact-resistant plastic or tempered-glass safety shield.

(1) The shield shall be at least 0.610 m (24 in.) high and shall wrap 180 degrees around the hazard or extend at least 0.305 m (12 in.) beyond the hazard in both directions.
(2) The shield shall be secured to the work surface with bolts or clamps to keep it in place.

14.5.2.1.4 Experiments or demonstrations involving chemicals that are performed outside a fume hood where a shield is not utilized shall be performed in a location that is at least 3.05 m (10 ft.) from students.

14.5.2.2 Experiments or demonstrations using flammable liquids and open flames shall be performed by a knowledgeable instructor.

14.5.2.3 The instructor shall conduct a safety briefing prior to the start of each experiment conducted by students to review the hazards of the chemicals used, the personal protective equipment required for the experiment, and a review of the emergency procedures.

4702-01 (NFPA 45 referenced standard modifications) (8/12/15)
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CERTIFICATION PURSUANT TO  
CHARTER §1043(d)

RULE TITLE: Fire Prevention Standards for Laboratories Using Chemicals  
REFERENCE NUMBER: 2015 RG 079  
RULEMAKING AGENCY: New York City Fire Department

I certify that this office has reviewed the above-referenced proposed rule as required by section 1043(d) of the New York City Charter, and that the above-referenced proposed rule:

(i) is drafted so as to accomplish the purpose of the authorizing provisions of law;

(ii) is not in conflict with other applicable rules;

(iii) to the extent practicable and appropriate, is narrowly drawn to achieve its stated purpose; and

(iv) to the extent practicable and appropriate, contains a statement of basis and purpose that provides a clear explanation of the rule and the requirements imposed by the rule.

/s/ STEVEN GOULDEN Date: August 14, 2015  
Acting Corporation Counsel
CERTIFICATION / ANALYSIS
PURSUANT TO CHARTER SECTION 1043(d)

RULE TITLE: Fire Prevention Standards for Laboratories Using Chemicals

REFERENCE NUMBER: FDNY-8

RULEMAKING AGENCY: Fire Department

I certify that this office has analyzed the proposed rule referenced above as required by Section 1043(d) of the New York City Charter, and that the proposed rule referenced above:

(i) Is understandable and written in plain language for the discrete regulated community or communities;

(ii) Minimizes compliance costs for the discrete regulated community or communities consistent with achieving the stated purpose of the rule; and

(iii) Does not provide a cure period because it does not establish a violation, modification of a violation, or modification of the penalties associated with a violation.

_/s/ Guenevere Knowles_  
Mayor’s Office of Operations  
August 14, 2015  
Date