Int. No. 1174

By Council Members Crowley, Koo, Koppell, Vann and Halloran (by request of the Mayor)

A Local Law to amend the New York city fire code, in relation to the enhancement of emergency preparedness in New York city and the adoption of current fire safety standards as incorporated in the 2009 edition of the international fire code, and to amend certain provisions of the New York city charter, the New York city mechanical code and the New York city plumbing code consistent with amendments to the New York city fire code.

Be it enacted by the Council as follows:

Section 1. Legislative intent. This local law arises from the mandate of section 29-104 of the administrative code, which requires the fire commissioner to review the latest edition of the international fire code and submit to the city council such proposed amendments to the New York city fire code as the fire commissioner determines should be made. Section 29-104 was enacted by local law 26 of 2008, which adopted a new fire code for New York city based on the international fire code, with amendments to reflect the unique New York City environment. This local law amends the New York city fire code to incorporate new fire safety standards and technologies adopted or reflected in the international fire code since the 2003 edition that was the basis for the 2008 New York city fire code. The fire code amendments enacted by this local law also reflect an evolution in thinking about the implementation of emergency preparedness requirements in a wide range of business, commercial and institutional occupancies. New emergency preparedness requirements address non-fire emergencies and coordinate plan, staffing and voice communication capabilities. These amendments will fulfill the goal of local law 26 of keeping the New York city fire code current and relevant to the fire safety challenges facing New York city.

§2. Paragraphs l, m, n and o of subdivision 2 of section 1301 of the New York city charter, as added by local law number 61 for the year 1991 and amended by local law number 26 for the year 2008, are amended to read as follows:

l. to manage and promote the economic development of all airports, airplane landing sites, seaplane bases, [and] heliports and helistops owned by the city, and to lease such property, subject to review and approval pursuant to sections one hundred ninety-seven-c and one hundred ninety-seven-d. No such lease may be authorized by the commissioner until a public hearing has been held with respect thereto after the publication of notice in the City Record at least thirty days in advance of such hearing;

m. except as provided in section 487, to have charge and control of the regulation for the health and safety of the general public of all airports, airplane landing sites, seaplane bases, heliports, helistops, marginal streets and parking facilities appurtenant thereto owned by the city;

n. except as provided in section 487, to establish, amend and enforce rules for the proper care and use of all public markets, wharf property, water front property and all airports, airplane landing sites, seaplane bases, [and] heliports and helistops owned by the city and placed in his or her charge or over which he or she shall have power of regulation, and to issue such orders as may be necessary for such enforcement. The violation of or the failure to comply with any such order or rule shall be triable in criminal court and punishable, upon conviction, by not more than thirty days imprisonment or by a fine of not less than one hundred dollars nor more than five thousand dollars, or both;

o. except as provided in section 487, to have the exclusive power to regulate all privately owned airports, airplane landing sites, seaplane bases, [and] heliports and helistops and the operation out of and into such bases as well as the control of ground effect craft and aircraft operations to or from other sites within the city not so designated as airports, heliports, helistops, airplane landing sites or seaplane bases;

§3. Subdivision g of section 487 of the New York city charter, as added by local law number 26 for the year 2008, is amended to read as follows:

g. The department shall have the power and authority to regulate helicopter landings and takeoffs at or from locations other than airports, heliports, helistops, seaplane bases or other facilities approved by the commissioner of small business services, helicopter external load lift operations, [seaplane landings and takeoffs at or from seaplane bases approved by the commissioner of small business services,] and hot air balloon operations. This subdivision shall not be construed to limit or impair the powers of any other agency established pursuant to this charter, except to the extent that the aforementioned powers granted to the department were previously exercised by the commissioner of small business services.

§4. Chapter 4 of the New York city plumbing code of chapter 6 of title 28 of the administrative code of the city of New York, as added by local law number 99 for the year 2005, amended by local law numbers 54 and 55 for the year 2010, and amended by local law number 41 for the year of 2012, is amended by adding a new section 429 to read as follows:

**SECTION PC 429**
**ROOFTOP GARDENS AND LANDSCAPING**

**429.1 Water supply.** Where a connection to an approved water supply is required by Section 318.5 of the New York City Fire Code, an approved fixture shall be provided for connection to such water supply in accordance with this code.

§5. Section 507.16 of the New York city mechanical code of chapter 8 of title 28 of the administrative code of the city of New York, as added by local law number 33 for the year 2007, is amended to read as follows:

**507.16 Performance test.** A performance test shall be conducted upon completion of and [witnessed by a representative of the Fire Department] before final approval of the installation of a ventilation system serving commercial cooking appliances. The test shall verify the rate of exhaust airflow required by Section 507.13, makeup airflow required by Section 508, and proper operation as specified in this chapter. The permit holder shall furnish the necessary test equipment and devices required to perform the tests.

§6. The New York city fire code, chapter 2 of title 29 of the administrative code of the city of New York, as added by local law number 26 for the year 2008, amended by local law numbers 37, 39, 41 and 64 for the year 2009, and amended by local law 2 for the year 2013, is amended to read as follows:

## CHAPTER 1
## ADMINISTRATION

## SECTION FC 101
## GENERAL

**101.1 Title.** This code, including any appendices hereto, shall be known as the New York City Fire Code, hereinafter referred to as "this code" or "the code."[.] All section numbers in this code shall be deemed to be preceded by the designation "FC."[.]

**101.2 Scope.** This code governs:

1. The manufacturing, storage, handling, use, sale and transportation of hazardous materials and combustible materials, except for the installation of storage tanks and auxiliary storage tanks for oil-burning equipment.

2. The design, installation, operation and maintenance of devices, equipment and systems designed to prevent, mitigate, control and extinguish fire, explosions or other life safety hazards.

3. Emergency [prepardness] preparedness and planning, including [the orderly evacuation of] procedures to provide information, guidance, direction and assistance to protect occupants of buildings, structures [or] and premises in the event of fire, explosion, biological, chemical or hazardous material incident or release, natural disaster, medical emergency or other emergency, or the threat thereof.

4. The prevention, mitigation and control of hazards to firefighters and emergency responders during emergency operations.

5. The operation and maintenance of any manual, automatic or other fire alarm or fire extinguishing device, equipment or system.

**101.3 Intent.** The purpose of this code is to establish reasonable minimum requirements and standards for life safety and property protection, to accomplish the purposes set forth in [Section 101.2] FC101.2.

**101.4 Severability.** If a section, subsection, sentence, clause or phrase of this code is adjudged by any court of competent jurisdiction to be invalid, such judgment shall not affect, impair, or invalidate the remainder thereof, but shall be confined in its operation to the section, subsection,

sentence, clause or phrase thereof directly involved in the controversy in which such judgment shall have been rendered.

## SECTION FC 102
## APPLICABILITY

**102.1 Design and installation provisions.** The design and installation provisions of this code shall apply to:

1. Facilities established and conditions arising on or after the effective date of this code.

2. Facilities and conditions not lawfully existing prior to the effective date of this code.

3. Facilities and conditions lawfully existing prior to the effective date of this code, except as otherwise provided in [Section 102.3] FC 102.3, 102.4 and 102.5.

**102.2 [Administrative, operational] Operational and maintenance provisions.** The [administrative,] operational and maintenance provisions of this code, including permit and certification requirements, shall apply to[:] all facilities, operations, conditions, uses and occupancies, regardless of when they were established or arose.

[1. Facilities, operations, conditions, uses and occupancies established or arising on or after the effective date of this code.

2. Facilities, operations, conditions, uses and occupancies established or existing prior to the effective date of this code.]

**102.2.1 Existing permits and certificates continued.** Permits and certificates for facilities, operations, conditions, uses and occupancies issued pursuant to the New York City Fire Prevention Code and in effect on the effective date of this code shall remain in effect until they expire unless sooner revoked or suspended in accordance with this code. Renewal of such permits and certificates shall be in accordance with the provisions of this code.

**102.2.2 New permits and certificates.** [In any case where a provision of] Whenever this code [requires] is amended or a rule is promulgated to require a permit or certificate for a facility, operation, condition, use or occupancy, and no permit or certificate was previously required therefor pursuant to [the New York City Fire Prevention Code] this code or the rules, such facility, operation, condition, use or occupancy may be continued without such permit or certificate [until July 1, 2009] for a period of 1 year from the effective date of such amendment or rule, except as may otherwise be provided by such amendment or rule.

**[102.3 Lawfully existing facilities and conditions.** Facilities, or parts thereof, lawfully existing on the effective date of this code, as to which the design or installation of a facility would not be allowed or approved under this code may be continued in compliance with the New York City Fire Prevention Code and other laws, rules and regulations or permit conditions applicable at the time such facility was lawfully allowed or approved, and as such provisions may be amended from time to time. Manufacturing, storage, handling or use of materials in premises under conditions that would not be allowed or approved under this code, but which conditions lawfully

existed in such premises on the effective date of this code, may be continued in compliance with the requirements of the New York City Fire Prevention Code and other laws, rules and regulations or permit conditions applicable at the time such condition was lawfully allowed or approved, and as such provisions may be amended from time to time.

**Exceptions:**

1. Facilities and conditions lawfully existing prior to the effective date of this code shall comply with the requirements of this code when specifically required by this code.

2. Facilities and conditions lawfully existing prior to the effective date of this code shall comply with the requirements of this code when the commissioner determines such facility or condition to constitute a life safety hazard.

3. Facilities and conditions existing prior to the effective date of this code shall comply with the requirements of this code when the part of the building, structure, facility or premises in which the facility is located or the condition exists undergoes a change in use or occupancy on or after such effective date.

4. Facilities and conditions existing prior to the effective date of this code shall comply with the requirements of this code when the part of the building, structure, facility or premises in which the facility is located or the condition exists, undergoes alteration, whether made voluntarily, or as a result of damage, deterioration or other cause, on or after such effective date.]

**102.3 Lawfully existing conditions as of June 30, 2008**. Except as otherwise provided in FC102.5, the following conditions, which were lawfully existing on June 30, 2008, but which would not be allowed or approved under the fire code enacted effective as of July 1, 2008, may be continued in compliance with the requirements of the New York City Fire Prevention Code and other laws, rules, regulations and permit conditions that existed when such conditions were lawfully allowed or approved and as such requirements may be amended from time to time:

1. The facilities that may be maintained on a premises, and the design and installation of such facilities;

2. The materials that may be manufactured, stored, handled or used in or on a premises, and the conditions of such manufacturing, storage, handling and/or use; and

3. The operations that may be conducted and/or the conditions under which such operation may be conducted.

**[102.4 Application of construction codes.** The design and construction of buildings, structures, facilities or other premises shall comply with the requirements of the construction codes.]

**102.4 Lawfully existing conditions as of the date of fire code amendments.** Except as otherwise provided in FC102.5, the following conditions lawfully arising on or after July 1, 2008, and lawfully existing on the effective date of an amendment to this code, which would not be allowed or approved under such amendment, may be continued in compliance with the

provisions of this code existing prior to such amendment, and other applicable laws, rules and regulations, and the terms and conditions of any permits and other approvals, applicable at the time such facility was lawfully allowed or approved, and as such provisions may be amended from time to time:

1. The facilities that may be maintained on a premises, and the design and installation of such facilities;

2. The materials that may be manufactured, stored, handled or used in or on premises, and the conditions of such manufacturing, storage, handling and/or use; and

3. The operations that may be conducted and/or the conditions under which such operation may be conducted.

**102.5** [Reserved.] **Fire code compliance of lawfully existing conditions.** A lawfully existing condition, as set forth in FC 102.3 and 102.4, shall, notwithstanding the provisions of such sections, comply with the requirements of this code under the following circumstances:

1. When specifically required by this code.

2. When the commissioner determines such facility or condition constitutes a life safety hazard.

3. When the part of the building, structure, facility or premises in which the lawfully existing condition exists undergoes a change in use or occupancy.

4. When the part of the building, structure, facility or premises in which the lawfully existing condition exists undergoes alteration, whether made voluntarily, or as a result of damage, deterioration or other cause.

**102.6 Relationship with other applicable codes, standards and rules.**

**102.6.1 Referenced codes.** Any codes or other provisions of law referenced in this code, including those referenced in FC Chapter 45, shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences or inconsistencies arise between the provisions of this code and any other code or provision of law referenced in this code, the more restrictive provision shall govern.

**102.6.1.1 Construction codes and Electrical Code references.** References in this code to the construction codes or the Electrical Code shall not be deemed to be a grant of authority to the commissioner to enforce such codes, provided, however, that the department may require proof of compliance with the requirements of such codes pursuant to [Section 105.3.9] FC105.3.9.

**102.6.2 Appendices and referenced standards**. Any appendix to this code and any referenced standard in FC Chapter 45 shall be considered part of the requirements of this code to the prescribed extent of each such reference. The provisions of any appendix or referenced standard may be amended by the commissioner pursuant to the rule making

process set forth in the charter. Where differences or inconsistencies arise between the referenced standards, the provisions of this code or any rules promulgated thereunder, the provisions of this code or such rules shall govern.

**102.6.3 Rules**. The commissioner may promulgate rules in accordance with the charter and this code.

**102.7 Subjects not regulated by this code.** Where no applicable fire safety or other safety standards or requirements are set forth in this code, or applicable laws, codes, rules or regulations enforced by the commissioner, facilities, operations and conditions in a building, structure, facility or other premises shall comply with nationally recognized fire safety or other safety standards of the particular industry, as approved. Nothing herein shall derogate from the authority of the commissioner to determine compliance with the requirements of the codes, standards, or rules for those facilities, operations and conditions within such buildings, structures, facilities or other premises within the commissioner's jurisdiction or responsibility.

**102.8 Matters not adequately provided for in this code.** Requirements that are essential for fire safety in an existing or proposed building, structure, or premises, or in connection with the regulation of any material, operation or facility, which are not specifically provided for by this code may be established by the commissioner.

**102.9 Internal references and inconsistent provisions.** Where one chapter, section or other provision of this code requires compliance with or otherwise references another chapter, section or other provision of this code, such reference shall be construed in a manner that harmonizes the various provisions and furthers the purpose of this code. Where British and metric units of measurement conflict, the British units shall govern.

## SECTION FC 103
## RESERVED

## SECTION FC 104
## DUTIES AND POWERS OF COMMISSIONER

**104.1 Enforcement.** The commissioner shall be responsible for the administration, interpretation and enforcement of this code. The commissioner may adopt policies, procedures, rules and regulations in order to clarify or implement the application of its provisions. Such interpretations, policies, procedures, rules and regulations shall be in compliance with the intent and purpose of this code and shall, except in those instances in which a modification has been granted, not have the effect of waiving requirements specifically provided for in this code.

**104.1.1 Asbestos abatement activity.** Notwithstanding any other provision of law, the commissioner may designate officers and employees of the Department of Environmental Protection to issue notices of violation, violation orders and Criminal Court process at premises in which asbestos abatement activity is taking place, for violations of this code and other laws, rules and regulations enforced by the department.

**104.1.2 Review of design and installation.** The commissioner may authorize the Department of Buildings to review construction documents filed with that agency for

compliance with the design and installation requirements of this code for battery systems, fire apparatus access roads, rooftop access and obstructions, and such other design and installation requirements as the commissioner, in consultation with the Commissioner of Buildings, may determine facilitates the design and construction process. The manner and scope of such review and the standards to be applied thereto shall be established by the commissioner in consultation with the Commissioner of Buildings, consistent with FC104.2.1.

**104.2 Applications and approvals.** The commissioner shall receive, review and, if satisfactory, approve, applications for permits, certificates and other approvals, and design and installation documents required to be submitted to the commissioner by this code or the construction codes, issue permits, inspect buildings, structures, facilities, premises, marine vessels, watercraft and motor vehicles for the purpose of enforcing compliance with the requirements of this code, and otherwise administer, implement and enforce the provisions of this code.

**104.2.1 Acceptance of professional certification.** The commissioner shall not accept professional certification of compliance with the requirements of this code and the rules in lieu of required department inspections, witnessing of tests, or approval of design and installation documents, except as otherwise provided in this section. Professional certification may only be accepted with respect to fire alarm system devices or equipment that are not part of the building's core fire alarm system. The commissioner shall adopt a written policy setting forth procedures by which professionally certified fire alarm system devices or equipment will be audited by the department to ensure the accuracy of such professional certifications. For purposes of this section, “professional certification" or "professionally certified" means the submission to the department of a signed, personal verification by a registered design professional that accompanies an application and/or design and installation documents filed with the department that attests that such application or design and installation documents do not contain any false information and that such application or design and installation documents are in compliance with all applicable laws, rules and regulations.

**104.2.1.1 Disqualification for false certification.** The commissioner may adopt rules setting forth the penalty for submission of false or fraudulent documents certifying compliance with the requirements of this code and the rules**.** Penalties may include disqualification from submission of professionally certified applications, as set forth in FC104.2.1. Nothing contained herein shall be deemed to prohibit the submission of design and installation documents by registered design professionals for department review and approval.

**104.3 Right of entry.** The commissioner and his or her authorized representatives, in the discharge of their duties, shall have the right to enter upon and inspect, at all reasonable times, any building, structure, facility, premises, marine vessel, watercraft, vehicle or any part thereof, for the purpose of determining compliance with the requirements this code and other applicable laws, rules and regulations enforced by the department. If access is not obtained, the commissioner shall have recourse to remedies provided by law to secure entry.

**104.4 Identification.** When entering property pursuant to [Section 104.3] FC104.3, officers and employees of the department shall identify themselves by exhibiting the badge or other official

identification of the department; and other authorized representatives of the commissioner shall identify themselves by producing and exhibiting their authority in writing signed by the commissioner.

**104.5 Notices and orders.** Notices, orders and violations may be issued by or in the name of the commissioner in accordance with Title 15 of the New York City Administrative Code to enforce the provisions of this code or the rules.

**104.5.1 Seizure of contraband material.** The commissioner may order the seizure, destruction or other arrangement for disposal thereof of any device, equipment or other article, the manufacture, storage, handling, use, transportation or sale of which is prohibited by this code or the rules, or which is manufactured, stored, handled, used, transported or sold in violation thereof.

**104.6 Official records.** The department shall keep official records of applications received, approvals, inspections, administrative decisions, permits and certificates issued, modifications approved, fees collected, and notices, orders and violations, and such other records as the commissioner may prescribe. Such official records shall be retained for the period required for retention of public records.

**104.7 Approved devices and equipment.** All devices, equipment or other articles approved by the commissioner shall be designed, constructed, installed and used in accordance with such approval. Devices, equipment and other articles required by the provisions of this code to be of a type for which a certificate of approval has been issued shall be designed, constructed, installed and used in accordance with such certificate approval conditions, [Section 112] FC112 and the rules.

**104.7.1 Device, equipment and system reuse.** Devices, equipment and systems shall not be reused or reinstalled unless they have been reconditioned, tested and placed in good and proper working condition. Devices, equipment and systems that are unsafe to operate or use shall not be operated or used.

**104.7.2 Technical assistance.** To determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building, structure, facility or other premises subject to inspection by the commissioner, the commissioner may require the owner to provide, at the owner's expense, a technical opinion and report prepared by a registered design professional or other individual or organization whose qualifications are acceptable to the commissioner. Such individual or organization shall evaluate the safety of the design, operation or use of the building, structure, facility or other premises and the facilities, operations and conditions situated or conducted thereon, as applicable.

**104.8 Modifications.** When the circumstances, conditions, limitations or surroundings of any business, occupation, trade, industry or premises to which this code [applies] or the rules apply are unusual, or such as to render it impracticable to enforce all the provisions applicable thereto, the commissioner may waive or modify such provisions to such extent, for such period of time, as the commissioner may deem necessary consistent with public safety.

**104.8.1 Application for modification.** Any owner or other person subject to a provision of this code or the rules may request the modification of such provision in accordance with this section.

**104.8.1.1 Submission.** Any person seeking a modification shall submit a written request to the commissioner stating the grounds thereof supported by relevant evidence and citation to this code or any other law, rule or regulation or other legal authority. Any additional information or other supplemental submission requested by the commissioner shall be filed with the department within [twenty (20)] 20 calendar days of the date of the request, or within such other time as may be prescribed by the commissioner.

**104.8.1.2 Determination.** The commissioner shall render a written determination denying the request, or granting such modification as the commissioner determines is necessary and appropriate upon such terms and conditions as the commissioner may prescribe.

**104.8.1.3 Stay of enforcement.** The filing of such request for a modification shall not stay the enforcement of the provision. The person filing such modification may request a stay of enforcement of such provision. Such request shall be in writing and shall be subject to the same requirements as a modification. The commissioner shall expeditiously render a written determination of such request for a stay, giving due consideration to the interests of public safety, the costs of compliance, and the apparent merits of the request.

**104.8.2 Board of standards and appeals variances.** Notwithstanding any other provision of law, rule or regulation, no application for a variance shall be granted by the board of standards and appeals in approving changes in bulk storage in excess of the standards set forth in this code or the rules, as it may apply to the storage of liquefied natural gas, synthetic or substitute natural gas or naptha in the liquid or gaseous state.

**104.9 Alternative devices, equipment and systems.** The provisions of this code and the rules are not intended to prevent the design, installation or use of any device, equipment or system not specifically prescribed or prohibited by this code or the rules, provided that any such alternative has been approved by the commissioner. The commissioner may approve such an alternative device, equipment or system where the commissioner finds that the proposed design, installation or use is satisfactory and complies with the intent of the provisions of this code or the rules, and that the device, equipment or system offered is, for the purpose intended, at least the equivalent of that prescribed in this code or the rules in quality, strength, effectiveness, fire resistance, durability and safety.

**104.10 Fire investigations.** The commissioner may investigate the cause, origin and circumstances of any fire, explosion or other life safety hazard.

**104.11 Authority at fires and other emergencies.** The firefighting personnel in charge at the scene of a fire or other emergency involving the protection of life or property, or any part thereof, shall have the authority to direct such operation as necessary to extinguish or control any fire, perform any rescue operation, investigate the existence of suspected or reported fires, gas leaks or other hazardous conditions or situations, or take any other action necessary in the reasonable performance of duty. In the exercise of such power, firefighting personnel may

prohibit any person, vehicle, marine vessel, watercraft or object from approaching the scene and may remove, or cause to be removed or kept away from the scene, any vehicle, marine vessel, watercraft or object which could impede or interfere with the operations of the department and, in the judgment of firefighting personnel, any person not actually and usefully employed in the extinguishing of such fire or in the preservation of property in the vicinity thereof.

**104.11.1 Barricades.** The firefighting personnel in charge at the scene of a fire or other emergency may place ropes, guards, barricades or other obstructions across any street, alley, place or private property in the vicinity of such operation so as to prevent accidents or interference with the lawful efforts of the department to manage and control the situation.

**104.11.2 Obstructing representatives of the department.** It shall be unlawful to obstruct, interfere with or otherwise hamper any representative of the department in conducting any inspection, issuing any notice, order or violation, or otherwise enforcing the provisions of this code, or any other law, rule or regulation enforced by the department, or otherwise executing the performance of his or her lawful duties.

**104.11.3 Systems and devices.** No person shall render a life safety device, equipment or system inoperative during an emergency except as directed by the firefighting personnel in charge of the scene of a fire or other emergency.

**104.11.4 Authority to disconnect utility service.** The department shall have the authority to disconnect or authorize disconnection of water, natural gas, electricity or other utility service in or on a building, structure or premises when necessary to safely or effectively conduct firefighting or other emergency operations or to abate a condition presenting an imminent danger to fire or life safety. If utility service has not been restored when the department leaves the premises and there is no representative of the owner at the premises, the department shall notify the utility within a reasonable time thereafter.

**104.12 Cooperation of other departments.** Upon request of the commissioner, it shall be the duty of all departments to cooperate with the department at all times and to furnish the department with such information, reports and assistance as the commissioner may require.

## SECTION FC 105
## PERMITS AND OTHER APPROVALS

**105.1 General.** Permits and other approvals shall be required as set forth in [Section 105] FC105.

**105.1.1 Permits required.** It shall be unlawful to manufacture, store, handle, use, sell or transport a hazardous material or combustible material, or to conduct an operation or to maintain a facility for which a permit is required pursuant to the provisions of this code, without such permit. Permits required by this code shall be obtained from the commissioner. Permit and other applicable fees shall be paid prior to issuance of the permit. Issued permits shall be kept on the premises designated therein at all times and shall be readily available for inspection by any representative of the department.

**105.1.2 Types of permits.** There shall be [two] three types of permits as follows:

1. **Site-specific permit.** Such permit authorizes the permit holder to manufacture, store, handle, use or sell hazardous materials or combustible materials, or conduct an operation or maintain a facility at a specific premises or location, for which a permit is required by [Section 105.6] FC105.6.

2. **Citywide permit.** Such permit authorizes the permit holder to store, handle, use[,] or sell [or transport] hazardous materials, or conduct an operation on a citywide basis, for which a permit is required by [Section 105.6] FC105.6. A citywide permit is valid to temporarily store, handle, use[,] or sell [or transport] hazardous materials or to conduct an operation at one or more locations subject to the following restrictions:

   2.1. [provided the] The duration of such activity at any individual location does not exceed 30 calendar days and all hazardous materials associated with such activity are removed from the location at the end of the workday. Periods of activity in excess of 30 calendar days at any one location shall require a site-specific permit.

   2.2. The quantity of hazardous materials being temporarily stored and used does not exceed 5 gallons (19 L) of gasoline, or 250 gallons (946 L) of any other flammable liquid, and 300 gallons (1136 L) of any combustible liquid. Storage or use of hazardous materials in quantities exceeding these amounts requires a site-specific permit for each location at which such storage or use occurs.

3. **Transportation permit.** Such permit authorizes the permit holder to transport, pick up and deliver hazardous materials.

**105.1.3 Permits for the same premises or location.** When more than one permit is required for the same premises or other location or portion thereof, the commissioner may consolidate such permits into a single permit; provided that each type of hazardous material, operation or facility is listed in the permit, and provided further that the total fees payable for such single permit shall be determined by adding the fees for the permits consolidated into the single permit.

**105.1.4 Approval of design and installation documents.** [Where approval of] The department shall approve design and installation documents [is] required by this code or [other law, rule and regulation, other than in connection with a permit application, applications shall be made for such approval in accordance with Section 105.4] the rules by marking such documents and/or by issuing a separate written approval.

**105.1.5 Insurance.** The commissioner may require applicants for permits or other approvals to obtain and furnish proof of general liability insurance, in such amounts and in accordance with such requirements[,] as may be set forth in this code or the rules, otherwise required by law, or required as a condition of the permit or other approval. The permit or other approval shall expire by operation of law if any such required insurance lapses, expires or is cancelled during the term of the permit or other approval.

**105.2 Permit application.** Application for a permit required by this code shall be made to the commissioner in such form and detail as the commissioner may prescribe. Applications for

permits shall be accompanied by design and installation documents and/or such other information or documentation as may be prescribed by this code, the rules or the department. Applications for permits relating to the storage, handling, use or transportation of high explosives shall be accompanied by proof of United States citizenship.

**105.2.1** Reserved.

**105.2.2 Inspection [authorized] <u>of premises and installations</u>.** Before a permit or other approval is issued, the commissioner may inspect the building, structure, facility, premises, marine vessel, <u>watercraft or</u> vehicle[, or any portion thereof] to confirm the facts set forth in the application, determine compliance with the requirements of this code, the rules and other applicable laws, rules or regulations enforced by the commissioner, or to evaluate whether any restrictions should be imposed as a condition of the permit or other approval. The department may require the applicant to arrange any such inspection, and require the applicant to attend such inspection with his or her design professionals, contractor or other appropriate representatives. <u>When a department inspection is required upon completion of an installation or other work or requested by the department, the applicant shall notify the department upon completion of such work and request such inspection, arrange for the presence of the appropriate representatives at such inspection, correct any deficiencies identified during such inspection, and keep the installation or other work accessible for department inspection until department approval is obtained.</u>

**105.2.3 Time limitation on application.** An application for a permit or other approval shall be deemed to have been abandoned [six months] <u>180 calendar days</u> after the date of filing, unless such application has been diligently prosecuted or a permit or other approval shall have been issued; except that the commissioner may grant one or more extensions of time for additional periods not exceeding 90 <u>calendar</u> days each if there is reasonable cause.

**105.2.4 Action on application.** Completed permit applications for the manufacture, storage, handling, use, transportation or sale of flammable or combustible liquids, combustible materials or hazardous materials or an operation or facility that comply with the requirements of this code and other applicable laws, rules and regulations shall be approved by the commissioner no later than 40 calendar days after the submission thereof, except that on or before the fortieth day, the commissioner may, for good cause, extend such time for an additional 40 calendar days. Permit applications that do not comply with the requirements of this code and other applicable laws, rules and regulations shall be denied or preliminarily denied no later than 40 calendar days from the submission thereof and written notice of such denial or preliminary denial, stating the grounds therefor, shall be promptly given to the applicant. When a permit application has been denied or preliminarily denied and is thereafter revised and resubmitted to meet the stated grounds for denial, the revised completed application shall be approved or denied or preliminarily denied in accordance with the foregoing procedures and time periods.

**105.3 Authority granted by permit <u>or other approval</u>.** A permit <u>or other approval</u> shall constitute permission to manufacture, store, handle, use, sell or transport hazardous materials or combustible materials, conduct an operation, or maintain a facility, as applicable, in accordance with this code <u>and the rules</u> where a permit is required by [Section 105.6] <u>FC105.6</u>. Such

permission shall not be construed as authority to violate, cancel or set aside any of the provisions of this code, the rules or other applicable laws, rules or regulations.

**105.3.1 Permit issuance and renewal.** Every permit or renewal thereof granted by the commissioner shall be for a period specified therein, not to exceed [two] 2 years, or as set forth in [Section 105.6] FC105.6, and shall expire at the end of such period unless the commissioner approves its renewal. Permits are not transferable and any change in occupancy, operation, tenancy or ownership shall require that a new permit be issued.

**105.3.2 through and including 105.3.4** Reserved.

**105.3.5 Posting the permit.** Permits shall be posted in a conspicuous location on the premises designated therein at all times and shall be readily available for inspection by any representative of the department.

**105.3.6 Compliance with the requirements of the code.** The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of other law, rule or regulation. Permits purporting to authorize any such violation shall not be valid. The department's approval of design and installation documents or other submission, in connection with or independent of a permit application, shall not prevent the department from requiring the correction of errors in such documents or other submission. Any addition to, or alteration of, approved design and installation documents shall be approved in advance by the department.

**105.3.7** Reserved.

**105.3.8 Hazardous industries.** Except as otherwise provided in this code, no person shall engage in a hazardous industry, trade, occupation, activity or operation requiring the manufacture, storage, handling, sale, use or transportation of hazardous materials or combustible materials without a permit, issued upon such conditions as the commissioner deems necessary in the interest of public safety.

**105.3.9 Compliance with the requirements of the construction codes and Electrical Code.** The commissioner may require that the applicant for a permit or renewal thereof demonstrate, by submission of a certificate of occupancy or other authorization or approval issued by the Department of Buildings, that the building, structure or premises or portion thereof used for the manufacture, storage, handling or use of flammable or combustible liquids, combustible materials or hazardous materials, and all operations or facilities subject to this code, are designed, constructed and occupied in accordance with the certificate of occupancy, the construction codes and the Electrical Code.

**105.3.9.1 Department of Buildings required approval.** No permit shall be issued when work requires the approval of the Commissioner of Buildings in connection with a material, operation or facility unless proof is submitted to the department that such work has been approved by the Commissioner of Buildings.

**105.4 Design and installation documents.** Design and installation documents required to be submitted to the [commissioner] department pursuant to the provisions of this code, the rules or

the construction codes, including but not limited to those set forth below, or as directed by the commissioner to demonstrate or document that a device, equipment, system, operation or facility regulated by this code is designed and installed in accordance with this code, shall be submitted in accordance with this section. Such submissions shall be reviewed by the department for compliance with the requirements of this code, the rules and other applicable laws, rules and regulations enforced by the department. The time limitations for approval of design and installation documents and for deeming such submissions abandoned shall be as set forth in [Section] FC 105.2.3 and 105.2.4 [and Section 105.2.3, respectively].

1. Aerosol products storage facilities:
   1.1. General purpose warehouses ([Section 2804] FC2804).
   1.2. Aerosol warehouses ([Section 2804] FC2804).
   1.3. Liquid storage rooms ([Section 2804] FC2804).
   1.4. Liquid warehouses ([Section 2804] FC2804).
   1.5. [Outside] Outdoor storage ([Section 2805] FC2805).
   1.6. Retail display ([Section 2806] FC2806).

2. Aircraft fueling systems ([Section 1106] FC1106).

3. Ammonia diffusion systems for refrigerating systems using ammonia refrigerant ([Section 606] FC606).

[4. Sprinkler systems where the design is specified in this code (Sections 2306, 2307, 2308, 2309, 2310, 2804, 2806 and 3404).]

[5] 4. Cellulose nitrate film storage facilities ([Section 306] FC306).

[6. CNG motor fuel-dispensing systems (Sections 2201).]

[7] 5. Combustible fibers storage facilities:
   [7.1] 6.1. Loose fiber storage ([Section 2904] FC2904).
   [7.2] 6.2. Baled fiber storage ([Section 2905] FC2905).

[8] 6. Combustible material storage ([Section 315] FC315).

[9] 7. Commercial cooking system fire extinguishing systems ([Section 904] FC904).

[10] 8. Corrosive materials systems and facilities:
   [10.1] 8.1. Storage ([Section 3104] FC3104).
   [10.2] 8.2. Handling and use ([Section 3105] FC3105).

[11] 9. Cryogenic fluids systems and facilities:
   [11.1] 9.1. Storage ([Sections] FC 3203 and 3204).
   [11.2] 9.2. Handling and use ([Sections] FC 3203 and 3205).
   [11.3] 9.3. Liquefied natural gas facilities ([Section 3206] FC3206).

[12] 10. Dry cleaning systems using Class II and III solvents ([Section 1207] FC1207).

[13] 11. Explosion control systems for certain hazardous materials and special uses ([Section 911] FC911).

[14] 12. Explosion (dust) protection systems for combustible metals, metal powders, metal dusts and sulfur ([Section 1304] FC1304).

[15] 13. Explosives ([Section 3304] FC3304).

14. Facilities in which a fumigant or insecticidal fogger are designed to be used in a stationary installation (FC1703).

[16] 15. Fire alarm systems ([Building Code Section 907] FC907 and Section 907 of the Building Code).

[17] 16. Fire apparatus access roads [for developments] and security gates installed across such roads ([Section 503] FC503).

17. Fire department in-building auxiliary radio communication systems (FC511).

18. Fixed guideway transit and passenger rail systems (FC321):
- 18.1. Emergency ventilation systems.
- 18.2. Emergency voice communication systems.
- 18.3. Means of egress.
- 18.4. Standpipe systems and other fire protection systems.

[18] 19. Flammable and combustible liquids systems and facilities:
- [18.1] 19.1. Piping, equipment, tanks, plants, terminals, fuel-dispensing facilities and similar facilities where flammable and combustible liquids are manufactured, stored, handled or used, including dispensing ([Section 3404] FC3404).
- [18.2] 19.2. Group M occupancy wholesale and retail sales uses ([Section 3404] FC3404).
- [18.3] 19.3. Liquid storage rooms ([Section 3404] FC3404).
- [18.4] 19.4. Liquid storage warehouses ([Section 3404] FC3404).
- [18.5] 19.5. Outdoor storage ([Section 3404] FC3404).
- [18.6] 19.6. Bulk plants and terminals ([Section 3406] FC3406).

[19] 20. Flammable gases systems and facilities:
- [19.1] 20.1. Storage ([Section 3504] FC3504).
- [19.2] 20.2. Handling and use ([Section 3505] FC3505).
- [19.3] 20.3. CNG storage in portable containers ([Section 3507] FC3508).
- [19.4] 20.4. Methane gas recovery from landfills ([Section 3508] FC3509).
- 20.5. Compressing of a flammable gas, including piped natural gas, to a pressure exceeding 6 psig (41.4 kPa) (FC Chapter 35).
- 20.6. Detection and alarm systems (FC 908.9 and 2211.7.2).

[20] 21. Flammable solids systems and facilities:
- [20.1] 21.1. Storage ([Section 3604] FC3604).
- [20.2] 21.2. Handling and use ([Section 3605] FC3605).

[21] 22. Flammable/combustible spraying, dipping or powder-coating systems and facilities:
[21.1] 22.1. Spray booths (spray finishing) ([Section 1504] FC1504).
[21.2] 22.2. Spray rooms (spray finishing) ([Section 1504] FC1504).
[21.3] 22.3. Dip tanks ([Section 1505] FC1505).
[21.4] 22.4. Spray booths (powder coating) ([Section 1507] FC1506).
[21.5] 22.5. Spray rooms (powder coating) ([Section 1507] FC1506).
22.6. Limited spraying space (FC1504).

[22] 23. Flaring systems for refrigerating systems using flammable or toxic or highly toxic refrigerants ([Section 606] FC606).

[23] 24. Hazardous materials systems and facilities ([Sections] FC 2703, 2704 and 2705) (applicable to compressed gases, corrosive materials, cryogenic fluids, explosives, flammable and combustible liquids, flammable gases, flammable solids, highly toxic and toxic materials, LPG, organic peroxides, oxidizers, pyrophoric materials, unstable (reactive) materials and water-reactive solids and liquids):
[23.1] 24.1. Tanks ([Section 2703] FC2703).
[23.2] 24.2. Piping, tubing, valves and fittings ([Section 2703] FC2703).
[23.3] 24.3. Highly toxic and toxic compressed gas rooms ([Section 2703] FC2703).

[24] 25. Highly toxic and toxic materials systems and facilities:
[24.1] 25.1. Storage, handling and use of highly toxic and toxic solids and liquids ([Section 3703] FC3703).
[24.2] 25.2. Storage, handling and use of highly toxic and toxic compressed gases ([Section 3704] FC3704).
[24.3] 25.3. Ozone gas generators ([Section 3705] FC3705).
25.4. Detection and alarm systems (FC 908.3 and 3704.2).

[25] 26. High-piled combustible storage areas ([Section 2301] FC2301).

[26] 27. Industrial furnaces ([Section 2101] FC2101).

[27. Liquid motor fuel-dispensing systems:
27.1. Automotive liquid motor fuel-dispensing facilities (Section 2201).
27.2. Marine liquid motor fuel-dispensing facilities (Section 2201).]

28. LPG ([Section 3801] FC3801).

29. Marina fire protection systems (FC319).

[29] 30. Medical [gas storage rooms (Section 3006)] gases:
30.1. Storage and piping systems (FC3006).
30.2. Monitoring and alarm systems (FC3006.4).

31. Motor fuel dispensing facilities (FC2201):
31.1. Fleet motor fuel-dispensing facilities.
31.2. Full-service motor fuel-dispensing facilities.

31.3. Self-service motor fuel-dispensing facilities.

32. Natural gas distribution piping systems designed for or operated at 15 psig (103 kPa gauge) or greater (Fuel Gas Code).

[30] 33. [Non-flammable] Nonflammable compressed gases systems and facilities ([Section 3003] FC3003).

[31] 34. Non-water fire extinguishing systems:
[31.1] 34.1. [Wet-chemical] Wet chemical systems ([Section 904] FC904).
[31.2] 34.2. Dry chemical systems ([Section 904] FC904).
[31.3] 34.3. Foam systems ([Section 904] FC904).
[31.4] 34.4. Carbon dioxide systems ([Section 904] FC904).
[31.5] 34.5. Halon systems (modification of lawfully existing installations) ([Section 904] FC904).
[31.6] 34.6. [Clean-agent] Clean agent systems ([Section 904] FC904).
34.7. Aerosol systems (FC904).

[32] 35. Organic coating manufacturing process facilities ([Section 2005] FC2005).

[33] 36. Organic peroxides storage and facilities:
[33.1] 36.1. Storage ([Section 3904] FC3904).
[33.2] 36.2. Handling and use ([Section 3905] FC3905).

[34] 37. Oxidizer systems and facilities:
[34.1] 37.1. Storage ([Section 4004] FC4004).
[34.2] 37.2. Handling and use ([Section 4005] FC4005).

[35] 38. Oxygen-fuel gas systems ([Sections] FC 2601 and 2609).

[36] 39. Private fire hydrant systems ([Section 508] FC508).

[37] 40. Pyrophoric materials systems and facilities:
[37.1] 40.1. Storage ([Section 4104] FC4104).
[37.2] 40.2. Handling and use ([Section 4105] FC4105).
[37.3] 40.3. Storage, handling and use of silane gas ([Section 4106] FC 4104 and 4105).

[38] 41. Pyroxylin plastics systems and facilities ([Section 4204] FC4204).

[39] 42. Semiconductor fabrication facilities:
[39.1] 42.1. Facilities ([Section 1803] FC1803).
[39.2] 42.2. Fabrication areas ([Section 1803] FC1803).
[39.3] 42.3. Hazardous production material (HPM) rooms ([Section 1803] FC1803).

43. Sprinkler systems where the design requirements are specified in this code (FC 2209, 2306, 2307, 2308, 2309, 2310, 2804, 2806 and 3404).

[40] 44. Treatment systems for refrigerating systems using toxic or highly toxic refrigerants ([Section 606] FC606).

[41] 45. Unstable ([Reactive] reactive) materials systems and facilities:
[41.1] 45.1. Storage ([Section 4304] FC4304).
[41.2] 45.2. Handling and use ([Section 4305] FC4305).

46. Vehicle tunnels and bridges (FC322):
46.1. Emergency ventilation systems.
46.2. Emergency voice communication systems.
46.3. Means of egress.
46.4. Standpipe systems and other fire protection systems.

[42] 47. Water-mist fire extinguishing systems ([Section 904] FC904).

[43] 48. Water-reactive solids and liquids systems and facilities:
[43.1] 48.1. Storage ([Section 4404] FC4404).
[43.2] 48.2. Handling and use ([Section 4405] FC4405).

49. Yard hydrant systems (FC 508.2.3 and 3406.4.10.5).

**105.4.1 Submissions.** Design and installation documents shall be submitted in such number and in such form and detail as may be prescribed by the commissioner. The design and installation documents shall be prepared by a registered design professional. The commissioner may require that such submissions be made in an approved electronic format or medium.

**105.4.2 Information on design and installation documents.** Design and installation documents shall be drawn to scale. Design and installation documents shall indicate the location, nature and extent of the work proposed and demonstrate compliance with the requirements of this code, the rules and other applicable laws, rules and regulations.

**105.4.3** Reserved.

**105.4.4 Approved documents.** The commissioner shall approve, or deny, or preliminarily deny design and installation documents in accordance with the procedures and time periods set forth in [Section 105.2.4] FC105.2.4. Upon review and approval of design and installation documents, the commissioner shall mark such approval upon such documents and/or issue a letter of approval or other form of written authorization. Design and installation documents approved by the commissioner are approved with the intent that such design and installation documents comply in all respects with the requirements of this code, the rules and any other applicable laws, rules or regulations. Review and approval by the commissioner shall not relieve the applicant of the responsibility of compliance with the requirements of this code, the rules and any other applicable laws, rules or regulations.

**105.4.5 Inspection and testing.** The commissioner may require that, upon completion, any installation for which approved design and installation documents are required by this code

or the rules be inspected and/or subjected to acceptance testing in the presence of a department representative.

**[105.4.5] 105.4.6 Corrected documents.** Where field conditions necessitate any change from the approved design and installation documents, corrected design and installation documents or other documentation acceptable to the department shall be submitted.

**[105.4.6] 105.4.7 Retention of design and installation documents.** One set of design and installation documents shall be retained by the commissioner. One set of approved design and installation documents shall be returned to the applicant, and shall be kept on the site of the building[,] or structure or at the work site at all times and readily available for inspection by any representative of the department until the required permit is posted on the premises as required by [Section 105.3.5] FC105.3.5, or where no permit is required, until the work performed under such approved design and installation documents has been inspected and approved by the department.

**105.5 Revocation.** The commissioner may revoke a permit issued under the provisions of this code when:

1. [The] the permit is used for a location or establishment other than that for which it was issued.

2. [The] the permit is used for a purpose or operation other than that listed in the permit.

3. [Conditions] conditions and limitations set forth in the permit have been violated.

4. [There] there has been a false statement or misrepresentation material to the issuance of the permit.

5. [The] the party engaging in the manufacture, storage, [handle] handling, use, sale or transportation of hazardous materials or combustible materials, or conducting an operation or maintaining a facility is different from the party to whom the permit was issued.

6. [The] the permit holder fails, refuses or neglects to timely comply with the commissioner's orders or notices of violation duly served in accordance with this code, or other law, rule or regulation enforced by the department.

7. [The] the permit was issued in error or in violation of this code or other applicable law, rule or regulation.

8. [Circumstances] circumstances or conditions material to the issuance of the permit applied for [and issued] have changed.

9. [Other] other good cause exists.

**105.6 Required permits.** The commissioner shall issue the following permits for the manufacture, storage, handling, use, transportation and sale of the following materials, the conduct of the following operations, and the design, installation, operation and maintenance of

the following facilities in accordance with this code and the construction codes, including the Building Code:

**Aerosol products.** A permit is required to store, handle or use an aggregate quantity of Level 1, 2 or 3 aerosol products in excess of 100 pounds (45.4 kg) net weight.

**Amusement buildings.** A permit is required to maintain or operate a special amusement building.

**Asphalt melter.** A permit is required to store, handle or use an asphalt melter.

[**Automotive liquid motor fuel-dispensing facility.** A permit is required to maintain or operate an automotive liquid motor fuel- dispensing facility.]

**Aviation operations.** A permit is required for the following aviation operations:

1. To operate or maintain an aircraft-fueling vehicle.

2. To operate or maintain [a seaplane base] an aircraft-fueling system.

3. To conduct a helicopter landing at other than an approved heliport, helistop or airport.

4. To conduct a helicopter lift operation.

5. To conduct a hot air balloon operation.

**Cellulose nitrate film.** A permit is required to store, handle or use cellulose nitrate film in the following quantities:

1. Any [amount] quantity in a Group A occupancy.

2. Quantities of 10 pounds (4.54 kg) or more in other than a Group A occupancy.

**Coke-fueled salamanders.** A permit is required to store, handle or use coke-fueled salamanders at a construction site.

**Combustible dust-producing operations.** A permit is required to maintain or operate a grain elevator, flour starch mill, feed mill, or a plant pulverizing aluminum, coal, cocoa, magnesium, spices or sugar, or other operations producing combustible dusts as defined in FC Chapter 2.

**Combustible fibers.** A permit is required to store or handle combustible fibers in quantities [greater than] exceeding 100 cubic feet (2.8 $m^3$).

**Exception:** A permit is not required for agricultural storage.

**Combustible liquids.** See "Flammable and combustible liquids."

**Combustible material storage.** A permit is required to store in any building, structure, premises or facility more than 2,000 cubic feet (56.6 $m^3$) gross volume of combustible empty packing cases, boxes, barrels or similar containers, rubber (excluding tires), cork or similar combustible material, including combustible waste, or more than 1,000 pounds (454 kg) of flammable plastic foam products, [irrespective] regardless of volume.

**Exceptions:**

1. A permit is not required for such storage in buildings or structures protected throughout by a sprinkler system.

2. A permit is not required if the storage is kept exclusively in a dedicated area of a building or structure which is protected throughout by a sprinkler system and separated from the rest of the building or structure by 2-hour fire-resistance-rated construction.

**Commercial cooking systems.** A permit is required to maintain or operate a commercial cooking system.

**Compressed gases.** A permit is required to store, handle or use compressed gases in [excess of the amounts listed] quantities exceeding those set forth in FC Table 105.6(1).

[**Exception]** **Exceptions:** A permit is not required for the:

1. [Permits are not required for motor vehicles equipped for and using compressed gases as a fuel for propelling the vehicle] storage and use of compressed gases in the fuel tank of a motor vehicle, aircraft, marine vessel or watercraft for motive power.

2. handling and use of medical-grade gaseous oxygen by trained and knowledgeable medical personnel engaged in providing licensed health care at patient locations citywide, outside of health care facilities, on a citywide response basis. This exception does not apply to any premises at which such gaseous oxygen is being stored.

3. handling of medical-grade gaseous oxygen by trained and knowledgeable medical personnel at any premises at which such oxygen is stored for use in the provision of licensed health care at patient locations citywide, outside of health care facilities, on a citywide response basis, but which is not used at such premises. This exception includes making connections for purposes of ascertaining the contents of the container and attaching ancillary equipment, but does not include filling, refilling or hydrostatic testing of the container.

[**Compressed natural gas (CNG) motor fuel-dispensing facility.** A permit is required to maintain or operate a CNG motor fuel-dispensing facility.]

**FC TABLE 105.6(1)**
**PERMIT [AMOUNTS] QUANTITIES FOR COMPRESSED GASES**

| TYPE OF GAS | [AMOUNT] QUANTITY (SCF) |
|---|---|
| Corrosive | 400 |
| Flammable | 400 |
| Highly toxic | Any [Amount] Quantity |
| Nonflammable and nonoxidizing, except carbon dioxide | 3,000 |
| Carbon dioxide | 4,500 |
| Oxidizing | 504 |
| Pyrophoric | Any [Amount] Quantity |
| Toxic | Any [Amount] Quantity |
| Unstable (reactive) | Any [Amount] Quantity |
| Water reactive | Any [Amount] Quantity |

For SI: 1 cubic foot = 0.02832 $m^3$.

**Compressing gases.** A permit is required to compress:

1. [A] a flammable gas, including piped natural gas, to a pressure exceeding 6 psig (41.4 Kpa).

2. [A] a nonflammable, corrosive or oxidizing gas, including air, to a pressure exceeding 100 psig (689.5 Kpa).

   **Exception**: Outdoor air compressing at other than a fair or festival.

**Cryogenic fluids.** A permit is required to manufacture, store, handle or use, including dispensing, cryogenic fluids in [excess of the amounts listed] quantities exceeding those set forth in FC Table 105.6(2).

**[Exception] Exceptions:** A permit is not required for the:

1. [Permits are not required for vehicles equipped for and using cryogenic fluids as a fuel for propelling the vehicle or for refrigerating the cargo] storage and use of cryogenic fluids in the fuel tank of a motor vehicle, aircraft, marine vessel or watercraft for motive power or for refrigerating the cargo.

2. storage, handling or use of liquid oxygen home care containers and liquid oxygen ambulatory containers in compliance with the requirements of FC4006 in residential dwelling units and residential health care dwelling units and sleeping rooms in Group I-1, I-4 and R occupancies.

3. handling and use of medical-grade liquid oxygen by trained and knowledgeable medical personnel engaged in providing licensed health care at patient locations citywide, outside of health care facilities, on a citywide response basis. This exception does not apply to any premises at which such liquid oxygen is being stored.

4. handling of medical-grade liquid oxygen at any premises at which such oxygen is stored by trained and knowledgeable medical personnel for use in the provision of licensed health care at patient locations citywide, outside of health care facilities, on a citywide

response basis, but which is not used at such premises. This exception includes making connections for purposes of ascertaining the contents of the container and attaching ancillary equipment, but does not include filling, refilling or hydrostatic testing of the container.

**FC TABLE 105.6(2)**
**PERMIT [AMOUNTS] QUANTITIES FOR CRYOGENIC FLUIDS**

| TYPE OF CRYOGENIC FLUID | INDOORS (gallons) | OUTDOORS (gallons) |
|---|---|---|
| Flammable | More than 1 | 10 |
| Nonflammable | 60 | 100 |
| Oxidizing (includes oxygen) | 10 | 50 |
| Physical or health hazard not indicated above | Any [Amount] Quantity | Any [Amount] Quantity |

For SI: 1 gallon = 3.785 L.

**Dry cleaning facilities**. A permit is required to maintain or operate dry cleaning equipment that utilizes a Class II or Class III solvent.

**Explosives.** A permit is required to store, handle, use or sell explosives as follows:

1. Store, sell or offer for sale any [amount] quantity of black powder and smokeless powder.

2. Store, sell or offer for sale any [amount] quantity of blasting caps.

3. Store, sell or offer for sale [200] two hundred or more shells of small arms ammunition.

4. Store, handle, use, sell or offer for sale any [amount] quantity of explosives, other than those specified in Items 1, 2 and 3 above.

**Fire department in-building auxiliary radio communication systems.** A permit is required to maintain or operate a fire department in-building auxiliary radio communication system.

**Fireworks.** A permit is required for each display or other event involving the handling, discharge or other use, or storage for use, of fireworks.

**Flammable and combustible liquids.** A permit is required:

1. [To] to store, handle or use [amounts of] Class I liquids, other than paints, varnishes, lacquers, gasoline and other petroleum-based Class I liquids, in [excess of] quantities exceeding 5 gallons (19 L), except that a permit is not required for the storage or use of [Class I] such liquids in the fuel tank of a motor vehicle, aircraft, marine vessel, or watercraft.

2. [To] to store, handle or use amounts of gasoline and other petroleum-based Class I liquids other than paints, varnishes and lacquers, in [excess of] quantities exceeding 2½ gallons (9.5 L), except that a permit is not required for the storage or use of [gasoline or other petroleum-based Class I] such liquids in the fuel tank of a motor vehicle, aircraft, marine vessel, or watercraft.

3. [To] to store, handle or use [amounts of] Class II or Class III liquids with a flash point of 300°F (149°C) or less, other than paints, varnishes and lacquers, in [excess of] quantities exceeding 10 gallons (38 L), except that a permit is not required for the [storage or use of Class II or Class III liquids with a flash point of 300°F (149°C) or less]:

   3.1. storage or use of such liquids in the fuel tank of a motor vehicle, aircraft, marine vessel, or watercraft.

   3.2. storage of fuel oil in stationary storage tanks in Group R-3 occupancies for use in stationary fuel oil burning equipment.

4. [To] to store, handle or use [amounts in excess of 20 gallons (76 L) of] Class I, Class II or Class III liquids having a flash point of 300°F (149°C) or less that are commonly used for painting, varnishing, staining or other similar purposes, including paint, varnish and lacquer, in quantities exceeding 20 gallons (76 L).

5. [To] to store, handle or use [amounts in excess of 70 gallons of petroleum based] petroleum-based Class III liquids with a flash point exceeding 300°F (149°C), in quantities exceeding 70 gallons (266L), except that a permit is not required for the storage and use of such liquids in the fuel tank of a motor vehicle, aircraft, marine vessel or watercraft for motive power.

6. [To] to operate a bulk plant or terminal or bulk transfer facility where flammable and combustible liquids are blended, produced, processed, transported, stored, dispensed or used.

7. [To] to manufacture flammable or combustible liquids.

8. [To] to store and/or use fuel oil stored on a barge, [or] marine vessel or watercraft moored to or anchored at privately owned waterfront property.

9. [To] to store and use fuel oil in quantities exceeding 10 gallons (38 L) on mobile heating and power generating trailers.

**Floor finishing.** A permit is required to conduct floor finishing or surfacing operations over an area exceeding 350 square feet (33 $m^2$) using Class I or Class II liquids [or where the quantity of floor finishing or surfacing products stored, handled or used requires a flammable or combustible liquid permit pursuant to this section].

**Fruit and crop ripening.** A permit is required to maintain or operate a fruit-, or crop-ripening facility or conduct a fruit-ripening process using ethylene gas.

**Fumigation and [thermal] insecticidal fogging.** A permit is required to maintain or operate a facility in which a fumigant or [thermal] insecticidal fogger is used in a stationary installation.

**Hazardous materials.** A permit is required to store, handle or use hazardous materials in [excess of the amounts] quantities exceeding those set forth in FC Table 105.6(3).

**FC TABLE 105.6(3)**
**PERMIT [AMOUNTS] QUANTITIES FOR HAZARDOUS MATERIALS**

| TYPE OF MATERIAL | [AMOUNT] QUANTITY |
|---|---|
| Combustible liquids | See [Section 105.6] FC105.6 for flammable and combustible liquids |
| Corrosive materials | |
| Gases | See FC Table 105.6(1) |
| Liquids | 55 gallons |
| Solids | 1000 pounds |
| Explosive materials | See [Section 105.6] FC105.6 for explosive materials |
| Flammable materials | |
| Gases | See FC Table 105.6(1) |
| Liquids | See [Section 105.6] FC105.6 for flammable and combustible liquids |
| Solids | See FC Table 105.6(4) |
| Highly toxic materials | |
| Gases | See FC Table 105.6(1) |
| Liquids | Any [Amount] quantity |
| Solids | Any [Amount] quantity |
| Oxidizing materials | |
| Gases | See FC Table 105.6(1) |
| Liquids | |
| Class 4 | Any [Amount] quantity |
| Class 3 | 1 gallon |
| Class 2 | 10 gallons |
| Class 1 | 55 gallons |
| Solids | |
| Class 4 | Any [Amount] quantity |
| Class 3 | 10 pounds |
| Class 2 | 100 pounds |
| Class 1 | 500 pounds |
| Organic peroxides | |
| Liquids | |
| Class I | Any [Amount] quantity |
| Class II | Any [Amount] quantity |
| Class III | 1 gallon |
| Class IV | 2 gallons |
| Class V | No Permit Required |
| Solids | |

| | |
|---|---|
| Class I | Any [Amount] quantity |
| Class II | Any [Amount] quantity |
| Class III | 10 pounds |
| Class IV | 20 pounds |
| Class V | No Permit Required |
| Pyrophoric materials | |
| Gases | See FC Table 105.6(1) |
| Liquids | Any [Amount] quantity |
| Solids | Any [Amount] quantity |
| Toxic materials | |
| Gases | See FC Table 105.6(1) |
| Liquids | 10 gallons |
| Solids | 100 pounds |
| Unstable (reactive) materials | |
| Gases | See FC Table 105.6(1) |
| Liquids | |
| Class 4 | Any [Amount] quantity |
| Class 3 | Any [Amount] quantity |
| Class 2 | 5 gallons |
| Class 1 | 10 gallons |
| Solids | |
| Class 4 | Any [Amount] quantity |
| Class 3 | Any [Amount] quantity |
| Class 2 | 50 pounds |
| Class 1 | 100 pounds |
| Water-reactive Materials | |
| Gases | See FC Table 105.6(1) |
| Liquids | |
| Class 3 | Any [Amount] quantity |
| Class 2 | 5 gallons |
| Class 1 | 55 gallons |
| Solids | |
| Class 3 | Any [Amount] quantity |
| Class 2 | 50 pounds |
| Class 1 | 500 pounds |

For SI: 1 gallon = 3.785 L, 1 pound = 0.454 kg.

**FC TABLE 105.6(4)**
**PERMIT [AMOUNTS] QUANTITIES FOR FLAMMABLE SOLIDS**

| FORMS OF FLAMMABLE SOLID | INDOORS (pounds) | OUTDOORS (pounds) |
|---|---|---|
| Pigs, ingots, billets, heavy castings | [1,000] 100 | [100] 1,000 |
| Light castings, light metallic products | [125] 100 | [100] 125 |
| Scraps, shavings, powders, dusts | 1 | 100 |

| | | |
|---|---|---|
| Other flammable solids | 1 | 100 |

For SI: 1 pound = 0.454 kg.

**Hazardous production material (HPM) facilities.** A permit is required to store, handle or use hazardous production materials.

**High-piled storage.** A permit is required to use an area exceeding 500 square feet (46 $m^2$) in a building or structure or part thereof as a high-piled storage area.

**Hot work operations.** A permit is required to conduct hot work using oxygen and a flammable gas.

**Industrial furnaces.** A permit is required to maintain or operate an industrial furnace regulated by FC Chapter 21.

**[Laboratory units.** A permit is required to store, handle or use hazardous materials in a laboratory unit in amounts exceeding 1 gallon (3..8 L) of flammable liquid, 1 gallon (3.8 L) of combustible liquid or 75 SCF (2.12 $m^3$) of flammable gas.]

**Liquefied petroleum gas (LPG).** A permit is required to store, handle or use [amounts of] LPG in [excess of the amounts] quantities exceeding those set forth in FC Table 105.6(1).

**[Exception] Exceptions:** A permit is not required for:

1. [A permit is not required for stationary] stationary LPG installations in Group R-3 occupancies.

2. the storage and use of LPG in the fuel tank of a motor vehicle, aircraft, marine vessel or watercraft for motive power.

**Lumber yards.** A permit is required to store [amounts of] lumber exceeding 100,000 board feet (8,333 $ft^3$) (236 $m^3$).

[**Marine liquid motor fuel-dispensing facility.** A permit is required to maintain or operate a marine liquid motor fuel dispensing facility.]

**Methane recovery.** A permit is required for the recovery of methane from landfills and related processing.

**Motor fuel-dispensing facilities.** A permit is required to maintain or operate the following types of motor fuel-dispensing facilities:

1. Fleet motor fuel-dispensing facilities.

2. Full-service motor fuel-dispensing facilities.

3. Self-service motor fuel-dispensing facilities.

**Natural gas [liquefication] liquefaction facility.** A permit is required to maintain or operate a natural gas [liquefication] liquefaction facility.

**Non-production chemical laboratory units.** A permit is required to store, handle or use hazardous materials in a laboratory unit in quantities exceeding 1 gallon (3.8 L) of flammable liquid, 1 gallon (3.8 L) of combustible liquid or 75 SCF (2.12 $m^3$) of flammable gas.

**Open flames.** A permit is required to use open flames:

1. [In] in any public assembly occupancy.

2. [In] in any other place of public gathering.

3. [In] in a covered mall building.

**Organic coatings.** A permit is required to conduct an organic-coating manufacturing operation producing more than 1 gallon (4 L) of an organic coating in one day.

**Places of assembly.** A permit is required to maintain or operate a place of assembly. The term of such permit shall be for a period not to exceed 1 year.

**Portable fueled space heaters.** A permit is required to store, handle or use portable fueled space heaters [as follows] that are fueled:

1. [Fueled] by a combustible liquid.

2. [Fueled] by compressed natural gas (CNG).

3. [Fueled] by liquefied petroleum gas (LPG).

4. [Fueled] by piped natural gas, except in Group R-3 occupancies.

**Pyrotechnic material.** A permit is required to store, handle or sell, including storage for sale, any quantity of pyrotechnic materials, articles and devices, other than pyrotechnic materials, articles and devices used solely for a purpose other than to create a special effect.

**Pyroxylin plastics.** A permit is required to store, handle and/or use pyroxylin plastics as follows:

1. To store, handle and/or use [more than 25 pounds (11 kg) of] raw pyroxylin plastic in quantities exceeding 25 pounds (11 kg).

2. To use any [amount] quantity of raw pyroxylin plastic for the assembly or manufacture of articles.

**Refrigerating system.** A permit is required to maintain or operate a refrigerating system that uses a group A1, A2, A3, B1, B2 or B3 refrigerant or that is mounted on or suspended from a roof or ceiling.

**Exceptions:**

1. A refrigerating system of less than five horsepower that uses a group A1 refrigerant and that is not mounted on or suspended from a roof or ceiling.

2. A refrigerating system installed in the residence portion of any building, installed in motor vehicles, aircraft, marine vessels, watercraft or tank cars, or employing water or air as a refrigerant.

**Repair garages.** A permit is required to maintain or operate a repair garage.

**Special effects.** A permit is required for:

1. [The] the discharge or other use for any purpose of any material, article or device of an explosive, flammable or combustible nature used to create a special effect, including fireworks meeting the definition of fireworks, 1.4G, and pyrotechnic materials, articles or devices.

2. [The] the storage for use in a special effects display or other event of any material, article or device of an explosive, flammable or combustible nature, including fireworks meeting the definition of fireworks, 1.4G, and pyrotechnic materials, articles or devices.

**Spraying or dipping.** A permit is required to conduct a spraying or dipping operation utilizing flammable or combustible liquids or the application of [combustible powders] powder coatings regulated by FC Chapter 15.

**Sulfur.** A permit is required to store, handle or use sulfur in [amounts that exceed] quantities exceeding 200 pounds (90.8 kg).

**Tar kettles.** A permit is required to store, handle or use a tar kettle.

**Tire-rebuilding plants.** A permit is required to maintain or operate a tire-rebuilding plant.

**Tires, scrap tires and tire byproducts.** A permit is required to store tires, scrap tires and tire byproducts, except tires mounted on vehicles, in [amounts that exceed] quantities exceeding:

1. [2,500] twenty-five hundred cubic feet (71 $m^3$) of total volume of scrap tires or [1,000] one thousand tires, whichever is less, either outdoors, or in buildings of noncombustible construction that are protected throughout by a sprinkler system.

2. [250] two hundred fifty cubic feet (7.1 $m^3$) of total volume of scrap tires or [100] one hundred tires, whichever is less, in buildings of combustible construction, or in buildings of noncombustible construction that are not protected throughout by a sprinkler system.

**Transportation of hazardous materials.** A permit is required to transport hazardous materials[, as follows] in or on a:

1. [Any] marine vessel or watercraft transporting upon the navigable waters within the city, any [amount] quantity of explosives for delivery at a wharf, pier, bulkhead, or other structure over or contiguous to such navigable waters, or to a marine vessel or watercraft lying thereto, in excess of the [amount] quantity required for the [vessel's] vessel or craft's own use.

2. [Any] motor vehicle transporting a flammable liquid in a quantity exceeding 1,000 pounds (454 kg) aggregate gross weight, except vehicles transporting paint products prominently labeled as such in accordance with applicable laws, rules and regulations.

3. [Any] motor vehicle transporting a combustible liquid in a quantity exceeding 1,000 pounds (454 kg) aggregate gross weight, except vehicles transporting paint products prominently labeled as such in accordance with applicable laws, rules and regulations.

4. [Any] motor vehicle transporting a compressed gas in [an amount] any quantity exceeding the limits set forth in [Tables] FC Table 105.6(1) or 105.6(2).

5. [Any] motor vehicle transporting any [amount] quantity of explosives, except small arms ammunition.

**Exceptions:** A permit is not required for:

1. the transportation of hazardous materials for transshipment when transported in a motor vehicle operated in compliance with the route and time requirements of FC2707.11 and the rules.

2. the storage and use of hazardous materials in the fuel tank of a motor vehicle, marine vessel or watercraft for motive power.

3. hazardous materials on motor vehicles, marine vessels or watercraft used for refrigerating the cargo.

4. the transportation by motor vehicle of medical-grade gaseous or liquid oxygen by trained and knowledgeable medical personnel engaged in providing licensed health care at patient locations citywide, outside of health care facilities, on a citywide response basis.

## SECTION FC 106
## INSPECTIONS

**106.1 Inspection authority.** The commissioner may enter and examine any building, structure, facility, premises, marine vessel, watercraft or vehicle in accordance with [Section 104.3] FC104.3, including any such place, boat or vehicle that has been issued a permit or other approval, for the purpose of enforcing this code or any other law, rule or regulation enforced by the commissioner.

**106.2** Reserved.

**106.3 Concealed work.** Whenever any installation subject to inspection, testing and/or approval in accordance with this code, the construction codes or any other law, rule or regulation prior to use is covered or concealed without having first been inspected, tested and/or approved, the commissioner may require that such work be exposed for inspection.

**106.4 Sharing results of inspections.** The commissioner, in coordination with the Commissioner of Buildings and the Commissioner of Environmental Protection, shall establish a procedure to share information regarding violations in accordance with Section 28-103.7.1 of the New York City Administrative Code.

## SECTION FC 107
## MAINTENANCE

**107.1 Maintenance [of safeguards] required.** Whenever [or wherever] any device, equipment, [or] system, operation, installation or facility regulated by this code or the rules is installed[, condition is established, or action is taken,] or established, including any condition or ancillary equipment necessary for its proper operation, whether or not required for compliance with the requirements of this code or the rules, such device, equipment, system, [condition, or action] operation, installation or facility shall thereafter be continuously maintained in good working order, in accordance with this code, [and] the rules, the construction codes and the manufacturer's instructions.

**107.2 Testing and operation.** Devices, equipment and systems requiring periodic inspection, testing or operation to ensure maintenance shall be inspected, tested or operated as set forth in this code and the rules.

**107.2.1 Test and inspection records.** Required test and inspection records shall be available at all times for inspection by any representative of the department or such records as the commissioner designates shall be filed with the department.

**107.2.2 Reinspection and testing.** Where any work, installation or test required to be witnessed by a representative of the department does not pass an initial inspection or test, the necessary corrections shall be made so as to achieve compliance with the requirements of this code or other law, rule or regulation enforced by the commissioner. The non-complying condition shall then be corrected and arrangements made for reinspection and/or retesting.

**107.3 Supervision.** Maintenance and testing shall be under the supervision of a competent person who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code and the rules. When required by specific provisions of this code or the rules, such person shall be certified by the department or the Department of Buildings.

**107.4 Tampering with or rendering equipment inoperable.** It shall be unlawful for any person to deface, obscure, remove or otherwise tamper with or render inoperable or inaccessible any fire protection system, fire hydrant, fire detection and alarm system, portable fire extinguisher or other fire appliance and related appurtenances, except as necessary during emergencies,

maintenance, repairs, alterations, drills, prescribed testing or as otherwise authorized by the commissioner.

**Exception:** Non-emergency use of fire hydrants approved by the Department of Environmental Protection.

**107.4.1 Temporary covering of fire protection devices.** Coverings placed on or over fire protection devices to protect them from damage during construction operations shall be removed immediately upon the completion of each work shift**.**

**107.4.2 Other tampering.** Locks, gates, doors, barricades, chains, enclosures, signs, tags or seals required by this code, the rules, permit or order of the commissioner shall not be removed, defaced, obscured, unlocked and/or otherwise rendered illegible or inoperable.

**107.5 Owner/occupant responsibility.** The owner shall be responsible at all times for the safe maintenance of a building, structure and premises in accordance with this code. Correction and abatement of violations of this code and the rules shall be the responsibility of the owner. If an occupant creates, or allows to be created, hazardous conditions in violation of this code or the rules, the occupant shall also be responsible for the abatement of such hazardous conditions.

**107.6 Overcrowding**. It shall be unlawful to cause overcrowding, maintain an indoor or outdoor space in an overcrowded condition, or allow an indoor or outdoor area or space to become overcrowded. The commissioner may order remedial actions necessary to abate the overcrowding condition and prevent future recurrence of such condition, including suspending or terminating the event or other gathering, vacating the premises, enforcing the lawful use and maximum occupancy of the premises and/or requiring the provision of fire guards.

**107.7 Recordkeeping.** [Recordkeeping required by this code, the rules or the referenced standards, including records of staff training, inspections, tests, servicing and other operation or maintenance of devices, equipment, systems or facilities,] A written record of the inspections, tests, servicing, fire watch and other operations and maintenance required by this code, the rules, the reference standards and any other required recordkeeping referenced therein, shall be maintained on the premises or other approved location for a minimum of 3 years, unless a different period of time is specified in such code, rules or referenced standards. The commissioner may prescribe the form and format of such recordkeeping. Such records shall be made available for inspection by any department representative, and a copy of such records shall be provided to the department upon request, without charge. The department additionally may require that certain records be filed with the department. Electronic filings may be made in lieu of paper filings, when approved.

## SECTION FC 108
## RESERVED

## SECTION FC 109
## VIOLATIONS

**109.1 Violations.** The provisions of this code and the rules shall be enforced in accordance with this chapter, Title 15 of the New York City Administrative Code and the rules.

**109.2 Penalties.** Penalties for violations of this code and the rules shall be in accordance with this chapter, Title 15 of the New York City Administrative Code and the rules.

**109.2.1 Transportation of extremely hazardous materials.** Except for transportation subject to [Section 2707.4] FC2707.4 and in addition to any other penalties provided by law, rule or regulation, a person who transports explosives, fireworks, chlorine, or any hazardous material in violation of this code or the rules shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than one thousand dollars and not more than ten thousand dollars, or imprisonment for not more than [six] 6 months or both, for each offense.

**109.2.2 Failure to provide fire protection systems.** In addition to any other penalties provided by law, rule or regulation, any person who shall violate, or refuse, or neglect to comply with any provision of law requiring a sprinkler system, fire alarm system or emergency lighting in a Group A occupancy shall upon conviction thereof be punished by a fine of not less than five hundred dollars nor more than ten thousand dollars for the first violation, not less than one thousand dollars nor more than ten thousand dollars for the second violation, not less than fifteen hundred dollars nor more than ten thousand dollars for the third violation, and not less than two thousand dollars nor more than ten thousand dollars for the fourth violation, and every subsequent violation, or, for any such violation by imprisonment for not more than [six] 6 months, or by both such fine and imprisonment.

**109.2.3 Criminal liability.** In the event that any person is burned by the explosion of any material the sale of which is prohibited by this code, or which has not been approved as herein provided, and death ensues therefrom, in addition to any other penalties provided by law, rule or regulation, the person found guilty of selling the material shall be deemed guilty of a felony, and, upon conviction, shall be punished by a fine of not less than one thousand dollars, nor more than five thousand dollars, or by imprisonment for a term not less than [one] 1 year nor more than [five] 5 years; and in case of a bodily injury the person injured may maintain an action for damages against the person violating the provisions of this code.

**109.2.4 Civil penalty for use of fireworks without a permit.** Nothwithstanding any other provision of law, and in addition to any criminal penalties that may apply, any person who violates [Section 105.6] FC105.6 by discharging or otherwise using fireworks without a permit shall be liable for a civil penalty of seven hundred fifty dollars, which may be recoverable in a proceeding before the New York City Environmental Control Board. For the purposes of subdivision e of Section 15-230 of the Administrative Code, such violation shall be deemed to be hazardous.

## SECTION FC 110
## RESERVED

## SECTION FC 111
## ORDER TO DISCONTINUE WORK

**111.1 Order.** Whenever the commissioner finds any work regulated by this code or the rules being performed in a manner contrary to the provisions of such code or the rules, any design and

installation document approved by the department, or any condition of a permit, or otherwise being performed in an unsafe manner, the commissioner may issue an order to discontinue work.

**111.2 Issuance.** An order to discontinue work shall be in writing and shall be issued to the owner or other person authorizing, supervising or engaging in the work. Upon issuance of an order to discontinue work, the cited work shall immediately cease. The order to discontinue work shall state the reason for the order, and the conditions under which the cited work may resume.

**111.3 Emergencies.** Where an emergency exists, the commissioner shall not be required to give written notice prior to ordering the work discontinued.

## SECTION FC 112
## CERTIFICATE OF APPROVAL

**112.1 Approval of articles, equipment and devices.** Where required by this code, the manufacturer of any article, equipment or device installed in any facility or used in connection with any material or operation shall obtain a certificate of approval for the design, installation, operation and/or maintenance of such article, equipment or device.

**112.2 Conditions of approval.** The commissioner may set forth in the certificate of approval conditions on the approved purpose or use of such article, equipment or device, or type, class or kind thereof, as may be necessary in the interest of public safety. The commissioner may include under a single certificate of approval more than one type, class or kind of article, equipment or device of a similar design or common characteristic.

**112.3 Markings.** Each article, equipment or device, or type, class or kind thereof, for which a certificate of approval has been issued shall have the number of such certificate plainly stamped or otherwise affixed upon it.

**112.4 List of acceptable laboratories, articles and devices.** A current list of all testing services and laboratories acceptable to the commissioner for the purpose of testing articles, equipment and devices, and a current list of all acceptable articles, equipment and devices shall be maintained by the department and made available for public inspection.

**112.5 Application.** Applications for a new or renewal certificate of approval required by the provisions of this code or the rules shall be made to the commissioner, in such form and detail as the commissioner may prescribe, including such information and documentation as the commissioner may require. An application for a certificate of approval shall include complete drawings of and specifications for the article, equipment or device for which approval is sought and, unless the commissioner determines that it is impracticable, the article, equipment or device itself shall be attached to or submitted with the application. The commissioner may require that the article, equipment or device be examined, tested or demonstrated at the applicant's expense in a manner prescribed by the commissioner, including examination and testing by a testing laboratory acceptable to the commissioner. In those instances where a testing or performance standard is not prescribed by this code or the rules, the article, equipment or device or type, class or kind of article, equipment or device shall have been examined and tested in a manner acceptable to the commissioner.

**112.6 Issuance.** The commissioner may grant an application for a certificate of approval upon a determination that the application article, equipment or device is designed for the purpose for which it is to be used and can be safely operated in accordance with this code, the rules and other applicable laws, rules and regulations.

**112.6.1 Term of certificate.** Every certificate or renewal thereof granted by the commissioner shall be for a period as specified therein, not to exceed 3 years, and shall expire at the end of such period unless the commissioner approves its renewal.

**112.6.2 Time for submission of renewal applications.** Applicants may apply for renewal during the period from 60 calendar days prior to a certificate's expiration date to not more than [one] 1 year after such date. The commissioner shall not renew certificates that have been expired for more than [one] 1 year. Applicants holding such certificates must apply for an original certificate and comply with all the original certificate requirements.

**112.6.3 Renewal.** Certificate renewals shall be at the discretion of the commissioner in the interest of public safety. The department may reevaluate the design and safety of the article, equipment or device in light of changes in applicable laws, rules or regulations, new technology, and safety concerns arising from the use of the article, equipment or device.

**112.7 Expired certificates.** It shall be unlawful to install articles, equipment or devices authorized by a certificate after the term of such certificate has expired.

**112.8 Certificate revocation and suspension.** The commissioner may, at any time, revoke or suspend a certificate for good cause. The certificate holder shall be afforded notice and an opportunity to be heard prior to any such suspension or revocation except that, in the circumstance of an imminent threat to public safety, such notice and opportunity to be heard may be given promptly after such revocation or suspension.

## SECTION FC 113
## CERTIFICATES OF FITNESS AND QUALIFICATION

**113.1 Supervision required.** The commissioner may require that a material, operation or facility subject to the provisions of this code, the rules, or other laws, rules and regulations enforced by the department, be manufactured, stored, handled, used, maintained, inspected and tested, transported, conducted by, or operated under the supervision of, a person holding a certificate pursuant to this section. The commissioner may require such supervision to be personal supervision or general supervision of the material, operation or facility. Where a reference in this code is made to a certificate of fitness without identifying the type of certificate, such reference shall be to the certificate of fitness designated by the commissioner as appropriate to conduct or supervise the material, operation or facility.

**113.1.1 Work location.** Except as otherwise provided in this code or the rules, the commissioner may issue certificates for one or more designated work locations.

**113.2 Duties.** In addition to any other responsibilities specified in this code or the rules, a certificate holder shall be responsible for:

1. [The] the safe manufacturing, storage, handling, use, operation, maintenance, inspection, testing, repair and/or supervision of the material, operation or facility, and emergency preparedness, for which the certificate is required, in accordance with this code, the rules, and any other applicable laws, rules and regulations.

2. [Notifying] notifying the department of any [explosion,] fire, explosion, reportable leak or other release of hazardous material, or other emergency related to the duties of his or her certificate.

3. [Keeping] keeping such certificate upon his or her person or otherwise readily available on the premises for inspection by any representative of the department, at all times while conducting or supervising the material, operation, [or] facility or emergency preparedness for which the certificate is required.

**113.3 Applications.** Applications for new or renewal certificates required by the provisions of this code or the rules shall be made to the commissioner, in such form and detail as the commissioner may prescribe, including such information and documentation as the commissioner may require.

**113.4 Minimum qualifications.** Applicants for certificates shall comply with the following minimum requirements:

1. Be at least 18 years of age, or such age above the age of 18 as may be required by law, rule or regulation.

2. Have a reasonable understanding of the English language and be able to answer satisfactorily such questions as may be asked of such applicant upon his or her examination.

3. Present such evidence of his or her character, habits and past employment, as may be satisfactory to the commissioner.

4. Present such evidence of his or her qualifications as set forth in the rules or the department's notice of examination for such certificate.

5. Pass an examination, administered by the department or other entity that tests the applicant's knowledge of the code, law, rules and regulations governing the regulated material, operation or facility, and the precautions and other actions necessary to ensure the proper and safe performance of his or her duties as a certificate holder.

6. When applying for a certificate of fitness relating to storage, handling and use of explosives, present proof of United States citizenship.

**113.5 Investigation.** Applicants are subject to an investigation by the department in connection with their application and their qualifications and fitness for the certificate.

**113.6 Fingerprinting.** Applicants for a certificate of fitness for the storage, use and handling of explosives, fireworks, pyrotechnics and special effects shall be fingerprinted and a criminal

background check conducted for the purposes authorized by law. The commissioner may require such fingerprinting and criminal background check for other certificates.

**113.7 Issuance.** The commissioner may grant an application for a certificate upon a determination that the applicant possesses the qualifications and fitness required for such certificate, as set forth in the code and the rules.

**113.7.1 Term of certificate.** Every certificate or renewal thereof granted by the commissioner shall be for a period as specified therein, not to exceed 3 years, and shall expire at the end of such period unless the commissioner approves its renewal.

**113.7.2 Time for submission of renewal applications.** Applicants may apply for renewal during the period from 60 calendar days prior to a certificate's expiration date to not more than [one] 1 year after such date. The commissioner shall not renew certificates that have been expired for more than [one] 1 year. Persons holding such certificates must apply for an original certificate and comply with all of the original certificate requirements.

**113.7.3 Renewal.** Certificate renewals shall be at the discretion of the commissioner in the interest of public safety based on a review of the certificate holder's qualifications and fitness. The department may review the certificate holder's qualifications and fitness and may require a certificate holder to complete a department-approved continuing education program and/or provide other proof of the holder's continuing qualifications and fitness.

**113.8 Expired certificates.** It shall be unlawful to perform or provide such supervision for a material, operation or facility authorized by a certificate after the term of such certificate has expired.

**113.9 Certificate revocation and suspension.** The commissioner may, at any time, revoke or suspend a certificate for misconduct, or other good cause. The certificate holder shall be afforded notice and an opportunity to be heard prior to any such suspension or revocation except that, in the circumstance of an imminent threat to public safety, such notice and opportunity to be heard may be given promptly after such revocation or suspension.

## SECTION FC 114
## CERTIFICATES OF LICENSE

**114.1 Supervision required.** The commissioner may require that the installation, alteration, testing and repair of liquid motor fuel storage and dispensing equipment and systems, and flammable or combustible liquid storage systems, be conducted by a person holding a certificate of license or by an employee of such certificate holder working under his or her direct supervision.

**114.2 Duties.** In addition to any other responsibilities specified in this code or the rules, a certificate of license holder shall be responsible for:

1. [The] the proper and safe installation, alteration, testing and repair of liquid motor fuel storage and dispensing equipment and systems, and flammable or combustible liquid

storage systems in accordance with this code, the rules, and any other applicable laws, rules and regulations.

2. [Verifying] verifying that all required approvals from the department have been obtained prior to installing, altering, testing or repairing liquid motor fuel storage and dispensing equipment, and flammable or combustible liquid storage systems.

3. [Notifying] notifying the department of any [explosion,] fire, explosion, reportable leak or other release of hazardous material, or other emergency related to the duties of his or her certificate.

**114.3 Applications**. Applications for new or renewal certificates required by the provisions of this code or the rules shall be made to the commissioner, in such form and detail as the commissioner may prescribe, including such information and documentation as the commissioner may require.

**114.4 Minimum qualifications.** Applicants for certificates shall comply with the following minimum requirements:

1. Be at least 18 years of age.

2. Have a reasonable understanding of the English language and be able to answer satisfactorily such questions as may be asked of such applicant upon his or her examination.

3. Present such evidence of his or her character and past employment, as may be satisfactory to the commissioner.

4. Present such evidence of his or her qualifications set forth in the rules or the department's notice of examination for such certificate.

5. Pass an examination, administered by the department or other entity, that tests the applicant's knowledge of the code, law, rules and regulations governing the installation, alteration, testing and repair of liquid motor fuel storage and dispensing equipment and systems and flammable and combustible liquid storage systems the precautions and other actions necessary to ensure the proper and safe performance of his or her duties as a certificate holder.

**114.5 Investigation.** Applicants and their principals are subject to an investigation by the department in connection with their application and their qualifications and fitness for the certificate.

**114.6 Fingerprinting.** The commissioner may require the fingerprinting and criminal background check of applicants for a certificate for purposes authorized by law.

**114.7 Issuance.** The commissioner may grant an application for a certificate of license upon a determination that the applicant possesses the qualifications and fitness required for such certificate, as set forth in the code and the rules.

**114.7.1 Term of certificate.** Every certificate or renewal thereof granted by the commissioner shall be for a period as specified therein, not to exceed 2 years, and shall expire at the end of such period unless the commissioner approves its renewal.

**114.7.2 Time for submission of renewal applications.** Applicants may apply for renewal during the period from 60 calendar days prior to a certificate's expiration date to not more than [one] 1 year after such date. The commissioner shall not renew certificates that have been expired for more than [one] 1 year. Persons holding such certificates must apply for an original certificate and comply with all of the original certificate requirements.

**114.7.3 Renewal.** Certificate renewals shall be at the discretion of the commissioner in the interest of public safety based on a review of the certificate holder's qualifications and fitness. The department may review the certificate holder's qualifications and fitness and may require a certificate holder to complete a department-approved continuing education program and/or provide other proof of the holder's continuing qualifications and fitness.

**114.8 Expired certificates.** It shall be unlawful to engage in the business authorized by a certificate after the term of such certificate has expired.

**114.9 Certificate revocation and suspension.** The commissioner may, at any time, revoke or suspend a certificate for misconduct or other good cause. The certificate holder shall be afforded notice and an opportunity to be heard prior to any such suspension or revocation except that, in the circumstance of an imminent threat to public safety, such notice and opportunity to be heard may be given promptly after such revocation or suspension.

**114.10 Insurance.** The commissioner may require certificate holders to obtain and furnish proof of general liability insurance, in such amounts and in accordance with such requirements, as may be set forth in the code or the rules, otherwise required by law, or required as a condition of the certificate issuance. The certificate shall expire by operation of law if any such required insurance lapses, expires or is cancelled during the term of the certificate.

## SECTION FC 115
## COMPANY CERTIFICATES

**115.1 Duties.** A certificate holder shall be responsible for the safe manufacturing, storage, handling, use, operation, maintenance, inspection, testing, repair and/or supervision of the activity for which the certificate is required, in accordance with this code, the rules and any other applicable laws, rules or regulations.

**115.2 Applications**. Applications for new or renewal certificates required by the provisions of this code or the rules shall be made to the commissioner, in such form and detail as the commissioner may prescribe, including such information and documentation as the commissioner may require.

**115.3 Minimum qualifications.** Applicants and their principals shall submit evidence acceptable to the commissioner of such experience and qualifications as set forth in this code, the rules or the department's notice of examination for such certificate.

**115.4 Investigation.** Applicants and their principals are subject to an investigation by the department in connection with their application and their qualifications and fitness for the certificate.

**115.5 Fingerprinting.** The commissioner may require the fingerprinting and criminal background check of applicants for a certificate and their principals.

**115.6 Issuance.** The commissioner may grant an application for a company certificate upon a determination that the applicant possesses all of the qualifications for such certificate, as set forth in the code and the rules.

**115.6.1 Term of certificate.** Every certificate or renewal thereof granted by the commissioner shall be for a period as specified therein, not to exceed 2 years, and shall expire at the end of such period unless the commissioner approves its renewal.

**115.6.2 Time for submission of renewal applications.** Applicants may apply for renewal during the period from 60 calendar days prior to a certificate's expiration date to not more than [one] 1 year after such date. The commissioner shall not renew certificates that have been expired for more than [one] 1 year. Persons holding such certificates must apply for an original certificate and comply with all of the original certificate requirements.

**115.6.3 Renewal.** Certificate renewals shall be at the discretion of the commissioner in the interest of public safety based on a review of the certificate holder's qualifications and fitness. The department may review the certificate holder's qualifications and fitness and may require a certificate holder to complete a department-approved continuing education program and/or provide other proof of the holder's continuing qualifications and fitness.

**115.7 Expired certificates.** It shall be unlawful to engage in the business authorized by a certificate after the term of such certificate has expired.

**115.8 Certificate revocation and suspension.** The commissioner may, at any time, revoke or suspend a certificate for misconduct or other good cause. The certificate holder shall be afforded notice and an opportunity to be heard prior to any such suspension or revocation except that, in the circumstance of an imminent threat to public safety, such notice and opportunity to be heard may be given promptly after such revocation or suspension.

**115.9 Misrepresentation as department employees.** No person may falsely represent himself or herself to be a member or agent of the department.

**115.10 Insurance.** The commissioner may require certificate holders to obtain and furnish proof of general liability insurance, in such amounts and in accordance with such requirements, as may be set forth in the code or the rules, otherwise required by law, or required as a condition of the certificate issuance. The certificate shall expire by operation of law if any such required insurance lapses, expires or is cancelled during the term of the certificate.

## SECTION FC 116
## EXPEDITOR REGISTRATION CERTIFICATES

**116.1 Registration.** No person may submit, file, request, negotiate or otherwise seek approval of applications for issuance of permits, or other approvals, including approval of design and installation documents, without first having obtained an expeditor registration certificate in accordance with this section and the rules. It shall be unlawful to hold oneself out to the public or otherwise represent that one is "registered with the fire department,"[,] "registered" or make any similar representation in such a manner as to convey the impression that such person is registered with the department unless such person is registered in accordance with this section.

**Exceptions:** The following persons are exempt from the provisions of this section:

1. Any person or entity making application on his, her or its own behalf. If the applicant is a partnership or corporation, the general partners and principal officers thereof shall be included within this exception. Principal officers of a corporation shall include the president, vice presidents, secretary and treasurer.

2. The occupants of a premises that is the subject of the application, if authorized by the owner to file the application.

3. Registered architects licensed by the New York State Department of Education.

4. Professional engineers licensed by the New York State Department of Education.

5. Attorneys admitted to practice in New York State.

6. [Master plumbers licensed by the Commissioner of Buildings,] Plumbers when such application relates to work performed under their license.

7. Master fire suppression piping contractors licensed by the Commissioner of Buildings, when such application relates to work performed under their license.

8. Master electricians licensed by the Commissioner of Buildings, when such application relates to work performed under their license.

9. Certificate of license holders, when such application relates to work performed under their license.

10. [Fire safety director or fire safety/emergency action plan director] FLS director and FEP coordinator certificate of fitness holders when the application relates to the [fire safety and evacuation plan or emergency action] emergency preparedness plan of the building for which they are registered.

11. Managing agents registered with the New York City Department of Housing Preservation and Development or the New York State Secretary of State.

12. Construction site fire safety managers when the application relates to fire safety at a construction site for which such certificate holder provides supervision.

**116.2 Applications.** Applications for new or renewal expeditor registration certificates required by [Section 116.1] FC116.1 shall be made to the commissioner, in such form and detail as the commissioner may prescribe, including such information and documentation as the commissioner may require.

**116.3 Investigation.** Applicants are subject to an investigation by the department in connection with their application and their qualifications and fitness for the certificate.

**116.4 Fingerprinting.** The commissioner may require fingerprinting and a criminal background check for a certificate for purposes authorized by law.

**116.5 Issuance.** The commissioner may grant an application for a certificate upon a determination that the applicant possesses all of the qualifications for such certificate, as set forth in the code and the rules, qualifying the applicant to appear before the department to submit, file, request, negotiate or otherwise seek approval of applications for issuance of permits, or other approvals.

**116.5.1 Term of certificate.** Every certificate or renewal thereof granted by the commissioner shall be for a period as specified therein, not to exceed 2 years, and shall expire at the end of such period unless the commissioner approves its renewal.

**116.5.2 Time for submission of renewal applications.** Applicants may apply for renewal during the period from 60 calendar days prior to a certificate's expiration date to not more than [one] 1 year after such date. The commissioner shall not renew certificates that have been expired for more than [one] 1 year. Persons holding such certificates must apply for an original certificate and comply with all of the original certificate requirements.

**116.5.3 Renewal.** Certificate renewals shall be at the discretion of the commissioner in the interest of public safety based on a review of the certificate holder's qualifications and fitness.

**116.6 Expired certificates.** It shall be unlawful to engage in the business authorized by a certificate when the term of such certificate has expired.

**116.7 Certificate revocation and suspension.** The commissioner may, at any time, revoke or suspend a certificate for misconduct or other good cause. The certificate holder shall be afforded notice and an opportunity to be heard prior to any such suspension or revocation except that, in the circumstance of an imminent threat to public safety, such notice and opportunity to be heard may be given promptly after such revocation or suspension.

## SECTION FC 117
## FEES

**117.1 Fees.** Fees shall be as set forth in FC Appendix A.

**117.2 Fee exemptions.** Exemptions from department fees shall be in accordance with [Sections] FC 117.2.1 through 117.2.3.

**117.2.1 Permit, inspection and performance test fee exemption.** The provisions of this code as to the payment of fees for permits, inspections or witnessing of required system performance tests shall not apply to premises used and owned or operated by a religious or educational institution, corporation or association organized and operated exclusively for religious or educational purposes that is qualified as an exempt organization pursuant to United States Internal Revenue Code Section 501(c)(3), provided that no part of the net earnings enures to the benefit of any private shareholder or individual; and provided further, that this exemption shall apply only to such portions of the premises used by such religious or educational institution, corporation or association predominantly as one of the following:

1. A house of worship, or dwelling units for members of the clergy of such religious institution, corporation or association situated on or adjacent to the same premises as such house of worship. For purposes of this section, "house of worship" shall mean that part of a premises classified in Occupancy Group A-3 that is used by members of a religious institution, corporation or association principally as a meeting place for divine worship or other religious observances, and "member of the clergy" shall mean a clergyman or minister, as defined in the religious corporations law, who officiates at or presides over such religious observances for such religious institution, corporation or association, and who does not derive his or her principal income from any other occupation or profession.

2. A school accredited by the state of New York providing kindergarten through twelfth grade education.

**117.2.2 Individual certificate fee exemption.** Employees of the city who submit evidence satisfactory to the commissioner that they require such certificate as a condition of their continued employment with the city shall be exempt from payment of any application, written examination, practical examination and renewal fees. This fee exemption shall not include any required late renewal or fingerprinting fees. Certificate holders converting their certificate from fee-exempt to non-fee-exempt status shall be required to pay all applicable original application, written examination and practical examination fees previously waived.

**117.2.3 Company certificate fee exemption.** Agencies of the city that require certificates to conduct the business of their agency shall be exempt from payment of certificate fees.

**117.3 Penalties and fees for late renewal.** Failure to timely render payment of fees for any certificate, permit or other approval issued by the commissioner, or service provided by the department, shall be sufficient grounds for denial of a certificate, permit or other approval or service, or renewal thereof. Fees for late renewal shall be in accordance with [Sections] FC 117.3.1 through 117.3.2.2.

**117.3.1 Late renewal of certificates.** In addition to the payment of the renewal fee, any applicant renewing a certificate more than 90 calendar days but less than [one] 1 year after its expiration date shall be subject to a late filing charge of 50 percent of the renewal fee or [25] twenty-five dollars, whichever is greater.

**117.3.2 Late renewal of permits.** Fees for late permit renewal shall be in accordance with [Sections] FC 117.3.2.1 and 117.3.2.2, except the commissioner may waive the payment of

late filing fees or prior annual fees, or both, upon a determination that the late renewal was caused by circumstances beyond the control of the applicant.

**117.3.2.1 Renewal within one year.** In addition to the payment of the renewal fee, any applicant renewing a permit more than 90 calendar days but less than [one] 1 year after its expiration date shall be subject to a late filing charge of 50 percent of the renewal fee.

**117.3.2.2 Renewal after one year.** In addition to the payment of the renewal fee, any applicant renewing a permit later than [one] 1 year after its expiration date shall be subject to a late filing charge of 100 percent of the renewal fee. Such applicant shall be liable also for all the annual fees which should have been paid from the date on which the permit expired to the date on which such permit was renewed.

**117.3.3 Late payment of fees for services.** All fees for services rendered by the department, including inspections and witnessing of tests, shall be paid within 30 calendar days of receipt of the bill therefor. Any disputes regarding such bill shall be submitted in writing within 20 calendar days of the date of receipt thereof. Failure to timely remit payment shall subject the owner or other person receiving such service to be additionally liable to the department for interest on the compensation due and owing to the department. Such interest shall be computed for the period from the date of the bill to the date of payment, based on the amount of the bill and the rate of interest set forth in Section 5004 of the New York Civil Practice Law and Rules.

**117.4 Liens on property for permit and inspection fees.** Liens on property for permit and inspection fees shall be as follows:

1. Any unpaid fee for an inspection performed by the department pursuant to law or rule, any unpaid fee for the issuance or renewal pursuant to this code of a permit to manufacture, store, handle, use or sell hazardous materials or combustible materials, or conduct an operation or maintain a facility on land or in a building specified therein, and any unpaid penalties imposed for late payment of any such renewal fees shall constitute a lien upon the land and buildings upon or in respect to which such inspection was performed, or upon the land and buildings specified in such permit, as hereinafter provided.

2. There shall be filed in the office of the department a record of all fees for inspections performed by or on behalf of the department, all fees for permits to manufacture, store, handle, use or sell hazardous materials or combustible materials, or conduct an operation or maintain a facility on land or in a building issued or renewed by the department, and all penalties for late payment of any such renewal fees imposed by the department. Such records shall be kept on a building by building basis and shall be accessible to the public during normal business hours. An entry of a fee on the records of the department shall constitute notice to all parties.

3. All such unpaid fees shall constitute a lien upon the land and building upon or in respect to which such inspection was performed, or upon the land and buildings specified in such permit, when the amount thereof shall have been definitely computed as a statement of account by the department, and the department shall cause to be filed in the office of the city collector an entry of the account stated in the book in which such charges against the

premises are to be entered. Such lien shall have a priority over all other liens and encumbrances except for the lien of taxes and assessments. However, no lien created pursuant to this section shall be enforced against a subsequent purchaser in good faith or mortgagee in good faith unless such transaction occurred after the date of entry of a fee on the records of the department pursuant to [Section 117.4(2)] FC117.4(2).

4. A notice thereof, stating the amount due and the nature of the charge, shall be mailed by the city collector, within 5 business days after such entry, to the last known address of the person whose name appears on the records in the office of the city collector as being the owner or agent or as a person designated by the owner to receive tax bills or, where no name appears, to the premises, addressed to either the owner or the agent.

5. If such charge is not paid within 30 calendar days from the date of entry, it shall be the duty of the city collector to receive interest thereon at a rate of 15 percent per annum, to be calculated to the date of payment from the date of entry.

6. Such charges and the interest thereon shall continue to be, until paid, a lien on the premises. Such lien shall be a tax lien within the meaning of Sections 11-319 and 11-401 of the New York City Administrative Code and may be sold, enforced or foreclosed in the manner provided in Chapters 1, 3 and 4 of Title 11 of the New York City Administrative Code or may be satisfied in accordance with Section 1354 of the New York State Real Property Actions and Proceedings Law.

7. Such notice mailed by the city collector pursuant to this section shall have stamped or printed thereon a reference to this section of this code.

8. In any proceedings to enforce or discharge a lien created pursuant to this section, the validity of the lien shall not be subject to challenge based on the lawfulness of the inspection, or the propriety and accuracy of the fee for which a lien is claimed, except as provided in this section.

9. No such challenge may be made except by the owner of the property, or a mortgagee or lienor whose mortgage or lien would, but for the provisions of this section, have priority over the department's lien.

**117.5 Disposition of revenues.** All fees, fines and forfeitures and all proceeds of suits for penalties, which may be paid or collected pursuant to this code, shall be paid into the general fund of the city established pursuant to Section 109 of the New York City Charter.

## CHAPTER 2
## DEFINITIONS

### SECTION FC 201
### GENERAL

**201.1 Scope.** Unless otherwise expressly stated, the following terms shall, for the purposes of this code, have the meanings set forth in this chapter.

**201.2 Interchangeability.** Words stated in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural the singular.

**201.3 Terms defined in other codes.** Where terms are not defined in this code and are defined in the construction codes or Electrical Code, such terms shall have the meanings ascribed to them as in those codes. Any reference to any of the construction codes shall be deemed to include any related or other applicable provisions of any of the construction codes.

**201.4 Terms not defined.** Where terms are not defined through the methods authorized by this section, such terms shall have the ordinarily accepted meanings as the context implies.

## SECTION FC 202
## DEFINITIONS

**AEROSOL.** See [Section 2802.1] FC2802.1.

**Level 1.** See [Section 2802.1] FC2802.1.

**Level 2.** See [Section 2802.1] FC2802.1.

**Level 3.** See [Section 2802.1] FC2802.1.

**AEROSOL CONTAINER.** See [Section 2802.1] FC2802.1.

**AEROSOL WAREHOUSE.** See [Section 2802.1] FC2802.1.

**AIRBLAST.** See [Section 3302.1] FC3302.1.

**AIRCRAFT LANDING SITE.** See [Section 1102.1] FC1102.1.

**AIRCRAFT OPERATION AREA.** See [Section 1102.1] FC1102.1.

**AIR-INFLATED STRUCTURE.** See [Section 2402.1] FC2402.1.

**AIRPORT.** See [Section 1102.1] FC1102.1.

**AIR-SUPPORTED STRUCTURE.** See [Section 2402.1] FC2402.1.

**ALARM NOTIFICATION APPLIANCE.** See [Section 902.1] FC902.1.

**ALARM SIGNAL.** See [Section 902.1] FC902.1.

**ALCOHOL-BASED HAND RUB.** See [Section 3402.1] FC3402.1.

**ALCOHOL-BLENDED MOTOR FUEL.** See FC2202.

**ALTERATION.** Any addition to, or modification of, an existing installation or facility, other than any repair made in the ordinary course of maintenance.

**AMMONIUM NITRATE.** See [Section 3302.1] FC3302.1.

**ANNUNCIATOR.** See [Section 902.1] FC902.1.

**APPLICATION.** An application submitted to the commissioner for a permit, certificate or other approval or determination issued or made by the commissioner pursuant to this code or other law, rule or regulation, including documents and oral representations submitted in connection with such application.

**APPROVED.** Acceptable to the commissioner.

**[AREAWAY.** See Section 502.1.]

**ARRAY.** See [Section 2302.1] FC2302.1.

**ARRAY, CLOSED.** See [Section 2302.1] FC2302.1.

**ASPHALT MELTER.** See FC302.1.

**ASSEMBLY AREA.** See FC402.1.

**ASSISTANT BLASTER.** See [Section 3302.1] FC3302.1.

**AUTOMATED RACK STORAGE.** See FC2302.1.

**AUTOMATIC.** See [Section 902.1] FC902.1.

**[AUTOMOTIVE LIQUID MOTOR FUEL-DISPENSING FACILITY.** See Section 2202.1.]

**AUTOMOTIVE SALVAGE AND WRECKING FACILITY.** See [Section 302.1] FC302.1.

**AVIATION FACILITY.** See [Section 1102.1] FC1102.1.

**BALED COTTON.** See FC2902.1

**BALED COTTON, DENSELY PACKED.** See FC2902.1.

**BARRICADE.** See [Section 3302.1] FC3302.1.

**Artificial barricade.** See [Section 3302.1] FC3302.1.

**Natural barricade.** See [Section 3302.1] FC3302.1.

**BARRICADED.** See [Section 3302.1] FC3302.1.

**[BATTERY, LEAD ACID.** See Section 602.1.]

**[BATTERY, VALVE-REGULATED LEAD-ACID (VRLA).** See Section 602.1.]

**[BATTERY, VENTED (FLOODED) LEAD-ACID.** See Section 602.1.]

**[BATTERY SYSTEM, STATIONARY LEAD ACID.** See Section 602.1.]

**BATTERY TYPES.** See FC602.1.

**Lithium-ion battery.** See FC602.1.

**Lithium metal polymer battery.** See FC602.1.

**Nickel cadmium (Ni-Cd) battery.** See FC602.1.

**Nonrecombinant battery.** See FC602.1.

**Recombinant battery.** See FC602.1.

**Stationary storage battery.** See FC602.1.

**Valve-regulated lead acid (VRLA) battery.** See FC602.1.

**Vented (Flooded) lead acid battery.** See FC602.1.

**BIN BOX.** See [Section 2302.1] FC2302.1.

**BLAST AREA.** See [Section 3302.1] FC3302.1.

**BLAST SITE.** See [Section 3302.1] FC3302.1.

**BLASTER.** See [Section 3302.1] FC3302.1.

**BLASTING AGENT.** See [Section 3302.1] FC3302.1.

**BLASTING CONTRACTOR CERTIFICATE.** See [Section 3302.1] FC3302.1.

**BLASTING CREW.** See [Section 3302.1] FC3302.1.

**BLASTING OPERATION.** See [Section 3302.1] FC3302.1.

**BOILING POINT.** See [Section 2702.1] FC2702.1.

**BRITISH THERMAL UNIT (BTU).** The heat necessary to raise the temperature of 1 pound (0.454 kg) of water by 1°F (0.5565°C).

**BUILDING.** An enclosed structure designed or occupied to house any use or occupancy.

**BUILDING CODE.** The 2008 New York City Building Code in effect on and after July 1, 2008, and as amended thereafter.

**BUILDING OCCUPANTS.** See FC402.1.

**BULK NITROUS OXIDE SYSTEM.** See [Section 4002.1] FC4002.1.

**BULK OXYGEN SYSTEM.** See [Section 4002.1] FC4002.1.

**BULK PLANT OR TERMINAL.** See [Section 3402.1] FC3402.1.

**BULK TRANSFER.** See [Section 3402.1] FC3402.1.

**BULLET RESISTANT.** See [Section 3302.1] FC3302.1.

**CARGO TANK.** See [Section 2702.1] FC2702.1.

**CARTON.** A cardboard or fiberboard box enclosing a product.

**CEILING LIMIT.** See [Section 2702.1] FC2702.1.

**CENTRAL STATION.** See [Section 902.1] FC902.1.

**CERTIFICATE OF APPROVAL.** A written statement issued by the commissioner, certifying that an article, device or equipment, or type, class or kind thereof, has been examined, tested and approved for a specific purpose or use in conformity with the requirements of the construction codes, this code or the rules.

**CERTIFICATE OF FITNESS.** A written statement issued by the commissioner certifying that the person to whom it is issued has passed an examination as to his or her qualifications or is otherwise deemed qualified to [use] perform one or more of the following duties, for which such certificate is required by this code or the rules: supervise a facility; conduct or supervise an operation; supervise the storage, handling and/or use of a material[, conduct or supervise an operation, or supervise a facility for which such certificate is required by this code or the rules]; or conduct or supervise emergency planning and preparedness activities.

**CERTIFICATE OF LICENSE.** A written statement issued by the commissioner authorizing the operation of a business to install, alter, test or repair liquid motor fuel storage and dispensing equipment and systems or flammable or combustible liquid storage systems, for which such certificate is required by this code or the rules.

**CERTIFICATE OF OPERATION.** See [Section 902.1] FC902.1.

**CERTIFICATE OF QUALIFICATION.** See [Section 602.1] FC602.1.

**CERTIFIED ATTENDANT.** See [Section 2202.1] FC2202.1.

**CHEMICAL.** See [Section 2702.1] FC2702.1.

**CHEMICAL NAME.** See [Section 2702.1] FC2702.1.

**CITYWIDE STANDARD KEY.** See [Section 502.1] FC502.1.

**CLEAN AGENT.** See [Section 902.1] FC902.1.

**CLOSED CONTAINER.** See [Section 2702.1] FC2702.1.

**CLOSED SYSTEM.** The use of any compressed gas, and the use of a solid or liquid hazardous material in equipment or a vessel or system that remains closed during normal operation, such that vapors emitted during the operation of such equipment, vessel, or system are not liberated outside of the equipment, vessel or system and the gas or hazardous material is not exposed to the atmosphere during such operation. Examples of closed systems include hazardous materials conveyed through a piping system into closed equipment or a closed vessel or system.

**CNG.** See [Section 2202.1] FC2202.1.

[**CNG MOTOR FUEL.** See Section 2202.1.]

**CNG MOTOR FUEL SYSTEM.** See [Section 2202.1] FC2202.1.

[**CNG MOTOR FUEL-DISPENSING FACILITY.** See Section 2202.1.]

**COKE.** See FC302.1.

**COKE-FUELED SALAMANDER.** See FC302.1.

**COMBUSTIBLE DUST.** See [Section 1302.1] FC1302.1.

**COMBUSTIBLE FIBERS.** See [Section 2902.1] FC2902.1.

**COMBUSTIBLE LIQUID.** See [Section 3402.1] FC3402.1.

**COMBUSTIBLE WASTE.** Any substance, item or other organic or inorganic matter that presents a fire hazard and is a byproduct or residue of the construction, use or occupancy of any premises, or any activity conducted thereon, that has no economic value in connection with such use or occupancy. A combustible waste that has economic value in connection with the use and occupancy of such premises shall be deemed to be a combustible material.

**COMMERCIAL COOKING APPLIANCES.** See [Section 602.1] FC602.1.

**COMMERCIAL COOKING EXHAUST SYSTEM SERVICING COMPANY CERTIFICATE.** See [Section 902.1] FC902.1.

**COMMERCIAL COOKING SYSTEM**. See [Section 902.1] FC902.1.

**COMMISSIONER.** Fire Commissioner of the City of New York or his or her duly authorized representative.

**COMMODITY.** See [Section 2302.1] FC2302.1.

**COMPRESSED GAS.** See [Section 3002.1] FC3002.1.

**Compressed gases in solution.** See [Section 3002.1] FC3002.1.

**Compressed gas mixtures.** See [Section 3002.1] FC3002.1.

**Liquefied compressed gases.** See [Section 3002.1] FC3002.1.

**Nonliquefied compressed gases.** See [Section 3002.1] FC3002.1.

**COMPRESSED GAS CONTAINER.** See [Section 3002.1] FC3002.1.

**COMPRESSED GAS SYSTEM.** See [Section 3002.1] FC3002.1.

**COMPUTATIONAL FLUID DYNAMICS ANALYSIS.** See FC302.1.

**[CONDITION.** The location or manner at or in which a material may be manufactured, stored, handled, used, or an operation conducted, upon a premises.]

**CONIFER.** See [Section 802.1] FC802.1.

**CONSTRUCTION CODES.** The 2008 New York City construction codes, consisting of the New York City Building, Fuel Gas, Mechanical and Plumbing Codes in effect on and after July 1, 2008, and as amended thereafter.

**CONSTRUCTION SITE.** See [Section 1402.1] FC1402.1.

**CONTAINER.** See [Section 2702.1] FC2702.1.

**CONTAINMENT SYSTEM.** See [Section 3702.1] FC3702.1.

**CONTAINMENT VESSEL.** See [Section 3702.1] FC3702.1.

**CONTINUOUS GAS DETECTION SYSTEM.** See [Section 1802.1] FC1802.1.

**CONTROL AREA.** See [Section 2702.1] FC2702.1.

**CORROSIVE MATERIAL.** See [Section 3102.1] FC3102.1.

**CRYOGENIC CONTAINER.** See [Section 3202.1] FC3202.1.

**CRYOGENIC FLUID.** See [Section 3202.1] FC3202.1.

**DANGER ZONE.** See [Section 3302.1] FC3302.1.

**DECORATION.** See [Section 802.1] FC802.1.

[**DECORATIVE MATERIAL.** See Section 802.1.]

[**DEFINED FIRE ALARM SYSTEM.** See Section 902.1.]

**DEFLAGRATION.** See [Section 2702.1] FC2702.1.

**DEPARTMENT.** The Fire Department of the City of New York.

**DEPARTMENT OF BUILDINGS.** New York City Department of Buildings.

**DEPARTMENT OF ENVIRONMENTAL PROTECTION.** New York City Department of Environmental Protection.

**DESIGN AND INSTALLATION DOCUMENTS.** Plans and specifications, or other written, graphic and pictorial documents or submissions, setting forth the location, design, arrangement and physical characteristics of the device, equipment, system, operation or facility for which approval by the commissioner is sought.

**DESIGN PRESSURE.** See [Section 2702.1] FC2702.1.

**DETACHED BUILDING.** See [Section 2702.1] FC2702.1.

**DETEARING.** See [Section 1502.1] FC1502.1.

**DETONATING CORD.** See [Section 3302.1] FC3302.1.

**DETONATION.** See [Section 3302.1] FC3302.1.

**DETONATOR.** See [Section 3302.1] FC3302.1.

**[DEVELOPMENT**. See Section 502.1.]

**DIP TANK.** See [Section 1502.1] FC1502.1.

**DISCHARGE AREA.** See [Section 1102.1] FC1102.1.

**DISCHARGE SITE.** See [Section 3302.1] FC3302.1.

**DISPENSING.** See [Section 2702.1] FC2702.1.

**DISPENSING DEVICE, OVERHEAD TYPE.** See [Section 2202.1] FC2202.1.

**DISPLAY SITE.** See [Section 3302.1] FC3302.1.

**DOTn.** United States Department of Transportation.

**DOTy**. United States Department of Treasury.

**DRAFT CURTAIN.** See [Section 2302.1] FC2302.1.

**DRY CLEANING.** See [Section 1202.1] FC1202.1.

**DRY CLEANING FACILITY.** See [Section 1202.1] FC1202.1.

**DRY CLEANING ROOM.** See [Section 1202.1] FC1202.1.

**DRY CLEANING SYSTEM.** See [Section 1202.1] FC1202.1.

**[EAP DIRECTOR.** See Section 401.7.2.]

**[EAP DRILL.** See Section 402.1.]

**[EAP STAFF.** See Section 402.1.]

**EARLY SUPPRESSION FAST-RESPONSE (ESFR) SPRINKLER.** See [Section 2302.1] FC2302.1.

**ELECTRIC BARBECUE.** See FC302.1.

**ELECTRICAL CODE.** The 2007 New York City Electrical Code in effect on July 1, 2008, and as amended thereafter.

**ELECTROSTATIC FLUIDIZED BED.** See [Section 1502.1] FC1502.1.

**[EMERGENCY ACTION PLAN.** See Section 402.1.]

**EMERGENCY ALARM SYSTEM.** See [Section 902.1] FC902.1.

**EMERGENCY CONTROL STATION.** See [Section 1802.1] FC1802.1.

**EMERGENCY ESCAPE AND RESCUE OPENING.** See [Section 1002.1] FC1002.1.

**EMERGENCY SHELTER.** See FC402.1.

**EMERGENCY SHUTOFF VALVE.** A valve designed to shut off the flow of gases or liquids.

**EMERGENCY SHUTOFF VALVE, AUTOMATIC.** A fail-safe self-closing valve designed to shut off the flow of liquids or gases upon activation of the valve's control system by automatic means.

**EMERGENCY SHUTOFF VALVE, MANUAL.** A manually operated valve designed to shut off the flow of liquids or gases.

**EVACUATION.** See FC402.1.

**EXCESS FLOW CONTROL.** See [Section 2702.1] FC2702.1.

**EXCESS FLOW VALVE.** See [Section 3702.1] FC3702.1.

**EXHAUSTED ENCLOSURE.** See [Section 2702.1] FC2702.1.

**EXIT.** See [Section 1002.1] FC1002.1.

**EXIT ACCESS.** See [Section 1002.1] FC1002.1.

**EXIT DISCHARGE.** See [Section 1002.1] FC1002.1.

**EXIT DISCHARGE, LEVEL OF.** See FC1002.1.

**EXPANDED PLASTIC.** See [Section 2302.1] FC2302.1.

**EXPLOSION.** See [Section 2702.1] FC2702.1.

**EXPLOSIVE.** See [Section 3302.1] FC3302.1.

**High Explosive.** See [Section 3302.1] FC3302.1.

**Low Explosive.** See [Section 3302.1] FC3302.1.

**Mass-detonating Explosives.** See [Section 3302.1] FC3302.1.

**UN/DOTn Class 1 Explosives.** See [Section 3302.1] FC3302.1.

**EXTERNAL LOAD.** See [Section 1102.1] FC1102.1.

**EXTRA-HIGH-RACK COMBUSTIBLE STORAGE.** See [Section 2302.1] FC2302.1.

**FABRICATION AREA.** See [Section 1802.1] FC1802.1.

**FACILITY.** Any premises subject to a design or installation requirement of this code, or at, in or upon which a material regulated by this code is manufactured, stored, handled, used or transported, or an operation regulated by this code is conducted.

**FAIL-SAFE.** A feature of the design of a device, equipment or system that automatically counteracts the effect of an anticipated possible source of failure, or prevents or mitigates a hazardous condition by automatically compensating for a failure or malfunction of the device, equipment or system.

**FALLOUT AREA.** See [Section 3302.1] FC3302.1.

**FEP.** See FC402.1.

**FEP STAFF.** See FC402.1

**FINISHED PYROXYLIN PLASTIC PRODUCTS.** See [Section 4202.1] FC4202.1.

**FIRE.** A rapid, persistent chemical reaction that releases heat and light, especially the burning of a combustible substance in the presence of oxygen. For purposes of this code, a flame used in any lawful, properly operating device, equipment or system or other controlled setting shall not be considered a fire.

**FIRE ALARM BOX, MANUAL.** See [Section 902.1] FC902.1.

**[FIRE ALARM CONTROL UNIT.** See Section 902.1.]

**FIRE ALARM SIGNAL.** See [Section 902.1] FC902.1.

**[FIRE ALARM SUB-SYSTEM**. See Section 902.1.]

**FIRE ALARM SYSTEM.** See [Section 902.1] FC902.1.

**FIRE APPARATUS ACCESS ROAD.** See [Section 502.1] FC502.1.

**FIRE AREA.** [See Section 902.1.] The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls and/or horizontal assemblies of a building. Areas of the building not provided with surrounding walls shall be included in the fire area if such areas are included within the horizontal projection of the roof or floor next above.

**FIRE COMMAND CENTER.** [See Section 502.1.] The principal attended or unattended location where the status of the detection, alarm communications and control systems is displayed, and from which the system(s) can be manually controlled.

**FIRE DEPARTMENT STANDARD KEY.** See [Section 502.1] FC502.1.

**FIRE DETECTOR, AUTOMATIC.** See [Section 902.1] FC902.1.

**FIRE DOOR ASSEMBLY.** Any combination of a fire door, frame, hardware, and other components.

**FIRE DRILL.** See [Section 402.1] FC402.1.

**FIRE EXTINGUISHING SYSTEM.** See [Section 902.1] FC902.1.

**FIRE GUARD.** [See Section 2602.1.] A person holding a certificate of fitness for such purpose, who is trained in and responsible for maintaining a fire watch.

**FIRE LANE.** See [Section 502.1] FC502.1.

**FIRE PARTITION.** A vertical assembly of materials designed to restrict the spread of fire.

**FIRE POINT.** See [Section 3402.1] FC3402.1.

**FIRE PROTECTION SYSTEM.** See [Section 902.1] FC902.1.

**FIRE-RETARDANT COATING.** See [Section 802.1] FC802.1.

**[FIRE SAFETY AND EVACUATION PLAN.** See Section 402.1.]

**FIRE WATCH.** A temporary measure intended to ensure continuous and systematic surveillance of a building or portion thereof by one or more qualified individuals for the purposes of identifying and controlling fire hazards, including detecting early signs of fire, raising an alarm of fire, [and] notifying the department, and performing such other fire safety duties as may be prescribed by the commissioner.

**FIREWORKS.** See [Section 3302.1] FC3302.1.

**Fireworks, 1.3G.** See FC3302.1.

**Fireworks, 1.4G.** See [Section 3302.1] FC3302.1.

**[Fireworks, 1.3G.** See Section 3302.1.]

**FIREWORKS CONTRACTOR CERTIFICATE.** See [Section 3302.1] FC3302.1.

**FIREWORKS DISPLAY.** See [Section 3302.1] FC3302.1.

**FLAME-RESISTANT MATERIAL.** See [Section 802.1] FC802.1.

**FLAME-RETARDANT TREATMENT.** See [Section 802.1] FC802.1.

**FLAME SPREAD.** See FC802.1.

**FLAMMABLE AND COMBUSTIBLE LIQUID STORAGE SYSTEM.** See [Section 3402.1] FC3402.1.

**FLAMMABLE CRYOGENIC FLUID.** See [Section 3202.1] FC3202.1.

**FLAMMABLE FINISHES.** See [Section 1502.1] FC1502.1.

**FLAMMABLE GAS.** See [Section 3502.1] FC3502.1.

**FLAMMABLE LIQUEFIED GAS.** See [Section 3502.1] FC3502.1.

**FLAMMABLE LIQUID.** See [Section 3402.1] FC3402.1.

**FLAMMABLE LIQUID MOTOR FUEL.** See [Section 2202.1] FC2202.1.

**[FLAMMABLE LIQUID MOTOR FUEL-DISPENSING FACILITY.** See Section 2202.1.]

**FLAMMABLE MATERIAL.** A material capable of being readily ignited from common sources of heat or at a temperature of 600°F (316°C) or less.

**FLAMMABLE SOLID.** See [Section 3602.1] FC3602.1.

**FLAMMABLE VAPOR AREA.** See FC1502.1.

**FLAMMABLE VAPORS OR FUMES.** See [Section 2702.1] FC2702.1.

**FLASH POINT.** See [Section 3402.1] FC3402.1.

**[FLEET AUTOMOTIVE LIQUID MOTOR FUEL-DISPENSING FACILITY.** See Section 2202.1.]

**[FLEET CNG MOTOR FUEL-DISPENSING FACILITY.** See Section 2202.1.]

**[FLEET MARINE LIQUID MOTOR FUEL-DISPENSING FACILITY.** See Section 2202.1.]

**FLEET MOTOR FUEL-DISPENSING FACILITY.** See FC2202.

**FLOAT.** See FC302.1.

**FLOOR FINISHING OPERATION.** See [Section 1502.1] FC1502.1.

**FLS.** See FC402.1.

**FLS STAFF.** See FC402.1

**FLUIDIZED BED.** See [Section 1502.1] FC1502.1.

**FRONTAGE SPACE.** See [Section 502.1] FC502.1.

**[FSP STAFF.** See Section 402.1.]

**FUEL GAS CODE.** The 2008 New York City Fuel Gas Code in effect on July 1, 2008, and as amended thereafter.

**[FULL SERVICE AUTOMOTIVE LIQUID MOTOR FUEL-DISPENSING FACILITY.** See Section 2202.1.]

**[FULL SERVICE CNG MOTOR FUEL-DISPENSING FACILITY.** See Section 2202.1.]

**[FULL SERVICE MARINE LIQUID MOTOR FUEL-DISPENSING FACILITY.** See Section 2202.1.]

**FULL-SERVICE MOTOR FUEL-DISPENSING FACILITY.** See FC2202.

**FUME CLASS 1.** See [Section 3302.1] FC3302.1.

**FUMIGANT.** See [Section 1702.1] FC1702.1.

**FUMIGATION.** See [Section 1702.1] FC1702.1.

**FUMIGATION AND [THERMAL] INSECTICIDAL FOGGING OPERATION COMPANY CERTIFICATE.** See [Section 1702.1] FC1702.1.

**FURNACE.** See [Section 2102.1] FC2102.1.

**CLASS A.** See [Section 2102.1] FC2102.1.

**CLASS B.** See [Section 2102.1] FC2102.1.

**CLASS C.** See [Section 2102.1] FC2102.1.

**CLASS D.** See [Section 2102.1] FC2102.1.

**FURNISHING.** See [Section 802.1] FC802.1.

**GAS CABINET.** See [Section 2702.1] FC2702.1.

**GAS ROOM.** See [Section 2702.1] FC2702.1.

**GENERAL SUPERVISION.** Except as otherwise provided in this code, supervision by the holder of any department certificate who is responsible for performing the duties set forth in [Section 113.2] FC113.2 but need not be personally present on the premises at all times.

**HANDLING.** See [Section 2702.1] FC2702.1.

**HAZARDOUS MATERIALS.** See [Section 2702.1] FC2702.1.

**HAZARDOUS PRODUCTION MATERIAL (HPM).** See [Section 1802.1] FC1802.1.

**HEALTH HAZARD.** See [Section 2702.1] FC2702.1.

**HELICOPTER LIFT OPERATION.** See [Section 1102.1] FC1102.1.

**HELIPORT.** See [Section 1102.1] FC1102.1.

**HELISTOP.** See [Section 1102.1] FC1102.1.

**HI-BOY.** See [Section 302.1] FC302.1.

**HIGH-PILED COMBUSTIBLE STORAGE.** See [Section 2302.1] FC2302.1.

**HIGH-PILED STORAGE AREA.** See [Section 2302.1] FC2302.1.

**HIGH-RISE BUILDING.** See FC402.1.

**HIGH-RISE FLOOR.** See FC402.1.

**HIGH-VOLTAGE TRANSMISSION LINE.** See FC302.1.

**HIGHLY TOXIC MATERIAL.** See [Section 3702.1] FC3702.1.

**HIGHWAY.** See [Section 3302.1] FC3302.1.

**HOOD.** See [Section 602.1] FC602.1.

**Type I.** See [Section 602.1] FC602.1.

**HOT AIR BALLOON OPERATION.** See [Section 1102.1] FC1102.1.

**HOT WORK.** See [Section 2602.1] FC2602.1.

**HOT WORK AREA.** See [Section 2602.1] FC2602.1.

**HOT WORK EQUIPMENT.** See [Section 2602.1] FC2602.1.

**HOT WORK PROGRAM.** See FC2602.1.

**HOT WORK PROGRAM AUTHORIZATIONS.** See [Section 2602.1] FC2602.1.

**[HOT WORK PROGRAM.** See Section 2602.1.]

**HPM FLAMMABLE LIQUID.** See [Section 1802.1] FC1802.1.

**HPM ROOM.** See [Section 1802.1] FC1802.1.

**HYDRANT-FUELING VEHICLE.** See [Section 1102.1] FC1102.1.

**IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).** See [Section 2702.1] FC2702.1.

**IMPAIRMENT COORDINATOR.** See [Section 902.1] FC902.1.

**IN-BUILDING RELOCATION.** See FC402.1.

**IN-BUILDING RELOCATION AREA.** See FC402.1.

**INCOMPATIBLE MATERIALS.** See [Section 2702.1] FC2702.1.

**INERT GAS.** Argon, helium, krypton, neon, nitrogen, xenon or other gas that does not react with other materials under atmospheric pressures and other conditions ordinarily encountered in common use.

**INHABITED BUILDING.** See [Section 3302.1] FC3302.1.

**INITIATING DEVICE.** See [Section 902.1] FC902.1.

**INSECTICIDAL FOGGING.** See FC1702.1.

**INTERIOR FINISH.** See [Section 802.1] FC802.1.

**IRRITANT.** A material which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact. A material shall be classified a skin irritant if, when tested in accordance with the regulations of the United States Consumer Product Safety Commission, as set forth in 16 CFR Section 1500.41, it results in an empirical score of 5 or more. A material shall be classified as an eye irritant in accordance with the regulations of the United States Consumer Product Safety Commission, as set forth in 16 CFR Section 1500.42.

**JOB SITE.** See [Section 3302.1] FC3302.1.

**KEY BOX.** See [Section 502.1] FC502.1.

**LABELED.** A listed material, device, equipment or system to which has been attached a label, symbol or other identifying mark of a nationally recognized testing laboratory or other approved organization, and whose labeling indicates compliance with nationally recognized standards and designates suitable usage.

**LABORATORY CHEMICAL.** See [Section 2702.1] FC2702.1.

**LABORATORY UNIT.** See [Section 2702.1] FC2702.1.

**LARGE-AREA BUILDING.** See FC402.1.

**LIMITED-SPRAYING SPACE.** See [Section 1502.1] FC1502.1.

**LIQUEFIED NATURAL GAS (LNG).** See [Section 2202.1] FC2202.1.

**LIQUEFIED PETROLEUM GAS (LPG).** See [Section 3802.1] FC3802.1.

**LIQUID.** See [Section 2702.1] FC2702.1.

**LIQUID MOTOR FUEL.** See [Section 2202.1] FC2202.1.

**LIQUID MOTOR FUEL STORAGE AND DISPENSING SYSTEM.** See [Section 2202.1] FC2202.1.

**LIQUID OXYGEN AMBULATORY CONTAINER.** See FC4002.1.

**LIQUID OXYGEN HOME CARE CONTAINER.** See FC4002.1.

**LIQUID STORAGE ROOM.** See [Section 3402.1] FC3402.1.

**LIQUID STORAGE WAREHOUSE.** See FC3402.1.

**[LIQUID TIGHT] LIQUID-TIGHT CONSTRUCTION.** Construction designed to prevent a liquid manufactured, stored, handled or used in a room or other area from escaping from such room or other area by means of penetration through a surface.

**LISTED.** A material, device, equipment or system included on a list published by a nationally recognized testing laboratory or other approved organization performing product evaluations that maintains periodic inspection of production of such listed material, device, equipment or system, and whose listing indicates compliance with nationally recognized standards and designates suitable usage.

**LOADER.** See [Section 3302.1] FC3302.1.

**LONGITUDINAL FLUE SPACE.** See [Section 2302.1] FC2302.1.

**LOW-PRESSURE CONTAINER.** See [Section 3202.1] FC3202.1.

**LOWER EXPLOSIVE LIMIT (LEL).** See [Section 2702.1] FC2702.1.

**LOWER FLAMMABLE LIMIT (LFL).** See [Section 2702.1] FC2702.1.

**MAGAZINE.** See [Section 3302.1] FC3302.1.

**MAGAZINE KEEPER.** See [Section 3302.1] FC3302.1.

**MANUAL STOCKING METHODS.** See [Section 2302.1] FC2302.1.

**MARINA.** See FC302.1.

**[MARINE LIQUID MOTOR FUEL-DISPENSING FACILITY.** See Section 2202.1.]

**MATERIAL SAFETY DATA SHEET (MSDS).** See [Section 2702.1] FC2702.1.

**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA.** See [Section 2702.1] FC2702.1.

**MAXIMUM ALLOWABLE WORKING PRESSURE (MAWP).** See [Section 3202.1] FC3202.1.

**MEANS OF EGRESS.** See [Section 1002.1] FC1002.1.

**MECHANICAL CODE.** The 2008 New York City Mechanical Code in effect on July 1, 2008, and as amended thereafter.

**MECHANICAL STOCKING METHODS.** See [Section 2302.1] FC2302.1.

**MEMBRANE STRUCTURE.** See [Section 2402.1] FC2402.1.

**METAL HYDRIDE.** See FC3502.1.

**METAL HYDRIDE HYDROGEN STORAGE SYSTEM**. See FC3502.1.

**MICROTURBINE.** See FC3502.1.

**MINIMUM SECURED RADIUS.** See [Section 3302.1] FC3302.1.

**MIXED-OCCUPANCY BUILDING.** See FC402.1.

**MORTAR.** See [Section 3302.1] FC3302.1.

**MOTOR VEHICLE.** See [Section 2202.1] FC2202.1.

**MUCKING.** See [Section 3302.1] FC3302.1.

**MULTI-FLOOR DWELLING UNIT.** See FC502.1.

**MULTIPLE-STATION ALARM DEVICE.** See [Section 902.1] FC902.1.

**[NESTING.** See Section 3002.1.]

**NATURAL DECORATIVE GREEN.** See [Section 802.1] FC802.1.

**NATURAL GAS.** A mixture of hydrocarbon gases and vapors, consisting principally of methane in gaseous form.

**NATURAL TREE.** See [Section 802.1] FC802.1.

**NESTING.** See Section 3002.1.

**NET EXPLOSIVE WEIGHT (net weight).** See [Section 3302.1] FC3302.1.

**NON-FIRE EMERGENCY.** See FC402.1.

**NON-FIRE EMERGENCY DRILL.** See FC402.1.

**NON-PRODUCTION LABORATORY.** See [Section 2702.1] FC2702.1.

**NORMAL TEMPERATURE AND PRESSURE (NTP).** See [Section 2702.1] FC2702.1.

**OCCUPANCY.** The purpose or activity for which a building or space is used or designed to be used. References to occupancy classification shall be deemed to include the equivalent occupancy classifications under the 1968 Building Code and all prior Building Codes or other applicable laws, rules and regulations. The occupancy classifications used in this code are defined as follows:

**Group A.** An assembly occupancy, including Groups A-1, A-2, A-3, A-4 and A-5, as defined in Section 303 of the Building Code.

**Group B.** A business occupancy, as defined in Section 304 of the Building Code.

**Group E.** An educational occupancy, as defined in Section 305 of the Building Code.

**Group F.** A factory and industrial occupancy, including Groups F-1 and F-2, as defined in Section 306 of the Building Code.

**Group H.** A high-hazard occupancy, including H-1, H-2, H-3, H-4 and H-5, as defined in Section 307 of the Building Code.

**Group I.** An institutional occupancy, including Groups I-1, I-2, I-3 and I-4, as defined in Section 308 of the Building Code.

**Group M.** A mercantile occupancy, as defined in Section 309 of the Building Code.

**Group R.** A residential occupancy, including Groups R-1, R-2 and R-3, as defined in Section 310 of the Building Code.

**Group S.** A storage occupancy, including Groups S-1 and S-2, as defined in Section 311 of the Building Code.

**Group U.** A utility and miscellaneous occupancy, as defined in Section 312 of the Building Code.

**OFFICE BUILDING.** See [Section 402.1] FC402.1.

**OPEN FIRES.** See [Section 302.1] FC302.1.

**OPEN FLAME.** See [Section 302.1] FC302.1.

**OPEN-FLAME DEVICE.** See [Section 302.1] FC302.1.

**OPEN SYSTEM.** The use of a solid or liquid hazardous material in equipment or a vessel, or system that remains open during normal operation, such that vapors are emitted during the operation of such equipment, vessel or system and the material is exposed to the atmosphere

during such operation. Examples of open systems for solids and liquids include dispensing from or into open beakers or containers, dip tank and plating tank operations.

**OPERATING PRESSURE.** The pressure at which a device, equipment or system operates.

**ORGANIC COATING.** See [Section 2002.1] FC2002.1.

**ORGANIC PEROXIDE.** See [Section 3902.1] FC3902.1.

**Class I.** See [Section 3902.1] FC3902.1.

**Class II.** See [Section 3902.1] FC3902.1.

**Class III.** See [Section 3902.1] FC3902.1.

**Class IV.** See [Section 3902.1] FC3902.1.

**Class V.** See [Section 3902.1] FC3902.1.

**Unclassified detonable.** See [Section 3902.1] FC3902.1.

**OUTDOOR CONTROL AREA.** See [Section 2702.1] FC2702.1.

**[OUT OF SERVICE] OUT-OF-SERVICE SYSTEM.** See [Section 902.1] FC902.1.

**OVERCROWDING.** A condition that exists when: (1) the number of occupants present in any premises or part thereof exceeds (a) the maximum number of occupants specified for such premises or part thereof by the certificate of occupancy or other authorization issued by the [New York City] Department of Buildings[,]; or[,] (b) in the absence of such certificate or authorization, the maximum number of occupants established by using the applicable occupant-area allowances set forth in Section 1004.1 of the Building Code; or (c) with respect to a rooftop place of assembly or place of public gathering, the number of occupants present in any such place exceeds one person per 10 square feet (0.929 $m^2$) of the rooftop area to be used for such purpose; or (2) the commissioner determines that a threat exists to the safety of the occupants of any premises or part thereof by reason of the number of persons on the premises and/or the presence of persons sitting and/or standing in locations that may obstruct or impede access to means of egress, including obstructing or impeding access to aisles, passages, corridors, stairways or exits.

**OWNER.** The owner of the freehold of any real property (as defined in section two of the Real Property Law), or of a lesser estate therein, a mortgagee or vendee in possession, assignee of rents, receiver, executor, trustee, lessee, agent, or any other person, firm or corporation, directly or indirectly in control of real property. Any reference in this code to the owner of any building, structure or premises shall be deemed to designate collectively any and all of the foregoing, including, but not limited to, the owner of the freehold or lesser estate therein and a managing agent designated by such owner pursuant to Section 27-2098 of the New York City Administrative Code.

**OXIDIZER.** See [Section 4002.1] FC4002.1.

**Class 1.** See [Section 4002.1] FC4002.1.

**Class 2.** See [Section 4002.1] FC4002.1.

**Class 3.** See [Section 4002.1] FC4002.1.

**Class 4.** See [Section 4002.1] FC4002.1.

**OXIDIZING CRYOGENIC FLUID.** See FC4002.1.

**OXIDIZING GAS.** See [Section 4002.1] FC4002.1.

**OZONE GAS GENERATOR.** See [Section 3702.1] FC3702.1.

**PASS-THROUGH.** See [Section 1802.1] FC1802.1.

**PERMISSIBLE EXPOSURE LIMIT (PEL).** See [Section 2702.1] FC2702.1.

**PERMIT.** A written statement issued by the commissioner authorizing the manufacture, storage, handling, use or transportation of a hazardous material, or other material, or to conduct an operation or to maintain a facility, for which a permit is required by this code.

**PERSONAL SUPERVISION.** Except as otherwise provided in this code, supervision by the holder of any department certificate who is required to be personally present on the premises, or other proximate location acceptable to the department, while performing the duties for which the certificate is required.

**PESTICIDE.** See [Section 2702.1] FC2702.1.

**PIER.** See FC302.1.

**PIPED NATURAL GAS.** Natural gas supplied by means of piping connected to a distribution system operated by a public utility.

**PLUMBER.** A licensed master plumber, as that term is defined by the Building Code, or a person working under the direct and continuing supervision of a licensed master plumber, as authorized by said code.

**PLUMBING CODE.** The 2008 New York City Plumbing Code in effect on July 1, 2008, and as amended thereafter.

**PORTABLE COOKING EQUIPMENT.** See [Section 902.1] FC902.1.

**PORTABLE FIRE EXTINGUISHER SALES COMPANY CERTIFICATE.** See [Section 902.1] FC902.1.

**PORTABLE FIRE EXTINGUISHER SERVICING COMPANY CERTIFICATE.** See [Section 902.1] FC902.1.

**PORTABLE FUELED EQUIPMENT.** See [302.1] FC302.1.

**PORTABLE SPACE HEATER.** See [Section 302.1] FC302.1.

**POWERED INDUSTRIAL EQUIPMENT.** See FC302.1.

**POWERED INDUSTRIAL TRUCK.** See [Section 302.1] FC302.1.

**PREMISES.** Any real property, including buildings and structures thereon, or any part thereof.

**PRESIGNAL SYSTEM.** See [Section 902.1] FC902.1.

**PRESSURE VESSEL.** See [Section 2702.1] FC2702.1.

**PRIMARY CONTAINMENT.** The first level of containment, consisting of the inside portion of that container which comes into immediate contact on its inner surface with the material being contained.

**PRIMER.** See [Section 3302.1] FC3302.1.

**PRIVATE ROAD.** See [Section 502.1] FC502.1.

**PRIVATE STREET.** See [Section 502.1] FC502.1.

**PROCESS TRANSFER.** See [Section 3402.1] FC3402.1.

**PROCESSING VESSEL.** See [Section 3402.1] FC3402.1.

**PROPELLANT.** See [Section 2802.1] FC2802.1.

**PROTECTED EXPOSURE.** See [Section 3302.1] FC3302.1.

**PROTECTED PREMISES.** See [Section 902.1] FC902.1.

**PROXIMATE AUDIENCE.** See [Section 3302.1] FC3302.1.

**PUBLIC STREET.** See [Section 502.1] FC502.1.

**PYROPHORIC MATERIAL.** See [Section 4102.1] FC4102.1.

**PYROTECHNIC ARTICLE OR DEVICE.** See [Section 3302.1] FC3302.1.

**PYROTECHNIC MATERIAL.** See [Section 3302.1] FC3302.1.

**PYROTECHNIC SUPPLIER CERTIFICATE.** See [Section 3302.1] FC3302.1.

**PYROXYLIN PLASTIC.** See [Section 4202.1] FC4202.1.

**RACK STORAGE.** See [Section 2302.1] FC2302.1.

**RAILWAY.** See [Section 3302.1] FC3302.1.

**RAW PYROXYLIN PLASTIC.** See [Section 4202.1] FC4202.1.

**READY BOX.** See [Section 3302.1] FC3302.1.

**REDUCED FLOW VALVE.** See [Section 3702.1] FC3702.1.

**REFINERY.** See [Section 3402.1] FC3402.1.

**REFRIGERANT.** See [Section 602.1] FC602.1.

**REFRIGERATING SYSTEM.** See [Section 602.1] FC602.1.

**REGISTERED DESIGN PROFESSIONAL.** An architect registered to practice the profession of architecture, or an engineer licensed to practice the profession of engineering, as set forth in the laws, rules and regulations of the State of New York.

**REGULAR BUSINESS HOURS.** See [Section 402.1] FC402.1.

**REMOTE SOLVENT RESERVOIR.** See [Section 3402.1] FC3402.1.

**REPAIR GARAGE.** See [Section 2202.1] FC2202.1.

**RESIN APPLICATION AREA.** See [Section 1502.1] FC1502.1.

**RESPONSIBLE PERSON.** See [Section 2602.1] FC2602.1.

**RETAIL DISPLAY AREA.** See [Section 2802.1] FC2802.1.

**ROLL COATING.** See [Section 1502.1] FC1502.1.

**RUBBISH.** Combustible and noncombustible waste materials, including dust, dirt, ashes, rags, paper, cartons, cans, plastic and glass containers, and discarded appliances.

**RULES.** Rules of the commissioner, promulgated pursuant to the authority granted by the New York City Charter, this code, or other law, rule or regulation.

**SAFETY CAN.** See [Section 2702.1] FC2702.1.

**SCENERY.** See [Section 802.1] FC802.1.

**SEAPLANE BASE.** See [Section 1102.1] FC1102.1.

**SECONDARY CONTAINMENT.** See [Section 2702.1] FC2702.1.

**SEED COTTON.** See FC2902.1.

**[SELF-SERVICE AUTOMOTIVE LIQUID MOTOR FUEL-DISPENSING FACILITY.** See Section 2202.1.]

**[SELF-SERVICE CNG MOTOR FUEL-DISPENSING FACILITY.** See Section 2202.1.]

**SELF-SERVICE MOTOR FUEL-DISPENSING FACILITY.** See FC2202.

**SEMICONDUCTOR FABRICATION FACILITY.** See [Section 1802.1] FC1802.1.

**SEPARATION DISTANCE.** See [Section 3302.1] FC3302.1.

**SERVICE CORRIDOR.** See [Section 1802.1] FC1802.1.

**SHELF STORAGE.** See [Section 2302.1] FC2302.1.

**SHELTER IN PLACE.** See FC402.1.

**SINGLE-STATION SMOKE ALARM.** See [Section 902.1] FC902.1.

**SMALL ARMS AMMUNITION.** See [Section 3302.1] FC3302.1.

**SMALL ARMS AMMUNITION PRIMERS.** See [Section 3302.1] FC3302.1.

**SMOKE ALARM.** See [Section 902.1] FC902.1.

**SMOKE DETECTOR.** See [Section 902.1] FC902.1.

**SMOKE DETECTOR MAINTENANCE COMPANY CERTIFICATE.** See [Section 902.1] FC902.1.

**SMOKELESS PROPELLANTS.** See [Section 3302.1] FC3302.1.

**SOLID.** See [Section 2702.1] FC2702.1.

**SOLID SHELVING.** See [Section 2302.1] FC2302.1.

**SOLVENT DISTILLATION UNIT.** See [Section 3402.1] FC3402.1.

**SPECIAL AMUSEMENT BUILDING.** A building that is temporary, permanent or mobile that contains a device or system that conveys passengers or provides a walkway along, around or over a course in any direction as a form of amusement arranged so that the egress path is not readily apparent due to visual or audio distractions or an intentionally confounded egress path, or is not readily available because of the mode of conveyance through the building or structure.

**SPECIAL EFFECT.** See [Section 3302.1] FC3302.1.

**SPECIAL INDUSTRIAL EXPLOSIVE DEVICE.** See [Section 3302.1] FC3302.1.

**SPEED BUMP.** See FC502.1.

**SPONSOR.** See [Section 3302.1] FC3302.1.

**[SPRAY AREA.** See Section 1502.1.]

**SPRAY BOOTH.** See [Section 1502.1] FC1502.1.

**SPRAY ROOM.** See [Section 1502.1] FC1502.1.

**[SPRAY] SPRAYING SPACE.** See [Section 1502.1] FC1502.1.

**SPRINKLER SYSTEM.** See [Section 902.1] FC902.1.

**STAGING AREA.** See [Section 1102.1] FC1102.1.

**STANDARD CUBIC FEET (SCF).** See [Section 2702.1] FC2702.1.

**STANDPIPE, MULTI-ZONE.** See [Section 902.1] FC902.1.

**STANDPIPE SYSTEM.** See [Section 902.1] FC902.1.

**STEEL.** Hot- or cold-rolled as defined by the Building Code.

**STRUCTURE**. Any construction on, above or below real property, including buildings, enclosures, sheds and tents.

**SUPERVISORY SIGNAL.** See [Section 902.1] FC902.1.

**SUPERVISORY SIGNAL-INITIATING DEVICE.** See [Section 902.1] FC902.1.

**SYSTEM.** See [Section 2702.1] FC2702.1.

**TANK.** A vessel containing more than 60 gallons (227 L).

**TANK, ATMOSPHERIC.** See [Section 2702.1] FC2702.1.

**TANK, PORTABLE.** See [Section 2702.1] FC2702.1.

**TANK, PRIMARY.** See [Section 3402.1] FC3402.1.

**TANK, PROTECTED ABOVEGROUND.** [See Section 2202.1 and Section 3402.1.] An atmospheric aboveground tank listed in accordance with UL 2085, including the design requirements of integral secondary containment, protection from physical damage, and an

insulation system designed to reduce the heat transferred to the primary tank when the tank is exposed to a high-intensity liquid pool fire.

**TANK, STATIONARY.** See [Section 2702.1] FC2702.1.

**TAR KETTLE.** See FC302.1.

**TENT.** See [Section 2402.1] FC2402.1.

**THEFT RESISTANT.** See [Section 3302.1] FC3302.1.

**[THERMAL INSECTICIDAL FOGGING.** See Section 1702.1]

**TNT EQUIVALENT.** See [Section 3302.1] FC3302.1.

**TOOL.** See [Section 1802.1] FC1802.1.

**TORCH-APPLIED ROOF SYSTEM.** See [Section 2602.1] FC2602.1.

**TOXIC MATERIAL.** See [Section 3702.1] FC3702.1.

**TRANSVERSE FLUE SPACE.** See [Section 2302.1] FC2302.1.

**TROUBLE SIGNAL.** See [Section 902.1] FC902.1.

**TUBE TRAILER.** See FC3002.1.

**[UNDERGROUND BUILDING.** See Section 402.1.]

**UNNECESSARY ALARM.** See [Section 902.1] FC902.1.

**UNSTABLE (REACTIVE) MATERIAL.** See [Section 4302.1] FC4302.1.

**Class 1.** See [Section 4302.1] FC4302.1.

**Class 2.** See [Section 4302.1] FC4302.1.

**Class 3.** See [Section 4302.1] FC4302.1.

**Class 4.** See [Section 4302.1] FC4302.1.

**UNWARRANTED ALARM**. See [Section 902.1] FC902.1.

**[VAPOR AREA.** See Section 1502.1.]

**VAPOR PRESSURE.** See [Section 2702.1] FC2702.1.

**VENDOR.** See [Section 3302.1] FC3302.1.

**VESSEL.** See FC302.1.

**VIEWING AREA.** See [Section 3302.1] FC3302.1.

**VOICE COMMUNICATION CAPABILITY.** See FC402.1.

**WATER-REACTIVE MATERIAL.** See [Section 4402.1] FC4402.1.

**Class 1.** See [Section 4402.1] FC4402.1.

**Class 2.** See [Section 4402.1] FC4402.1.

**Class 3.** See [Section 4402.1] FC4402.1.

**WHARF.** See FC302.1.

**WORKSTATION.** See [Section 1802.1] FC1802.1.

**ZONING RESOLUTION.** The New York City Zoning Resolution.

## CHAPTER 3
## GENERAL PRECAUTIONS AGAINST FIRE

### SECTION FC 301
### GENERAL

**301.1 Scope.** This chapter shall govern the operation and maintenance of buildings, structures and premises with respect to precautions to prevent fire and the spread of fire. This chapter shall additionally govern the design, installation, operation and maintenance of the operations, facilities and premises set forth herein.

**301.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

### SECTION FC 302
### DEFINITIONS

**302.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**ASPHALT MELTER.** An approved device designed to heat asphalt, typically for waterproofing operations, that, utilizing a flammable gas or a combustible liquid, generates an enclosed flame that indirectly heats a vessel containing the asphalt.

**AUTOMOTIVE SALVAGE AND WRECKING FACILITY.** Any premises used for the dismantling and/or wrecking of motor vehicles in connection with the sale of auto parts or scrap metal.

**COKE.** A solid carbonaceous material manufactured from the distillation of bituminous coal, petroleum or coal tar, with a thermal heating value of not more than 13,200 British thermal units per hour (3869 W), a volatile composition of not more than 0.5 percent, an NFPA Standard 704 fire hazard rating of not more than 1, and an NFPA Standard 704 reactivity rating of 0.

**COKE-FUELED SALAMANDER.** A metal vessel, typically cylindrical in shape, used to burn coke in the open air for the purpose of maintaining an open fire for construction-related curing and drying. A coke-fueled salamander does not utilize a combustible liquid or flammable gas and does not generate a flame in a sustained or controlled manner and therefore is not an open flame device or portable space heater as those terms are used in this code.

**COMPUTATIONAL FLUID DYNAMICS ANALYSIS.** A simulation and analysis of air flow, including temperature gradients, and for a fire, the products of combustion, over time and distance.

**ELECTRIC BARBECUE.** Any device designed for heating or cooking food on an open grate cooking surface above exposed heating elements. An electric grill that has its heating elements embedded within a solid cooking surface is not an electric barbecue.

**FLOAT.** A floating dock or structure to which marine vessels or watercraft may be moored and which is typically used as means by which passengers and freight may be transferred from ship to shore.

**HI-BOY.** A cart used to move hot roofing materials on a roof.

**HIGH-VOLTAGE TRANSMISSION LINE.** An electrical power transmission line operating at or above 66 kilovolts.

**MARINA.** A facility on, in or around a body of water, protected by natural or manmade features, that is used or designed to be used for the mooring, servicing or storage of marine vessels or watercraft, or the provision of services to the passengers and crews of such vessels or watercraft. A marina typically is comprised of one or more docks, piers, wharfs, and storage and fueling facilities for watercraft.

**OPEN FIRES.** The burning of materials wherein products of combustion are emitted directly into the ambient air without passing through a stack or chimney from an enclosed chamber. For the purpose of this definition, a chamber shall be regarded as enclosed when, during the time combustion occurs, only apertures, ducts, stacks, flues or chimneys necessary to provide combustion air and permit the escape of exhaust gas are open.

**OPEN FLAME.** A flame that is generated by any material or device in a sustained and controlled manner and that is not securely enclosed by noncombustible material, such as a candle that is unenclosed or enclosed in a globe or lantern, or a gas light lantern, but not a flame contained in a furnace or other similar approved device, equipment or system. Torches operated in accordance with FC Chapter 26 and lighted smoking paraphernalia shall not be considered an open flame.

**OPEN-FLAME DEVICE.** Any device utilizing an open flame.

**PIER.** A structure built over the water, typically supported by piles.

**PORTABLE FUELED EQUIPMENT.** Any portable device, equipment or system, whether or not flue-connected, that utilizes a flammable or combustible liquid or flammable gas as a fuel, except an open-flame device.

**PORTABLE SPACE HEATER.** Any portable equipment designed or used for space heating that utilizes a combustible liquid or flammable gas as a fuel, whether or not flue-connected.

**POWERED INDUSTRIAL EQUIPMENT.** Equipment used in commercial and industrial applications, including floor scrubbers and floor buffers, powered by a lead-acid battery system.

**POWERED INDUSTRIAL TRUCK.** A forklift, tractor, platform lift truck or motorized hand truck powered by [an electrical motor] a lead-acid battery system, a metal hydride hydrogen storage system or an internal combustion engine. Powered industrial trucks do not include farm vehicles or [automotive] motor vehicles for highway use.

**TAR KETTLE.** A device designed to heat tar, asphalt, pitch or similar materials, typically for waterproofing operations, that, utilizing a flammable gas or a combustible liquid, generates a flame to heat a vessel containing such a material. Tar kettle does not include asphalt melters.

**VESSEL.** A motorized watercraft, other than a seaplane, used or capable of being used as a means of transportation, including watercraft not primarily used for transportation purposes, such as houseboats.

**WHARF.** A structure or bulkhead constructed along the shore of an inlet, lake or river, or other navigable body of water, used or designed to be used to tie up vessels so that they may lie alongside the shore, and/or to anchor piers or floats.

## SECTION FC 303
## TAR KETTLES AND ASPHALT MELTERS

**303.1 Transporting.** Tar kettles and asphalt melters shall not be transported or otherwise moved when the heat source for the kettle or melter is operating.

**Exception:** Tar kettles and asphalt melters in the process of patching road surfaces.

**303.2 Location.** Tar kettles and asphalt melters shall not be located within 20 feet (6096 mm) of any combustible material, combustible building surface or any building opening and within a controlled area identified by the use of traffic cones, barriers or other approved means. Tar kettles, asphalt melters and pots shall not be utilized [inside or] indoors or on the roof of a building or structure, except that LPG-fueled asphalt melters may be utilized on the roof of a building or structure in accordance with the rules. Roofing kettles, and operating tar kettles and asphalt melters shall not block means of egress, gates, roadways or entrances.

**303.3 Location of fuel containers.** Fuel containers shall be located at least 10 feet (3048 mm) from the burner.

**Exception:** Containers properly insulated from heat or flame are allowed to be within 2 feet (610 mm) of the burner.

**303.4 Supervision.** An operating tar kettle or asphalt melter requiring a permit shall be under the personal supervision of a person holding a certificate of fitness. The certificate of fitness holder shall be within 100 feet (30 480 mm) of the kettle or melter, have the kettle or melter within sight and have unobstructed access to the kettle or melter. Ladders and other obstacles shall not form a part of the route between the certificate of fitness holder and the kettle or melter. The certificate of fitness holder shall not have to climb or descend a ladder or circumvent any obstacle to gain access to the kettle or melter.

**303.5 Portable fire extinguishers.** There shall be at least one portable fire extinguisher complying with the requirements of [Section 906] FC906 and with a minimum 3-A:40-B:C rating within 25 feet (7620 mm) of each tar kettle and asphalt melter during the period such kettle or melter is being utilized, and one additional portable fire extinguisher with a minimum 3-A:40-B:C rating on the roof being covered.

**303.6 Lids.** Tar kettles and asphalt melters shall be equipped with tight-fitting lids.

**303.7 Hi-boys.** Hi-boys shall be constructed of noncombustible materials. Hi-boys shall be limited to a capacity of 55 gallons (208 L). Fuel sources or heating elements shall not be allowed as part of a hi-boy.

**303.8 Kettle and asphalt melter construction.** Any kettle used as a tar kettle and any melter used as an asphalt melter shall be constructed of noncombustible materials.

**303.9 Fuel containers under air pressure.** It shall be unlawful to store, handle or use fuel containers that operate under air pressure.

**303.10 Flammable liquid fuel.** It shall be unlawful to store, handle or use tar kettles or asphalt melters that utilize flammable liquid as a fuel.

**303.11 Roofing operations.** Roofing operations, including repairs, using open-flame devices shall comply with the requirements of [Section 1417] FC1417 and FC Chapters 26 and 35.

## SECTION FC 304
## STORAGE AND ACCUMULATION OF RUBBISH AND OTHER COMBUSTIBLE WASTE

**304.1 Accumulation of combustible waste.** It shall be unlawful to cause or allow rubbish and other combustible waste to accumulate in a building or structure or upon a premises.

**304.1.1 Maintenance.** Roofs, courts, yards, vacant lots, alleys, parking lots, open spaces, and the space beneath a grandstand, bleacher, pier, wharf, or other similar structure, shall be

regularly cleaned so as to prevent the accumulation of any rubbish, vegetation or other combustible waste.

**304.1.2 Vegetation.** Weeds, grass, vines, brush or other vegetation that is capable of being ignited shall be regularly pruned, or cleared and removed for a distance of 10 feet (3048 mm) from any building or structure [by the owner].

**304.2 Unsafe storage of combustible waste prohibited.** It shall be unlawful to store rubbish or other combustible waste in a manner that creates a fire hazard or public nuisance.

**304.3 Containers.** Rubbish and other combustible waste stored pending removal in a building or structure or upon a premises shall be stored in accordance with this section, and any other applicable law, rule or regulation.

**304.3.1 Spontaneous ignition.** Rubbish and other combustible waste susceptible to spontaneous ignition, such as oily rags, shall be stored in a listed disposal container. Contents of such containers shall be removed and disposed of daily.

**304.3.2 Capacity exceeding [5.33 cubic feet] 40 gallons.** [Containers] Dumpsters and other containers with a capacity exceeding [5.33 cubic feet (40 gallons)] 40 gallons (0.15 $m^3$) shall be provided with lids. [Containers and] Such containers and their lids shall be constructed of noncombustible materials or [approved combustible] of materials having a peak rate of heat release not exceeding 300 $kW/m^2$ when tested in accordance with ASTM E 1354 at an incident heat flux of 50 $kW/m^2$ in the horizontal orientation, and listed and labeled as such.

**304.3.3 Capacity exceeding [1.5 cubic yards] 200 gallons.** Dumpsters and other containers with an individual capacity [of 1.5 cubic yards (40.5 cubic feet)] exceeding 200 gallons ([1.15] 0.76 $m^3$) [or more] shall not be stored [in buildings or placed] indoors, and shall not be stored outdoors within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines.

**Exceptions:**

1. Dumpsters or containers in areas protected throughout by a sprinkler system.

2. Storage [shall not be prohibited] in a building or structure of Type I or Type IIA construction or other construction with an equivalent fire rating, where such [storage] building or structure is located not less than 10 feet (3048 mm) from other buildings or structures and used exclusively for container or dumpster [or other container] storage.

**304.3.4 Wastebaskets in Group I-2 and I-3 occupancies.** Wastebaskets and other waste containers, including their lids, used in Group I-2 and I-3 occupancies shall be constructed of noncombustible materials or of materials having a peak rate of heat release not exceeding 300 $kW/m^2$ when tested in accordance with ASTM E 1354 at an incident heat flux of 50 $kW/m^2$ in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (76 L) or more shall be listed in accordance with UL 1315 and shall be provided with a noncombustible lid.

**304.4 Outdoor storage.** Outdoor storage of combustible [materials] waste at a transfer station, recycling facility, or other lawful outdoor combustible waste storage facility, shall [not be located within 10 feet (3048 mm) of a property line or within 50 feet (15240 mm) of the nearest wall of a building occupied as a Group A occupancy, Group E (educational) occupancy or Group R-2 occupancy] comply with the requirements of FC315.

**[304.4.1 Height.** Storage shall not exceed 20 feet (6096 mm) in height.

**304.4.2 Reduced separation distance.** The separation distances required by Section 304.4 may be reduced when approved and when in compliance with the requirements of Sections 304.4.2.1 through 304.4.2.3.

**304.4.2.1 Fencing.** The storage shall be enclosed by an approved well-constructed and maintained fence between 10 and 18 feet (3048 and 5486 mm) in height above the street level. If any building having an unpierced fire wall adjoins the enclosure, no fence shall be required on that side.

**304.4.2.2 Separation from building openings.** The storage shall be completely separated from any window or door openings of any wall of an adjoining building by a well-constructed and maintained fence of noncombustible material of an approved height, erected at least 6 feet (1829 mm) from such opening and extending at least 6 feet (1829 mm) on each side thereof and continued to the sides of the enclosure or carried to the walls of the building.

**304.4.2.3 Pile height.** The storage at any point shall not be piled higher than 2 feet (610 mm) below the top of the fence required by Section 304.4.2.1.

**304.4.3 Portable fire extinguishers.** At least one portable fire extinguisher with a rating of at least 4-A shall be provided for every 2,500 square feet (232.3 $m^2$) of storage area, or portion thereof, or in lieu thereof, a hose of at least 1 inch (25.4 mm) in diameter, equipped with a nozzle of at least ½ inch (12.7 mm) in diameter, sufficient in length to reach all parts of the enclosure, and connected to an adequate water supply may be provided.]

## SECTION FC 305
## IGNITION SOURCES

**305.1 Clearance from ignition sources.** Clearance between ignition sources, such as [light fixtures] luminaires, heaters and open-flame devices, and combustible materials shall be maintained in an approved manner.

**305.2 Hot ashes and spontaneous ignition sources.** Hot ashes, cinders, smoldering coals or greasy or oily materials subject to spontaneous ignition shall not be deposited in a combustible container, or within 10 feet (3048 mm) of other combustible material, including combustible walls and partitions and combustible waste, or within 2 feet (610 mm) of openings to buildings or structures.

**Exception:** The minimum required separation distance to other combustible materials shall be 2 feet (610 mm) where the material is deposited in a covered, noncombustible [receptacle] container placed on a noncombustible floor, ground surface or stand.

**305.3 Open-flame warning devices.** It shall be unlawful to use an open-flame device on roadways as a warning signal or for any other purposes.

**Exception:** The use of fusees at the scene of an emergency or as required by standard railroad operating procedures.

**305.4 Deliberate or negligent burning.** It shall be unlawful to deliberately or through negligence set fire to or cause the burning of combustible material or combustible waste in such a manner as to endanger the safety of persons or property.

## SECTION FC 306
## MOTION PICTURE FILM AND SCREENS

**306.1 Motion picture projection rooms.** Electric arc, xenon or other light source projection equipment which develops hazardous gases, dust or radiation and the projection of ribbon-type cellulose nitrate film, regardless of the light source used in projection, shall be operated within a motion picture projection room complying with the requirements of [Section 409] Chapter 4 of the Building Code.

**306.2 Cellulose nitrate film storage, handling and use.** Cellulose nitrate film shall be stored, handled and used in accordance with NFPA 40 and subject to the approval of the commissioner.

**306.2.1 Supervision.** The handling and use of cellulose nitrate film, including motion picture projection, shall be under the personal supervision of a person holding a certificate of fitness. The storage of cellulose nitrate film shall be under the general supervision of a person holding a certificate of fitness.

**306.3 Motion picture screens.** The screens upon which motion pictures are projected shall be of noncombustible construction as set forth in Chapter 6 of the Building Code, or shall [be treated to be flame resistant in accordance with] meet the flame propagation performance criteria of NFPA 701, or shall comply with the requirements for a Class A interior finish in accordance with [Section 803] Chapter 8 of the Building Code. Screens installed prior to the effective date of this code shall comply with the applicable Building Code requirements. The construction supporting such motion picture screens shall be of noncombustible construction as set forth in Chapter 6 of the Building Code, and shall comply with the load bearing requirements of the Building Code.

## SECTION FC 307
## OPEN FIRES

**307.1 General.** Kindling, building, maintaining or using an open fire is prohibited.

**Exceptions:**

1. [Outdoor] Portable outdoor barbecues [on residential property] as authorized by [Section 307.5] FC307.5.

2. Outdoor noncommercial barbecue fires in equipment provided by and located in city parks where such open fires are [permitted] allowed by the Department of Parks and Recreation.

3. In connection with training of fire brigades or similar purposes by persons or entities where such training is required by law, rule or regulation.

4. Approved open fires used for special effects in connection with television, motion picture, theatrical and other entertainment productions.

5. Coke-fueled salamanders at a construction site in accordance with FC307.6 and the rules.

**307.2** [Reserved.

**307.2.1] Authorization.** Open fires allowed pursuant to [Section 307.1] FC307.1 may only be kindled, built, maintained or used with the prior written authorization of the agencies with regulatory jurisdiction, property owner and other required approvals, and only when such open fires are maintained in compliance with all conditions of such authorization or approval. The commissioner may prohibit the kindling, building, maintaining or use of open fire or order the extinguishment of any open fire allowed by this section, upon a determination that such open fire will create an undue hazard because of conditions in the surrounding environment.

**307.3** Reserved.

**307.4 Attendance.** Open fires shall be constantly attended until the fire is extinguished. A minimum of one portable fire extinguisher complying with the requirements of [Section 906] FC906 with a minimum 4-A rating or other approved on-site fire-extinguishing equipment, such as [dirt, sand, water barrel,] a garden hose [or water truck] connected to an approved water supply, shall be available for immediate use.

**[307.5 Barbecues on residential premises.** Outdoor barbecues on residential premises shall be installed, operated and maintained in accordance with Sections 307.5.1 through 307.5.3.

**307.5.1 Charcoal and electric barbecues.** Outdoor barbecues designed to use charcoal or electricity with a total grate area not exceeding 10 square feet (0.929 $m^2$) may be installed, operated and maintained on any residential premises, provided that such barbecues are not installed or operated within 10 feet (3048 mm) of any combustible waste, or combustible material, including combustible building surfaces, balconies and decks, and a garden type hose attached to a water supply or a minimum of one portable fire extinguisher complying with the requirements of Section 906 with a minimum 4-A rating is readily available for use.

**307.5.2 Piped natural gas-fired barbecues.** Outdoor barbecues designed to use piped natural gas shall be installed, operated and maintained in accordance with Section 307.5.1.

The natural gas piping shall comply with the requirements of the construction codes, including the Plumbing Code.

**307.5.3 LPG-fired barbecues.** Outdoor barbecues designed to use LPG from portable containers shall be installed, operated and maintained on the premises of a Group R-3 occupancy in accordance with Section 307.5.1 and the following requirements:

1. Not more than two containers may be stored and/or used.

2. Each container shall have a maximum capacity of 20 pounds (9.08 kg) LPG, except that on balconies, each container shall have a maximum capacity of 16.4 ounces (0.465 kg) LPG.]

**307.5 Portable outdoor barbecues.** Charcoal, electric, and LPG and piped natural gas-fueled portable outdoor barbecues may be operated and maintained in compliance with the requirements of this section.

**307.5.1 General.** Portable outdoor barbecues burning charcoal, powered by electricity, or fueled by LPG containers or piped natural gas may be stored and used on any residential premises in compliance with the requirements of this section and the rules. Portable outdoor barbecues burning charcoal, powered by electricity, or fueled by piped natural gas may be stored and used on any other premises in compliance with the requirements of this section and the rules, except as may be restricted by the Zoning Resolution or the Department by rule or order. Stationary outdoor grills and other outdoor cooking equipment shall be installed in accordance with the Building and Mechanical Codes, and operated and maintained in accordance with this section.

**307.5.2 Grate area.** The total grate area of a portable outdoor barbecue shall not exceed 10 square feet (0.929 $m^2$).

**307.5.3 Clearance distances.** Portable outdoor barbecues shall not be stored or used within 10 feet (3048 mm) of any combustible waste, combustible material, or any combustible building surface, including combustible roofs and decks. To the maximum extent feasible, windows, doors and other building openings within 10 feet (3048 mm) of a barbecue in use shall be kept closed. An entrance door shall be closed immediately after entering or exiting the building while the barbecue is in use.

**307.5.4 Fire extinguishing equipment.** A garden-type hose attached to a water supply, or a minimum of one portable fire extinguisher complying with the requirements of FC906 with a minimum 4-A rating, shall be provided for any portable outdoor barbecue, and shall be readily accessible whenever the portable outdoor barbecue is in use. A portable fire extinguisher complying with the requirements of FC906 and with a Class K rating shall be provided for any portable outdoor barbecue used for commercial cooking purposes, and shall be readily accessible whenever such barbecue is in use.

**307.5.5 Natural gas piping.** The natural gas piping supplying portable outdoor barbecues designed to use piped natural gas shall be designed and installed in accordance with the Fuel Gas Code.

**307.5.6 LPG containers.** Portable outdoor barbecues fueled by LPG containers shall additionally comply with the requirements of FC307.5.6.1 and 307.5.6.2.

**307.5.6.1 Group R-2 occupancies.** Only portable outdoor barbecues designed for use with LPG containers with a capacity of 16.4 ounces (0.465 kg) may be stored or used on the premises of a Group R-2 occupancy. Indoor storage of 16.4-ounce (0.465 kg) LPG containers for this or any other purpose is limited to a maximum of four such containers per dwelling unit.

**307.5.6.2 Group R-3 occupancies.** Portable outdoor barbecues designed for use with LPG containers with a capacity of 20 pounds (9.08 kg) or LPG containers with a capacity of 16.4 ounces (0.465 kg) may be stored or used on the premises of a Group R-3 occupancy. Twenty-pound LPG containers shall not be stored or used indoors, or on any rooftop or balcony. A maximum of two 20-pound LPG containers may be used to fuel a portable outdoor barbecue. Indoor storage of 16.4-ounce (0.465 kg) LPG containers for this or any other purpose is limited to a maximum of four such containers per dwelling unit.

**307.5.7 Cleaning.** Portable outdoor barbecues shall be periodically cleaned by removing grease or fat accumulations from grills and in trays below the grill.

**307.6 Coked-fueled salamanders.** Coke and coke-fueled salamanders may be stored, handled and used for construction-related curing and drying at construction sites in accordance with this section and the rules.

**307.6.1 Supervision.** The handling and use of coke and coke-fueled salamanders at construction sites, including the extinguishment of the coke, shall be under the personal supervision of a certificate of fitness holder. A certificate of fitness holder may not supervise the handling or use of more than fifty coke-fueled salamanders, or the handling or use of coke or coke-fueled salamanders that are located on more than one floor. The storage of coke and coke-fueled salamanders at construction sites shall be under the general supervision of a certificate of fitness holder.

## SECTION FC 308
## OPEN FLAMES

**308.1 General.** This section governs the use of open flames in all buildings, structures and premises.

**308.2 Prohibitions.** It shall be unlawful to:

1. [Cause] cause or allow an open flame to be lit or maintained in any room or other area of a building, structure, premises, marine vessel, watercraft or other place in which a hazardous material is stored, handled or used, or where conditions exist that could cause ignition of flammable vapors or combustible material.

2. [Use] use or maintain in any area in which smoking is prohibited, as set forth in [Section 310] FC310 or elsewhere in this code, a lighted match or other flame which has not been approved for use by the commissioner in such areas.

3. [Place] place or discard, or cause to be placed or discarded, an open flame, lighted match or other flaming substance or object on any surface or article where it can cause the ignition of combustible material or combustible waste, or otherwise cause an unwanted fire.

4. store or use candles, incense or similar open-flame producing items in Group R-1 college and university dormitories.

**308.3 Use of open flames.** Open flames may only be lighted, maintained and used in Group A [occupancy] occupancies and public gathering places in accordance with this section.

**308.3.1** [Reserved.] **Flaming food and beverage preparation.** The preparation of flaming foods or beverages in Group A occupancies and public gathering places shall be in accordance with FC 308.3.1.1 through 308.3.1.5.

**308.3.1.1 Dispensing.** Flammable or combustible liquids used in the preparation of flaming foods or beverages shall be dispensed from one of the following:

1. A 1-ounce (29.6 ml) container; or

2. A container not exceeding 1-quart (946.5 ml) capacity with a controlled-pouring device that will limit the flow to a 1-ounce (29.6 ml) serving.

**308.3.1.2 Containers not in use.** Containers shall be secured to prevent spillage when not in use.

**308.3.1.3 Serving of flaming food.** The serving of flaming foods or beverages shall be done in a safe manner and shall not create flames higher than 6 inches (152.4 mm). The pouring, ladling or spooning of liquids is restricted to a maximum height of 8 inches (203 mm) above the receiving receptacle.

**308.3.1.3.1 Ignition.** The flaming food or beverage shall be ignited on serving tables. Such tables shall have noncombustible tops or, if the top is combustible, it shall be protected by a noncombustible mat. The mat, when used, shall cover the entire top of the table. Flames shall be extinguished before serving the food or beverage.

**308.3.1.4 Location.** Flaming foods or beverages shall be prepared only in the immediate vicinity of the table being served. Flaming foods and beverages shall not be transported or carried while burning.

**308.3.1.5 Fire protection.** The person preparing the flaming foods or beverages shall have a wet cloth towel immediately available for use in smothering the flames in the event of an emergency and, in addition to portable fire extinguishers required by FC906, carbon dioxide type extinguishers with at least a 5-B rating shall be kept within 25 feet

(7620 mm) of the area in which flaming foods and beverages are ignited and at the doorway between the kitchen and the dining area.

**308.3.2 Open-flame decorative devices.** Open-flame decorative devices, including wall-mounted candles, torch sconces, insect-repellant candles in glass jars or metal cans, tabletop candles and oil lamps, free standing torch holders and candelabras, shall comply with the following requirements:

1. Class I and Class II liquids and LPG shall not be used.

2. Liquid- or solid-fueled lighting devices containing more than 8 ounces (237 ml) of fuel must self-extinguish and not leak fuel at a rate of more than 0.25 teaspoon per minute (1.26 ml per minute) if tipped over.

3. The device or holder shall be constructed to prevent the spillage of liquid fuel or wax at the rate of more than 0.25 teaspoon per minute (1.26 ml per minute) when the device or holder is not in an upright position.

4. The device or holder shall be designed so that it will return to the upright position after being tilted to an angle of 45 degrees from vertical.

   **Exception:** Devices that self-extinguish if tipped over and do not spill fuel or wax at the rate of more than 0.25 teaspoon per minute (1.26 ml per minute) if tipped over.

5. The flame shall be enclosed except where openings on the side are not more than 0.375 inch (9.5mm) diameter or where openings are on the top and the distance to the top is such that a piece of tissue paper placed on the top will not ignite in 10 seconds.

6. Enclosures shall be made of noncombustible materials and securely attached to the open-flame device.

   **Exception:** An enclosure is not required to be attached to any open-flame device that will self-extinguish if the device is tipped over.

7. Fuel canisters shall be safely sealed for storage.

8. Storage and handling of combustible liquids shall be in accordance with FC Chapter 34.

9. Shades, where used, shall be made of noncombustible materials and securely attached to the open-flame device holder or enclosure.

10. Candelabras with flame-lighted candles shall be securely fastened in place to prevent overturning, and shall be located away from occupants using the area and away from possible contact with drapes, curtains or other combustibles.

11. Open-flame decorative devices in Group A occupancies and other buildings, structures and premises used for a public gathering shall additionally comply with the

requirements of applicable rules promulgated by the commissioner designed to ensure the safe use of such devices.

**308.3.3 Separation from combustibles.** Open flames shall be kept at a safe distance from decorations, decorative vegetation or other combustible materials.

**308.3.4 Aisles and exits.** Lighted candles shall be prohibited in areas where occupants stand, or in an aisle or exit.

**308.3.5** Reserved.

**308.3.6 Theatrical performances.** Where use is approved in conjunction with theatrical performances, open flames shall be used in accordance with FC Chapter 33 and NFPA 160.

**308.3.7 Prohibition.** It shall be unlawful to light, maintain or use an open flame in a Group A occupancy or other building or structure used for a public gathering.

**Exceptions:**

1. Open flames may be used in the following locations and circumstances, provided that precautions are taken to prevent ignition of combustible material and otherwise ensure the safety of occupants, in accordance with this code, the rules and the permit:

   1.1. Where necessary for ceremonial or religious purposes.

   1.2. On stages and platforms as a necessary part of a performance in accordance with [Section 308.3.6] FC308.3.6.

   1.3. Where candles on tables are securely supported on substantial noncombustible bases and the candle flames are protected in accordance with FC308.3.2(5).

   1.4. The preparation of flaming foods or beverages in accordance with [Section 308.6] FC308.3.1.

   1.5. Open-flame devices using LPG for demonstrations in exhibitions or trade shows.

   1.6. Open-flame [device] devices for food warming and browning.

   1.7. Open-flame decorative devices in accordance with FC308.3.2.

2. Nonportable heat-producing equipment installed in compliance with the requirements of FC Chapter 6 and the Mechanical Code.

3. Natural gas light fixtures installed in compliance with the requirements of the Building Code and the Plumbing Code, and approved precautions are taken to prevent ignition of combustible materials.

**308.4 Torches for removing paint.** It shall be unlawful to remove paint in or on buildings, structures or premises with a torch or any other flame-producing device. Such paint removal may be performed using heat-producing devices other than open-flame devices. The person using such heat-producing device to remove the paint shall remain at the location where the heating operation was performed to maintain a fire watch for not less than [one] 1 hour after using such device.

**308.5** [Reserved.

**308.5.1] Signals and markers.** Open-flame devices, such as lanterns or kerosene road flares, shall not be operated or used as a signal or marker in or on any building, structure or premises.

**Exception:** The proper use of fusees at the scene of an emergency or as required by standard railroad operating procedures.

**[308.5.2] 308.6 Portable fueled open-flame devices.** Portable open-flame devices fueled by flammable gases or combustible liquids shall be enclosed or used in such a manner as to prevent the flame from contacting or igniting combustible material or combustible waste.

**[308.6 Flaming food and beverage preparation.** The preparation of flaming foods or beverages in Group A occupancies and public gathering places shall be in accordance with Section 308.6.1 through 308.6.5.

**308.6.1 Dispensing.** Flammable or combustible liquids used in the preparation of flaming foods or beverages shall be dispensed from one of the following:

1. A 1-ounce (29.6 ml) container; or

2. A container not exceeding 1-quart (946.5 ml) capacity with a controlled-pouring device that will limit the flow to a 1-ounce (29.6 ml) serving.

**308.6.2 Containers not in use.** Containers shall be secured to prevent spillage when not in use.

**308.6.3 Serving of flaming food.** The serving of flaming foods or beverages shall be done in a safe manner and shall not create flames higher than 6 inches (152.4 mm). The pouring, ladling or spooning of liquids is restricted to a maximum height of 8 inches (203 mm) above the receiving receptacle.

**308.6.3.1 Ignition.** The flaming food or beverage shall be ignited on serving tables. Such tables shall have noncombustible tops or, if the top is combustible, it shall be protected by a noncombustible mat. The mat, when used, shall cover the entire top of the table. Flames shall be extinguished before serving.

**308.6.4 Location.** Flaming foods or beverages shall be prepared only in the immediate vicinity of the table being served. Flaming foods and beverages shall not be transported or carried while burning.

**308.6.5 Fire protection.** The person preparing the flaming foods or beverages shall have a wet cloth towel immediately available for use in smothering the flames in the event of an emergency and, in addition to portable fire extinguishers required by Section 906, a carbon dioxide extinguisher with at least a 5-B rating shall be kept within 25 feet (7620 mm) of the flaming food or beverage preparation area and at the doorway between the kitchen and the dining area.]

## SECTION FC 309
## POWERED INDUSTRIAL TRUCKS AND EQUIPMENT

**309.1 General.** Powered industrial trucks and powered industrial equipment shall be designed, operated and maintained in accordance with this section.

**309.1.1 Hazardous locations.** Powered industrial trucks used in areas designated as hazardous (classified) locations in accordance with the Electrical Code shall be listed and labeled for use in such environments in accordance with NFPA 505. Entry by non-classified equipment may be allowed for the purpose of maintenance where the owner has established an entry authorization procedure and has verified that the entry area is clear of hazardous environment and will remain so for the duration of the entry.

**309.1.2 Powered industrial trucks using flammable gas fuel.** Powered industrial trucks that use LPG or other flammable gas as fuel shall be limited to one fuel container with a capacity not greater than 40 pounds (18.16 kg) or 340 SCF (9.63 $m^3$) of flammable gas, whichever is less. Liquefied gas containers installed in a horizontal position shall be of such a design that the pressure relief valve will discharge vapor properly. Such powered industrial trucks shall not be parked near open flames or other heat or ignition sources, or near open pits, underground entrances, elevator shafts, or similar areas. Such powered industrial trucks shall be stored and used in locations with adequate ventilation. It shall be unlawful to store or use such powered industrial trucks in a basement, cellar or other areas below grade [areas, including in a basement or cellar].

**309.2 Battery chargers.** Battery chargers used to charge batteries in powered industrial trucks and powered industrial equipment shall be of an approved type. Combustible storage shall be kept a minimum of 3 feet ([915] 914 mm) from battery chargers. Battery charging shall not be conducted in areas accessible to the public.

**309.3 Ventilation.** Ventilation shall be provided in an approved manner in battery-charging areas to prevent the accumulation of flammable gas.

**309.4 Portable fire extinguishers.** Powered industrial trucks shall be equipped with one 2-B:C rated portable fire extinguisher. Battery-charging areas shall be provided with a portable fire extinguisher complying with the requirements of [Section 906] FC906 having a minimum 4-A:20-B:C rating within 20 feet (6096 mm) of the battery charger.

**309.5 [Storage and handling of fuel] Fueling.** Powered industrial trucks using a liquid or gas fuel shall be [refueled or have their cylinders replaced outdoors or in areas specifically approved for that purpose and in accordance with this code and the rules. All connecting and disconnecting of fuel gas containers shall be performed outdoors away from open pits, underground entrances, or similar below grade areas, and away from all open flames or other heat or ignition sources] fueled in compliance with the requirements of FC309.5.1 through 309.5.4.

**309.5.1 Location.** All fueling, including container replacement, shall be conducted outdoors or in areas specifically approved for that purpose, and in accordance with this code and the rules.

**309.5.2 Container replacement.** Outdoor connecting and disconnecting of fuel gas containers shall be conducted away from open pits, underground entrances, or other areas below grade, and away from all open flames or other heat or ignition sources. Fueling of powered industrial trucks shall be in accordance with FC Chapter 38, if LPG-powered, and FC Chapters 22 and 35, if CNG-powered, and the rules.

**309.5.3 Fixed fuel-dispensing equipment.** Fixed liquid fuel-dispensing equipment for powered industrial trucks and for filling of portable containers used to fuel powered industrial equipment shall be designed, installed, operated and maintained in accordance with FC Chapter 22.

**309.5.4 Hydrogen fueling.** Filling of containers for powered industrial trucks with hydrogen, including metal hydride hydrogen storage system containers, shall be conducted in accordance with FC2209.

**309.6 Repairs.** Repairs to fuel systems, electrical systems and repairs utilizing open flame or welding shall be done in approved outdoor locations [outside of buildings] or in indoor areas specifically approved for that purpose.

**309.7 Storage.** When not in use, powered industrial trucks that use a liquid and/or a gas fuel shall be stored in approved designated storage areas. Each storage area shall be provided with a portable fire extinguisher complying with the requirements of [Section 906] FC906 having a minimum 4-A:20-B:C rating.

## SECTION FC 310
## SMOKING

**310.1 General.** Smoking, including the carrying of a lighted pipe, cigar, cigarette or any other type of smoking paraphernalia or material, shall be conducted in accordance with this section.

**310.2 Prohibitions.** It shall be unlawful to:

1. [Smoke] smoke in any area in which smoking is prohibited, as set forth in this section or elsewhere in this code.

2. [Place] place or discard, or cause to be placed or discarded, any lighted pipe, cigar, cigarette or other type of smoking paraphernalia or material where it can cause the ignition of combustible material or combustible waste, or otherwise cause an unwanted fire.

3. [Smoke] smoke in any building, structure, premises or part thereof where flammable or combustible materials or explosives are manufactured, stored, handled, used or transported.

4. [Smoke] smoke in the following occupancies and spaces:

4.1. Cellars and basements, except in R-3 occupancies.

4.2. Group A occupancies and public gathering places.

4.3. Group M occupancies.

4.4. Hospitals, nursing homes, [sanatorias, convalescent homes, homes for] rehabilitation facilities and similar medical facilities housing the ill, aged [or chronic patients] and infirm, except within designated smoking rooms when in compliance with the requirements of the Title 17 of the Administrative Code, the New York City Health Code and rules promulgated by the commissioner.

4.5. On any bulkhead, dock, drydock, shipyard, pier, wharf, warehouse or shed on the waterfront.

4.6. On board any ship, barge, ferry, lighter, carfloat, scow, and all other similar floating watercraft or equipment whether berthed or moored at a dock, wharf, pier, or to a marine vessel made fast thereto or in a shipyard.

4.7. Factories as set forth in Section 283 of the New York State Labor Law.

4.8. As otherwise prohibited by this code or the rules.

**310.3 "No Smoking" signs.** When smoking is prohibited by this code or the rules, durable "No Smoking" signs shall be conspicuously posted at approved locations throughout the facility or other location in accordance with [Section 310] FC310, or as otherwise specifically provided in this code. The content, lettering, size and color of required "No Smoking" signs shall be in accordance with the rules, or as otherwise approved by the commissioner.

**310.3.1 Location.** "No Smoking" signs shall be conspicuously posted at all entrances to facilities in which smoking has been entirely prohibited and any area therein where hazardous materials are stored, handled or used. Facilities or areas within such facilities in which smoking is allowed in designated areas shall have signs indicating that smoking is allowed in designated areas only.

**310.4 Removal of signs prohibited.** A posted "No Smoking" sign shall not be removed, obscured or rendered illegible.

**310.5 Compliance with "No Smoking" signs.** It shall be unlawful to smoke, or discard or deposit any burning substance, in any building, structure or premises or part thereof, in which "No Smoking" signs are posted pursuant to this code or the rules or otherwise for fire safety purposes.

**310.6 Ash trays.** Where smoking is [permitted] allowed, suitable noncombustible ash trays or receptacles shall be provided at appropriate locations.

**310.7** Reserved.

**310.8 Hazardous environmental conditions.** The commissioner may prohibit lighted matches, cigarettes, cigars or other burning substances in any location upon a determination that such activity creates an undue fire hazard because of conditions in the surrounding environment.

## SECTION FC 311
## VACANT AND TEMPORARILY UNOCCUPIED PREMISES

**311.1 Vacant buildings.** Any vacant building, structure or premises, or part thereof, [that is] shall be deemed to constitute a temporarily unoccupied building and shall be safeguarded and maintained in compliance with the requirements of this section, unless such building, structure or premises has been deemed unsafe pursuant to Article 216 of Title 28 of the Administrative Code, in which case it shall be safeguarded and maintained in compliance with the requirements of [this section,] the Department of Buildings and/or the Department of Housing, Preservation and Development, as applicable. [Any vacant building, structure or premises, or part thereof, not deemed unsafe pursuant to such provisions shall be deemed to constitute a temporarily unoccupied building, and shall comply with the requirements of this section applicable thereto.]

**311.2 Temporarily unoccupied buildings.** Temporarily unoccupied buildings, structures, premises or parts thereof, including tenant spaces, shall be secured and protected in accordance with this section.

**311.2.1 Security.** Exterior openings and interior openings accessible to unauthorized persons, including tenants, shall be locked or otherwise protected to prevent entry by unauthorized persons.

**311.2.2 Fire protection.** Fire alarm, sprinkler and standpipe systems shall be maintained in an operable condition at all times, except as authorized by the commissioner.

**311.2.3 Fire separation.** Fire-resistance-rated partitions, fire barriers, and fire walls, including those separating temporarily unoccupied tenant spaces from the remainder of the building shall be maintained. Openings, joints, and penetrations in fire-resistance-rated assemblies shall be protected in accordance with Chapter 7 of the Building Code.

**311.3 Removal of combustible waste.** The owner of any building, structure or premises, or part thereof, that is deemed unsafe, and any temporarily unoccupied building, structure or premises, or part thereof, shall remove therefrom and prevent accumulations of rubbish and other combustible waste by regular cleaning of the premises.

**Exception:** Temporarily unoccupied buildings, structures, premises or parts thereof undergoing construction or repair in accordance with the Building Code, where rubbish and other combustible waste is controlled and removed in accordance with [Section 304] FC304.

**311.4 Removal of hazardous materials.** The owner of any vacant building, structure or premises, or part thereof, that contains hazardous materials and that is deemed unsafe pursuant to Article 216 of Title 28 of the Administrative Code shall comply forthwith with the facility closure requirements of [Section 2701.6] FC2701.6. The owner of a temporarily unoccupied building, structure or premises, or part thereof, that contains hazardous materials regulated by FC Chapter 27 shall comply with the facility closure requirements of [Section 2701.6] FC2701.6. Vacant and temporarily unoccupied buildings, structures or premises, and all parts thereof, shall thereafter be maintained free of hazardous materials, including hazardous waste material, except as approved by the commissioner.

**311.5 Covered malls.** Unoccupied tenant spaces in covered malls shall be:

1. kept free from the storage of any combustible materials.

2. kept separate from other tenant spaces and areas of the mall by maintaining any fire separation requirement of the Building Code during the period of time that the space remains unoccupied or under reconstruction.

3. periodically inspected on at least a weekly basis to ensure that the space is being maintained in accordance with this section. Doors to spaces shall be secured from entry by keeping all doors locked at all times when the space is unoccupied.

4. kept free from rubbish and other combustible waste.

## SECTION FC 312
## VEHICLE IMPACT PROTECTION

**312.1 General.** Vehicle impact protection required by this code shall be provided by posts that comply with the requirements of [Section 312.2] FC312.2 or by other approved physical barriers that comply with the requirements of [Section 312.3] FC312.3.

**312.2 Posts.** [Guard posts] Posts used to provide vehicle impact protection shall comply with the following requirements:

1. Constructed of steel not less than 4 inches (102 mm) in diameter and concrete filled.

2. Spaced not more than 4 feet (1219 mm) between posts on center.

3. Set not less than 3 feet (914 mm) deep in a concrete footing of not less than a 15-inch ([381 mm] 381-mm) diameter.

4. Set with the top of the posts not less than 3 feet (914 mm) above [ground] grade.

5. Located not less than 3 feet (914 mm) from the protected object.

**312.3 Other barriers.** Physical barriers shall be a minimum of 36 inches (914 mm) in height and shall resist a force of 12,000 pounds (53 375 N) applied 36 inches (914 mm) above the adjacent ground surface.

## SECTION FC 313
## PORTABLE FUELED EQUIPMENT

**313.1 Scope.** The storage, handling and use of portable fueled equipment shall be governed by this section and the rules.

**313.2 General.** Portable fueled equipment shall be stored, handled and used in accordance with this section.

**313.3 Prohibitions.** It shall be unlawful to:

1. Store, handle or use indoors portable fueled equipment, including lawn-care equipment, snow blowers, portable generators and kerosene and other portable space heaters. The owner of a building, structure or premises shall not provide, or cause to be provided, any such equipment, including equipment designed for space heating.

   **Exceptions:**

   1. [Storage, handling and/or use of portable fueled equipment, other than portable fueled space heaters, in buildings or structures constructed for such purposes in accordance with this code and the Building Code. Portable fueled equipment may be stored and handled, and motor vehicles may be stored, handled and used, in garages or garage spaces if such garage or garage spaces are separated from the dwelling spaces or other occupancies in accordance with the construction codes, including the Building Code.] Indoor storage of lawn-care equipment, power washers, snow blowers, portable generators and other portable fueled equipment designed for outdoor use in a garage or garage space separated from dwelling spaces or other occupancies in accordance with the Building Code, or in a building classified as a Group U occupancy; or in another approved storage area in a building. This exception shall not apply to portable space heaters.

   2. The storage, handling and use of portable fueled equipment where authorized by this code, including this section, [Sections] FC 308 and 314, and FC Chapter 14.

   3. The storage of portable fueled equipment for sale or distribution in a mercantile or storage occupancy.

   4. The storage, handling and use of portable fueled equipment in a business, factory or mercantile occupancy engaged in the business of manufacturing or repairing of such equipment, provided that portable space heaters are operated solely in connection with such manufacturing or repair, and are not used for space heating purposes.

2. Store, handle or use for space heating, other than storage for sale, any portable fueled equipment that utilizes a flammable liquid as a fuel, or, except as authorized by [Section 313.5] FC313.5, that utilizes a combustible liquid as a fuel. Any such portable fueled equipment that shows evidence of having been used shall be deemed to be or have been in use.

3. Use any portable fueled equipment that utilizes waste oil as a fuel. Any such portable fueled equipment that shows evidence of having been used shall be deemed to be or have been in use.

**313.4 [Removal] Confiscation and removal.** The commissioner may confiscate or order the removal of portable fueled equipment from indoor or outdoor locations where the storage, handling [and/]or use of such equipment is determined by the commissioner to be hazardous.

**313.5 Portable [fueled] space heaters.** Portable fueled equipment used for space heating shall additionally be stored, handled and used in accordance with [Sections 313.5.1 through 313.5.2] FC 313.5.1 and 313.5.2.

**313.5.1 Listing and labeling of space heaters.** Portable [fueled] space heaters and other portable fueled equipment used for space heating shall be listed and labeled.

**313.5.2 Authorized uses.** Portable [fueled equipment] space heaters may be used for space heating as set forth in [Sections 313.5.2.1 through 313.5.2.6] FC 313.5.2.1 through 313.5.2.6.

**313.5.2.1 Portable natural gas heaters.** Portable space heaters fueled by [natural gas supplied from a public utility] piped natural gas may be stored, handled and used for outdoor use when designed, installed, operated and maintained in accordance with this code, including FC313.6, the rules and the construction codes, including the Building Code.

**313.5.2.2 Construction sites.** Portable [fueled] space heaters may be stored, handled and used at construction sites in accordance with FC Chapter 14 and the rules.

**313.5.2.3** [**Business storage and handling.** Portable fueled space heaters may be stored, handled and used for indoor or outdoor use when they are lawfully used in the business of manufacturing, storing, handling, selling, repairing or transporting such heaters, provided that such heaters are not stored, handled or used for the purpose of space heating.] Reserved.

**313.5.2.4 Local emergency.** In the event of failure during severe cold weather of a central heating unit in any building or structure other than a private dwelling, multiple dwelling or Group A occupancy, portable [fueled] space heaters approved for such indoor use may be used for a period not to exceed [two] 2 weeks when such use has been approved.

**313.5.2.5 Public emergencies.** In the event of a public emergency which disrupts, interferes with or impairs the operation or use of equipment, supplies or utilities normally

utilized for heating, use of portable [fueled] space heaters for indoor or outdoor use may be authorized by the commissioner upon a declaration of emergency by the mayor.

**313.5.2.6 Supervision.** The handling and use of portable [fueled] space heaters shall be under the personal supervision of a certificate of fitness holder or a plumber. The storage of portable [fueled] space heaters, and the fuel therefor, shall be under the general supervision of a certificate of fitness holder or a plumber.

**Exception:** Group R-3 occupancies.

**313.6 Portable natural gas heaters.** Portable space heaters fueled by piped natural gas shall be designed, operated and maintained in accordance with FC 313.6.1 through 313.6.5.

**313.6.1 Clearance to buildings.** Heaters shall be located outdoors and at least 5 feet (1524 mm) from any building or structure.

**313.6.2 Clearance to combustible materials.** Heaters shall not be located beneath, or closer than 5 feet (1524 mm) to combustible decorations and combustible overhangs, awnings, sun control devices or similar combustible attachments to buildings or structures.

**313.6.3 Proximity to exits.** Heaters shall not be located within 5 feet (1524 mm) of exits or exit discharges.

**313.6.4 Tip-over switch.** Heaters shall be equipped with a tilt or tip-over switch that automatically shuts off the flow of gas if the appliance is tilted more than 15 degrees (0.26 rad) from the vertical.

**313.6.5 Guard against contact.** The heating element or combustion chamber of heaters shall be permanently protected so as to prevent accidental contact by persons or material.

## SECTION FC 314
## INDOOR DISPLAYS

**314.1 General.** Indoor displays in any occupancy shall be designed and installed in accordance with [Sections] FC 314.2 through 314.4.

**314.2 Fixtures and displays.** Fixtures and displays of goods for sale to the public shall be arranged so as to maintain free, immediate and unobstructed access to exits as required by FC Chapter 10 and the construction codes, including the Building Code.

**314.3 Highly combustible goods.** It shall be unlawful to display highly combustible goods, including flammable or combustible liquids, liquefied flammable gases, oxidizing materials, pyroxylin plastics and agricultural goods, in main exit access aisles, corridors, common areas of covered malls, or within 5 feet (1524 mm) of entrances to exits and exterior exit doors.

**314.4 Vehicles and watercraft.** Watercraft and fueled vehicles, including motor vehicles, motorcycles and mopeds, that are displayed indoors shall comply with the following requirements:

1. Batteries shall be disconnected.

2. Fuel in fuel tanks shall not exceed one-quarter tank or 5 gallons (19 L) (whichever is [least] less).

3. Fuel tanks and fill openings shall be closed and [sealed to prevent tampering] secured with a locking gas cap.

4. Fueling or defueling shall not be conducted indoors.

5. Such additional requirements as the commissioner may promulgate governing the display of such vehicles and watercraft in Group A occupancies, and buildings, structures or premises used for public gatherings.

**314.5 Required clearance from fire safety systems**. Sprinklers and fire alarm systems shall not be obstructed by indoor displays.

**314.5.1 Sprinkler systems.** A sprinkler system shall be installed in or under covered kiosks, displays, booths, or concession stands that exceed 4 feet (1219 mm) in width. The clearance between any sprinkler head deflector installed above the top of the kiosks, displays, booths, or concession stands shall not be less than 18 inches (457 mm).

**Exception:** Open-grid and drop-out ceilings complying with the requirements of NFPA 13, as modified by FC Appendix B, may be installed beneath sprinklers.

**314.5.2 Fire alarm systems.** Sufficient clearance shall be provided between kiosks, displays, booths, or concession stands and fire alarm and carbon monoxide systems equipment and devices including detectors and strobes, so as not to interfere with their operation.

## SECTION FC 315
## COMBUSTIBLE MATERIALS STORAGE

**315.1 General.** Combustible materials shall be stored, handled and used in accordance with this section.

**Exception:** Storage of materials during construction and demolition operations shall comply with the requirements of FC Chapter 14.

**315.2 Storage in buildings.** Storage of combustible materials in buildings shall be orderly. Storage area shall be separated from heaters or heating devices by distance or shielding so that ignition cannot occur.

**315.2.1 Ceiling clearance.** Storage shall be maintained 2 feet (610 mm) or more below the ceiling in areas of buildings not protected by a sprinkler system, or a minimum of 18 inches (457 mm) below sprinkler head deflectors in areas protected by a sprinkler system.

**315.2.2 Means of egress.** Combustible materials shall not be stored in a manner that obstructs egress from any building, structure or premises.

**315.2.3 Equipment rooms.** Combustible material shall not be stored in boiler rooms, mechanical rooms or electrical equipment rooms.

**315.2.4 Attic, under-floor and concealed spaces.** Attic, under-floor and concealed spaces used for storage of combustible materials shall be protected on the storage side as required for 1-hour fire-resistance-rated construction. Openings shall be protected by assemblies that are self-closing and are of noncombustible construction or solid wood core not less than 1.75 inches (44.5 mm) in thickness. Storage shall not be placed on exposed joists.

**Exceptions:**

1. Areas protected throughout by sprinkler systems.

2. Group R-3 and Group U occupancies.

3. Groups S-1 and S-2 occupancies.

**315.3 Outdoor storage.** Outdoor storage of combustible materials shall not be located within 10 feet (3048 mm) of a property line or within 50 feet (15 240 mm) of the nearest wall of a building occupied as a Group A occupancy, Group E educational occupancy, Group I-2 occupancy, or any building, structure or premises used for a public gathering.

**315.3.1 Storage beneath overhead projections from buildings.** Combustible materials stored or displayed outdoors at locations adjoining buildings or structures that are protected throughout by a sprinkler system shall not be stored or displayed under eaves, canopies or other projections or overhangs that are not protected by a sprinkler system.

**315.3.2 Height.** Storage in the open shall not exceed 20 feet (6096 mm) in height.

**315.3.3 Reduced separation distance.** The separation distances required by [Section 315.3] FC315.3 may be reduced when approved and when in compliance with the requirements of [Sections] FC 315.3.3.1 through 315.3.3.3.

**315.3.3.1 Fencing.** The outdoor storage area shall be enclosed by an approved well-constructed and maintained fence between 10 and 18 feet (3048 and 5486 mm) in height above the street level. If any building having an unpierced fire wall adjoins the enclosure, no fence shall be required on that side.

**315.3.3.2 Separation from building openings.** The outdoor storage area shall be completely separated from any window or door openings of any wall of an adjoining building by a well-constructed and maintained fence of [non combustible]

noncombustible material of an approved height, erected at least 6 feet (1829 mm) from such opening and extending at least 6 feet (1829 mm) on each side thereof and continued to the sides of the enclosure or carried to the walls of the building.

**315.3.3.3 Pile height.** The outdoor storage at any point shall not be piled higher than 2 feet (610 mm) below the top of the fence required by [Section 315.3.3.1] FC315.3.3.1.

**315.3.4 Portable fire extinguishers.** At least one portable fire extinguisher with a rating of at least 4-A shall be provided for every 2,500 square feet (232.3 $m^2$) of storage area, or portion thereof, or in lieu thereof, a hose of at least 1 inch ([25.4] 25 mm) in diameter, equipped with a nozzle of at least ½ inch (12.7 mm) in diameter, sufficient in length to reach all parts of the enclosure, and connected to an adequate water supply may be provided.

**315.4 Space underneath grandstands and bleachers.** Except where enclosed in not less than 1-hour fire-resistance-rated construction in accordance with the Building Code, spaces underneath grandstand and bleacher seating shall not be occupied or utilized for purposes other than means of egress.

**315.5 Storage underneath high-voltage transmission lines.** It shall be unlawful to store hazardous materials or combustible materials outdoors within the utility easement underneath high-voltage transmission lines.

## SECTION FC 316
## HAZARDS TO EMERGENCY RESPONDERS

**316.1 Hoistway and shaftway protection.** The doors and/or gates to hoistways, freight elevator shafts, trap doors and other means used to provide access to vertical openings, shall be kept closed and secured, or otherwise protected, except when being used to provide access, and shall be closed, secured or otherwise protected, as applicable, at the end of each work day.

**316.2 Shaftway markings.** Vertical shafts shall be identified as required by this section.

**316.2.1 Exterior access to shaftways.** Outside openings accessible to the department and which open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

**316.2.2 Interior access to shaftways.** Door or window openings to a hoistway or shaftway from the interior of the building shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible.

**Exception:** Marking shall not be required on shaftway openings which are readily discernible as openings onto a shaftway by the construction or arrangement.

**316.3 Pitfalls.** Installations designed to disable, injure, maim or kill intruders are prohibited. No person shall install or use firearms, sharp or pointed objects, razor wire, explosives, flammable or

combustible liquid containers, or dispensers containing highly toxic, toxic, irritant, piercing sounds or other hazardous materials in a manner which may passively or actively disable, injure, maim or kill a firefighter or other emergency responder who enters a building or premises, forcibly or otherwise, for the purpose of controlling or extinguishing a fire, rescuing trapped occupants or rendering other emergency assistance.

**316.4 Security device.** It shall be unlawful to install, operate or maintain a security device that emits any substance that could obscure a means of egress in any building, structure or premises.

## SECTION FC [316] 317
## AUTOMOTIVE SALVAGE AND WRECKING FACILITIES

**[316.1] 317.1 General.** Automotive salvage and wrecking facilities shall be designed, installed, operated and maintained in accordance with this section. The design and installation provisions of this section shall apply to both new and existing facilities.

**[316.2] 317.2 Prohibitions.** It shall be unlawful to:

1. Dispose of any fuel or flammable or combustible liquid waste by discharging or otherwise disposing of such fuel or liquid waste in any drain or sewer, upon any premises, or in any river, stream or other body of water.

2. Light or maintain an open fire for the burning, dismantling, salvaging, scrapping wrecking of motor vehicles or parts thereof.

**[316.3] 317.3 Supervision.** The de-fueling of motor vehicle fuel tanks and the transfer of fuel from the [de-fueling] defueling equipment shall be under the personal supervision of a certificate of fitness holder.

**[316.4] 317.4 Facility requirements.** Automotive salvage and wrecking facilities shall be in accordance [Sections 316.4.1 through 316.4.3] with FC 317.4.1 through 317.4.3.

**[316.4.1] 317.4.1 Licensing.** Department permits and other approvals shall be issued to an automotive salvage and wrecking facility only if such facility is licensed and maintained in accordance with requirements of the New York State Department of Motor Vehicles and the New York City Department of Consumer Affairs.

**[316.4.2] 317.4.2 Lawful occupancy.** Department permits and other approvals shall be issued to automotive salvage and wrecking facilities only if use of the premises for such facility is authorized by the certificate of occupancy or otherwise constitutes a lawful use of the premises.

**[316.4.3] 317.4.3 Design requirements.** Automotive salvage and wrecking facilities shall be designed in accordance with [Sections 316.4.3.1 and 316.4.3.3] FC 317.4.3.1 through 317.4.3.3.

**[316.4.3.1] 317.4.3.1 Facility enclosure.** The facility shall be enclosed on all sides by a solid, opaque fence or wall at least 8 feet (2438 mm) in height in accordance with the Building Code and the Zoning Resolution.

**[316.4.3.2] 317.4.3.2 Fire apparatus roads.** The facility shall be accessible from fire apparatus roads with a minimum unobstructed width of 20 feet (6096 mm). An outdoor area of the facility shall be accessible by fire apparatus roads on all four sides with a distance between such roads of not greater than 50 feet (15 240 mm) by 100 feet (30 480 mm).

**[316.4.3.3 De-fueling] 317.4.3.3 Defueling area.** The [de-fueling] defueling of motor vehicle fuel tanks shall be conducted at an approved location that is protected throughout by a fire extinguishing system.

**[316.5] 317.5 Operation and maintenance.** Automotive salvage and wrecking facilities shall be operated and maintained in accordance with [Sections 316.5.1 through 316.5.4] FC 317.5.1 through 317.5.4.

**[316.5.1] 317.5.1 Fire apparatus access roads.** Fire apparatus access roads shall be maintained unobstructed to provide access for department apparatus.

**[316.5.2] 317.5.2 Torch operations.** Torch operations shall be conducted in accordance with FC Chapter 26 and in compliance with the following requirements:

1. Torch operations shall be conducted at least [25] 35 feet ([7620] 10 668 mm) from combustible waste, other motor vehicles, stacks of motor vehicles or other combustible material, unless protection in the form of [non-combustible] noncombustible shields or covers are provided to restrict the scattering of sparks and molten metal.

2. Torch operations shall not be conducted in any location where hazardous gases or vapors may be present. Fuel tanks of motor vehicles shall be emptied of fuel and purged of all flammable vapors before any torch operations are commenced.

3. Compressed gas containers, when in use, shall be properly supported and placed a safe distance from torch operations.

4. Compressed gas containers, when not in use, and reserve containers, shall be properly supported and stored in a location remote from torch operations. The valves of such containers shall be closed and protected from mechanical damage by the placement of protective caps. Empty containers shall be treated as full.

5. Torch operation areas shall be protected by a charged hose line, at least 1 inch ([25.4] 25 mm) in diameter, connected to an approved source of water. In lieu of such hose line, at least [4] four portable fire extinguishers with a minimum 2-A rating each may be provided.

6. The torch operator or a person designated as a fire watch shall search the torch operation area immediately after operations to determine that no sparks or molten metal

remain in the area. Additionally, a second such search shall be conducted [one-half] ½ hour thereafter. A record of such searches shall be maintained in a log book at the premises and made available for inspection by any representative of the department.

**[316.5.3] 317.5.3 Draining of motor vehicle fluids.** The draining of fluids from motor vehicles shall be in accordance with [Sections 316.5.3.1 and 316.5.3.2] FC 317.5.3.1 and 317.5.3.2.

**[316.5.3.1] 317.5.3.1 Draining of motor vehicle fuel tanks.** As soon as practicable after arrival, the fuel tank of motor vehicles received at salvage and wrecking facilities shall be [de-fueled] defueled through the vehicle's fuel connection, or other approved procedure. [De-fueling] Defueling equipment shall be listed for such purpose as a complete assembly and shall have a container capacity not exceeding 65 gallons (246 L). The fuel recovered by the [de-fueler] defueler shall be transferred to a storage tank complying with the requirements of FC Chapter 22 or 34, as applicable. [De-fueling] Defueling equipment shall not be used to fuel motor vehicles.

**[316.5.3.2] 317.5.3.2 Draining of other motor vehicle fluids.** Crankcase oil and other flammable or combustible liquid waste shall be removed from motor vehicles and stored outdoors, in tanks complying with the requirements of FC Chapter 34, or, when approved, portable containers.

**[316.5.4] 317.5.4 Emergency operations.** In automotive salvage and wrecking facilities provided with cranes for the purpose of moving or stacking motor vehicles, procedures shall be developed by the owner such that a crane operator would be made available in a reasonable period of time in the event that crane operation is required during a fire or other emergency.

**[316.6] 317.6 Excessive fires.** The occurrence of more than two fires in an automotive salvage and wrecking facility during any 12-month period shall give rise to a rebuttable presumption that the owner has failed to properly maintain the facility in compliance with the requirements of this section, and shall be grounds for revocation of department permits and other approvals, or other appropriate enforcement action.

## SECTION FC318
## ROOFTOP GARDENS AND LANDSCAPING

**318.1 General.** Rooftop gardens and landscaping, including living walls, shall be designed, installed, operated and maintained in accordance with the construction codes, including the Building Code and this section.

**318.2 Rooftop access and obstructions.** Rooftop gardens and landscaping subject to the rooftop access and obstruction provisions of FC504.4 shall be designed and installed in compliance with the requirements of that section.

**318.3 Maintenance of vegetation.** Rooftop gardens and landscaping shall be maintained in a healthy condition and shall not be allowed to encroach upon areas required to be kept clear.

Vegetation shall be regularly pruned for these purposes and vegetation capable of being ignited shall be regularly cleared and removed from the rooftop and the building.

**318.4 Maintenance equipment.** Portable fueled equipment, including flammable and combustible liquid fuels, used for the maintenance of rooftop garden and landscaping vegetation shall be stored in accordance with FC 313 and 3404.3.4.4.

**318.5 Water supply.** Rooftop gardens or landscaping exceeding 250 square feet (23 m²) shall be provided with a rooftop garden hose connected to an approved water supply. Where the size of the rooftop garden, extent of landscaping, type of vegetation, and/or premises maintenance history warrant, the department may require installation of an irrigation system or other approved method of hydration to ensure proper maintenance of the vegetation.

## SECTION FC 319
## MARINAS

**319.1 Scope.** This section shall govern the design, installation, operation and maintenance of marinas mooring or storing more than five marine vessels or watercraft 65 feet (19 812 mm) or less in length.

**319.2 General.** Marinas shall be designed, installed, operated and maintained in accordance with the requirements of NFPA 303 and this section.

**319.3 Fire safety precautions**. Marinas shall comply with the fire safety precautions set forth in NFPA 303 and this section.

**319.3.1 Combustible waste.** Marinas shall be kept free of accumulations of combustible waste in accordance with FC304. Rubbish and other combustible waste shall not be allowed to accumulate beneath marina structures, piers or wharves.

**319.3.2 Sources of ignition.** Open flames and open-flame devices shall not be used within 3 feet (914 mm) of combustible material. Open flames, open-flame devices and other sources of ignition shall not be stored or used in the areas in which smoking is prohibited pursuant to FC319.3.3. Portable electric lights approved for use in a hazardous location shall be used where flammable vapors may be present, and shall be equipped with safety devices designed to prevent physical damage to the bulbs.

**319.3.3 Smoking.** It shall be unlawful to smoke in the following areas of a marina, and any other areas as the commissioner may proscribe by rule:

1. Where fuels are stored or dispensed.

2. Where flammable or combustible liquids are stored, handled or used.

3. Battery storage and battery charging areas.

4. Covered or enclosed boat storage areas.

**319.3.4 Lumber and other combustible material storage.** Lumber and other combustible materials shall be stored in accordance with FC Chapter 19, at a location separate from the area in which marine vessel construction or repair, marine vessel or watercraft fueling, or other work involving the handling or use of flammable or combustible liquids or open flames is conducted.

**319.4 Marina operations.** Marinas shall be operated in accordance with NFPA 303 and this section.

**319.4.1 Storage.** Marine vessels and watercraft shall be stored in accordance with Chapter 7 of NFPA 303 and this section.

**319.4.1.1 Clearances.** No vessel or watercraft shall be stored closer than 3 feet (914 mm) to any lot line, or closer than 3 feet (914 mm) horizontally from another vessel, unless access for firefighting operations is provided in another approved manner.

**319.4.1.2 Combustible waste and cargo.** All combustible waste and cargo shall be removed from vessels and watercraft in storage.

**319.4.1.3 Batteries and fuel**. Where practicable, batteries and all fuel shall be removed from the vessel. Where removal of batteries is impracticable, precautions during charging of batteries shall be taken in accordance with FC319.3. Where removal of fuel is impracticable, all tank stop valves shall be closed and the tank inspected to ensure that there are no leaks. Adequate ventilation shall be provided for hull and bilge areas.

**319.4.1.4 Covers.** Shrink-wrapped plastic or other material used to cover vessels in storage shall be flame-resistant in accordance with FC Chapter 8 and the rules.

**319.4.2 Hot work operations.** Hot work operations and other use of open flames shall comply with the requirements of FC Chapter 26 and this section. All flammable liquid, combustible liquid or flammable gas, except the fuel in stationary storage tanks of vessels, shall be removed from the vessel before any hot work is performed on the vessel. In addition, before hot work is performed batteries and battery terminals shall be protected against accidental shorting or sparking, or the batteries shall be removed. If hot work is to be conducted on a vessel's stationary fuel tank or fuel piping, both the tank and the piping shall first be emptied and purged. All areas of the vessel, including the bilge, shall be ventilated to eliminate any flammable and combustible vapors before any hot work is commenced.

**319.4.3 Engine test stand fuel supply.** Engine test stands shall be supplied by a fuel storage system complying with the requirements of FC Chapter 34. The fuel tank supplying the engine test stand shall be installed outdoors, and the fuel tank and piping located a safe distance from engine exhaust. The fuel piping shall be of steel construction and provided with an automatic shutoff valve designed to shut off the fuel supply in the event of a fire.

**319.5 Flammable and combustible liquids and flammable gases.** The storage, handling and use of flammable and combustible liquids and flammable gases shall be in accordance with FC Chapters 34, 35 and 38 and this section.

**319.5.1 Marine liquid fuel dispensing.** Marine liquid motor fuel-dispensing facilities shall be designed, installed, operated and maintained in accordance with FC Chapter 22.

**319.5.2 Use for cleaning.** Use of flammable and combustible liquids for cleaning purposes shall be in accordance with FC3405.3.6.1.

**319.5.3 Storage arrangements.** Except when displayed for sale in sealed containers, flammable and combustible liquids shall be stored in liquid storage cabinets, liquid storage rooms or in approved underground storage systems. Such installations shall comply with the requirements of FC Chapters 22 and 34.

**319.5.4 Quantity limitations when stored for sale.** Flammable and combustible liquids displayed for sale in sealed containers shall comply with the requirements of FC Chapters 22 and 34, as applicable, except in no case shall the quantities displayed exceed 200 gallons (757 L).

**319.5.5 Flammable gases.** LPG on vessels used for residential purposes shall be stored, handled and used in compliance with the requirements of FC Chapter 38 and the rules. CNG on vessels used for residential purposes shall be stored, handled and used in compliance with the requirements of FC Chapter 35 and the rules.

**319.6 Fire protection systems and equipment.** Marinas shall be equipped with fire protection systems and equipment in accordance with this section.

**319.6.1 Standpipes.** If the furthest point of any pier or float exceeds 250 feet (76 200 mm) from a fire apparatus-accessible location, the pier or float shall be equipped throughout with a standpipe system in accordance with NFPA 303. Systems shall be provided with hose connections located such that no point on the marina pier or float system exceeds 150 feet (45 720 mm) from a standpipe hose connection. Such system shall have a design capacity of 250 gallons per minute (946 L/min) and shall be provided with one or more fire department connections at an approved location, and when required by the commissioner, to an approved water supply. Standpipe hose connection locations shall be clearly identified by a flag or other approved means designed to be readily visible from the pier accessing the float system.

**319.6.2 Yard hydrant system.** Fire apparatus-accessible locations as required by FC319.7.1 shall be within 250 feet (76 200 mm) of a fire hydrant or other approved water supply, and shall be situated such that a hose stream from 250 feet (76 200 mm) of hose line stretched from such location will reach all portions of the premises.

**319.6.3 Portable fire extinguishers.** One non-freezing type portable fire extinguisher of the ordinary (moderate) hazard type shall be provided at each required standpipe hose connection. Where there is no standpipe connection, one non-freezing type portable fire extinguisher with at least a 2-A rating shall be provided for every 2,500 square feet (232 $m^2$), or part thereof. Additional portable fire extinguishers, suitable for the hazards involved, shall be provided and maintained in accordance with FC906.

**319.7 Fire department access**. Fire apparatus access shall be provided to a marina facility as set forth in Chapters 4 and 7 of NFPA 303, and FC 319.7.1 and 319.7.2.

**319.7.1 Access road.** A road capable of supporting a department firefighting apparatus, with a width of not less than 20 feet (6096 mm) or a width as required by FC503, where applicable, shall be provided from a public street to one or more fire apparatus-accessible locations on the premises.

**319.7.2 Aisles.** Any outdoor area of the marina shall be accessible by fire apparatus on all four sides, with a distance between the fire apparatus-accessible aisles of not more than 75 feet (22 860 mm). Such access aisles shall be kept unobstructed.

**319.7.3 Parking.** Motor vehicles shall not be parked on fire apparatus access roads or aisles, unless approved.

**319.7.4 Slip identification.** Slips and other mooring spaces shall be individually identified by a number and/or letter, which shall be conspicuously marked or posted. The direction to each slip and mooring space shall be conspicuously marked or posted at the base of each pier, finger pier, float and finger float.

**319.7.5 Fire department staging areas.** Staging areas for fire department access and firefighting operations shall be provided on all floats. An area at least 4 feet wide by 10 feet long (1219 mm by 3048 mm), exclusive of walkways, with a curb or barrier having a minimum height of 4 inches (102 mm) shall be provided and maintained unobstructed at each standpipe hose connection for this purpose. Each staging area shall be identified by a durable sign reading "FIRE DEPARTMENT STAGING AREA—KEEP CLEAR."

**319.8 Emergency communications and preparedness.** Emergency communications and emergency preparedness shall be in accordance with FC 319.8.1 and 319.8.2.

**319.8.1 Communications.** The marina shall be provided with a public address system or other approved means of notifying occupants of a fire on the premises. A telephone not requiring a coin to operate or another approved, clearly identified means to notify the department, shall be provided on the premises in an approved location.

**319.8.2 Emergency preparedness.** Marina owners shall designate and train a fire brigade in fire emergency procedures, including the sounding of an alarm, notification to the department, and operation of fire protection systems and portable fire extinguishers. A chart designating the members of the fire brigade and indicating each person's responsibilities shall be posted on the premises in a conspicuous approved location.

## SECTION FC 320
## LAUNDRY CARTS

**320.1 Laundry carts with a capacity of 1 cubic yard or more.** Laundry carts with an individual capacity of 200 gallons (1 cubic yard or 0.76 $m^3$) or more used for laundry purposes shall be constructed of noncombustible materials or of materials having a peak rate of heat release not exceeding 300 $kW/m^2$ at an incident heat flux of 50 $kW/m^2$ when tested in a

horizontal orientation in accordance with ASTM E 1354, and shall be listed and labeled as such.

## SECTION FC 321
## FIXED GUIDEWAY TRANSIT
## AND PASSENGER RAIL SYSTEMS

**321.1 Scope.** This section shall govern the design, installation, operation and maintenance of underground, open cut, surface and elevated fixed guideway transit and passenger rail systems.

**321.2 Design and installation.** The design and installation of fire safety and life safety systems for fixed guideway transit and passenger rail systems, including emergency ventilation systems, emergency voice communication systems, fire protection systems and means of egress, shall be in accordance with NFPA 130 and all Annexes thereto, as modified by FC Appendix B; the Electrical Code; the provisions of the construction codes applicable to fire safety and life safety systems; and this section.

**321.2.1 Fire scenario design parameters.** Approved fire scenarios used for designing fixed guideway transit and passenger rail systems shall be in accordance with Sections 4.6 and A 4.6 of NFPA 130, as modified by FC Appendix B, and the following:

1. The worst case scenario, as set forth in NFPA 130, as modified by FC Appendix B, shall be used for both the station and trainway designs.

2. Computational fluid dynamics analysis for the fire simulation shall be performed for an approved period of time, both with and without mitigating systems, including but not limited to ventilation and sprinkler protection.

3. The tenable condition parameters reported in the computational fluid dynamics analysis, including but not limited to heat, visibility and carbon monoxide, shall be precisely reported in the analysis.

**321.3 Operation and maintenance.** The operation and maintenance of fixed guideway transit and passenger rail systems shall be in accordance with NFPA 130 and all Annexes thereto, as modified by FC Appendix B.

**321.4 Construction site fire safety.** Construction operations of fixed guideway transit and passenger rail systems, including stations and tunnels, shall be conducted in accordance with Chapter 33 of the Building Code; this code, including FC Chapter 14; and NFPA 130, as modified by FC Appendix B. Approved fire extinguishing systems shall be provided for construction shanties and construction storage facilities and areas.

## SECTION FC 322
## ROAD TUNNELS, BRIDGES AND OTHER LIMITED ACCESS HIGHWAYS

**322.1 Scope.** This section shall govern the design, installation, operation and maintenance of road tunnels, bridges and other limited access highways used or designed to be used by motor vehicles.

**322.2 Design and installation.** The design and installation of fire safety and life safety systems for road tunnels, bridges and other limited access highways, including emergency ventilation systems, emergency voice communication systems, fire protection systems and means of egress, shall be in accordance with NFPA 502, as modified by FC Appendix B; the Electrical Code; the provisions of the construction codes applicable to fire safety and life safety systems; and this section.

**322.2.1 Fire scenario design parameters.** Approved fire scenarios used for designing road tunnels shall be in accordance with NFPA 502, as modified by FC Appendix B, and the following:

1. The worst case scenario, as set forth in NFPA 502, as modified by FC Appendix B, shall be used for designs.

2. Computational fluid dynamics analysis for the fire simulation shall be performed for an approved period of time, both with and without mitigating systems, including but not limited to ventilation and sprinkler protection.

3. The tenable condition parameters reported in the computational fluid dynamics analysis, including but not limited to heat, visibility and carbon monoxide, shall be precisely reported in the analysis.

**322.3 Operation and maintenance.** The operation and maintenance of road tunnels, bridges and other limited access highways used or designed to be used by motor vehicles shall be in accordance with NFPA 502, as modified by FC Appendix B.

**322.4 Construction site fire safety.** Construction operations of road tunnels, bridges and other limited access highways shall be conducted in accordance with Chapter 33 of the Building Code; this code, including FC Chapter 14; and NFPA 502, as modified by FC Appendix B. Approved fire extinguishing systems shall be provided for construction shanties and construction storage facilities and areas.

## SECTION FC 323
## WASTEWATER TREATMENT AND COLLECTION FACILITIES

**323.1 Scope.** This section shall govern the design, installation, operation and maintenance of fire protection systems and other fire safety measures at wastewater treatment and collection facilities.

**323.2 General.** Fire protection systems and other fire safety measures at wastewater treatment facilities shall be designed, installed, operated and maintained in accordance with NFPA 820.

## SECTION FC 324
## ELECTRIC GENERATING PLANTS

**324.1 Scope.** This section shall govern the design, installation, operation and maintenance of fire protection systems and other fire safety measures at electric generating plants.

**324.2 General.** Fire protection systems and other fire safety measures at electric generating plants shall be designed, installed, operated and maintained in accordance with NFPA 850, except for microturbine installations, which shall be designed, installed, operated and maintained in accordance with FC3510.

## [CHAPTER 4
## EMERGENCY PLANNING AND PREPAREDNESS

### SECTION FC 401
### GENERAL

**401.1 Scope.** The provisions of this chapter shall govern emergency reporting, planning and preparedness.

**401.2 Approval.** Where required by this code, fire safety and evacuation plans and emergency action plans shall be approved by the commissioner.

**401.3 Emergency notification.** Any owner, occupant or other person who becomes aware of a fire or explosion or any other emergency shall immediately report such emergency to the department. No owner or other person shall issue any directive or take any action to prevent or delay the reporting of a fire or other emergency to the department.

**401.3.1** Reserved.

**401.3.2** Reserved.

**401.3.3 Fire drills and emergency action plan drills.** Nothing in this section shall prohibit the sounding or other activation of a fire alarm signal for the purposes of conducting a fire drill or EAP drill in accordance with Section 405.

**401.4** Reserved.

**401.5** Reserved.

**401.6 Supervision of fire safety and evacuation plans.** The owner shall designate competent persons to act as FSP staff, train the FSP staff and conduct fire drills. Such persons shall possess such qualifications and/or hold such certificate of fitness as are required by this chapter or the rules. The owner shall ensure that adequate FSP staff is present on the premises during regular business hours, and at other times when the building is occupied, to perform the duties and responsibilities set forth in the fire safety and evacuation plan. The owners of the following buildings and occupancies shall additionally comply with the requirements set forth in Sections 401.6.1 through 401.6.8.

**401.6.1 Group A occupancies.** The FSP staff in Group A occupancies whose lawful use, occupancy or operation requires issuance of a license by the New York City Department of

Consumer Affairs shall be organized and trained by a person holding a certificate of fitness for fire safety training.

**401.6.2 Group B occupancy office buildings.** Group B occupancy office buildings or parts thereof occupied or designed to be occupied by more than 500 persons on one or more floors, including street level, or by more than 100 persons on one or more floors other than street level, shall comply with the requirements of Sections 401.6.2.1 through 401.6.2.2.

**Exception:** Office buildings that have lawfully installed an interior fire alarm system, provided that the fire drills required by Section 405 are conducted by a person holding a certificate of fitness as fire drill conductor.

**401.6.2.1 FSP staff.** The fire safety and evacuation plan shall designate a fire safety director, deputy fire safety directors, fire safety building evacuation supervisors, fire safety wardens, deputy fire safety wardens, fire safety brigade members and searchers, with such authority, duties and qualifications as set forth in the rules.

**401.6.2.2 Fire safety director.** The fire safety director and deputy fire safety directors designated in the fire safety and evacuation plan shall hold a fire safety director certificate of fitness, and shall have the following duties and responsibilities and such other duties and responsibilities as prescribed by rule:

1. The fire safety director shall be present in the building during regular business hours. When the fire safety director is absent during such hours, a deputy fire safety director shall be present in the building and shall perform the duties of the fire safety director.

2. In the event of a fire, the fire safety director shall report to the fire command station or designated alternative location, and, if appropriate, implement the fire safety and evacuation plan in accordance with its terms and the provisions of the rules, and notify arriving emergency response personnel and incident commander of the fire and the building response thereto.

3. The fire safety director designated shall be fully familiar with the provisions of the fire safety and evacuation plan and shall conduct FSP staff training drills required by Section 406.

4. The fire safety director shall conduct the fire drills required by Section 405.

**401.6.3 Buildings with class B or M occupancy fire alarm system.** Buildings or parts thereof equipped with a fire alarm system with voice communication of the type required in Group B or M occupancies, regardless of whether such system is required in such building or part thereof, shall comply with the requirements of Section 401.6.2.

**401.6.4 Group I-2 occupancies.** FSP staff training drills required by Section 406 shall be conducted by a person holding a certificate of fitness for fire safety training.

**401.6.5 Group R-1 occupancies.** Group R-1 occupancy buildings or parts thereof shall be operated in accordance with Sections 401.6.5.1 through 401.6.5.2.

**Exceptions:**

1. Group R-1 college or school student dormitories occupied or designed to be occupied by 500 persons or less, and that are 6 stories or 75 feet (22 860 mm) in height from grade or less need not designate a fire safety director or deputy fire safety directors.

2. Homeless shelters operated in accordance with Section 401.6.8.

3. All other Group R-1 occupancies occupied by 30 or fewer lodgers, with not more than 15 lodgers above street level; operated to accommodate no more than these numbers of lodgers; designed to contain 30 or fewer sleeping rooms, with not more than 15 sleeping rooms above street level; and in each instance not occupied or operated to be occupied by lodgers, or designed to contain sleeping rooms, on any floor more than 75 feet (22 860 mm) above street level.

**401.6.5.1 FSP staff.** The fire safety and evacuation plan shall designate a fire safety director, and a sufficient number of deputy fire safety directors and fire safety brigade members, with such authority, duties and qualifications as set forth in the rules. The fire safety director and deputy fire safety directors designated shall be fully familiar with the provisions of the fire safety and evacuation plan.

**401.6.5.2 Fire safety director.** The fire safety director and deputy fire safety directors designated in the fire safety and evacuation plan shall hold a fire safety director certificate of fitness, and shall have the following duties and responsibilities and such other duties and responsibilities as prescribed by rule:

1. The fire safety director shall be present in the building at all times. When the fire safety director is absent, a deputy fire safety director shall be present in the building and shall perform the duties of the fire safety director.

2. In the event of a fire, the fire safety director shall report to the fire command station or designated alternative location, and, if appropriate, implement the fire safety and evacuation plan in accordance with its terms and the rules, and notify arriving emergency response personnel and incident commander of the fire and the building response thereto.

3. The fire safety director and deputy fire safety directors designated shall be fully familiar with the provisions of the fire safety and evacuation plan, and when a fire brigade is required by Section 401.6.5.1, shall conduct fire brigade training drills required by Section 406.

4. The fire safety director shall conduct fire drills required by Section 405.

**401.6.6 Buildings or parts thereof with class R-1 occupancy fire alarm system.** Buildings or parts thereof equipped with a fire alarm system with voice communication of the type

required in R-1 occupancies, regardless of whether such system is required in such building or part thereof, shall comply with the requirements of Section 401.6.5.

**401.6.7 Group R-2 occupancies as set forth in Section 404.2.1(8).** Group R-2 occupancies, occupied or operated to be occupied, as set forth in Section 404.2.1(8), in whole or in part, shall comply with the requirements of Section 401.6.5.

**401.6.8 Group R-1 homeless shelters.** Group R-1 occupancy buildings or parts thereof occupied as a homeless shelter shall be in accordance with Sections 401.6.8.1 through 401.6.8.3.

**401.6.8.1 FSP staff.** The fire safety and evacuation plan shall designate a fire safety coordinator and a sufficient number of deputy fire safety coordinators, with such authority, duties and qualifications as set forth in the rules.

**401.6.8.2 Fire safety coordinator.** The fire safety coordinator and deputy fire safety coordinators designated in the fire safety and evacuation plan shall hold a fire safety coordinator certificate of fitness, and shall have the following duties and responsibilities and such other duties and responsibilities as prescribed by rule:

1. The fire safety coordinator shall be present in the building at all times while the building is occupied. When the fire safety coordinator is absent, a deputy fire safety coordinator shall be present in the building and shall perform the duties of the fire safety coordinator.

2. In the event of a fire, the fire safety coordinator shall report to the fire command station or designated alternative location, and, if appropriate, implement the fire safety and evacuation plan in accordance with its terms and the provisions of the rules, and notify arriving emergency response personnel and incident commander of the fire, the building response thereto, and the building's fire protection systems.

3. The fire safety coordinator and deputy fire safety coordinators designated shall be fully familiar with the provisions of the fire safety and evacuation plan. The fire safety coordinator shall conduct fire drills required by Section 405.

**401.6.8.3 Fire guard patrols.** Buildings or parts thereof occupied or operated to be occupied by homeless persons shall be continuously patrolled by a person holding a certificate of fitness as fire guard. Every area of the building shall be patrolled at least once every hour.

**401.7 Supervision of emergency action plan.** The owner shall designate competent persons to act as EAP staff, train the EAP staff and conduct EAP drills. Such persons shall possess such qualifications and/or hold such certificate of fitness as set forth in this chapter or the rules. The owner shall ensure that adequate EAP staff is present on the premises during regular business hours, and other times when the building is occupied, to perform the duties and responsibilities as set forth in the emergency action plan. The owner shall additionally comply with the requirements set forth in Sections 401.7.1 and 401.7.2.

**401.7.1 EAP staff.** The emergency action plan shall designate a fire safety/EAP director, deputy fire safety/EAP directors, fire safety/EAP building evacuation supervisors, fire safety/EAP wardens, deputy fire safety/EAP wardens, fire safety/EAP brigade members and critical operation staff, with such authority, duties and qualifications as set forth in the rules.

**401.7.2 Fire safety/EAP director.** The fire safety/EAP director and deputy fire safety/EAP directors designated in the emergency action plan shall hold a fire safety/EAP director certificate of fitness, shall be the persons designated as the fire safety director and deputy fire safety director in the fire safety and evacuation plan, and shall have the following duties and responsibilities and such other duties and responsibilities as prescribed by rule:

1. The fire safety/EAP director shall be present in the building during regular business hours. When the fire safety/EAP director is required but absent, a deputy fire safety/EAP director shall be present in the building and shall perform the duties of the fire safety/EAP director.

2. In the event of an emergency requiring sheltering in place, in-building relocation, partial evacuation or evacuation, the fire safety/EAP director shall report to the fire command station or designated alternative location, and, if appropriate, implement the emergency action plan in accordance with its terms and the rules, and notify arriving emergency response personnel and incident commander of the emergency and the building response thereto.

3. The fire safety/EAP director shall be fully familiar with the provisions of the emergency action plan, and shall conduct EAP staff training drills required by Section 406.

4. The fire safety/EAP director shall conduct EAP drills required by Section 405.

**401.8 Periodic inspection.** Any occupancy, building, or part thereof required to have a fire safety and evacuation plan, emergency action plan and/or a public gathering site plan pursuant to the provisions of this chapter or the rules, shall be subject to periodic fire safety inspection by the department, including to ensure that the fire safety and evacuation plan, the emergency action plan and/or the public gathering site plan have been prepared and/or implemented in compliance with the requirements of this chapter.

**401.9 Workplace exit inspections.** In addition to any other inspection requirement imposed by law, rule or regulation, the department shall inspect Group M occupancies to determine whether workplace exits are locked in violation of Section BC 1001.3.1 of the Building Code. A minimum of 50 unannounced inspections shall be conducted each year. Such inspections shall include, but not be limited to, premises at which violations of such section are known or suspected to have occurred.

## SECTION FC 402
## DEFINITIONS

**402.1 Definition.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

**EAP DRILL.** A training exercise by which building occupants are familiarized with and/or practice the procedures for safe, orderly and expeditious sheltering in place, in-building relocation, partial evacuation or evacuation, in accordance with the emergency action plan, and to evaluate the efficiency and effectiveness of the implementation of such plan.

**EAP STAFF.** The individuals identified in an emergency action plan as responsible for the implementation of such plan, including but not limited to the fire safety/EAP director, deputy fire safety/EAP director, fire safety/EAP building evacuation supervisor, fire safety/EAP wardens, deputy fire safety/EAP wardens and members of the fire safety/EAP brigade.

**EMERGENCY ACTION PLAN.** A written plan which sets forth the circumstances and procedures for the sheltering in place, in-building relocation, partial evacuation or evacuation of building occupants in response to an incident involving an explosion, a biological, chemical or nuclear incident or release, natural disaster or other emergency, or the threat thereof, or a declaration of emergency by a lawful authority.

**FIRE DRILL.** A training exercise by which building occupants are familiarized with and/or practice the procedures for the safe, orderly and expeditious in-building relocation, partial evacuation or evacuation, as applicable to the occupancy or building type, in accordance with the fire safety and evacuation plan, and to evaluate the efficiency and effectiveness of the implementation of such plan.

**FIRE SAFETY AND EVACUATION PLAN.** A written plan which sets forth the circumstances and procedures for the in-building relocation, partial evacuation or evacuation of building occupants, required or as appropriate for such occupancy or building type, in response to a fire.

**FSP STAFF.** The individuals identified in a fire safety and evacuation plan as responsible for the implementation of such plan.

**OFFICE BUILDING.** A group B occupancy designed and arranged to provide offices and other areas for the conduct of business ordinarily conducted in offices.

**REGULAR BUSINESS HOURS.** Times of day and days of the week during which a building or occupancy is normally occupied and business is conducted, and any time when an office building is occupied by more than 500 persons on one or more floors, including street level, or by more than 100 persons on one or more floors other than street level.

**UNDERGROUND BUILDING.** A building or part thereof having a floor level for human use or occupancy more than 30 feet (9144 mm) below the lowest level of exit discharge, as that term is defined in the Building Code.

## SECTION FC 403
## PUBLIC GATHERINGS

**403.1 General.** The commissioner may establish by rule requirements to ensure fire safety at indoor and outdoor public gatherings, including arcades, bazaars, carnivals, displays, exhibits,

street fairs and theaters. Such requirements may include preparation and submission to the department of a site plan; pre-event fire safety inspection; provision of fire guards or other qualified personnel; and provision and maintenance of fire apparatus access, and of aisles and other means of egress from the public gathering.

**403.2 Overcrowding prohibited.** Overcrowding shall not be caused, maintained or allowed in any indoor or outdoor area or space used for public gatherings.

**403.3 Limitations on standing at public gatherings.** Where the Building Code, certificate of occupancy or approved seating plan allows audience members to stand at performing arts or other indoor or outdoor events at which seating is provided for the audience, standing areas shall be maintained in accordance with Sections 403.3.1 through 403.3.4.

**403.3.1 Standing areas to be indicated.** The space to be occupied by standing audience members shall be separated from the space to be left clear for passage by a rope, tape or other thin material at a height of not less than 3 feet (914 mm) nor more than 4 feet (1219 mm) above the floor, supported by lightweight posts, all to be constructed and placed so as not to constitute an obstruction in case of panic or emergency. Such standing areas shall be clearly demarcated by durable markings on the floor indicating the boundaries of the standing area.

**403.3.2 Standing in aisles.** It shall be unlawful to stand, or allow any person to stand, in or at the head of an aisle.

**403.3.3 Standing in passageways.**

1. If the passageway is more than 6 feet (1829 mm) and less than 16 feet (4877 mm) deep, persons may stand therein, provided an unobstructed passageway of at least 6 feet (1829 mm) in depth is left open, and there are no more than four rows of persons standing.

2. If the passageway is more than 16 feet (4877 mm) deep, any number of persons or rows of persons may stand therein, provided that an unobstructed passageway of at least 10 feet (3048 mm) in depth is left open.

3. In places of assembly having a passageway to the rear of the seats, 6 feet (1829 mm) or less in depth, and having in addition an outer passageway in the rear thereof, to which all aisle heads have straight and direct access, a maximum of two rows of persons may be permitted to stand in the passageway to the rear of such seats.

**403.3.4 Standing in balconies.** Only one row of persons shall be allowed to stand in balconies.

**403.4 Announcements.** In performing arts theaters or motion picture theaters, and in any other Group A occupancy in which there is a non-continuous performance or program, other than an occupancy regularly attended by the same audience, an audible announcement shall be made not more than 10 minutes prior to the start of each performance or program informing the occupants of the location of the exits to be used in the event of a fire or other emergency, provided, however, that in any theater the announcement may be projected upon a screen or other surface

approved by the commissioner in a manner approved by the commissioner. Notwithstanding the foregoing, the commissioner may grant an exception from such requirement upon a determination that the occupancy has at least one exit clearly visible from every seat or standing area from which members of the audience are authorized to view the performance.

**403.5 Trade shows.** The owner of any Group A occupancy wherein a trade show or other similar temporary exhibition is to be conducted shall, at least one month before the date of such exhibition, submit to the department a written notice and a plan containing the following information and such other information and documentation as the commissioner may prescribe:

1. The dates, times, location, and nature of the trade show or other exhibition, and whether the event will be open to the public or restricted to the trade.

2. The design and arrangement of the trade show or other exhibition, including aisles, display booths, decorations and drapes, and equipment using any hazardous material or open flame.

## SECTION FC 404
## FIRE SAFETY AND EVACUATION PLANS AND EMERGENCY ACTION PLANS

**404.1 General.** The owner of any premises subject to this section shall cause a fire safety and evacuation plan and an emergency action plan to be prepared for such premises in a form prescribed by the commissioner, and periodically reviewed and amended, in accordance with this section and the rules. The commissioner may prescribe by rule the qualifications of the person preparing such plans.

**404.1.1 Existing buildings.** For purposes of Section 102.2, the preparation of a fire safety and evacuation plan and an emergency action plan shall constitute an operational requirement. Owners of buildings and occupancies not required to have a fire safety and evacuation plan prior to the effective date of this code shall have one year from such effective date to prepare and, if required pursuant to Section 404.6, submit, such plan. Any owner of a building or occupancy that has an approved fire safety plan and an emergency action plan on the effective date of this code shall not be required to prepare and/or file new plans within such one-year period, but shall maintain the existing plans in compliance with the requirements of the laws, rules and regulations applicable to such plans prior to the effective date of this code and such additional or amended requirements as may be adopted after the effective date of this code, as applicable in accordance with the terms of such additional or amended requirements.

**404.2 Where required.** A fire safety and evacuation plan and/or emergency action plan is required for the occupancies and buildings as set forth in Sections 404.2.1 and 404.2.2.

**404.2.1 Fire safety and evacuation plans.** A fire safety and evacuation plan is required for the following occupancies and buildings:

1. Group A occupancies, other than Group A occupancies used exclusively for purposes of religious worship that have an occupant load less than 2,000.

2. Group B occupancy office buildings or parts thereof and other office buildings or parts thereof, occupied or designed to occupied by more than 500 persons on one or more floors, including street level, or by more than 100 persons on one or more floors other than street level.

3. Group B occupancy educational facilities.

4. Group E occupancy schools, educational facilities and day care facilities.

5. Group H occupancies, except buildings or parts thereof that have prepared one or more of the following plans in compliance with applicable requirements:

   5.1. An emergency action plan in accordance with the regulations of the United States Department of Labor, as set forth in 29 CFR Section 1910.119.

   5.2. A contingency plan and emergency procedures in accordance with the regulations of the New York State Department of Environmental Conservation, as set forth in 6 NYCRR Part 373.

   5.3. A risk management plan in accordance with the rules of the New York City Department of Environmental Protection, as set forth in 15 RCNY §41-08.

6. Group I occupancies.

7. Group M occupancies occupied or designed to be occupied by more than 500 persons on one or more floors, including street level, or by more than 100 persons on one or more floors other than street level, or in which more than 25 persons are employed.

8. Group R-1 occupancies, occupied by more than 30 lodgers, or more than 15 lodgers above street level, for a period of 90 days or less; and/or operated to accommodate such numbers of lodgers for such period of occupancy; and/or designed to contain a total of more than 30 sleeping rooms, or more than 15 sleeping rooms above the street level, for such period of occupancy; and/or occupied by one or more lodgers on a floor more than 75 feet (22 860 mm) above the street level, for such period of occupancy, or operated or designed for such lodging.

9. Group R-2 occupancies occupied by more than 30 lodgers, or more than 15 lodgers above street level, for a period of 90 days or less; and/or operated to accommodate such number of lodgers for such period of occupancy; and/or designed to contain a total of more than 30 sleeping rooms, or more than 15 sleeping rooms above the street level, for such period of occupancy; and/or occupied by one or more lodgers on a floor more than 75 feet (22 860 mm) above the street level, for such period of occupancy, or operated or designed for such lodging. All other Group R-2 occupancies shall comply with the requirements of Section 408.9.

10. Buildings or parts thereof equipped with a fire alarm system with voice communication of the type required in Class B, R-1 or M occupancies, regardless of whether such system is required in such building or part thereof.

11. Buildings with an atrium and containing a Group A, E or M occupancy.

12. Covered malls exceeding 50,000 square feet (4645 $m^2$) in aggregate floor area.

13. Buildings that are greater than 6 stories or 75 feet (22 860 mm) in height, except Group R-2 occupancies.

14. Underground buildings occupied or designed to be occupied by more than 100 persons below street level.

15. Buildings occupied or designed to be occupied to provide emergency shelter for more than 15 homeless persons for more than 30 days in a year.

**404.2.2 Emergency action plans.** An emergency action plan is required in Group B occupancy office buildings or parts thereof:

1. Greater than 6 stories in height; or

2. Greater than 75 feet (22 860 mm) in height; or

3. Occupied or designed to be occupied by more than 500 persons on one or more floors, including street level, or by more than 100 persons on one or more floors other than street level; or

4. Equipped with a fire alarm system with voice communication of the type required in Class B or M occupancies, regardless of whether such system is required in such building or space; or

5. Ordered by the department to comply with the requirements of this section, based upon a determination that compliance with this section is required in the interest of public safety given the location, use or occupancy of the building.

**404.3 Contents.** Fire safety and evacuation plan and emergency action plan contents shall be in accordance with Sections 404.3.1 and 404.3.2.

**404.3.1 Fire safety and evacuation plans.** A fire safety and evacuation plan shall include the following information and such other information and documentation as the commissioner may prescribe:

1. The procedures for notifying building occupants of a fire and reporting a fire to the department, including the preferred and any alternative means of notifying and reporting.

2. Whether the response to a fire emergency will require the occupants of the building to be completely evacuated, partial evacuation or relocated within the building, and the procedures for each such response.

3. Site plans indicating the following:

   3.1. Surrounding buildings and streets, including cross streets, and fire apparatus access roads.

   3.2. The location of building occupant assembly areas, if applicable.

4. Floor plans, with corresponding legend, identifying the locations of the following, as applicable:

   4.1. Exits.

   4.2. Evacuation routes.

   4.3. Fire barriers.

   4.4. Areas of refuge.

   4.5. Stairs with letter designation.

   4.6. Access and convenience stairways.

   4.7. Elevator bank letter and car number designations.

   4.8. Fire command station.

   4.9. Fire warden phones.

   4.10. Manual fire alarm boxes.

   4.11. Standpipe hose outlets.

   4.12. Sprinkler and standpipe system riser diagrams and siamese connections.

   4.13. Sprinkler and standpipe system control valves.

   4.14. Any part of the building not protected by a sprinkler system.

   4.15. Emergency power generator and fuel supply.

5. Permitted hazardous material and combustible material storage, handling or use at the premises.

6. Identification of fire safety director or other building employees responsible for implementing the fire safety and evacuation plan, training FSP staff, or other duties related to the fire safety and evacuation plan.

7. Identification and assignment of personnel responsible for operation of building fire protection, fire extinguishing and life safety systems, or other critical equipment.

8. Procedures for employees who must operate critical equipment.

9. Procedures for accounting for building employees and building occupants after such employees or occupants have been relocated or evacuated to a safe area.

10. Identification and assignment of personnel responsible for implementing the plan.

11. Identification of personnel available, if any, to provide emergency medical care.

12. A description of the emergency voice/alarm communication system alert tone and preprogrammed voice messages, when approved.

13. Procedures for identifying in advance building occupants who require assistance to participate in the plan because of an infirmity or disability or other special need, and approved procedures for providing for such assistance.

**404.3.2 Emergency action plans.** The commissioner shall promulgate rules establishing standards, procedures and requirements for the safety of occupants in any office building or part thereof in the event of an explosion, a biological, chemical or nuclear incident or release, natural disaster or other emergency, or the threat thereof, or a declaration of emergency by lawful authorities, including procedures for the orderly evacuation therefrom. Such rules may require the owner of such premises to develop a written emergency action plan that includes the following information, and such other information and documentation as the commissioner may prescribe:

1. Preparation of the emergency action plan, including the form and submission of such plan and supporting documentation.

2. The responses to be taken in response to each type of emergency.

3. The designation and qualifications of EAP staff, and their emergency action plan duties and responsibilities.

4. Reporting of emergencies to the department.

5. Communication with building occupants.

6. Use of elevators and the operation of other building systems.

7. The conduct of EAP drills.

8. Recordkeeping requirements.

9. Obligations of building occupants and employers of building occupants.

10. Procedures for identifying in advance building occupants who require assistance to participate in the plan because of an infirmity or disability or other special need, and approved procedures for providing for such assistance.

**404.4 Periodic review and revision.** Fire safety and evacuation plans and emergency action plans shall be reviewed and updated as necessitated by changes in staff assignments, use or occupancy, or the design and arrangement of the premises, but at least annually. An entry shall be made in the log book required by Section 405.5 documenting such review, and indicating the general nature of any amendments to be made to such plan.

**404.5 Maintenance on premises.** A copy of the fire safety and evacuation plan and the emergency action plan shall be readily available on the premises during regular business hours. For buildings provided with a fire command station, the plans shall be maintained at such station, if practicable.

**404.6 Submission of plans.** Group B office building fire safety and evacuation plans and emergency action plans, fire safety and evacuation plans for Group R-1 occupancies and buildings with a fire alarm system with voice communication as set forth in Section 404.2.1(9), and such other fire safety and evacuation plans as may be specified by the commissioner by rule, shall be submitted to the commissioner for acceptance. Such plans shall be accompanied by a copy of the fire protection plan filed with the New York City Department of Buildings in accordance with the Building Code, unless already submitted to the department. A fire safety and evacuation plan and an emergency action plan, as applicable, shall be prepared, and, as applicable, accepted prior to occupancy of the building.

**404.7 Building information card.** The commissioner may require by rule the preparation of a building information card depicting and/or setting forth the relevant fire safety information for a building or occupancy for which a fire safety and evacuation plan is required to be submitted to the department pursuant to Section 404.6. A building information card, when required to be prepared, shall be maintained on the premises and made available upon request to any department representative.

## SECTION FC 405
## FIRE DRILLS AND EAP DRILLS

**405.1 General.** Fire drills and EAP drills shall be conducted in occupancies and buildings set forth in Section 404.2, in accordance with Sections 405.2 and 405.3.

**405.2 Frequency of fire drills.** Required fire drills shall be conducted in the buildings set forth in Section 404.2, in accordance with Table 405.2. All building occupants, including the FSP staff, shall participate in fire drills.

### TABLE 405.2
### FIRE DRILL FREQUENCY

| OCCUPANCY OR BUILDING TYPE | FREQUENCY |
|---|---|
| Group B colleges and universities | In accordance with Section 405.2.1 |
| Group B office buildings subject to compliance with Section 404.2.1(2) | Quarterly[b] |

| | |
|---|---|
| Group E day care facilities | Monthly |
| Group E schools and educational facilities | In accordance with Section 405.2.2 |
| Group F | Monthly in accordance with Section 405.2.3 |
| Group I-1[a] | In accordance with Section 405.2.4 |
| Group R-1 college or school student dormitories | In accordance with Section 405.2.2 |
| Group R-1 homeless shelters | Monthly on each shift |
| Group R-2 occupancies subject to compliance with Section 404.2.1(8) | Quarterly on each shift |

a. Fire drills in residential care assisted living facilities shall include complete evacuation of the building in accordance with Section 408.5.5.
b. The frequency may be reduced to semi-annually two years after the certificate of occupancy has been issued.

**405.2.1 Group B occupancy colleges and universities fire drill frequency.** In Group B colleges and university facilities, the frequency and timing of fire drills shall be in accordance with the New York State Education Law.

**405.2.2 Group E occupancy schools and educational facility fire drill frequency.** In Group E schools and educational facilities, including dormitories, the frequency and timing of fire drills shall be in accordance with New York State Education Law.

**405.2.3 Group F occupancy fire drill frequency.** Fire drills in Group F occupancies shall be conducted as required and in accordance with the New York City Board of Standards and Appeals Rules, as set forth in 2 RCNY § 9-01.

**405.2.4 Group I-1 occupancy fire drill frequency.** Fire drills in Group I-1 occupancies shall be conducted at least six times per year, two times per year on each shift. Twelve drills shall be conducted in the first year of operation.

**405.3 EAP drills.** The owner shall conduct EAP drills on a regular basis, during regular business hours, in accordance with this section and the rules.

**405.3.1 Frequency of EAP drills.** EAP drills shall be conducted on a regular basis, as follows:

1. At least two EAP drills shall be conducted within one year of the date of department acceptance of the building's initial emergency action plan, the first of which shall be conducted within six months of such date of acceptance.

2. Beginning one year from the date of department acceptance of the building's initial emergency action plan, an EAP drill shall be conducted on each floor of the building at least once a year.

**405.3.2 Participation in EAP drills.** All building occupants present on the affected floors at the time the EAP drill is conducted, including visitors, shall be required to participate in such drill.

**405.3.3 Coordination with fire drills.** EAP drills shall be conducted separately from fire drills required for the building, and shall highlight the differences between the building's fire safety and evacuation plan and emergency action plan, and the appropriate actions to be taken by building occupants upon implementation of each plan.

**405.4 Time.** Drills shall be conducted at varying times of day.

**405.5 Recordkeeping.** A written record of fire drills and EAP drills shall be maintained in a bound log book with consecutive numbered pages, or other form of approved electronic recordkeeping, and maintained on the premises for a period of 3 years for fire drills, and 5 years for EAP drills, and made available upon request of any department representative. An entry shall be made in such log book for each fire drill and EAP drill that is conducted in the building that includes the following information, and such other information and documentation as the commissioner may require:

1. The name and, if applicable, certificate of fitness number of the person conducting the drill.

2. Date and time of the drill.

3. Name and title of the FSP staff or EAP staff assisting in the conduct of the drill.

4. Number of occupants participating in the drill.

5. Evaluation of effectiveness of the drill, including any delays and deficiencies.

6. If evacuation was conducted, time required to accomplish evacuation.

**405.6** Reserved.

**405.7 Alarm activation.** The fire alarm system shall be activated each time a fire drill is conducted to initiate the drill and familiarize building occupants with the alarm tones.

**405.8 Accounting for occupants.** Occupants in a building shall be accounted for in accordance with Sections 405.8.1 and 405.8.2.

**405.8.1 Educational occupancies.** When occupants are evacuated and directed to an assembly area, school administrators shall account for all students present in the building prior to the drill.

**405.8.2 Office buildings.** In office buildings, all areas of the building to be evacuated shall be searched to ensure that all occupants have participated in the drill.

## SECTION FC 406
## FIRE SAFETY AND EVACUATION PLAN AND EMERGENCY ACTION PLAN STAFF TRAINING

**406.1 General.** FSP staff and EAP staff shall be trained in the performance of their duties in accordance with the fire safety and evacuation plan and emergency action plan, respectively.

**406.2 Frequency.** FSP staff and EAP staff shall receive initial training in the contents of the fire safety and evacuation plan and emergency action plan upon commencement of their authority and duties in the building. Such staff shall participate in training sessions designed to familiarize

them with their duties pursuant to the plan in accordance with the frequency set forth in Tables 406.2(1) and 406.2(2), as applicable. A written record of such staff training shall be maintained in a bound log book with consecutive numbered pages, or other form of approved recordkeeping, and maintained on the premises for a period of 3 years and made available for inspection by department representatives. An entry shall be made in such log book for each training session conducted.

**TABLE 406.2(1)**
**FSP STAFF TRAINING DRILLS**

| OCCUPANCY OR BUILDING TYPE | REFRESHER TRAINING DURATION AND FREQUENCY |
|---|---|
| Group A | 1 hour quarterly |
| Group I-1 | 30 minutes every 2 months |
| Group I-2 | Monthly in accordance with Section 406.2.1 |
| Group R-1 | 1 hour quarterly on each shift |
| Buildings with a fire alarm system with communication as set forth in Section 404.2.1(9) | 1 hour quarterly[a] |
| All other occupancies or building types | 1 hour annually |

a. The commissioner may require participation of building occupants in the training drill, depending upon the nature of the occupancy in which such fire alarm system is installed. Training drills shall be conducted on a semi-annual basis beginning two years after the certificate of occupancy has been issued.

**406.2.1 Group I-2 occupancy FSP staff training drills.** In Group I-2 occupancies, FSP staff training drills may be conducted throughout the entire occupancy or in specific areas thereof, but training shall be conducted in each and every area of the occupancy over the period of 1 year. Such training shall be conducted at least once each month for a total of not less than twelve training drills per year, distributed among the three shifts as follows:

1. Day shift - at least three training drills.

2. Evening shift - at least six training drills.

3. Night shift - at least three training drills.

**TABLE 406.2(2)**
**EAP STAFF TRAINING DRILLS**

| EAP STAFF MEMBER | INITIAL TRAINING DURATION | REFRESHER TRAINING DURATION AND FREQUENCY |
|---|---|---|
| Deputy fire safety/EAP directors | 3 hours | 1 hour semi-annually |
| Fire safety/EAP building evacuation supervisors | 3 hours | 1 hour semi-annually |
| Fire safety/EAP wardens | 2 hours | 1 hour annually |
| Deputy fire safety/EAP warden | 2 hours | 1 hour annually |
| Fire safety/EAP brigade | 2 hours | 1 hour annually |

## SECTION FC 407
## RESERVED

## SECTION FC 408
## USE AND OCCUPANCY-RELATED REQUIREMENTS

**408.1 General.** The premises used or occupied for the purposes set forth in this section shall additionally comply with the requirements of this section, as applicable.

**408.2 Group A occupancies.** All Group A occupancies shall comply with the requirements of Sections 408.2.1.

**408.2.1 Seating plan.** A copy of the seating plan for Group A occupancies required by the Building Code shall be submitted to the department prior to occupancy.

**408.3 Group B occupancies.** Group B occupancy office buildings or parts thereof, occupied or designed to be occupied by more than 500 persons on one or more floors, including street level, or by more than 100 persons on one or more floors other than street level, shall be operated and maintained in compliance with the additional emergency preparedness and planning requirements set forth in the rules.

**408.4 Group H-5 occupancies.** Group H-5 occupancies shall comply with the requirements of Sections 408.4.1 through 408.4.4.

**408.4.1 Plans and diagrams.** In addition to the requirements of Section 404 and Section 407.6, plans and diagrams shall be maintained in an approved location on the premises indicating the plan for each area, the amount and type of HPM stored, handled and used, locations of shutoff valves for HPM supply piping, emergency telephone locations and locations of exits.

**408.4.2 Periodic review and revision.** The plans and diagrams required by Section 408.4.1 shall be maintained up to date and the commissioner shall be notified of all changes in use or occupancy, and design and arrangement of the premises.

**408.4.3 Emergency response team.** Responsible persons shall be designated the on-site emergency response team and trained to be liaison personnel for the department. These persons shall aid the department in preplanning emergency responses, identifying locations where HPM is stored, handled and used, and be familiar with the chemical nature of such material. An adequate number of personnel for each work shift shall be designated.

**408.4.4 Emergency drills.** Emergency drills of the on-site emergency response team shall be conducted on a regular basis but not less than once every three months. Records of emergency drills conducted shall be maintained in the same manner as records of fire drills.

**408.5 Group I-1 occupancies.** Group I-1 occupancies shall comply with the requirements of Sections 408.5.1 through 408.5.5.

**408.5.1 Fire safety and evacuation plan.** The fire safety and evacuation plan required by Section 404 shall include special FSP staff actions, including fire protection procedures necessary for residents, and shall be revised upon admission of any resident with special needs.

**408.5.2** Reserved.

**408.5.3 Resident training.** Residents capable of assisting in their own evacuation shall be trained in the proper actions to take in the event of a fire. The training shall include actions to take if the primary escape route is blocked. Where the resident is given rehabilitation or

habilitation training, training in fire prevention and actions to take in the event of a fire shall be a part of the rehabilitation training program. Residents shall be trained to assist each other in case of fire to the extent their physical and mental abilities permit them to do so without additional personal risk.

**408.5.4** Reserved.

**408.5.5 Resident participation.** Fire drills shall involve the actual evacuation of all residents to a selected assembly area.

**408.6 Group I-2 occupancies.** Group I-2 occupancies shall comply with the requirements of Sections 408.6.1 and 408.6.2.

**408.6.1 Evacuation not required.** During fire drills, the movement of patients to safe areas or to the exterior of the building is not required.

**408.6.2 Coded alarm signal.** When fire drills are conducted after visiting hours or when patients or residents are expected to be asleep, a coded announcement is allowed instead of audible alarms.

**408.7 Group I-3 occupancies.** Group I-3 occupancies shall comply with the requirements of Sections 408.7.1 through 408.7.4.

**408.7.1 FSP staff training content.** FSP staff shall be instructed in the proper use of portable fire extinguishers and other manual fire suppression equipment.

**408.7.2 Staffing.** In Group I-3 occupancies, FSP staff shall be in the building at all times, and within three floors or 300 feet (91 440 mm) horizontal distance of the access door of each resident housing area. When movement of occupants from one smoke compartment to another or egress from the building is impeded by staff-controlled manual releases, the FSP staff responsible for controlling such movement or egress must be continuously available to initiate emergency procedures within 2 minutes of an alarm.

**Exception:** FSP staff shall not be required to be located within three floors or 300 feet (9144 mm) of areas in which all locks may be unlocked automatically in accordance with Section 408.4 of the Building Code.

**408.7.3 Notification.** Provision shall be made to promptly notify FSP staff of an emergency.

**408.7.4 Keys.** Keys necessary for unlocking doors installed in a means of egress shall be individually identifiable by both touch and sight.

**408.8 Group R-1 occupancies.** Group R-1 occupancies shall comply with the requirements of Sections 408.8.1 and 408.8.3.

**408.8.1 Evacuation diagrams.** A diagram depicting two evacuation routes shall be posted on or immediately adjacent to every required egress door from each hotel guest room, motel guest room, or dormitory room. The diagram shall indicate the following:

1. A visual representation of the number of doors opening onto the public corridor which must be passed to reach each exit stair.

2. Location of the fire alarm pull stations.

3. Procedures to be followed in the event of a fire alarm or smoke detector alarm.

4. A written description or visual representation of the procedures to be followed in the event of fire or smoke conditions.

**408.8.2** Reserved.

**408.8.3 Signage.** Group R-1 occupancies shall comply with the additional signage and such other emergency preparedness and planning requirements set forth in the rules.

**408.9 Group R-2 occupancies.** Group R-2 occupancy buildings or parts thereof with 3 or more dwelling units, including apartment houses, apartment buildings, apartment hotels and other residential buildings or parts thereof that are occupied for the shelter and sleeping accommodations of individuals on a month to month or longer-term basis shall comply with the requirements of Sections 408.9.1 through 408.9.4 and the rules. Such buildings or parts thereof shall not be required to comply with the supervision requirements of Sections 401, and the requirements of Sections 404, 405 and 406.

**Exception:** Group R-2 occupancy buildings or parts thereof required to prepare a fire safety and evacuation plan as set forth in Section 404.2.1(8). Such buildings or parts thereof shall be operated and maintained in compliance with the additional emergency preparedness and planning requirements set forth in the rules.

**408.9.1 Residential fire safety guide and notices.** The owner of any premises containing a Group R-2 occupancy shall cause a fire safety guide to be prepared for such premises, and periodically reviewed, amended and distributed in accordance with this section and the rules.

**408.9.1.1 Fire safety guide.** The residential fire safety guide shall serve to inform building occupants and building service employees as to the building's construction, fire safety systems, means of egress, and evacuation and other procedures to be followed in the event of fire in the building.

**408.9.1.2 Fire safety notices.** The fire safety notice shall serve to inform building occupants, building service employees and visitors as to the evacuation and other procedures to be followed in the event of fire in the building. Such notice shall be in such form as prescribed by the commissioner by rule and shall be posted within each dwelling unit and such other locations as set forth in the rules.

**408.9.2 Periodic review and revision.** Fire safety guides and notices shall be reviewed prior to each distribution and posting, and shall be revised within 60 days of any material change in the building's fire safety systems, means of egress or other building condition required to be included in such fire safety guide or notice.

**408.9.3 Distribution and posting.** A copy of the fire safety guide and fire safety notice shall be distributed to building occupants, and fire safety notices shall be posted as set forth in this section and the rules.

**408.9.3.1 Cooperative or condominium.** In Group R-2 occupancies with a cooperative or condominium form of ownership and management, the board of directors, condominium association or other party generally responsible for maintenance of common areas shall be responsible for the preparation and distribution of the fire safety guide, the posting and maintenance of fire safety notices in common areas, and the preparation and distribution to individual dwelling unit owners or proprietary lessees of fire safety notices for dwelling unit doors, including instructions and the means for affixing the notice. The owners or proprietary lessees of the individual units in such residential buildings or parts thereof shall be responsible for the posting and maintenance of the fire safety notice on their respective dwelling unit doors.

**408.9.4 Floor numbering list.** The commissioner shall promulgate rules establishing requirements for the electronic submission of floor numbering lists to the department by owners of buildings or parts thereof classified in Group R-2 occupancies that are 150 feet (45 720 mm) or more in height, and such other occupancies as the commissioner may designate by rule. Such rules shall provide that each owner of a building with non-sequential or non-standard floor numbering, as defined by rule, submit a floor numbering list indicating the floor numbers assigned to each floor, and submit an amended floor numbering list within 2 business days of a change in any floor numbering designation.

**408.10 Group R-1 occupancy school and college dormitories.** Group R-1 school and college dormitories shall prepare an FSP, or prepare and distribute a fire safety guide and notice, as prescribed by the commissioner by rule.

**408.11 Covered mall buildings.** Covered mall buildings shall comply with the requirements of Sections 408.11.1 through 408.11.3.

**408.11.1 Floor plan.** The floor plan required by Section 404.3.1(4) shall additionally include the following information:

1. Each occupancy, including identification of tenant.

2. Exits from each tenant space.

**408.11.2 Tenant identification.** Each occupied tenant space provided with a secondary exit to the exterior or exit corridor shall be provided with tenant identification by business name and/or address. Letters and numbers shall be conspicuously posted on the exterior or exit corridor side of the door, be plainly legible and shall contrast with their background.

**408.11.3 Maintenance.** Unoccupied tenant spaces shall be:

1. Kept free from the storage of any combustible materials.

2. Kept separate from other tenant spaces and areas of the mall by maintaining any fire separation requirement of the Building Code during the period of time that the space remains unoccupied or under reconstruction.

3. Periodically inspected on at least a weekly basis to ensure that the space is being maintained in accordance with this section. Doors to spaces shall be secured from entry by keeping all doors locked at all times when the space is unoccupied.

4. Kept free from rubbish and other combustible waste.

**408.12 Buildings with Class B or M fire alarm systems.** Buildings or parts thereof equipped with a fire alarm system with voice communication of the type required in Class B or M occupancies, regardless of whether such system is required in such building or space, shall be operated and maintained in compliance with the requirements of Section 408.3.

**408.13 Buildings with Class R-1 fire alarm systems.** Buildings or parts thereof equipped with a fire alarm system with voice communication of the type required in Group R-1 occupancies, regardless of whether such system is required in such building or space, shall be operated and maintained in compliance with the requirements of Section 408.8.3.

**408.14 Fire emergency reporting.** In a conspicuous location in every lobby or entrance hall of a commercial or public building, the owner shall post a sign indicating the method of transmitting a fire alarm. Such signs shall conform to the following format and the owner shall insert all information necessary to complete the instructions contained therein:

Fire alarm box at_____ and_____
(Name of street) (Name of street)
or

To report a fire by telephone dial"911" or, depending upon the borough in which the property is located, insert one of the following telephone numbers:

| | |
|---|---|
| Bronx properties | (718) 999-3333 |
| Brooklyn properties | (718) 999-4444 |
| Manhattan properties | (212) 999-2222 |
| Queens properties | (718) 999-5555 |
| Staten Island properties | (718) 999-6666 |

**Exception:** This section shall not apply to educational facilities where fire drills are conducted in accordance with Section FC 405.

**408.14.1 Fire emergency reporting signs.** Signs required by this section shall be of such size and contain such lettering as the commissioner may prescribe by rule.]

## CHAPTER 4
## EMERGENCY PLANNING AND PREPAREDNESS

### SECTION FC 401

## GENERAL

**401.1 Scope.** This chapter governs emergency reporting, planning and preparedness.

**401.2 Emergency reporting.**

**401.2.1 Reporting to department.** Any owner, occupant or other person who becomes aware of a fire or explosion or any other emergency shall immediately report such emergency to the department. No owner or other person shall issue any directive or take any action to prevent or delay the reporting of a fire or other emergency to the department.

**401.2.2 Signage.** A durable, legible sign setting forth the following information for reporting a fire or other emergency (including the text to be inserted based on the building's location) shall be posted in a conspicuous location in the lobby of the main front entrance of a Group A, B, E, F, I, M and R-1 building:

Fire alarm box at_____ and_____
(Name of street) (Name of street)

or

To report a fire by telephone dial "911" or, depending upon the borough in which the property is located, insert one of the following telephone numbers:

| | |
|---|---|
| Bronx properties | (718) 430-0200 |
| Brooklyn properties | (718) 965-8300 |
| Manhattan properties | (212) 570-4300 |
| Queens properties | (718) 476-6200 |
| Staten Island properties | (718) 494-4296 |

**Exception:** Buildings exempt from such sign requirement as set forth in the rules.

**401.3 Emergency preparedness plans.** The emergency preparedness plans required by this chapter shall serve to assure that procedures are in place that can be timely implemented in the event of a fire or non-fire emergency to provide the information, guidance, direction and assistance needed to protect the safety of building occupants, including, if necessary, effecting their evacuation, relocation or sheltering in place. Such emergency preparedness plans shall further serve to assure that knowledgeable assistance is readily available on the premises to emergency response personnel responding to a fire or non-fire emergency at the premises.

**401.3.1 General.** The owner of any premises required by this chapter to have an emergency preparedness plan shall cause such plan to be prepared for such premises in the form prescribed by the commissioner, and periodically reviewed and amended, in accordance with this section and the rules. The commissioner may prescribe by rule the qualifications of the person preparing such plans.

**401.3.2 Types of emergency preparedness plans.** This chapter establishes the following three types of emergency preparedness plans, which reflect the use, size, complexity and risk vulnerability of the building or occupancy; the presence of building staff and/or other

building occupants capable of implementing such plan; the availability of voice communication capability; and other considerations:

1. Level 1: comprehensive fire safety/emergency action plan (FC401.4).

2. Level 2: fire and emergency preparedness plan (FC401.5).

3. Level 3: fire and emergency preparedness guide and notices (FC401.6).

**401.3.3 Maintenance on premises.** A copy of the emergency preparedness plan shall be maintained at the premises for which such plan is required and kept readily available for inspection at all times. The department may require that the emergency preparedness plan be maintained at an approved location on the premises in an approved first responder box secured by a citywide standard key to ensure availability of the plan at all times.

**401.3.4 Building information card and floor plans.** In buildings required to prepare a comprehensive fire safety and emergency action plan, and in high-rise buildings and large-area buildings required to prepare a fire and emergency preparedness plan, or as otherwise required by this chapter or the rules, a building information card depicting and/or setting forth the fire safety information prescribed by the commissioner by rule shall be maintained on the premises and otherwise made available to the department as set forth in the rules. When required by this code or rule, the building information card and floor plans for any such building shall be submitted to the Department in an approved manner.

**401.3.5 Periodic review and revision.** Emergency preparedness plans and building information cards shall be reviewed and updated as necessitated by changes in staff assignments, use or occupancy, or the design and arrangement of the premises, but at least annually. An entry shall be made in the log book required by FC401.8 documenting such review, and indicating the general nature of any amendments to be made to such plan. Submission of an amended emergency preparedness plan shall not be required solely by reason of staffing changes or revisions to the building information card. Fire and emergency preparedness guides and notices shall be reviewed prior to each distribution required by this code or the rules, and shall be revised within 60 days of any change in building construction or service equipment materially affecting the content of such guide or notice.

**401.3.6 Applicability to existing buildings and occupancies.** The preparation of an emergency preparedness plan shall constitute an operational requirement. Except as otherwise provided in this section, all owners of buildings and occupancies required by this chapter to have an emergency preparedness plan shall have 18 months from the promulgation of rules implementing the emergency preparedness plan provisions of this chapter to prepare such plan and, if required by this chapter, submit it to the department for acceptance.

**401.3.6.1 New and existing buildings and occupancies.** Until rules implementing the emergency preparedness plan provisions of this chapter take effect, buildings and occupancies required to prepare an emergency preparedness plan under this code shall comply with the emergency preparedness plan requirements set forth in the Fire Code and rules in effect on the date prior to the effective date of this section.

**401.3.6.2 Updating of existing fire safety and evacuation plans.** Any owner of a Group B office building existing on the effective date of this section that is required by this chapter to have a comprehensive fire safety and emergency action (Level 1) plan and:

1. for which building a fire safety and evacuation plan was submitted and approved by the Department prior to January 1, 2000, and has not been comprehensively amended since January 1, 2011, shall prepare and submit for department approval within 3 years of the effective date of this section a comprehensive fire safety and emergency action (Level 1) plan complying with the requirements of this chapter and the rules. This provision shall not be construed to extend the time for compliance with provisions of this chapter requiring the preparation and periodic review and revision of such plans.

2. for which building a fire safety and evacuation plan was submitted and approved by the Department on or after January 1, 2000, but prior to January 1, 2011, and has not been comprehensively amended since January 1, 2011, shall prepare and submit for department approval within 5 years of the effective date of this section a comprehensive fire safety and emergency action (Level 1) plan complying with the requirements of this chapter and the rules. This provision shall not be construed to extend the time for compliance with provisions of this chapter requiring the preparation and periodic review and revision of such plans.

**401.3.7 Existing emergency preparedness staffing.** Any building or occupancy that prior to the effective date of this section obtained department approval of the voluntary installation of a fire alarm system with two-way voice communication and was required to provide a fire safety director or other specified emergency preparedness staffing shall maintain such staffing unless a higher level of staffing is required by this chapter.

**401.3.8 Cooperation.** All owners, employers of building occupants, and building occupants shall cooperate in the development and coordination of emergency preparedness plans.

## 401.4 Comprehensive fire safety/emergency action plan (Level 1)

**401.4.1 General.** The commissioner shall promulgate rules establishing standards, procedures and requirements for a written comprehensive fire safety and emergency action plan that addresses the safety of occupants of premises in the event of a fire, explosion, biological, chemical or nuclear incident or release, natural disaster, or other emergency, or the threat thereof, or a declaration of emergency by a lawful authority, and for the coordination of the emergency response to a medical emergency at the premises.

**401.4.2 Form.** The rules shall specify the form of the comprehensive fire safety and emergency action plan and supporting documentation.

**401.4.3 Content.** The rules shall specify the information to be contained in the comprehensive fire safety and emergency action plan, which shall include the following information and documentation, and/or such other information and documentation as the commissioner may prescribe:

1. The designation of an FLS director and other FLS staff, and their respective duties and responsibilities, including FLS staff responsible for the operation of building elevators, fire protection systems, mechanical ventilation systems, building utilities, and other building service equipment.

2. The procedures for reporting a fire or other emergency to the department, including the primary and alternative means of such reporting.

3. The procedures for coordinating with firefighting, emergency medical service and other emergency response personnel, including notifying such personnel upon arrival of the location of the emergency and the response thereto.

4. The means provided for receiving and monitoring public emergency notification systems in accordance with FC401.9.

5. The procedures for notifying building occupants of a fire or other emergency, including the primary and alternative means of such notification, the alarm or tone sounded to alert building occupants, and the information communicated to building occupants.

6. The actions to be taken in response to a fire and each type of non-fire emergency, and whether the response will require the sheltering in place, in-building relocation, partial or full evacuation of building occupants, or combination thereof, and the procedures for each such response.

7. The procedures for accounting for building occupants after such occupants have been in-building relocated, or partially or fully evacuated to a safe area.

8. The procedures for identifying any persons on the premises who are qualified and willing to provide cardio-pulmonary resuscitation or other emergency medical care to building occupants upon notification by the FLS director.

9. Site plans indicating the following:

9.1. Surrounding buildings and streets, including cross streets, and fire apparatus access roads.

9.2. The location of building occupant assembly areas.

10. A written description of the following building components and service equipment and their location, as applicable:

10.1. Access to and egress from the building, including entrances and exits.

10.2. Corridors and exit passageways providing access to exit stairwells or exit discharges.

10.3. Stairwells with letter designation.

10.4. Access and convenience stairs.

10.5. Elevators, with bank letter and car number designations.

10.6. Fire command center.

10.7. Floor warden and firefighter telephones.

10.8. Manual fire alarm boxes.

10.9. Fire department connections, and sprinkler and standpipe system control valves.

10.10. Areas of the building not protected by a sprinkler system.

10.11. Emergency power generators and associated fuel storage.

10.12. Evacuation and in-building relocation routes.

10.13. Areas of refuge and in-building relocation areas.

10.14. Any evacuation assistance devices.

10.15. Automatic external defibrillators required by law to be maintained for public use.

11. Sprinkler system and standpipe system riser diagrams, identifying the locations of the following, as applicable:

11.1. Water supply.

11.2. Fire department connections.

11.3. Gravity and pressure tanks.

11.4. Fire pumps.

11.5. Water supply control valves.

11.6. Piping, except branch sprinkler piping.

12. Locations of hazardous material storage in quantities requiring a permit, and hazardous material operations and facilities regulated by this code.

13. Procedures for identifying in advance building occupants who require assistance to participate in the plan because of an infirmity or disability or other special need, and approved procedures for providing for such assistance.

14. A fire safety maintenance program.

15. A building information card in accordance with FC401.3.4.

**401.4.4 Submission and acceptance.** Every comprehensive fire safety and emergency action plan shall be submitted to the department for acceptance in the manner prescribed by the department. Acceptance of such plans shall be obtained prior to occupancy of the building or occupancy.

**401.4.5 Fire and life safety staff.** The owner of any premises required by this chapter to have a comprehensive fire safety and emergency action plan shall designate competent persons to act as FLS staff, including a person designated to serve as FLS director. The owner shall employ or otherwise retain sufficient FLS staff to implement such plan during regular business hours and to otherwise comply with the requirements of this chapter and the rules. The persons designated as FLS staff shall possess such qualifications and/or hold such certificates of fitness as are required by this chapter or the rules.

**401.4.5.1 Fire and life safety director.** The comprehensive fire safety and emergency action plan shall designate an FLS director and deputy FLS directors who shall hold an FLS director certificate of fitness. The FLS director shall have the following duties and responsibilities and such other duties and responsibilities as the commissioner may prescribe by rule:

1. The FLS director shall be present in the building at all times during regular business hours. When the FLS director is absent during regular business hours, a deputy FLS director shall be present in the building and shall perform the duties of the FLS director. When a building other than a Group R-1 transient residential building or occupancy is occupied, but the number of building occupants falls below the level requiring the presence of an FLS director, the FLS building evacuation supervisor may perform the duties of the FLS director. The FLS director shall endeavor to ensure that adequate FLS staff is present during regular business hours, and, in the absence of designated staff, shall designate interim FLS staff.

2. In the event of a fire, a medical emergency or other non-fire emergency in the building, the FLS director shall report to the fire command center or designated alternative location; implement such fire safety and/or non-fire emergency actions as are warranted by the circumstances, in accordance with the provisions of the comprehensive fire safety and emergency action plan, this code and the rules; notify arriving emergency response personnel of the nature of the emergency and the response thereto; and comply with the directions of the emergency response personnel and/or other lawful authority.

3. The FLS director designated shall be fully familiar with the provisions of the comprehensive fire safety and emergency action plan and shall conduct the FLS staff training and fire and non-fire emergency drills required by FC 401.4.5.2 and 401.7.

**Exception:** FLS staff training and fire and non-fire emergency drills may be conducted by a person holding a certificate of fitness as FEP coordinator or fire drill conductor under the personal supervision of the FLS director.

**401.4.5.2 Training.** FLS staff shall be trained in the performance of their duties in accordance with the comprehensive fire safety and emergency action plan.

**401.4.5.2.1 Initial training.** FLS staff shall receive initial training in the contents of the comprehensive fire safety and emergency action plan upon their designation as FLS staff. Such training shall familiarize them with:

1. their duties in the event that it is necessary to implement fire safety or non-fire emergency actions in accordance with such plan; and

2. appropriate fire prevention measures for the occupancy.

**401.4.5.2.2 Refresher training.** With the exception of the FLS director, FLS staff shall receive, and participate in, periodic refresher training to maintain their state of readiness.

**401.4.5.2.3 Duration and frequency of training.** The duration and frequency of initial and refresher training of FLS staff shall be in accordance with FC Table 401.4.5.2.3.

**FC TABLE 401.4.5.2.3**
**FLS STAFF TRAINING**

| FLS STAFF MEMBER | INITIAL TRAINING DURATION | | REFRESHER TRAINING DURATION AND FREQUENCY | |
|---|---|---|---|---|
| | FIRE SAFETY | NON-FIRE EMERGENCY | FIRE SAFETY | NON-FIRE EMERGENCY |
| Deputy FLS directors (all occupancies) | Not applicable | Not applicable | 1 hour annually | 1 hour semiannually |
| FLS building evacuation supervisors | 2 hours | 3 hours | 1 hour annually | 1 hour semiannually |
| All other FLS staff | 1 hour | 2 hours | 1 hour annually | 1 hour annually |

**401.4.5.2.4 Training methods.** FLS staff training sessions shall be provided in the form of live instruction and, if desired, computerized training. At least one-half (½) of the FLS staff training sessions required each year shall be in the form of live instruction, which may incorporate video presentations and/or review of other educational materials. The balance of the required training sessions may be conducted in the form of approved computerized training, without live instruction, provided that such computerized training is interactive, and includes an evaluation of the FLS staff members' understanding of the training materials.

**401.4.5.2.5 Recordkeeping.** A written record of FLS staff training shall be maintained in the log book required by FC401.8. An entry shall be made in such log book for each training session conducted.

## 401.5 Fire and emergency preparedness plan (Level 2)

**401.5.1 General.** The commissioner shall promulgate rules establishing standards, procedures and requirements for a written fire and emergency preparedness plan that

provides for fire safety and non-fire emergency preparedness in buildings or occupancies of a lesser size, complexity, and/or risk vulnerability than those requiring a comprehensive fire safety and emergency action plan, and for the coordination of the emergency response to a medical emergency at the premises.

**401.5.2 Form.** Fire and emergency preparedness plans shall have a simplified, standardized format that allows for completion by persons without specialized qualifications. The rules promulgated by the commissioner shall specify the form of such plans and any supporting documentation.

**401.5.3 Content.** The rules promulgated by the commissioner shall specify the information to be contained in the fire and emergency preparedness plan, which shall include the following information and documentation, and/or such other information and documentation as the commissioner may prescribe:

1. The designation of the FEP coordinator, by name, certificate number and position at the premises, and other FEP staff, by name and/or position at the premises, and certificate number, if required.

2. The procedure by which a fire or other emergency is reported to the department, and the FEP staff responsible for ensuring such reporting.

3. The procedure for notifying building occupants of a fire or other emergency, and the FEP staff responsible for ensuring such notification.

4. The procedure for coordinating with firefighting, emergency medical service and other emergency response personnel, including notifying such personnel upon arrival of the location of the emergency and the response thereto, and the FEP staff responsible for such coordination.

5. The procedure for monitoring a public emergency notification system in accordance with FC401.9.

6. Procedures for identifying and assisting building occupants who require assistance because of an infirmity, disability or other special need.

7. Identification of fire prevention measures appropriate to the occupancy, to be included in staff training and drills, and the FEP staff or building staff responsible for addressing any unsafe conditions, including:

    7.1. Unobstructed and unimpeded access to means of egress.

    7.2. Proper storage and removal of combustible materials and combustible waste on the premises.

    7.3. Maintenance of decorative vegetation.

    7.4. Proper use of extension cords, outlets and electrical equipment.

7.5 Maintenance of sprinkler head clearances.

7.6 Posting and maintenance of "No Smoking" signs required by this code.

8. The procedure for the ongoing monitoring of the premises during regular business hours to verify compliance with the following requirements, and the FEP staff responsible for such monitoring:

8.1. Access to the means of egress is unobstructed and unimpeded.

8.2. The premises does not become overcrowded.

8.3. Allowable use of open flames and open-flame devices is being conducted properly and safely.

8.4. The prohibition against smoking, where required by this code or the rules, is being observed.

**401.5.4 Submission and acceptance.** Fire and emergency preparedness plans prepared for a high-rise building or a large-area building shall be submitted for department acceptance, prior to occupancy of the building or occupancy, in the manner prescribed by the department. All other fire and emergency preparedness plans shall be maintained on the premises and made available for review by a department representative. If such plan is unavailable or determined to be deficient, the department may order that a plan prepared in compliance with this chapter and the rules be submitted to the department for acceptance. Nothing contained herein shall preclude the department from establishing by rule a procedure for the on-line preparation and filing of all fire and emergency preparedness plans required pursuant to this chapter.

**401.5.5 Fire and emergency preparedness staff.** The owner of any premises required by this chapter to have a fire and emergency preparedness plan shall designate competent persons to act as FEP staff, including a person designated to serve as the FEP coordinator pursuant to FC401.5.5.1. An owner of such a premises shall not be required to employ or otherwise retain staff solely for purposes of complying with the requirements of this chapter, but shall designate persons employed or otherwise working at the premises to serve as FEP staff and assign them the duties and responsibilities necessary to implement the fire and emergency preparedness plan and otherwise comply with the requirements of this chapter and the rules.

**401.5.5.1 Fire/emergency preparedness coordinator.** A manager or other responsible FEP staff member employed at the premises shall be designated in the fire and emergency preparedness plan as the FEP coordinator and shall hold an FEP coordinator certificate of fitness. A person holding a certificate of fitness as an FLS director may serve as the FEP coordinator without obtaining a separate certificate of fitness. The FEP coordinator shall have the following duties and responsibilities and such other duties and responsibilities as the commissioner may prescribe by rule:

1. The FEP coordinator shall be fully familiar with the provisions of the fire and emergency preparedness plan and shall conduct the FEP staff training and fire and non-fire emergency drills required by FC 401.5.5.2 and 401.7.

**Exception:** FEP staff training and fire and non-fire emergency drills may be conducted by a person holding a certificate of fitness as fire drill conductor under the general supervision of the FEP coordinator.

2. The FEP coordinator need not be personally present on the premises during regular business hours, but shall be responsible for overseeing and monitoring the performance of the duties and responsibilities of the FEP staff set forth in the fire and emergency preparedness plan.

3. The FEP coordinator shall endeavor to ensure that adequate FEP staff is present during regular business hours, and, in the absence of designated FEP staff, shall designate interim FEP staff.

**401.5.5.2 Training.** FEP staff shall be trained in the performance of their duties in accordance with the fire and emergency preparedness plan.

**401.5.5.2.1 Initial training.** FEP staff shall receive 1 hour of initial training in the fire and emergency preparedness plan upon their designation as FEP staff. Such training shall familiarize them with:

1. their duties in the event the fire and emergency preparedness plan is implemented; and

2. appropriate fire prevention measures for the occupancy.

**401.5.5.2.2 Refresher training.** With the exception of the FEP coordinator, FEP staff shall receive 30-minutes quarterly refresher training.

**401.5.5.2.3 Training methods.** FEP staff training shall be provided in the manner set forth in FC401.4.5.2.4.

**401.5.5.2.4 Recordkeeping.** A written record of FEP staff training shall be maintained in the log book required by FC401.8. An entry shall be made in such log book for each training session conducted.

## 401.6 Fire and emergency preparedness guide and notices (Level 3)

**401.6.1 General.** The commissioner shall promulgate rules establishing standards, procedures and requirements for a:

1. fire and emergency preparedness guide that serves to inform building occupants and building staff about the building, fire prevention measures and fire and non-fire emergency preparedness; and/or

2. fire and non-fire emergency notices that serve to inform building occupants, building staff and visitors as to whether to shelter in place or evacuate the building, and other procedures to be followed in the event of a fire or non-fire emergency.

**401.6.2 Form.** The fire and emergency preparedness guide and notices shall be in such form as prescribed by the commissioner by rule.

**401.6.3 Content.** The rules promulgated by the commissioner shall specify the information to be contained in the fire and emergency preparedness guide and notices, which shall include the following information, and/or such other information and documentation as the commissioner may prescribe:

1. Fire and Emergency Preparedness Guide.

1.1. Construction type.

1.2. Fire protection systems.

1.3. Voice communication systems.

1.4. Means of egress.

1.5. Guidance with respect to sheltering in place, evacuation and other procedures to be followed in the event of fire or non-fire emergency.

1.6. Lessons learned from fires in similar occupancies.

1.7. Medical emergencies.

2. Fire and Emergency Preparedness Notices.

2.1. Construction type.

2.2. Guidance with respect to sheltering in place, evacuation and other procedures to be followed in the event of fire or non-fire emergency.

**401.6.4 Distribution and posting.** The fire and emergency preparedness guide shall be distributed to building occupants and building service employees as set forth in the rules. The fire and emergency preparedness guide shall be posted within each dwelling unit and at such other locations as set forth in the rules.

**401.6.5 Occupancy-specific requirements.** The form, content, distribution and posting of the fire and emergency preparedness guide and notices may vary by occupancy. Occupancies required to prepare a fire and emergency preparedness guide and/or notices shall be as set forth in this chapter or the rules.

**401.7 Drills and education for fire and non-fire emergencies.** Fire and non-fire emergency drills and education shall be conducted, in the manner prescribed in this section and the rules, in

buildings and occupancies required to have an emergency preparedness plan pursuant to this chapter, except Group R-2 apartment buildings and occupancies, and in such other buildings and occupancies as provided in this chapter.

**401.7.1 Content.** Drills and other forms of education shall be conducted to enhance the fire and non-fire emergency preparedness of building occupants, including building staff and employees of building tenants. Drills shall serve to familiarize building occupants as to the proper actions to take in the event of a fire or other emergency, the primary and secondary evacuation and in-building relocation routes, and fire prevention measures appropriate to the occupancy. The commissioner shall promulgate rules prescribing standards, procedures and requirements for the conduct of fire and non-fire emergency drills and educational sessions, including their subject matter and duration. Drills shall be in the form of live instruction, except as authorized by the rules.

**401.7.2 Combined drills and education.** A single drill or educational session shall address both fire and non-fire emergency preparedness. All drills and educational sessions shall make mention that different directions may be given to building occupants depending upon whether there is a fire or other emergency, and the nature of the non-fire emergency.

**401.7.3 Timing.** Drills shall be conducted at varying times of day and during all work shifts.

**401.7.4 Participation in drills and education.** Except as otherwise provided in this chapter, all building occupants shall participate in fire and non-fire emergency drills and education, including building staff and FLS or FEP staff with responsibility for the portions of the building or occupancy undergoing such drill or education.

**401.7.5 Alarm activation.** The fire alarm system shall be activated each time a fire drill or non-fire emergency drill is conducted to initiate the drill and familiarize building occupants with the alarm tones. Nothing in this code shall be construed to prohibit the activation of the fire alarm signal for the purposes of conducting a fire drill or a non-fire emergency drill.

**Exception:** In buildings or occupancies in which all building occupants are not required by this code to participate in the drill, the fire alarm system need not be activated to initiate the drill, provided that, in accordance with the rules, another means is employed to familiarize those building occupants participating in the drill with the fire alarm tones that would be sounded in the event of an actual emergency.

**401.7.6 Frequency.** The frequency of required combined fire and non-fire emergency drills for each type of occupancy shall be in accordance with FC Table 401.7.6.

**FC TABLE 401.7.6**
**DRILL PARTICIPATION AND FREQUENCY**

| TYPE OF BUILDING OR OCCUPANCY | REQUIRED PARTICIPATION | FREQUENCY |
|---|---|---|
| Group A | Regular building occupants. Participation of patrons, guests and visitors not required. | Semiannually |
| Group M | | |
| Group R-1, except homeless shelters and dormitories[a] | | |
| Group R-1 homeless shelters and emergency shelters | All building occupants | Monthly |
| Group B office[a] | All building occupants | Semiannually |
| Group B colleges and universities | All building occupants | In accordance with New York State |

| | | |
|---|---|---|
| Group E educational<br>Group R-1 dormitory | | Education Law |
| Group E day care facilities | All building occupants | Monthly |
| Group F | All building occupants | Monthly |
| Group H | All building occupants | Semiannually |
| Group I-1 | All building occupants | Bimonthly[b] |
| Group I-2 | Regular building occupants.<br>Participation of patients and visitors not required. | Semiannually |
| Group S | Regular building occupants.<br>Participation of visitors not required. | Semiannually |

a. In the 2 years following acceptance of a comprehensive fire safety and emergency action plan, drills shall be conducted quarterly.
b. In the first year of occupancy of an I-1 building or occupancy, drills shall be conducted monthly.

**401.7.7 Non-fire emergency education.** When required by this chapter, building occupants shall receive non-fire emergency education. In buildings and occupancies in which non-fire emergency drills are not conducted, such education shall consist of the distribution of educational materials explaining the different types of non-fire emergencies and the types of responses to such emergencies, including sheltering in place, relocating within the building, or evacuating the building. Such materials shall be distributed to building staff and employees of building tenants prior to their commencing work at the premises.

**401.7.8 Recordkeeping**. Drills and education shall be documented by entries in the logbook required to be maintained in accordance with FC401.8.

**401.8 Emergency preparedness recordkeeping.** Buildings and occupancies required to have an emergency preparedness plan pursuant to this chapter, except buildings and occupancies required to prepare a fire and emergency guide and notice, shall maintain a log book in accordance with this section.

**401.8.1 General.** A log book or other approved system of recordkeeping shall be maintained for purposes of documenting emergency preparedness.

**401.8.2 Format.** A bound log book with consecutive numbered pages, an approved electronic format, or other approved form of recordkeeping, shall be maintained in accordance with the requirements of FC107.7.

**401.8.3 Entries.** Entries shall be made in the log book to document drills, education, staff training, plan review and amendment, plan implementation and/or such other information as the commissioner may require by rule.

**401.9 Access to public emergency notification systems.** While performing the duties of such position, FLS directors and FEP coordinators shall have access to NYC Notify, CorpNet or such other approved public emergency notification system providing notice of New York City emergencies as the commissioner may prescribe by rule. Such access may be by means of any portable or desktop device readily available for use on the premises under their supervision. The commissioner may prescribe by rule buildings and occupancies in which FLS directors and FEP coordinators shall have access to a public emergency notification system.

**401.10 Periodic inspection.** Any building, occupancy, or part thereof required to have a comprehensive fire safety and emergency action plan, fire and emergency preparedness plan,

and/or a public gathering site plan pursuant to the provisions of this chapter or the rules shall be subject to periodic fire safety inspection by the department, including inspection of any such plan to confirm that it has been prepared and/or implemented in compliance with the requirements of this chapter and the rules.

**401.11 Workplace exit inspections.** In addition to any other inspections that the department may conduct, the department shall inspect Group M occupancies to determine whether workplace exits are locked in violation of Section 1001.3.1 of the Building Code. A minimum of fifty unannounced inspections shall be conducted each year. Such inspections shall include, but not be limited to, premises at which violations of such section are known or suspected to have occurred.

## SECTION FC 402
## DEFINITIONS

**402.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

**ASSEMBLY AREA.** A designated area outside of a building to which building occupants are directed to report upon implementation of a partial or full evacuation in accordance with a comprehensive fire safety and emergency action plan or a fire and emergency preparedness plan.

**BUILDING OCCUPANTS.** All persons in the building, including employees, building staff and visitors.

**EMERGENCY SHELTER.** The temporary use and occupancy of a premises, or part thereof, including but not limited to armories, auditoriums, community centers, gymnasiums, houses of worship and schools, that are not designed to be occupied for emergency housing, but are authorized by the Department of Buildings to be operated and/or occupied for such purposes for more than fifteen persons for more than 30 consecutive days.

**EVACUATION.** The emptying of a building or part thereof of building occupants in response to a fire or non-fire emergency.

**FEP**. Fire and emergency preparedness.

**FEP STAFF.** The individuals identified in a fire and emergency preparedness plan as responsible for the implementation of such plan, including but not limited to FEP coordinators.

**FLS**. Fire and life safety.

**FLS STAFF.** The individuals required to implement a comprehensive fire safety and emergency action plan, as identified in such plan, including but not limited to the FLS director, deputy FLS director, members of the FLS brigade and any staff designated as critical operations staff.

**FIRE DRILL.** A training exercise by which building occupants are familiarized with and/or practice the procedures for the safe, orderly and expeditious sheltering in place, in-building relocation, partial or full evacuation, or any combination thereof, in the event of a fire, in accordance with the emergency preparedness plan for the premises.

**HIGH-RISE BUILDING.** Any building designed or constructed in accordance with the 1968 Building Code, any prior Building Code, or other applicable laws, rules and regulations, that is more than six stories or 75 feet (22 860 mm) in height, and any building designed or constructed in accordance with the Building Code that has one or more occupied floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle apparatus access.

**HIGH-RISE FLOOR.** Any occupied floor in a high-rise building that is at or above the height that causes such building to be classified as a high-rise building.

**IN-BUILDING RELOCATION.** The controlled movement of building occupants from an endangered area of a building to an in-building relocation area within the same building in response to a fire or non-fire emergency.

**IN-BUILDING RELOCATION AREA.** A designated area in a building to which building occupants may be relocated in accordance with the emergency preparedness plan for the premises.

**LARGE-AREA BUILDING**. A building that is not a high-rise building, but is either a Group B office building within the meaning of Section 907.2.2.2 of the Building Code that has a total gross area of more than 100,000 square feet (9290 $m^2$) or a building of an occupancy type other than Group R-2 or Group R-3 that has a total gross area of more than 100,000 square feet (9290 $m^2$).

**MIXED-OCCUPANCY BUILDING.** A building or structure housing more than one occupancy or type of occupancy required by this chapter to prepare an emergency preparedness plan.

**NON-FIRE EMERGENCY.** A biological, chemical or nuclear incident or release; declaration of emergency by a lawful authority; explosion; medical emergency; natural disaster; or other emergency affecting the premises or the safety of building occupants.

**NON-FIRE EMERGENCY DRILL.** A training exercise by which building occupants are familiarized with and/or practice the procedures for safe, orderly and expeditious sheltering in place, in-building relocation, partial or full evacuation, or combination thereof, in the event of a non-fire emergency, in accordance with the emergency preparedness plan for the premises.

**OFFICE BUILDING.** A Group B occupancy designed and arranged to provide offices and other areas for the conduct of business ordinarily conducted in offices.

**REGULAR BUSINESS HOURS.** Times of day and days of the week during which a building or occupancy is normally occupied and business is conducted, and any time when a building or occupancy required to have a comprehensive fire and emergency action plan is occupied by more than five hundred persons, or more than one hundred persons above or below the street level. The number of persons employed in a building or occupancy during regular business hours shall be computed based on the work shift or other regular work schedule during which the largest number of employees or other persons working at the premises are present at the premises.

**SHELTER IN PLACE.** The precaution of directing building occupants to remain indoors, at their present location, in response to a fire or non-fire emergency.

**VOICE COMMUNICATION CAPABILITY.** The ability to communicate to the occupants of a building or occupancy by means of a fire alarm system with one-way or two-way voice communication.

## SECTION FC 403
## PUBLIC GATHERINGS

**403.1 General.** The commissioner may establish requirements to ensure fire safety at indoor and outdoor public gatherings, including arcades, bazaars, cafes, carnivals, displays, entertainment, exhibits, rooftop events and street fairs. Such requirements may include preparation and submission to the department of a site plan, including identification of materials, operations and facilities regulated by the Fire Code that will be stored, conducted or maintained in conjunction with the public gathering; pre-event fire safety inspection; provision of fire guards or other qualified personnel; and provision and maintenance of fire apparatus access, and of aisles and other means of access to and egress from the public gathering. Persons conducting such fire watch shall have the duties and responsibilities set forth in FC901.7.2.1 with respect to the areas being monitored in connection with public gatherings. The commissioner may conduct periodic inspections of public gathering places that are used or frequented on a regular basis.

**403.2 Overcrowding prohibited.** Overcrowding shall not be caused, maintained or allowed in any indoor or outdoor area or space used for public gatherings.

**403.3 Limitations on standing.** Where the Building Code, certificate of occupancy or approved seating plan allows audience members to stand at performing arts or other indoor or outdoor events at which seating is provided for the audience, standing areas shall be maintained in accordance with FC407.5.

## SECTION FC 404
## OFFICE BUILDINGS

**404.1 General.** Group B office buildings and occupancies shall comply with the emergency preparedness requirements set forth in FC 401, 416 and this section.

**404.2 Emergency preparedness in office buildings and occupancies with comprehensive fire safety/emergency action plans.** Group B office buildings and occupancies required by FC404.2.1 to have a comprehensive fire safety and emergency action plan shall comply with the emergency preparedness requirements of this section.

**404.2.1 Comprehensive fire safety/emergency action plan (Level 1).** A comprehensive fire safety and emergency action plan in accordance with FC401.4 shall be prepared for:

1. a high-rise or large-area Group B office building occupied or designed to be occupied by more than five hundred persons, or more than one hundred persons above or below the street level.

2. a Group B office occupancy occupied or designed to be occupied by a total of more than one hundred persons on one or more high-rise floors.

3. any other Group B office building, and any other Group B office occupancy, occupied or designed to be occupied by more than five hundred persons, or more than one hundred persons above or below the street level, that was required to have a fire safety director under the New York City Fire Prevention Code or this code prior to the effective date of this section.

4. any other Group B office building or occupancy as to which the commissioner determines that preparation of such a plan is in the interest of public safety given the location, use or occupancy of the building.

**Exception:** Office buildings and occupancies subject to FC404.2.1(1) and (2) that have lawfully installed an interior fire alarm system.

**404.2.2 Fire and life safety staff.** The comprehensive fire safety and emergency action plan required by FC401.4 shall designate FLS staff consisting of an FLS director, deputy FLS directors, FLS building evacuation supervisors, FLS wardens, deputy FLS wardens, FLS brigade members and searchers, to exercise the authority and perform the duties of their respective FLS assignments. FLS staff shall be provided with initial and refresher FLS staff training in accordance with FC401.4.5.2. FLS brigade members shall be trained in the use of portable fire extinguishers.

**404.3 Emergency preparedness in office buildings and occupancies with fire and emergency preparedness plans.** Group B office buildings and occupancies required by FC404.3.1 to have a fire and emergency preparedness plan shall comply with the emergency preparedness requirements of this section.

**404.3.1 Fire and emergency preparedness plan (Level 2).** A fire and emergency preparedness plan in accordance with FC401.5 shall be prepared for a Group B office building or occupancy occupied or designed to be occupied by more than five hundred persons, or more than one hundred persons above or below street level, other than buildings and occupancies subject to FC404.2.

**404.3.2 Fire and emergency preparedness staff.** The commissioner may prescribe by rule that, in Group B office buildings and occupancies that are provided with voice communication capability (other than buildings and occupancies subject to FC404.2), there shall be present during regular business hours one or more members of the FEP staff required pursuant to FC401.5.5 who hold a certificate of fitness for emergency announcements and other fire safety duties.

## SECTION FC 405
## HOTELS, MOTELS AND OTHER TRANSIENT RESIDENTIAL OCCUPANCIES

**405.1 General.** Group R-1 buildings and occupancies, including any hotel, motel, boarding house, hostel and single room occupancy, shall comply with the emergency preparedness requirements set forth in FC 401, 405.2, 405.3, 405.5 and 416.

Exceptions:

1. Homeless shelters and emergency shelters, which shall comply with FC 401, 405.4, 405.5 and 416.

2. Dormitories operated by or affiliated with educational institutions, which shall comply with the requirements of FC 401, 410 and 416.

**405.2 Emergency preparedness in transient residential buildings and occupancies with comprehensive fire safety/emergency action plans.** Group R-1 residential buildings and occupancies required by FC405.2.1 to have a comprehensive fire safety and emergency action plan shall comply with the emergency preparedness requirements of this section.

**405.2.1 Comprehensive fire safety/emergency action plan (Level 1).** A comprehensive fire safety and emergency action plan in accordance with FC401.4 shall be prepared for:

1. a high-rise Group R-1 residential building, including hotels and club houses providing similar accommodation.

2. a Group R-1 residential building with a total of more than fifty sleeping rooms above street level, or communal sleeping facilities above street level occupied or designed to be occupied by a total of more than fifty lodgers, and which is provided with voice communication capability.

**405.2.2 Fire and life safety staff.** The comprehensive fire safety and emergency action plan required by FC405.2.1 shall designate FLS staff consisting of an FLS director, deputy FLS directors and a sufficient number of FLS brigade members to exercise the authority and perform the duties of their respective FLS assignments. FLS staff shall be provided with initial and refresher FLS staff training in accordance with FC401.4.5.2. FLS brigade members shall be trained in the use of portable fire extinguishers.

**405.3 Emergency preparedness in transient residential buildings and occupancies with fire and emergency preparedness plans.** Group R-1 residential buildings and occupancies required by FC405.3.1 to have a fire and emergency preparedness plan shall comply with the emergency preparedness requirements of this section.

**405.3.1 Fire and emergency preparedness plan (Level 2).** A fire and emergency preparedness plan in accordance with FC401.5 shall be prepared for a Group R-1 residential building or occupancy (other than buildings and occupancies subject to FC405.2) with a total of more than thirty sleeping rooms, or more than fifteen sleeping rooms above street level, or communal sleeping facilities occupied or designed to be occupied by a total of more than thirty lodgers, or more than fifteen lodgers above the street level.

**405.3.2 Fire and emergency preparedness staff.** The commissioner may prescribe by rule that in Group R-1 buildings and occupancies provided with voice communication capability (other than buildings and occupancies subject to FC405.2) there shall be present during regular business hours one or more members of the FEP staff required pursuant to FC401.5.5 who hold a certificate of fitness for emergency announcements and other fire safety duties.

**Exception:** Any Group R-1 residential building or occupancy provided with voice communication capability that was required by the New York City Fire Prevention Code or this code prior to the effective date of this section to have a fire safety director present in the building during regular business hours shall retain such staffing.

**405.4 Emergency preparedness in homeless shelters and emergency shelters.** Group R-1 residential buildings or occupancies operated or occupied as a homeless shelter, and any emergency shelter, shall comply with the emergency preparedness requirements of this section.

**405.4.1 Comprehensive fire safety/emergency action plan (Level 1).** A comprehensive fire safety and emergency action plan in accordance with FC401.4 shall be prepared for:

1. a high-rise Group R-1 homeless shelter.

2. a Group R-1 homeless shelter that is provided with voice communication capability, and either has a total of more than fifty rooms above street level or has communal sleeping facilities above street level occupied or designed to be occupied by a total of more than fifty lodgers.

**405.4.2 Fire and life safety staff.** The comprehensive fire safety and emergency action plan required by FC405.4.1 shall designate fire and life safety staff in accordance with FC405.2.2.

**405.4.3 Fire and emergency preparedness plan (Level 2).** A fire and emergency preparedness plan in accordance with FC401.5 shall be prepared for a Group R-1 building or occupancy operated or occupied as a homeless shelter (other than buildings and occupancies subject to FC405.4.1), and any emergency shelter.

**405.4.4 Fire and emergency preparedness staff.** The fire and emergency preparedness plan required by FC405.4.3 shall designate an FEP shelter coordinator and a sufficient number of deputy FEP shelter coordinators, with such qualifications, duties and authority as set forth in the rules.

**405.4.4.1 FEP shelter coordinator.** The FEP shelter coordinator and deputy FEP shelter coordinators designated in the fire and emergency preparedness plan shall hold an FEP shelter coordinator certificate of fitness, and shall have the following duties and responsibilities and such other duties and responsibilities as prescribed by rule:

1. The FEP shelter coordinator shall be present in the building at all times while the building is occupied. When the FEP shelter coordinator is absent, a deputy FEP shelter coordinator shall be present in the building and shall perform the duties of the FEP shelter coordinator.

2. In the event of a fire, a medical emergency or other non-fire emergency, the FEP shelter coordinator shall report to the fire command center or designated alternative location, and, if appropriate, implement the fire and emergency preparedness plan in accordance with its terms and the provisions of the rules, and notify arriving emergency response personnel and incident commander of the fire or non-fire emergency, the building response thereto, and the building's fire protection systems.

3. The FEP shelter coordinator and deputy FEP shelter coordinators designated shall be fully familiar with the provisions of the fire and emergency preparedness plan. The FEP shelter coordinator shall conduct staff training and fire and non-fire emergency drills required by FC401.

**405.4.5 Fire guard patrols in emergency shelters.** Buildings or parts thereof occupied or operated to be occupied by emergency shelters shall be continuously patrolled by a fire guard. Every area of the building shall be patrolled at least once every hour.

**405.5 Fire and emergency notice.** There shall be posted on or immediately adjacent to the main entrance door of guest rooms in Group R-1 buildings and occupancies and any emergency shelter a notice that provides the following information and guidance to building occupants, and/or such other information as the commissioner may prescribe by rule:

1. A visual representation of the location to each exit stairwell, the route thereto, and the number of doors opening onto the public corridor that must be passed to reach each such stairwell.

2. Location of manual fire alarm boxes.

3. A written description and/or visual representation of the procedures to be followed in the event of a fire, smoke condition or other emergency.

## SECTION FC 406
## APARTMENT BUILDINGS

**406.1 General.** Apartment buildings and other Group R-2 buildings and occupancies shall comply with the emergency preparedness requirements set forth in FC 401, 416 and this section.

**406.2 Emergency preparedness in apartment buildings.** Apartment buildings and other Group R-2 buildings and occupancies shall comply with the following emergency preparedness requirements:

**406.2.1 Fire emergency preparedness guide and notices (Level 3).** Fire and emergency preparedness guide and notices in accordance with FC401.7 and the rules shall be prepared, and periodically reviewed and amended, for a Group R-2 building or occupancy.

**406.2.2 Non-sequential or non-standard floor numbering.** The commissioner shall promulgate rules establishing requirements for the electronic submission of floor numbering lists to the department by owners of Group R-2 buildings or occupancies that are 150 feet (45

720 mm) or more in height, and such other occupancies as the commissioner may designate by rule. Such rules shall provide that each owner of a building with non-sequential or non-standard floor numbering, as defined by rule, shall submit to the department a floor numbering list indicating the floor numbers assigned to each floor, and submit an amended floor numbering list within 2 business days of a change in any floor numbering designation.

**406.3 Responsibility of cooperative or condominium apartment owners.** In Group R-2 buildings and occupancies with a cooperative or condominium form of ownership and management, the board of directors, condominium association or other party generally responsible for maintenance of common areas shall be responsible for the preparation and distribution of the fire and emergency preparedness guide, the posting and maintenance of fire and emergency preparedness notices in common areas, and the preparation and distribution to individual dwelling unit owners or proprietary lessees of fire and non-fire emergency notices for dwelling unit doors, including instructions and the means for affixing the notice. The owners or proprietary lessees of the individual units in such residential buildings or parts thereof shall be responsible for the posting and maintenance of the fire and non-fire emergency notice on their respective dwelling unit doors.

## SECTION FC 407
## ASSEMBLY OCCUPANCIES

**407.1 General.** Group A occupancies and public gathering places, other than Group A occupancies operated or occupied exclusively for purposes of religious worship that have an occupant load less than two thousand, shall comply with the emergency preparedness requirements set forth in FC 401, 416 and this section. Such occupancies and places shall additionally comply with fire safety precautions required pursuant to FC403.1.

**407.2 Emergency preparedness in assembly occupancies with comprehensive fire safety/emergency action plans.** Group A occupancies required by FC407.2.1 to have a comprehensive fire safety and emergency action plan shall comply with the emergency preparedness requirements of this section.

**407.2.1 Comprehensive fire safety/emergency action plan (Level 1).** A comprehensive fire safety and emergency action plan in accordance with FC401.4 shall be prepared for a Group A building with an occupancy of five thousand or more persons, or any other building or structure that houses one or more Group A occupancies where the combined occupancy of such Group A occupancies is five thousand or more persons.

**407.2.2 Fire and life safety staff.** The comprehensive fire and emergency action plan required by FC407.2.1 shall designate FLS staff consisting of an FLS director, deputy FLS directors and a sufficient number of FLS brigade members, to exercise the authority and perform the duties of their respective FLS assignments. FLS staff shall be provided with initial and refresher FLS staff training in accordance with FC401.4.5.2. The commissioner may prescribe by rule that there be present during regular business hours one or more members of the FLS staff who hold a certificate of fitness for crowd management and other fire safety duties.

**407.3 Emergency preparedness in assembly occupancies with fire and emergency preparedness plans.** Group A buildings or occupancies and public gathering places that are required by FC407.3.1 to have a fire and emergency preparedness plan shall comply with the emergency preparedness requirements of this section.

**407.3.1 Fire and emergency preparedness plan (Level 2).** A fire and emergency preparedness plan in accordance with FC401.5 shall be prepared for a Group A building or occupancy or public gathering place not subject to FC407.2 that:

1. is designed to be occupied by three hundred or more persons;

2. is provided with voice communication capability;

3. has a stage or in which entertainment or other activities that are the focus of attention are regularly conducted;

4. is occupied or designed to be occupied as a ballroom, dance hall or night club; or

5. is occupied or designed to be occupied as a bar, catering hall, restaurant or similar establishment, on one or more high-rise floors, including any rooftop area.

**407.3.2 Fire and emergency preparedness staff.** The commissioner may prescribe by rule that in Group A buildings or occupancies and public gathering places that there be present during regular business hours one or more members of the FEP staff required pursuant to FC401.5.5 who hold a certificate of fitness for crowd management and other fire safety duties.

**407.3.3 Assembly spaces without staff.** Halls or other assembly spaces that are rented or otherwise made available for events without dedicated staff, such as social halls in houses of worship and community organizations, are not required to prepare a fire and emergency preparedness plan pursuant to FC407.3.1.

**407.4 Seating plan.** A copy of the seating plan required for Group A occupancies by the Building Code shall be submitted to the department prior to occupancy. A seating plan depicting the arrangement of seating in a place of assembly, location of aisles and such other information as may be required by rule shall be submitted to the Department for its review and approval. A copy of the approved seating plan shall be maintained on the premises and made available for inspection by any department representative.

**407.5 Limitations on standing in Group A occupancies and public gatherings.** Where the Building Code, certificate of occupancy or approved seating plan allows audience members to stand at performing arts or other indoor or outdoor events at which seating is provided for the audience, standing areas shall be maintained in accordance with FC 407.5.1 through 407.5.4.

**407.5.1 Standing areas to be indicated.** The space to be occupied by standing audience members shall be separated from the space to be left clear for passage by a rope, tape or other thin material at a height of not less than 3 feet (914 mm) nor more than 4 feet (1219 mm) above the floor, supported by lightweight posts, all to be constructed and placed so as not to

constitute an obstruction in case of panic or emergency. Such standing areas shall be clearly demarcated by durable markings on the floor indicating the boundaries of the standing area.

**407.5.2 Standing in aisles.** It shall be unlawful to stand, or allow any person to stand, in or at the head of an aisle.

**407.5.3 Standing in passageways.** Standing is authorized in Group A occupancies and public gathering places in accordance with the following requirements.

1. If the passageway is more than 6 feet (1829 mm) and less than 16 feet (4877 mm) deep, persons may stand therein, provided an unobstructed passageway of at least 6 feet (1829 mm) in depth is left open, and there are no more than four rows of persons standing.

2. If the passageway is more than 16 feet (4877 mm) deep, any number of persons or rows of persons may stand therein, provided that an unobstructed passageway of at least 10 feet (3048 mm) in depth is left open.

3. In places of assembly having a passageway to the rear of the seats, 6 feet (1829 mm) or less in depth, and having in addition an outer passageway in the rear thereof, to which all aisle heads have straight and direct access, a maximum of two rows of persons may be permitted to stand in the passageway to the rear of such seats.

**407.5.4 Standing in balconies.** Only one row of persons shall be allowed to stand in balconies.

**407.6 Announcements.** In performing arts theaters or motion picture theaters, and in any other Group A occupancy in which there is a non-continuous performance or program, other than an occupancy regularly attended by the same audience, an audible announcement shall be made not more than 10 minutes prior to the start of each performance or program informing the occupants of the location of the exits to be used in the event of a fire or other emergency, provided, however, that in any theater the announcement may be projected upon a screen or other surface approved by the commissioner in a manner approved by the commissioner. Notwithstanding the foregoing, the commissioner may grant an exception from such requirement upon a determination that the occupancy has at least one exit clearly visible from every seat or standing area from which members of the audience are authorized to view the performance.

**407.7 Trade shows.** The owner of any Group A occupancy wherein a trade show or other similar temporary exhibition is to be conducted shall, at least one month before the date of such exhibition, submit to the department a written notice and a plan containing the following information and such other information and documentation as the commissioner may prescribe:

1. The dates, times, location, and nature of the trade show or other exhibition, and whether the event will be open to the public or restricted to the trade.

2. The design and arrangement of the trade show or other exhibition, including aisles, display booths, decorations and drapes, and equipment using any hazardous material or open flame.

## SECTION FC 408
## ASSISTED LIVING FACILITIES AND SIMILAR OCCUPANCIES

**408.1 General**. Assisted living facilities, adult homes, community residences, congregate care facilities, enriched housing, halfway houses, intermediate care facilities, residential care facilities, social rehabilitation facilities, substance abuse rehabilitation centers and other Group I-1 buildings and occupancies in which building occupants are capable of self-preservation and capable of responding to a fire or other emergency without assistance from others shall comply with the emergency preparedness requirements set forth in FC 401, 416 and this section.

**408.2 Emergency preparedness in assisted living facilities and similar occupancies with fire and emergency preparedness plans (Level 2).** A fire and emergency preparedness plan in accordance with FC401.5 shall be prepared for a Group I-1 building or occupancy with more than twenty-five persons above or below street level.

**408.3 Fire and emergency preparedness staff.** The commissioner may prescribe by rule that in Group I-1 buildings or occupancies provided with voice communication capability there shall be present during regular business hours one or more members of the FEP staff required pursuant to FC401.5.5 who hold a certificate of fitness for emergency announcements and other fire safety duties.

**408.4 Special drill requirements.** In addition to the requirements of FC401.7, persons residing in Group I-1 occupancies shall:

1. participate in a full building evacuation on an annual basis.

2. if capable of participating in an evacuation or in-building relocation without assistance, be trained to provide assistance to other such residents to the extent that their physical and mental abilities permit them to do so without additional personal risk.

**408.5 Fire and emergency notice.** A fire and emergency notice in accordance with FC405.5 shall be posted within each dwelling unit in the building or occupancy, on or immediately adjacent to the main entrance door to the dwelling unit.

## SECTION FC 409
## CORRECTIONAL FACILITIES AND OTHER SECURED FACILITIES

**409.1 General.** Correctional facilities, secure psychiatric hospitals and other Group I-3 buildings and occupancies (including prisons, detention centers and pre-release centers) regulated by New York State Department of Correctional Services or the New York State Education Department, shall maintain the emergency preparedness staff and conduct the drills required by the regulations of the New York State Department of Correctional Services, and otherwise comply with the requirements of such regulations.

**409.2 Staffing and staff training**. The following staffing and staff training shall be provided in Group I-3 buildings and occupancies:

**409.2.1 Staffing.** In Group I-3 occupancies, staff trained in emergency preparedness procedures shall be in the building at all times, and within three floors or 300 feet (91 440 mm) horizontal distance of the access door of each resident housing area. Keys necessary for unlocking doors installed in a means of egress shall be individually identifiable by both touch and sight. When movement of occupants from one smoke compartment to another or egress from the building is impeded by staff-controlled manual releases, the staff responsible for controlling such movement or egress must be continuously available to initiate emergency procedures within 2 minutes of an alarm.

**Exception:** Staff shall not be required to be located within three floors or 300 feet (9144 mm) of areas in which all locks may be unlocked automatically in accordance with Section 408.4 of the Building Code.

**409.2.2 Staff training.** The staff responsible for emergency preparedness procedures in Group I-3 occupancies shall be trained in the use of portable fire extinguishers and other manual fire extinguishing equipment.

**409.2.3 Notification.** Provision shall be made to promptly notify emergency preparedness staff of a fire or non-fire emergency.

## SECTION FC 410
## EDUCATIONAL OCCUPANCIES

**410.1 General.** Schools, colleges, universities and other Group B and Group E educational buildings and occupancies; Group R-1 dormitories operated by or on behalf of educational institutions; and Group E day care facilities shall comply with the emergency preparedness requirements set forth in FC 401, 416 and this section.

**410.2 Day care plans**. Group E educational buildings and occupancies regulated by the New York City Department of Health and Mental Hygiene shall prepare and maintain a written safety plan addressing fire safety, medical emergencies and evacuation procedures, in compliance with the rules or other requirements of that agency.

**410.3 Emergency preparedness in Group B educational occupancies with comprehensive fire safety/emergency action plans.** Group B educational buildings and occupancies required by FC410.3.1 to have a comprehensive fire safety and emergency action plan shall comply with the emergency preparedness requirements of this section.

**410.3.1 Comprehensive fire safety/emergency action plan (Level 1).** A comprehensive fire safety and emergency action plan in accordance with FC401.4 shall be prepared for:

1. a high-rise Group B educational building that is provided with voice communication capability.

2. a Group B educational occupancy occupied or designed to be occupied by a total of more than one hundred persons on one or more high-rise floors, that is provided with voice communication capability.

**410.3.2 Fire and life safety staff.** The comprehensive fire and life safety plan required pursuant to FC410.3.1 shall designate an FLS director and such other FLS staff as the commissioner may prescribe by rule as appropriate for the manner in which the building or occupancy, or floors thereof, is used or staffed.

**410.4 Emergency preparedness in educational occupancies and dormitories with fire and emergency preparedness plans.** Educational and dormitory buildings and occupancies required by FC410.4.1 to have a fire and emergency preparedness plan shall comply with the emergency preparedness requirements of this section.

**410.4.1 Fire and emergency preparedness plan (Level 2).** A fire and emergency preparedness plan in accordance with FC401.5 shall be prepared for the following buildings and occupancies (other than buildings and occupancies subject to FC410.3):

1. a high-rise Group B educational building.

2. a high-rise Group E educational building.

3. a Group B educational occupancy occupied or designed to be occupied by a total of more than one hundred persons on one or more high-rise floors.

4. a Group E educational occupancy occupied or designed to be occupied by a total of more than one hundred persons on one or more high-rise floors.

5. a high-rise Group R-1 dormitory building.

6. a Group R-1 dormitory building or occupancy, with a total of more than fifty sleeping rooms above street level, or communal sleeping facilities above street level occupied or designed to be occupied by a total of more than fifty lodgers.

**410.4.2 Fire and emergency preparedness staff.** The commissioner may prescribe by rule that in a Group B, E or Group R-1 dormitory building or occupancy subject to FC410.4.1 that is provided with voice communication capability there shall be present during regular business hours one or more members of the FEP staff required pursuant to FC401.5.5 who hold a certificate of fitness for emergency announcements and other fire safety duties.

**410.4.3 Fire and emergency notice.** In Group R-1 dormitory buildings or occupancies subject to FC410.4.1, a fire and emergency notice in accordance with FC405.5 shall be posted within each dwelling unit in the building or occupancy, on or immediately adjacent to the main entrance door to the dwelling unit.

**410.5 Emergency preparedness in dormitories without fire and emergency preparedness plans.** Group R-1 dormitory buildings and occupancies, other than buildings and occupancies subject to FC410.4, shall comply with the following emergency preparedness requirements:

**410.5.1 Fire and emergency preparedness guide and notices (Level 3).** Fire and emergency preparedness guide and notices in accordance with FC401.6 and the rules shall be prepared, and periodically reviewed and amended, for a Group R-1 dormitory.

**410.6 Special drill requirements.** Fire and non-fire emergency drills shall be conducted in all educational buildings and occupancies and dormitories in accordance with FC401.7 and the rules. The frequency and timing of drills in educational occupancies shall be in accordance with the New York State Educational Law. Group E occupancies shall establish procedures for accounting for students after they have been relocated or evacuated during a drill.

## SECTION FC 411
## FACTORIES

**411.1 General.** Group F buildings and occupancies shall comply with the emergency preparedness requirements set forth in FC 401, 416 and this section, except that Group F buildings and occupancies regulated by New York State Labor Law §279 shall maintain the emergency preparedness staff and conduct the drills required by the rules of the New York City Board of Standards and Appeals, as set forth in 2 RCNY §9-01, and otherwise comply with the requirements of such rules, and, if located in a mixed-occupancy building, shall additionally comply with the requirements of FC416.

**411.2 Emergency preparedness in factories with fire and emergency preparedness plans (Level 2).** A fire and emergency preparedness plan in accordance with FC401.5 shall be prepared for a Group F building and occupancy with more than twenty-five persons above or below street level during regular business hours.

## SECTION FC 412
## HIGH HAZARD OCCUPANCIES

**412.1 General.** Group H buildings and occupancies shall comply with the emergency preparedness requirements set forth in FC 401, 416 and this section, except that such requirements shall not apply to Group H buildings and occupancies that have prepared one or more of the following plans in compliance with applicable requirements:

1. An emergency action plan in accordance with the regulations of the United States Department of Labor, as set forth in 29 CFR Section 1910.119.

2. A contingency plan and emergency procedures in accordance with the regulations of the New York State Department of Environmental Conservation, as set forth in 6 NYCRR Part 373.

3. A risk management plan in accordance with the rules of the New York City Department of Environmental Protection, as set forth in 15 RCNY §41-08.

**412.2 Emergency preparedness in high-hazard buildings and occupancies with fire and emergency preparedness plans (Level 2).** A fire and emergency preparedness plan in accordance with FC401.5 shall be prepared for a Group H building and occupancy with more

than twenty-five persons above or below street level during regular business hours, excluding Group H buildings and occupancies required to comply with FC412.1(1), (2) or (3).

**412.3 Group H-5 occupancies.** Group H-5 occupancies shall additionally comply with the requirements of Sections 412.3.1 through 412.3.4.

**412.3.1 Plans and diagrams.** Plans and diagrams shall be maintained in an approved location on the premises indicating the plan for each area, the amount and type of HPM stored, handled and used, locations of shutoff valves for HPM supply piping, emergency telephone locations and locations of exits.

**412.3.2 Periodic review and revision.** The plans and diagrams required by FC412.3.1 shall be maintained up to date and the department shall be notified of all changes in use or occupancy, and design and arrangement of the premises.

**412.3.3 Emergency response team.** On-site emergency response personnel shall be familiar with the HPM stored, handled or used on the premises. Responsible persons shall be designated to an on-site emergency response team. An emergency response team shall be staffed for each workshift to coordinate their emergency response activities with emergency response personnel, and shall cooperate with the department in planning emergency responses.

**412.3.4 Emergency response drills.** Emergency drills of the on-site emergency response team shall be conducted on a regular basis but not less than once every 3 months. Records of emergency drills conducted shall be maintained in the same manner as records of fire and non-fire emergency drills.

## SECTION FC 413
## HOSPITALS, NURSING HOMES AND OTHER PATIENT AND RESIDENTIAL CARE FACILITIES

**413.1 General**. Hospitals, nursing homes, adult homes, ambulatory care facilities, community residences, enriched housing, intermediate care facilities and other Group I-2 buildings and occupancies caring for or housing more than three persons not capable of self-preservation and not capable of responding to a fire or other emergency without assistance from others shall comply with the emergency preparedness requirements set forth in FC 401, 416 and this section.

**413.2 Emergency preparedness in patient and residential care facilities with fire and emergency preparedness plans (Level 2).** A fire and emergency preparedness plan in accordance with FC401.5 shall be prepared for a hospital, nursing home, ambulatory care facility or other Group I-2 building or occupancy.

**413.3 Fire and life safety staff.** The fire and emergency preparedness plan required for hospitals pursuant to FC413.2 shall designate an FLS director and such other FLS staff as the commissioner may prescribe by rule as appropriate for such building or occupancy.

**413.4 Fire and emergency preparedness staff.** The commissioner may prescribe by rule that in all Group I-2 buildings or occupancies provided with voice communication capability, other than

hospitals, there shall be present during regular business hours one or more members of the FEP staff required pursuant to FC401.5.5 who hold a certificate of fitness for emergency announcements and other fire safety duties.

**413.5 Drills.** Fire and non-fire emergency drills in Group I-2 buildings and occupancies may be conducted in accordance with the provisions of FC 413.5.1 and 413.5.2.

**413.5.1 Coded alarm signal.** During drills, coded announcements may be made in lieu of an audible alarm to alert medical and other fire and emergency preparedness staff of such drill.

**413.5.2 Relocation of patients.** During drills, the in-building relocation of patients to safe areas or to the exterior of the building is not required.

**413.6 FSP staff training.** FSP staff training may be conducted throughout the entire building or occupancy or in specific areas thereof, but training shall be conducted in all areas of the building or occupancy within each 1 year period. Such training shall be conducted at least once each month for a total of not less than twelve training drills per year, as follows: at least three drills during the day shift; at least six drills during the evening shift, and at least three drills during the night shift.

## SECTION FC 414
## MERCANTILE OCCUPANCIES AND COVERED MALLS

**414.1 General**. Department stores, retail and wholesale stores and other Group M buildings and occupancies, including covered malls accessory thereto, shall comply with the emergency preparedness requirements set forth in FC 401, 416 and this section.

**414.2 Emergency preparedness in mercantile occupancies with comprehensive fire safety/emergency action plans.** Group M occupancies that are required by FC414.2.1 to have a comprehensive fire safety and emergency action plan shall comply with the emergency preparedness requirements of this section.

**414.2.1 Comprehensive fire safety/emergency action plan (Level 1).** A comprehensive fire safety and emergency action plan in accordance with FC401.4 shall be prepared for:

1. a high-rise Group M building.

2. a building with one or more Group M occupancies with an aggregate area of more than 100,000 square feet (9290 $m^2$) on high-rise floors.

3. a covered mall of more than 100,000 square feet (9290 $m^2$), not counting the square footage of anchor buildings as that term is defined in the Building Code.

**414.2.2 Fire and life safety staff.** The comprehensive fire safety and emergency action plan required by FC414.2.1 shall designate FLS staff consisting of an FLS director, deputy FLS directors, FLS building evacuation supervisor and a sufficient number of FLS brigade members to exercise the authority and perform the duties of their respective FLS

assignments. FLS staff shall be provided with initial and refresher FLS staff training in accordance with FC401.4.5.2.

**414.3 Emergency preparedness in mercantile buildings and occupancies with fire and emergency preparedness plans.** Group M buildings and occupancies required by FC414.3.1 to have a fire and emergency preparedness plan shall comply with the emergency preparedness requirements of this section.

**414.3.1 Fire and emergency preparedness plan (Level 2).** A fire and emergency preparedness plan in accordance with FC401.5 shall be prepared for the following buildings and occupancies (other than buildings and occupancies subject to FC414.2):

1. a Group M occupancy of more than 30,000 square feet (2787 $m^2$), in which more than twenty-five persons are employed during regular business hours.

2. a building with one or more Group M occupancies with an aggregate area of more than 30,000 square feet (2787 $m^2$) in which more than twenty-five persons are employed during regular business hours.

3. a covered mall of more than 30,000 square feet (2787 $m^2$), excluding anchor buildings (as that term is defined in the Building Code).

**414.3.2 Fire and emergency preparedness staff.** The commissioner may prescribe by rule that in a Group M building or occupancy provided with voice communication capability, other than buildings and occupancies subject to FC414.2, there shall be present during regular business hours one or more members of the FEP staff required pursuant to FC401.5.5 who hold a certificate of fitness for emergency announcements and other fire safety duties**.**

## SECTION FC 415
## WAREHOUSES AND OTHER STORAGE OCCUPANCIES

**415.1 General.** Warehouses and other Group S buildings shall comply with the emergency preparedness requirements set forth in FC401, FC416, and this section.

**415.1.1 Emergency preparedness in buildings and occupancies with fire and emergency preparedness plans (Level 2).** A fire and emergency preparedness plan in accordance with FC401.5 shall be prepared for:

1. a high-rise or large area Group S building in which more than twenty-five persons are employed during regular business hours.

2. a non-high-rise Group S building with an aggregate of more than 20,000 square feet (1858 $m^2$) of high-piled combustible storage.

**415.1.2 Fire and emergency preparedness staff.** The commissioner may prescribe by rule that in a Group S building or occupancy provided with voice communication capability there shall be present during regular business hours one or more members of the FEP staff required

pursuant to FC401.5.5 who hold a certificate of fitness for emergency announcements and other fire safety duties.

## SECTION FC 416
## MIXED OCCUPANCY BUILDINGS

**416.1 General.** The owners of a mixed-occupancy building and each occupancy within such building required to have an emergency preparedness plan pursuant to this chapter shall comply with the emergency preparedness requirements of this section with respect to such building and occupancies.

**416.2 Single plan.** In lieu of a separate Level 1 or 2 emergency preparedness plan for each occupancy, a single emergency preparedness plan may be developed for the entire building or multiple occupancies within a single building, provided that it meets or exceeds the level of emergency preparedness required for each occupancy.

**416.3 Coordination of plans.** The owner preparing an emergency preparedness plan for an occupancy in a mixed-occupancy building shall consult the owner responsible for preparing the emergency preparedness plan for each other occupancy within such building with respect to evacuation and in-building relocation procedures, including use of stairwells and elevators and designation of in-building relocation areas and assembly areas.

**416.4 Coordination of drills.** The owner of a mixed-occupancy building and the owner of each occupancy within such a building required to conduct emergency preparedness drills pursuant to this chapter shall conduct a coordinated drill at least once every 2 years.

**416.5 Communications.** The owner of a mixed-occupancy building and the owner of each occupancy within such a building required to have emergency preparedness plan pursuant to this chapter shall arrange for a means of communication between their respective FLS directors, FEP coordinators and/or designated FEP staff, in the event of a fire or other emergency. Such communications may be by telephone (other than a telephone requiring a coin to operate), text message, e-mail, walkie-talkie, or other approved means.

**416.6 Notification of fires and non-fire emergencies and coordination of responses.** In the event of a fire or other emergency in a mixed-occupancy, notification shall be made to the other occupancies and, if necessary, the emergency preparedness staffs of the respective occupancies shall coordinate their responses to the emergency, as follows:

**416.6.1 Fires.** An FLS director, FEP coordinator and/or a designated emergency preparedness staff member who becomes aware of fire on the premises shall promptly notify the FLS director, FEP coordinator and/or designated staff in the other occupancies in the mixed-occupancy building. The staffs shall coordinate the evacuation, in-building relocation and/or sheltering in place of their respective building occupants, and other matters requiring coordination pursuant to their emergency preparedness plans.

**416.6.2 Non-fire emergencies.** An FLS director, FEP coordinator and/or a designated emergency preparedness staff member who becomes aware of a non-fire emergency shall promptly notify the FLS director, FEP coordinator and/or designated emergency

preparedness staff for any other occupancy that could be affected by such emergency, or who is situated in the building's entrance lobby and who would be first encountered by firefighters or other emergency personnel responding to the emergency.

# CHAPTER 5
# FIRE OPERATIONS FEATURES

## SECTION FC 501
## GENERAL

**501.1 Scope.** This chapter shall govern the design, installation, operation and maintenance of buildings, structures and premises with respect to requirements designed to ensure safe and effective firefighting operations.

**501.2** [Reserved] **Permits.** Permits shall be required as set forth in FC105.6.

**501.3 [Design and installation documents.** The commissioner may require that design and installation documents for proposed fire apparatus access roads, showing their location, dimensions and specifications, and design and installation documents for private fire hydrant systems, including hydraulic calculations, be submitted to the department for review and approval prior to installation.] Reserved.

**501.4 [Timing of installation.] General.** Buildings, structures and premises shall be designed, installed, operated and maintained in accordance with this chapter.

**501.4.1 Newly-constructed buildings and structures.** When fire apparatus access roads, frontage spaces, private hydrants or yard hydrants are [or a water supply for fire protection is] required to be installed[, such protection] in connection with a newly constructed building or structure, such roads, frontage spaces and hydrants shall be installed and made serviceable prior to and during the time of construction, except [when approved alternative methods of protection are provided] that, in connection with a phased development, the provision of fire apparatus access and water supply shall be as set forth in design and installation documents approved by the department. Interim access and water supply arrangements will be considered pending completion of heavy construction that would damage the roads or piping, provided that such arrangements would not unduly impair firefighting operations. Temporary [street] signs shall be installed at each street intersection when construction of new roadways allows passage by motor vehicles in accordance with [Section 505.2] FC505.2.

**501.4.2 Lawfully existing fire department access.** Fire department access to buildings, structures and premises not fronting on a public street may be continued in compliance with the provisions of FC 102.3, 102.4, and 102.5, when such fire department access was lawfully existing as of June 30, 2008 or the date of an amendment to this code relating to fire department access. The private roads providing such lawfully existing fire department access shall be deemed to constitute fire apparatus access roads pursuant to this chapter.

**501.4.3 Alterations and change of occupancy.** A building or structure undergoing alteration or a change of occupancy under the circumstances set forth in FC 501.4.3.1 and 501.4.3.2 shall comply with the requirements set forth in said sections.

**501.4.3.1 Provision of sprinkler protection in altered buildings on substandard width fire apparatus access roads.** An existing building or structure that undergoes alteration or a change in use or occupancy and which is located on a public street or fire apparatus access road that has a substandard road width as set forth in FC 503.2.10 or 503.3.2 shall install a sprinkler system throughout such building, when:

1. The cost of making alterations to the building (other than alterations made to Group R-3 occupancies) in any 12-month period exceeds 60 percent of the value of the building, as set forth in New York City Administrative Code §27-115; or

2. By reason of alteration or otherwise, there is a change in the "main use or dominant occupancy" of the building, as determined by the New York City Department of Buildings for purposes of assigning a single occupancy classification to the building, including any change from a Group R-3 occupancy to a Group R-2 occupancy, but excluding a change in use or occupancy that is limited to restoring a building that was originally constructed as a one-family or two-family dwelling to its original one-family or two-family use and occupancy; or

3. There is an increase of more than 125 percent in the square footage of the floor area of a building (excluding attic, basement and cellar space, as those terms are defined in Section 202 of the Building Code); or

4. There is a change constituting an alteration under the Building Code (excluding rooftop equipment installations) to a building of combustible (non-fireproof) construction with a height of 35 feet (10 668 mm) or less above the grade plane, that increases the height of such building to more than 35 feet (10 668 mm) above the grade plane (with the terms "grade plane" and "building height" having the meanings set forth in Section 502.1 of the Building Code); or

5. A one-family Group R-3 occupancy is being altered to a two-family Group R-3 occupancy, except where:

   5.1. the alteration involves converting a basement space to a separate dwelling unit, and the new basement dwelling unit is protected throughout by a sprinkler system; or

   5.2. the alteration does not involve converting a basement space to a separate dwelling unit, and either at least two lawful accessory off-street parking spaces are provided on the premises, or sufficient space exists to park two motor vehicles on a common driveway shared exclusively with an adjoining Group R-3 occupancy.

**501.4.3.2 Compliance with rooftop access requirements on altered rooftops.** The rooftop of an existing building or structure that undergoes alteration shall comply with the requirements of FC504.4.

## SECTION FC 502
## DEFINITIONS

**502.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**[AREAWAY.** A space below grade, adjacent to a building, open to the outdoors and enclosed by walls.]

**CITYWIDE STANDARD KEY.** A key of special or controlled design, also known as a "2642" key, approved by the commissioner which serves to operate elevator emergency recall and emergency in-service operation service switches and other devices or locks as required by the construction codes, including the Building Code, this code or the rules.

[**DEVELOPMENT**. A development includes the construction of a new building on a zoning lot, the relocation of an existing building to another zoning lot, or the use of a tract of land for a new use.]

**FIRE APPARATUS ACCESS ROAD.** A road that serves to provide access for fire apparatus from a public street to the frontage space of one or more buildings [in a development] not directly fronting on a public street. A fire apparatus access road includes any road that serves such purpose whether denominated as a [fire lane, private street] driveway, parking lot lane, private road[, driveway] or [parking lot lane] private street.

**[FIRE COMMAND CENTER.** The principal attended or unattended location where the status of the detection, alarm communications and control systems is displayed, and from which the system(s) can be manually controlled.]

**FIRE DEPARTMENT STANDARD KEY.** A key of special or controlled design, also known as a "1620" key, for the use of department personnel and others specifically authorized by the commissioner, which serves to operate all switches, locks and other devices required to be operable by a citywide standard key.

**FIRE LANE.** A public or private road, [or other passageway developed to allow the passage of] roadway lane, parking lot lane or other surface designed to allow vehicular access, that has been specifically designated by means of signs or roadway markings as a priority thoroughfare for fire apparatus. [It may also serve as a secondary means of access to a private road.]

**FRONTAGE SPACE**. A street or an open space [outside of a building that is within 30 feet (9144 mm)] in front of and adjoining the main front entrance to the building and not less than 30 feet (9144 mm) in any dimension[. It shall be] that is accessible from a public street or fire apparatus access road, provides access to the building, and serves as a staging area for firefighting and other emergency operations. It shall be designed and constructed to allow

operation of department apparatus on the front side of the building and shall be maintained free of obstructions that may interfere with its use by the department.

**KEY BOX.** A secure[, tamperproof] device with a lock operable only by a [fire department] citywide standard key[, and containing building entry keys and other keys that may be required for access in an emergency] or other approved key.

**MULTI-FLOOR DWELLING UNIT.** A dwelling unit or other residential occupancy with living space on a floor other than the floor upon which the entrance door to such room, unit or occupancy is located, or which is accessed by means of an interior stair or passageway from an entrance door on another floor.

**PRIVATE ROAD.** A [road or other passageway to two or more buildings or structures in a development that serves to provide access from a public street and which may serve as a fire apparatus access road. Private] private driveway, lane or street, or other means of vehicular access to one or more buildings, structures or premises not directly fronting on a public street. A private road does not include a public street.

**PUBLIC STREET.** All streets [mapped or dedicated for public use], including mapped streets, record streets, marginal streets and restricted use streets, established on the city map maintained pursuant to Section 198 of the New York City Charter or dedicated for general public use and accepted for such purposes by the City of New York.

**SPEED BUMP.** Any raised roadway designed to reduce the speed of traffic to 20 miles per hour (32.2 kilometers per hour) or less, including any speed hump, speed table or other raised speed reducer, commonly referred to as "speed bumps."

## SECTION FC 503
## FIRE APPARATUS ACCESS [ROADS]

**[503.1 Where required.** Fire apparatus access roads shall be designed, installed and maintained in accordance with this section.

**503.1.1 Fire apparatus access roads.** Buildings or structures shall be accessible to department fire apparatus by way of a public street or an approved fire apparatus access road with an asphalt, concrete or other approved driving surface installed in accordance with the standards of the New York City Department of Transportation and capable of supporting the imposed load of department apparatus weighing at least 75,000 pounds (34 050 kg) and the operational load of department aerial apparatus outrigger support (48,000 pounds (21 792 kg) over a 2 foot (610 mm) by 2 foot (610 mm) area). When fire apparatus access roads are required by this section, such roads shall provide access from a public street to the frontage space of each building or structure in a development in accordance with this section.

**503.1.2 Additional access.** The commissioner may require more than one means of fire apparatus access based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

**503.1.3 High-piled storage.** Fire apparatus access roads to buildings used for high-piled combustible storage shall additionally comply with the applicable requirements of Chapter 23.

**503.2 Specifications.** Fire apparatus access roads to one or more buildings in a development shall comply with the requirements of this code and the standards established by the New York City Department of Transportation and shall be designed and installed in accordance with Sections 503.2.1 through 503.2.7.

**503.2.1 Dimensions.** Fire apparatus access roads shall have an unobstructed width of not less than 38 feet (11 582 mm) and an unobstructed vertical clearance of not less than 14 feet (4267 mm).

**Exceptions.** A fire apparatus access road may be less than 38 feet (11 582 mm) in width provided that it satisfies the following requirements:

1. The fire apparatus access road has an unobstructed width of not less than 34 feet (10 363 mm) and satisfies the requirements of Section 26-21 of the Zoning Resolution; or

2. The fire apparatus access road has an unobstructed width of not less than 30 feet (9144 mm) and satisfies the requirements of Section 119-214 of the Zoning Resolution; or

3. It is not less than 30 feet (9144 mm) wide, provides access to not more than 5 dwelling units, and all buildings to which the private road provides access are protected throughout by a sprinkler system.

**503.2.2 Authority.** The commissioner may require an increase in the minimum access widths where circumstances arising from site conditions or the design of the development render such widths inadequate for fire or other emergency response operations.

**503.2.3 Surface.** Fire apparatus access roads shall comply with the requirements of the New York City Department of Transportation and shall be designed and maintained to support the imposed loads of fire apparatus, as set forth in Section 503.1.1, and shall be surfaced so as to provide all-weather driving capabilities.

**503.2.4 Turning radius.** The required turning radius of a fire apparatus access road shall be determined by the commissioner.

**503.2.5 Dead ends.** Dead-end fire apparatus access roads more than 150 feet (45 720 mm) in length, as measured from the curb line of the nearest public street which is not itself a dead–end, shall be provided with an approved turnaround area for fire apparatus in accordance with Table 503.2.5. Such roads more than 150 feet (45 720 mm) and up to and including 400 feet (121 920 mm) in length shall not require a turnaround if all buildings served by the road are protected throughout by a sprinkler system. Dead-end fire apparatus roads shall not exceed 400 feet (121 920 mm) in length unless approved by the commissioner.

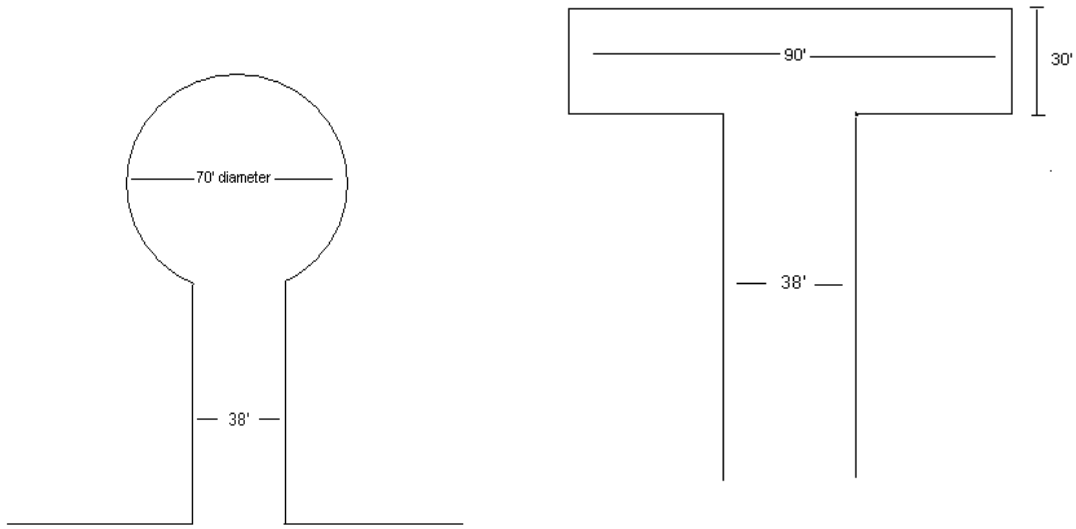
**TABLE 503.2.5**

**REQUIREMENTS FOR DEAD-END FIRE APPARATUS ACCESS ROADS**

| LENGTH (feet) | WIDTH (feet)[b] | TURNAROUNDS REQUIRED |
|---|---|---|
| 0–150 | 38 | None required |
| > 150 and ≤ 400[a] | 38 | 90-foot hammerhead, or 70-foot-diameter unobstructed cul-de-sac or other approved means.[c] |
| > 400 | Only where approved by the commissioner | |

For SI: 1 foot = 304.8 mm.
a. A turnaround may not be required if all buildings served by the road are protected throughout by a sprinkler system.
b. Except as otherwise provided in Section 503.2.1.
c. See Figure 503.2.5]

[

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[a. 70-Foot-Diameter Cul-de-Sac b. 90-Foot Hammerhead

**FIGURE 503.2.5 DEAD-END FIRE APPARATUS ACCESS ROAD TURNAROUND**

**503.2.6 Bridges and elevated surfaces.** Where a bridge or an elevated surface is part of a fire apparatus access road, the bridge shall be constructed and maintained in accordance with the standards established by the New York City Department of Transportation. Bridges and elevated surfaces shall be designed for a live load sufficient to carry the imposed loads of fire apparatus. Vehicle load limits shall be posted at both entrances to bridges when required by the commissioner. Where elevated surfaces designed for emergency vehicle use are adjacent to surfaces which are not designed for such use, approved barriers, approved signs or both shall be installed and maintained when required by the commissioner.

**503.2.7 Grade.** The grade of the fire apparatus access road shall not exceed 10 percent unless approved by the commissioner.

**503.3 Marking.** Where required by the commissioner, approved signs shall be provided for fire apparatus access roads, in conspicuous locations, to identify such roads or prohibit the obstruction thereof. A posted sign shall not be defaced, obscured, removed, mutilated or otherwise rendered illegible.

**503.4 Obstruction of fire apparatus access roads.** Fire apparatus access roads shall not be obstructed in any manner. Vehicles shall not be parked on fire apparatus access roads, except in

authorized parking locations. The minimum widths and clearances established in Section 503.2.1 shall be maintained at all times.

**503.5 Required gates or barricades.** The commissioner may require the installation and maintenance of gates or other approved barricades across fire apparatus access roads, trails or other accessways, excluding public streets.

**503.5.1 Secured gates and barricades.** When required, gates and barricades shall be secured in an approved manner. Roads, trails and other accessways that have been closed and obstructed in the manner prescribed by Section 503.5 shall not be trespassed on or used unless authorized by the owner and the commissioner.

**Exception:** The restriction on use shall not apply to government officials in conjunction with their official duties.

**503.6 Fire apparatus access road gates.** The installation of gates across a fire apparatus access road shall be approved by the commissioner. Gates and appurtenances shall not reduce the approved width of a fire apparatus access road. Where gates are installed, they shall have an approved means of emergency operation. The emergency operation of such gate shall be maintained in good working order at all times.

Gates securing a fire apparatus access road shall comply with the following requirements:

1. The minimum gate width shall be not less than that approved for the fire apparatus access road.

2. Gates shall be of the swinging or sliding type.

3. Design and installation of manually operated gates shall allow for operation by one person.

4. The gates shall be maintained in good working order at all times and replaced or repaired when defective.

5. An approved opening device for emergency access by firefighters or other emergency response personnel shall be provided for electrically operated gates.

6. Manually operated gates shall not be locked with a padlock or chain and padlock unless they are capable of being opened by standard tools such as bolt cutters.

7. Only approved locking devices shall be used.

**503.7 Signs.** Fire apparatus access roads subject to parking restrictions shall be marked with permanent NO PARKING—FIRE ACCESS ROAD signs complying with Figure 503.7. Signs shall have a minimum dimension of 12 inches (305 mm) wide by 18 inches (457 mm) high and have red letters on a white reflective background. Signs shall be posted on the sides of the fire apparatus access road upon which parking is prohibited.]

[

**FIGURE 503.7 FIRE ACCESS ROAD SIGN**

]

**[503.8 Public streets.** Access to buildings on public streets shall comply with the requirements of Sections 503.8.1 through 503.8.3.

**503.8.1 Dead ends.** Dead end public streets in excess of 150 feet (45 720 mm) in length, as measured from the curb line of the nearest public street that is not a dead-end, shall be provided with an approved turnaround area for fire apparatus that meets the requirements of Section 503.2.

**Exception:** A turnaround shall not be required for dead end public streets more than 150 feet (45 720 mm) in length if all new buildings on such street are protected throughout by a sprinkler system.

**503.8.2 Substandard width**. Except as otherwise approved, buildings on public streets that have an unobstructed width of less than 38 feet (11 582 mm) shall be protected throughout by a sprinkler system.]

**503.1 General.** Buildings shall be accessible to department fire apparatus by way of a public street or approved fire apparatus access road. The public street or fire apparatus access road shall provide access to the frontage space of the building.

**503.2 Fire apparatus access roads.** Fire apparatus access roads shall be provided, designed, installed and maintained in accordance with this section.

**503.2.1 Where required.** Where the frontage space to a building does not directly front on a public street, a fire apparatus access road shall be provided from the public street to the frontage space of such building.

**503.2.2 Design and construction.** Except as otherwise provided in FC503.2.4, a fire apparatus access road shall be designed and constructed in accordance with the standards of the New York City Department of Transportation and in compliance with the following requirements:

**503.2.2.1 Surface.** Fire apparatus access roads shall have an all-weather driving surface constructed of asphalt, concrete or other approved permeable or impermeable material.

**503.2.2.2 Load-bearing capacity.** Fire apparatus access roads shall be capable of supporting the imposed load of department apparatus weighing at least 80,000 pounds (36 320 kg) and the operational load of department apparatus outrigger of 52,000 pounds (23 608 kg) over a 2 foot (610 mm) by 2 foot (610 mm) area.

**503.2.2.3 Grade.** The grade of the fire apparatus access road shall not exceed 10 percent unless approved by the commissioner.

**503.2.2.4 Turning radius.** The required turning radius of a fire apparatus access road shall be determined by the commissioner.

**503.2.2.5 Bridges and elevated surfaces.** Any bridge or elevated surface on a fire apparatus access road shall be designed for a live load sufficient to carry the imposed loads of fire apparatus. Signs shall be posted at both entrances to any bridge or elevated surfaces not capable of carrying such a load. Roadways or surfaces not capable of carrying such load that adjoin fire apparatus roads shall be separated by approved barriers and/or marked by approved signs.

**503.2.2.6 Angles of approach.** The angles of approach and departure for fire apparatus access roads shall be within the limits established by the department based on the department's fire apparatus.

**503.2.3 Roadway width and vertical clearance.** Fire apparatus access roads shall have an unobstructed width of not less than 34 feet (10 363 mm) excluding shoulders, except as provided in FC 503.2.3.1 through 503.2.3.4, and an unobstructed vertical clearance of not less than 14 feet (4267 mm).

**503.2.3.1 Special zoning districts.** In Special Hillside Preservation Districts complying with the requirements of Section 119-214 of the Zoning Resolution, or other special zoning district regulation restricting the width of streets or private roads to less than 34 feet (10 363 mm), a fire apparatus access road shall have an unobstructed width of not less than 30 feet (9144 mm), excluding shoulders.

**503.2.3.2 Small residential developments**. Where access is being provided to residential developments of not more than five dwelling units, and all buildings to which the road provides access are protected throughout by a sprinkler system, a fire apparatus access road shall have an unobstructed width of not less than 30 feet (9144 mm), excluding shoulders.

**503.2.3.3 Buildings set back from street**. Where the main front entrance to a building is set back more than 40 feet (12 192 mm) from the curb line, a fire apparatus access road shall have the unobstructed width and comply with the other requirements set forth in FC503.2.4.

**503.2.3.4 Special conditions.** Where the commissioner determines that the nature and location of the building served by the fire apparatus road or other site conditions render such roadway width or vertical clearance inadequate for firefighting or other emergency

response operations, the commissioner may require that the roadway width or vertical clearance be increased.

**503.2.4 Buildings set back from street.** Where the main front entrance to a building is set back more than 40 feet (12 192 mm) from the curb line, a fire apparatus access road with the unobstructed roadway width required by FC503.2.3 shall be provided to the frontage space of the building, except as otherwise provided in FC 503.2.4.1 through 503.2.4.3.

**503.2.4.1 Group R-3 occupancies set back 100 feet or less.** The fire apparatus access road to a Group R-3 building with any main front entrance located more than 40 feet (12 192 mm) but not more than 100 feet (30 480 mm) from the street line (as measured along the route of the fire apparatus access road) may be designed and constructed in compliance with the requirements of the Building Code for driveways where:

1. The driveway is designed and is used exclusively to provide access only to a single Group R-3 building, and to no other buildings; and

2. The height of the Group R-3 building does not exceed 35 feet (10 668 mm) above the grade plane (with the terms "building height" and "grade plane" having the meanings set forth in Section BC502.1 of the Building Code); and

3. The driveway provides access to the frontage space of each occupancy, except as otherwise provided in FC504.1.2; and

4. The dwelling units are equipped with interconnected smoke alarms, in accordance with Section 907.2.10 of the Building Code.

**503.2.4.2 Group R-3 occupancies set back more than 100-150 feet.** The fire apparatus access road to a Group R-3 building with any main front entrance located more than 100 feet (30 480 mm) but not more than 150 feet (45 720 mm) from the street line (as measured along the route of the fire apparatus access road) shall be designed and constructed with an unobstructed width of not less than 20 feet (6096 mm) in accordance with FC503.2.2 where:

1. The fire apparatus access road is designed and is used exclusively to provide access only to a single Group R-3 building, and to no other buildings; and

2. The height of the Group R-3 building does not exceed 35 feet (10 668 mm) above the grade plane (with the terms "building height" and "grade plane" having the meanings set forth in Section 502.1 of the Building Code); and

3. The fire apparatus access road provides access to the frontage space of each occupancy, except as otherwise provided in FC504.1.2; and

4. The dwelling units are equipped with interconnected smoke alarms, in accordance with Section 907.2.10 of the Building Code; and

5. The dwelling units are protected throughout by a sprinkler system; and

6. At least two off-street parking spaces for a one-family dwelling, and at least three such spaces for a two-family dwelling are provided on the premises separate from the fire apparatus access road; and

7. Parking is prohibited on the fire apparatus access road, and a "No Parking" sign conforming to the requirements of FC503.2.7.2 is conspicuously posted at the entrance to the access road.

**503.2.4.3 Group R-3 occupancies set back more than 150 feet.** The fire apparatus access road to a Group R-3 building with any main front entrance located more than 150 feet (45 720 mm) from the street line (as measured along the route of the fire apparatus access road) shall be designed and constructed in compliance with FC503.2.2, except as approved by the commissioner and subject to such conditions as the commissioner may require.

**503.2.5 Obstruction.** Fire apparatus access roads shall not be obstructed in any manner that impedes vehicular access, except for lawful parking and speed bumps. Speed bumps shall be identified by approved signage or roadway markings.

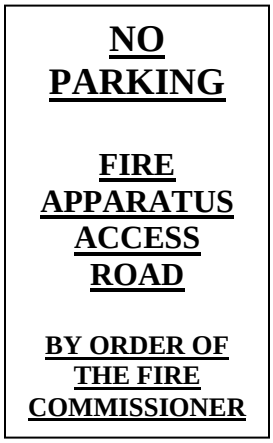
**503.2.6 Secondary fire apparatus access.** The commissioner may require more than one fire apparatus access road to one or more buildings where fire apparatus access is impeded to or on the primary access road as a result of substandard width public streets, substandard width fire apparatus access roads, traffic patterns, traffic calming devices, railroad crossings, and other conditions that would significantly delay an emergency response.

**503.2.7 Parking.** Motor vehicles shall not be parked on fire apparatus access roads except in lawful parking spaces that do not obstruct fire apparatus access. Curbside street parking that is lawfully established in accordance with the Zoning Resolution, Building Code and/or other applicable laws, rules and regulations is allowed on any fire apparatus access road if such curbside street parking does not reduce the usable roadway width to less than 18 feet (5486 mm). This requirement shall not be applicable to fire apparatus access roads whose design and use for parking was lawfully existing prior to the effective date of this section. For purposes of this usable roadway width determination, the dimensions of each parking space shall not be less than established by the department, consistent with the regulations of the New York City Department of Transportation for vehicles intended to be parked in such spaces, or, in the absence of such standard, as approved by the department.

**503.2.7.1 Parking regulations necessitated by roadway configuration.** The commissioner may restrict parking on fire apparatus roads where the angle of approach, curvature of the road, or other roadway configuration or site conditions impede the ability of fire apparatus to make turns or otherwise navigate the fire apparatus access road. Such restrictions shall constitute an operational requirement of this code.

**503.2.7.2 Signage and roadway markings.** On any fire apparatus access road upon which parking is prohibited, or upon which there are both lawful curbside street parking and parking restrictions, appropriate signage and/or roadway markings shall be provided in accordance with this section.

**503.2.7.2.1 Signage.** Fire apparatus access roads subject to parking restrictions shall be marked with permanent NO PARKING—FIRE APPARATUS ACCESS ROAD signs complying with FC Figure 503.2.7.2.1. Signs shall have a minimum dimension of 12 inches (305 mm) wide by 18 inches (457 mm) high and have red letters on a white reflective background. Signs shall be posted on the sides of the fire apparatus access road upon which parking is prohibited.




**FC FIGURE 503.2.7.2.1**
**NO PARKING SIGN**
**FIRE APPARATUS ACCESS ROAD**

**503.2.7.2.2 Roadway markings.** Where required by the commissioner, approved roadway markings that include the words NO PARKING—FIRE APPARATUS ACCESS ROAD shall be provided for fire apparatus access roads to identify them as fire apparatus access roads.

**503.2.8 Gates.** The design of gates across a fire apparatus access road shall be in accordance with this section.

**503.2.8.1 Design requirements.** Gates across a fire apparatus access road shall comply with the following requirements:

1. The gates shall not encroach upon or otherwise reduce the required or approved width of a fire apparatus access road.

2. Gates shall be of the swinging or sliding type.

3. Manually-operated gates shall be designed to allow for operation by one person.

4. Only approved locking devices shall be used.

5. Manually-operated gates shall not be locked with a padlock or chain and padlock unless the padlock and chain are capable of being cut with standard bolt cutters.

6. Automatically-operated gates shall be designed and installed in accordance with ASTM F 2200 and UL 325, as applicable, and shall have an approved means of manual operation for emergency access by firefighters and other emergency response personnel.

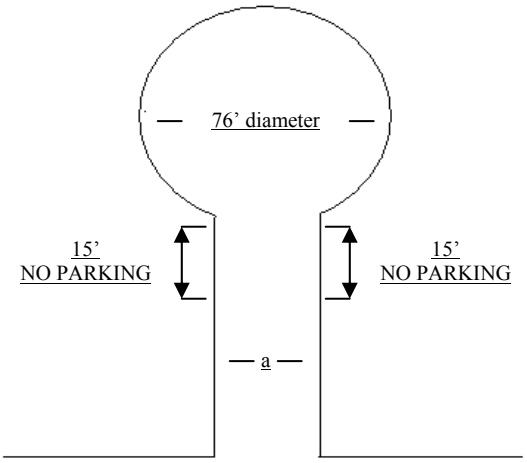
**503.2.8.2 Use to restrict access.** The commissioner may require the installation of locked gates where access to a road is to be restricted for fire apparatus use. It shall be unlawful to operate or park a motor vehicle on a fire apparatus access road restricted in this manner unless authorized by the commissioner.

**503.2.9 Dead-end turnarounds.** Dead-end fire apparatus access roads more than 150 feet (45 720 mm) in length, as measured from the curb line of the nearest public street which is not itself a dead-end, shall be provided with an approved turnaround area for fire apparatus in accordance with FC Table 503.2.9. Such roads more than 150 feet (45 720 mm) but not more than 400 feet (121 920 mm) in length shall not require a turnaround if all buildings served by the road that are further than 150 feet (45 720 mm) from the curb line of the nearest public street that is not a dead-end are protected throughout by a sprinkler system, excluding buildings in which the lack of a sprinkler system is a lawfully existing condition pursuant to FC 102.3, 102.4 and 102.5. Dead-end fire apparatus roads shall not exceed 400 feet (121 920 mm) in length unless approved by the commissioner.

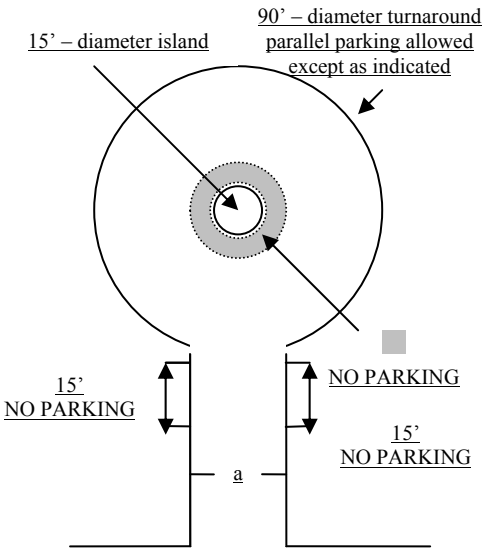
**FC TABLE 503.2.9**
**REQUIREMENTS FOR DEAD-END FIRE APPARATUS ACCESS ROADS**

| LENGTH (feet) | WIDTH (feet)[b] | TURNAROUNDS REQUIRED |
|---|---|---|
| 0–150 | 34 | None required |
| > 150 and < 400[a] | 34 | 90-foot hammerhead, or 76-foot-diameter unobstructed turnaround, 90-foot-diameter turnaround with a 15-foot-diameter island, or other approved means.[c] |
| > 400 | As approved | Such roads are allowed only where approved by the commissioner |

For SI: 1 foot = 304.8 mm.
a. A turnaround shall not be required if all buildings served by the road are protected throughout by a sprinkler system.
b. Except as otherwise provided in FC503.2.3.
c. See FC Figure 503.2.9.

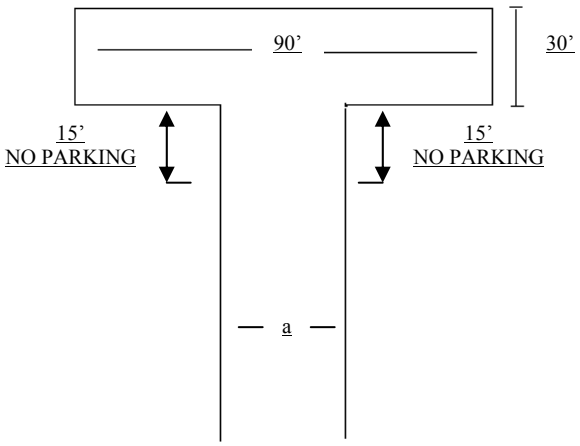



1. 76-Foot-Diameter Turnaround




2. 90-Foot-Diameter Turnaround with

up to 15-Foot-Diameter Island




3. 90-Foot Hammerhead

a. 34 feet (10 363 mm) except as otherwise provided in FC503.2.3.

**FC FIGURE 503.2.9 DEAD-END FIRE APPARATUS ACCESS ROAD TURNAROUND**

**503.2.10 Substandard width roads.** Buildings on fire apparatus access roads that have an unobstructed roadway width of less than 34 feet (10 363 mm) shall be protected throughout by a sprinkler system. Buildings served by a substandard width fire apparatus access road that is a lawfully existing condition pursuant to FC 102.3, 102.4 and 102.5 shall comply with this requirement when undergoing alteration or a change of occupancy in accordance with FC501.4.3. This requirement shall not apply to any detached, unheated, carport, garden shed, greenhouse, private parking garage for not more than three motor vehicles, tower or other accessory building, that is:

1. Classified by the Building Code as a Group U occupancy;

2. Not occupied or designed to be occupied for residential, commercial or office purposes; and

3. Accessory to a Group R-2 or Group R-3 occupancy.

**503.3 Public streets.** Buildings fronting on public streets shall comply with the requirements of FC 503.3.1 and 503.3.2.

**503.3.1 Dead-end turnarounds.** Dead-end public streets in excess of 150 feet (45 720 mm) in length, as measured from the curb line of the nearest public street that is not a dead-end, shall be provided with an approved turnaround area for fire apparatus that complies with the requirements of FC503.2.9.

**Exception:** A turnaround shall not be required for dead-end public streets more than 150 feet (45 720 mm) in length if all buildings on such street further than 150 feet (45 720 mm) from the curb line of the nearest street that is not a dead-end are protected throughout by a sprinkler system, excluding buildings in which the lack of a sprinkler system is a lawfully existing condition pursuant to FC 102.3, 102.4 and 102.5.

**503.3.2 Substandard width**. Buildings on public streets that have an unobstructed width of less than 34 feet (10 363 mm) shall be protected throughout by a sprinkler system. Buildings on substandard width public streets that were not required prior to the effective date of this section to be protected throughout by a sprinkler system shall comply with this requirement when undergoing alteration or a change of occupancy subject to FC501.4.3. This requirement shall not apply to any Group U occupancy complying with the requirements of FC503.2.10.

**503.4 Fire lanes.** It shall be unlawful to park on a fire lane. Where other vehicular traffic is allowed on a fire lane, such traffic shall yield to fire apparatus or other department emergency response vehicles.

**503.4.1 Signage.** Fire lanes subject to parking restriction shall be marked with permanent NO PARKING-FIRE LANE signs complying with FC Figure 503.4.1, and/or approved roadway markings. Signs shall have a minimum dimension of 12 inches (305 mm) wide by 18 inches (457 mm) high and have red letters on a white reflective background. Signs shall be posted on the sides of the fire lane upon which parking is prohibited.

**FC FIGURE 503.4.1 FIRE LANE SIGN**

**503.5 Outdoor parking lots.** Outdoor parking lot lanes between rows of parking spaces and aisle space between motor vehicles shall comply with the requirements of the Building Code and Zoning Resolution, except that parking lot lanes that serve as the fire apparatus access road to the main front entrances of buildings situated in parking lots shall comply with the fire apparatus access requirements set forth in this code or such other roadway width requirements established by the Fire Department by rule.

## SECTION FC 504
## BUILDING AND ROOFTOP ACCESS [TO BUILDINGS AND ROOFS]

**504.1 Frontage space.** Buildings shall be provided with a frontage space in compliance with the requirements of this chapter and the Building Code. The term "frontage space" shall have the meaning set forth in FC502 for purposes of this code. For purposes of the Building Code, "frontage space" shall have the meaning set forth in Section 502 thereof.

**Exception:** Accessory buildings or structures classified by the Building Code as a Group U occupancy.

**504.1.1 Main front entrance.** The main front entrance of a building is the entrance that is designed to serve as the primary means of ingress and egress to the building, and which is located on a side of the building that contains windows, emergency escape and rescue openings, outdoor building corridors or other building openings that serve to afford firefighters access to the upper floors of the building. Where a building has more than one entrance that is so designed and situated, the owner may designate one such entrance as the main front entrance of the building, provided, however, that if such entrance does not provide an appropriate location for firefighting operations, the commissioner may require that another entrance be designated the main front entrance.

**504.1.2 Occupancies with separate entrances.** When a building contains more than one occupancy and separate entrances are provided for individual occupancies, there shall be a main front entrance for each such occupancy, and a separate frontage space shall be provided for each main front entrance, except that a second frontage space is not required for a two-family Group R-3 occupancy if unobstructed access, 5 feet (1524 mm) in width, is provided to the rear yard and to the main front entrance of any dwelling unit from either side of the building that is not directly accessible from the public street, fire apparatus access road, or driveway. An open accessory parking area not less than 5 feet (1524 mm) in width shall be sufficient to constitute unobstructed access to the rear yard, regardless of the presence of parked vehicles in such parking area.

**[504.1] 504.1.3 Building access.** [Exterior doors and openings required by this code or the construction codes, including the Building Code, shall be maintained in a manner that affords access by firefighting personnel in accordance with the requirements of this section, Chapter 10, and the Building Code.] An approved access walkway leading from the fire apparatus access [roads to] road or driveway to the main front entrance of each occupancy or other exterior openings shall be provided when required by the commissioner.

**[504.1.1] 504.1.4 Frontage space obstructions**. Obstructions, such as planters, fences and bollards, shall not be placed in the required frontage space unless they have been approved by the Commissioner of Buildings, the Commissioner of Transportation, or the commissioner, as applicable.

**504.2 Maintenance of exterior doors and openings.** Exterior doors and openings required by this code or the construction codes, including the Building Code, shall be maintained in a manner that affords access by firefighting personnel in accordance with the requirements of this section, FC Chapter 10, and the Building Code. Exterior doors and their function shall not be eliminated without prior approval of the [New York City] Department of Buildings. Exterior doors that have been rendered nonfunctional and that retain a functional door exterior appearance shall have a sign affixed to the exterior side of the door with the words THIS DOOR BLOCKED. The sign

shall consist of letters having a principal stroke of not less than 0.75 inch (19.1 mm) wide and at least 6 inches (152 mm) high on a contrasting background. Required department access doors shall not be obstructed or eliminated. Exit and exit access doors shall comply with the requirements of FC Chapter 10 and the construction codes, including the Building Code. Access doors for high-piled combustible storage shall comply with the requirements of [Section 2306.6.1] FC2306.6.1.

**504.3 Stairway access to roof**. Stairway access to the roof shall be in accordance with FC Chapter 10 and the construction codes, including the Building Code. Such stairway shall be marked at street and floor levels with a sign indicating that the stairway continues to the roof. Where roofs are used for [roof] rooftop gardens or for other lawful purposes, stairways shall be provided as required for such occupancy classification.

**504.4 Rooftop access and obstructions.** The rooftops of buildings 100 feet (30 480 mm) or less in height, except rooftops with a slope exceeding [20°] 20 degrees (0.35 rad) from the horizontal, shall be designed, installed, operated and maintained in accordance with this section and in a manner that avoids or minimizes obstructions [to access for] that impede firefighting operations such as vertical ventilation of heat and smoke, surveillance of rear yards and courtyards, and rooftop-aided rescues. For purposes of this section only, "rooftop" shall include rooftops of building setbacks, and "obstruction" shall mean any fixture or other item that is not readily movable by [a] one person without the use of tools or equipment, including air conditioning systems, billboards and other signs, cellular antenna equipment, columns and girders, cooling towers, fuel oil storage tanks, generators, heating systems, planters, solar panels, ventilation system ducts, intakes and exhausts, and window cleaning equipment, but shall not include [non-metallic] nonmetallic decking that is readily cut by standard power tools.

**504.4.1 Rooftop access.** Access to building rooftops shall be provided [as follows] for fire operations by providing unobstructed access to the rooftop, including unobstructed passage across the building parapet, perimeter fence or other obstructions, and a safe landing. Such rooftop access shall be provided in compliance with the following required clearances:

1. For each 12 linear feet (3658 mm) of building perimeter accessible from the frontage space of the building and from any other exposure accessible to fire apparatus, a minimum clearance of 6 feet (1829 mm) in width and 6 feet (1829 mm) in depth from any obstruction shall be provided at the parapet wall or other perimeter of the rooftop.

2. Where such building perimeter is 24 linear feet (7315 mm) or greater, but less than 36 linear feet (10 973 mm), the required clearance openings shall be separated by a distance of not less than 12 linear feet (3658 mm).

3. Where such building perimeter is 36 linear feet (10 973 mm) or greater, the required clearance openings may be contiguous, provided, however, that such contiguous openings shall not exceed 12 linear feet (3658 mm) and shall be separated from other required clearance openings by a distance of not less than 12 linear feet (3658 mm).

4. Each exposure accessible by fire apparatus may be treated separately for purposes of locating clearance openings and otherwise complying with the requirements of this provision.

[2. A minimum clearance of 6 feet (1829 mm) in all directions shall be provided from each door opening onto a rooftop from a dwelling unit, stairway, bulkhead, or other occupied space or means of egress, as measured from the door hinge.

3. A minimum clearance of 3 feet (914 mm) in all directions shall be provided from any fire escape or rooftop access ladder, as measured from each side of the ladder or landing.]

5. Awnings, sun control devices, solar panels or other structures affixed to an exterior building wall below the roof line shall not obstruct fire apparatus aerial ladder access to the rooftop perimeter access locations.

6. Scaffolding obstructing rooftop access locations shall be designed to provide secure landings at such locations in an approved manner.

**504.4.2 Rooftop access signs and markings.** Where required by the department, a sign, decal or approved marking shall be provided on the exterior wall of a building, at an approved location on a lower story, directly below the rooftop perimeter access landings, to identify the location of such rooftop access. The department may require such signs or markings when rooftop conditions not apparent from the street make rooftop access unsafe at locations other than the approved building perimeter access landings, or do not allow for access to the roof.

**504.4.3 Rooftop access landings.** At each rooftop perimeter access location, there shall be a safe landing area not less than 6 feet (1829 mm) in any dimension, connected to the clear path required by FC504.4.4. The landing shall not be obstructed by a fence, except as approved. If approved, such fence shall be provided with a standard 3-foot-wide (914 mm) gate that swings inward. Such gate may be secured by a padlock and chain capable of being cut by standard bolt cutters from either side of the gate, or secured by other approved device.

[**504.4.2**] **504.4.4 Rooftop [obstructions] clear path.** [Unobstructed space shall be provided on rooftops sufficient to allow firefighting operations, as follows:

1.] A clear path of not less than 6 feet (1829 mm) horizontal width and 9 feet (2743 mm) in height shall be provided from the front of the building to the rear of the building and from one side of the building to the other for each 100 linear feet (30 480 mm) of rooftop width and depth[, except that a conduit or pipe in compliance with the requirements of this section may cross such path]. Such path shall comply with the following requirements:

1. Such clear path shall be accessible from each [point of the] rooftop perimeter access [from which clearance is] landing required pursuant to [Section 504.4.1] FC504.4.3.

2. Such clear path shall afford reasonable access to bulkhead doors, fire escapes, access ladders, cockloft vents, skylights, scuttles and shafts. Such access shall include, to the maximum extent practicable, 3-feet (914 mm) clearance on three sides of the skylight or scuttle.

3. A conduit or pipe may cross such clear path in accordance with FC504.4.7.

4. Any lawful fence obstructing such clear path shall be provided with a standard 3-foot-wide (914 mm) gate, which may be secured by padlock or chain capable of being cut by standard bolt cutters, or secured by other approved device.

5. When the main building rooftop has more than one level, a fixed ladder or other approved means shall be provided to afford access along the clear path from one roof level to the next, excluding any height differential between levels exceeding one story or 16 feet (4077 mm), and any level with a rooftop area that is less than 6 feet (1829 mm) in any dimension.

6. On an "H"-shaped building or other building whose irregular configuration renders a single clear path inadequate to provide access to each wing of the building or other rooftop area, the commissioner may require one or more additional clear paths to provide adequate access to such rooftop areas.

[2. To the maximum extent practicable, conduits, including cable trays, and piping, shall be installed on the rooftop side of the parapet wall. If such installation is not practicable, conduits and piping shall be installed along the periphery of the rooftop, in order to minimize rooftop obstructions. Steps or ramps constructed of non-combustible material and equipped with railings shall be provided in the clear paths for any conduits or piping installations that exceed 1 foot (305 mm) in height above the rooftop. All conduits and piping installations shall be color-coded with continuous, durable and weatherproof reflective or luminescent markings as follows:

2.1. High voltage wiring – Red.

2.2. Low voltage wiring – Orange.

2.3. Natural gas piping – Yellow.

2.4. Other compressed gas piping – Yellow, labeled at regular intervals with the type of gas.

2.5. Fuel oil piping – Yellow with black stripes.]

**504.4.5 Rooftop clear path protection.** Adequate protection, in the form of a securely affixed protective railing or barrier that is 42 inches (1067 mm) above the roof surface in height along the clear path, shall be provided for any shaft, building perimeter or elevation adjoining the clear path or rooftop perimeter access landing (except the rooftop access landing itself).

**Exception:** Height differentials of 6 feet (1829 mm) or less.

**504.4.6 Required rooftop clearances**. A minimum clearance of 6 feet (1829 mm) in all directions shall be provided from each door opening onto a rooftop from a dwelling unit,

stairway, bulkhead, or other occupied space or means of egress, as measured from the door hinge. A minimum clearance of 3 feet (914 mm) in all directions shall be provided from any fire escape or rooftop access ladder, as measured from each side of the ladder or landing.

**504.4.7 Rooftop conduits and piping.** To the maximum extent practicable, conduits, including cable trays, and piping, shall be installed at rooftop locations where they do not obstruct rooftop access landings, clear path or required clearances. If it is impracticable to avoid these areas, conduits and piping shall be designed and installed to facilitate access and minimize tripping hazards. Steps or ramps (or platforms with steps, ramps or ladders) shall be provided that are constructed of noncombustible material, equipped with railings, and designed to allow any conduit or piping installations that exceed 1 foot (305 mm) in height above the roof surface, or more than 24 inches (610 mm) in width, to be readily traversed. Steps, ramps, platforms and ladders shall not be placed in areas or in a manner that would obstruct any door or means of egress. All conduits and piping installations shall be color-coded with continuous, durable and weatherproof reflective or luminescent markings as follows, and for conduit and piping installed after July 1, 2014, shall be continuously labeled in an approved manner to indicate its contents:

1. High voltage wiring – Red.

2. Low voltage wiring – Orange.

3. Natural gas piping – Yellow.

4. Other compressed gas piping – Yellow, labeled at regular intervals with the type of gas.

5. Fuel oil piping – Yellow with black stripes.

[**504.4.3]** **504.4.8** **[Telecommunications]** **Rooftop telecommunications installations.** Telecommunications installations on building rooftops, including cellular antenna installations, shall additionally comply with the following requirements:

1. Transmitting antennas shall be identified by affixing to the antenna, the antenna mounting, or a conspicuous location near the antenna, continuous, durable and weatherproof reflective or luminescent markings and [3 inch (76.2 mm)] not less than 3-inch (76-mm) lettering that reads, "TRANSMITTER."

2. A durable sign shall be conspicuously posted on or near any equipment closet, roof base station or similar telecommunications antenna installation, identifying the owner of the installation, providing a [24 hour/7 day] 24-hour/7-day per week telephone number by which such owner can be contacted, and identifying the installation, including antennas and other powered equipment associated with the installation, by number or other unique designation.

[**504.4.4 Existing installations.** Existing telecommunications conduit and piping installations shall comply with the operational requirements for marking and signage set forth in this section within one year of the effective date of this code.]

**[504.5 Parking lots on developments.** Parking lot lanes between rows of parking spaces shall have a width of at least 24 feet (7315 mm). A minimum aisle space of at least 24 inches (610 mm) between vehicles shall be provided.]

**504.4.9 Rooftop gardens**. Rooftop gardens and landscaping, including living walls, shall be designed, installed, operated and maintained in compliance with the requirements of the construction codes, including the Building Code and this section.

**504.4.9.1 Perimeter and clear path access.** Rooftop gardens and landscaping shall not obstruct any rooftop area access to which is required pursuant to this section, including rooftop perimeter access and landings, clear path and clearances.

**504.4.9.2 Landscaped rooftops.** Rooftop access landings, clear paths and other areas access to which is required pursuant to FC 504.3 and 504.4.4 may be landscaped in compliance with the following requirements:

1. The earth or other landscaping material in such areas shall be securely contained and compacted in such a manner as to ensure a stable, continuous surface with a slope not exceeding the slope of the rooftop.

2. Vegetation in such areas shall be limited to grass or other plants that do not exceed 12 inches (305 mm) in height and do not constitute a tripping hazard or pitfall.

**504.4.9.3 Maintenance and water supply.** Rooftop gardens and landscaping shall be maintained and provided with a water supply in accordance with FC318. Equipment used for the maintenance of rooftop gardens and landscaping shall be stored in accordance with FC318.

**504.4.10 Rooftop solar installations.** Rooftop solar installations shall be designed, installed, operated and maintained in accordance with FC512.

## SECTION FC 505
## PREMISES IDENTIFICATION

**505.1 Address numbers.** [All buildings] Buildings and structures shall have their lawful address numbers, building numbers or approved building identification placed at a location on or near a building that allows such building identification to be plainly discernible from the public street or frontage space. These numbers shall contrast with their background. Address numbers shall be Arabic numerals or alphabet letters. Numbers shall be a minimum of 4 inches (102 mm) high with a minimum stroke width of [0.5] ½ inch (12.7 mm). Address numbers shall additionally comply with the requirements of the Building Code, New York City Housing Maintenance Code and the borough president of the borough in which such building is located.

**505.1.1 Developments**. Buildings within developments shall be identified in compliance with the requirements of [Section 505.1] FC505.1. Where required by the commissioner, additional signage shall be provided in new developments which is clearly visible at the intersection of the public street and any fire apparatus access road that provides access to

buildings in the development. The additional signage shall indicate the addresses of all buildings in the development served by the fire apparatus access road.

**505.2 Street or road signs.** Streets and roads within developments shall be identified with approved signs in accordance with the requirements of the New York City Department of Transportation. Temporary signs shall be installed at each street intersection when construction of new roadways allows passage by motor vehicles. Signs shall be of an approved size, weather resistant and be maintained until replaced by permanent signs.

**505.3 Identification of apartment and guest rooms.** The location of, and entrance to, each dwelling unit (guest room or sleeping room) in a Group R-1 building or occupancy, and each dwelling unit in a Group R-2 building or occupancy, shall be identified in accordance with this section and the rules to assist emergency response personnel responding to fires, medical emergencies and other emergencies at the premises.

**505.3.1 Apartment and guest room numbers.** Each dwelling unit shall be identified on the public corridor side of the door by a room number and/or letter marking or sign conspicuously and durably printed or posted on or adjacent to at least one entrance door.

**505.3.2 Public entry and corridor signage.** In a Group R-1 or R-2 building or occupancy with more than eight dwelling units on a floor, a sign shall be conspicuously posted in the elevator lobby or other public entry on each floor, and in the public corridor opposite each stairwell entrance, identifying by directional arrows and dwelling unit numbers and/or letters, the direction to each dwelling unit. Such signage need not be provided in the public entry or opposite any stairwell entrance in any building or on any floor where the entrances to dwelling units are located in a single direction from such entry or stairwell entrance.

**505.3.3 Existing installations.** Existing buildings and occupancies shall comply with the operational requirements for marking and signage set forth in FC 505.3.1 and 505.3.2 within 2 years of the effective date of this section.

**505.4 Apartment, guest room and stairwell fire emergency markings**. Dwelling units (apartments, guest rooms and sleeping rooms) and stairwell entrances in Group R-1 and Group R-2 buildings and occupancies shall be marked in accordance with this section and the rules to facilitate firefighting and emergency rescue operations at the premises.

**505.4.1 Multi-floor dwelling units.** The entrance door to a multi-floor dwelling unit in a Group R-1 or Group R-2 building or occupancy shall be identified on the door jamb on the public corridor side of the door by an approved fire emergency marking, not more than 12 inches (305 mm) from the bottom of the door, indicating the dwelling unit number and/or letter. In addition, every door of each such multi-floor dwelling unit that opens to a public corridor or other means of egress shall be identified on the public corridor side of the door by one or more upward or downward-pointing arrows indicating the direction(s) of the other floor(s) to which the multi-floor dwelling unit is connected.

**505.4.2 Apartment and sleeping rooms.** Except as otherwise provided in FC505.4.1, and except in buildings protected throughout by a sprinkler system, in a Group R-1 or R-2 building or occupancy with more than eight dwelling units on a floor, each dwelling unit

shall be identified by an approved fire emergency marking, not more than 12 inches (305 mm) from the bottom of the door, indicating the dwelling unit number and/or letter.

**505.4.3 Stairwell signage.** Except in buildings protected throughout by a sprinkler system, each stairwell door in a building or occupancy subject to compliance with the requirements of FC505.4.1 or FC505.4.2 shall be identified as a stairwell door on the door jamb on the public corridor side of the door with an approved marking or sign not more than 12 inches (305 mm) from the bottom of the door, unless such stairwell entrance has been marked in compliance with Section 1026.11 of the Building Code.

**505.4.4 Design and materials.** The fire emergency markings for dwelling unit entrance doors shall be of photoluminescent, retroreflective or other approved material, durable, water-resistant and securely affixed and shall use Arabic numerals and/or English alphabet letters. The fire emergency marking on multi-floor dwelling units shall be a minimum of 3 inches (76 mm) high and 1½ inches (38 mm) wide with a stroke width of ½ inch (12.7 mm) and the fire emergency markings required by FC 505.4.2 and 505.4.3 shall be in accordance with the rules. Any approved fire emergency marking may be used provided that the same type of marking is consistently used throughout the building. Photoluminescent markings and signs shall comply with the Building Code requirements for photoluminescent exit path markings.

**505.4.5 Existing installations.** Existing buildings and occupancies shall comply with the operational requirements for marking and signage set forth in FC505.4.1 within 2 years of the effective date of this section, and with the operational requirements for marking and signage as set forth in FC 505.4.2 and 505.4.3 within 3 years of the effective date of this section.

**505.5 Covered mall exterior door signage.** Each exterior door that provides access directly to a tenant space in a covered mall or to a corridor serving as an exit passageway from one or more such tenant spaces shall be provided with signage or markings identifying the business occupying such space or spaces. Such identification shall be durably and conspicuously posted or marked on or adjacent to the outdoor side of the exterior door such that the business name is readily discernible from nearby parking lot lanes.

## SECTION FC 506
## [KEY BOXES] KEYS AND KEY ACCESS

**506.1 General**. This section shall govern the use and possession of keys required for firefighter service elevator operation, key boxes, gates and barriers, and other locked areas, boxes or cabinets to which the department requires access for firefighting operations.

**506.2 Citywide-standard keys.** Citywide-standard keys shall be used to operate firefighter service elevators, and to provide access to key boxes, gates and barriers, and other locked areas, boxes or cabinets to which the department requires access for firefighting operations**,** in accordance with this section.

**506.2.1 Elevator keys.** Firefighter service elevator key switches shall be operable by a citywide standard key.

[**506.1 Where required]** **506.2.2 Key boxes.** Where access to or within a building, structure or [an area] premises is restricted because of [secured] locked doors or other building openings, or where immediate access [is necessary] would be needed for [life-saving] lifesaving or firefighting purposes in the event of a fire or other emergency, the [commissioner] department may require that keys be kept in a key box [operable by a fire department standard key or other approved key to be] installed in an approved location. [The key box shall be of an approved type and shall contain keys to gain necessary access as required by the commissioner.] The owner shall ensure that the key kept in the lock box is replaced whenever a lock securing the area, box or cabinet is changed or rekeyed.

[**506.1.1 Locks]** **506.2.3 Gates and barriers.** [An approved lock operable by a fire department standard key shall be installed on gates or similar barriers when required by the commissioner.] Wherever a gate or similar barrier obstructs fire department access or fire apparatus access to a premises, and a lock is installed on such gate or barrier, the lock shall be of an approved type and operable by a citywide standard key.

**506.2.4 First responder box.** The department may require that a locked box operable by a citywide standard key be provided in a designated area in a building, structure or premises to store plans, building information cards or other materials that will assist firefighting personnel responding to a fire or other emergency at the premises.

[**506.2 Key box maintenance.** The owner of the building shall immediately notify the commissioner and provide the new key when a lock is changed or rekeyed. The key to such lock shall be secured in the key box.]

**506.3 Access to citywide standard keys.** It shall be unlawful to possess a citywide standard key except for persons authorized to possess such key in connection with the following purposes:

1. Owners of buildings equipped with firefighter service elevators, or their authorized representatives, including FLS directors and FEP coordinators.

2. Elevator contractors.

3. Elevator inspectors of the Department of Buildings.

4. Persons authorized to conduct testing and other maintenance or servicing of fire alarm systems.

5. Authorized department personnel.

6. New York City police officers and other approved law enforcement personnel.

7. Building owners required to have key boxes, locked boxes or locked gates or barriers pursuant to this code, or their authorized representatives.

8. Building owners with locked gates and barriers that block required fire department and fire apparatus access.

9. Locksmiths or other authorized key suppliers when in connection with their lawful business operations.

**506.4 Access to fire department standard keys.** It shall be unlawful to possess a fire department standard key, except for authorized department personnel and other approved persons.

## SECTION FC 507
## RESERVED
## [HAZARDS TO EMERGENCY RESPONDERS

**507.1 Hoistway and shaftway protection.** The doors and/or gates to hoistways, freight elevator shafts, trap doors and other means used to provide access to vertical openings, shall be kept closed and secured, or otherwise protected, except when being used to provide access, and shall be closed, secured or protected, as applicable, at the end of each work day.

**507.2 Shaftway markings.** Vertical shafts shall be identified as required by this section.

**507.2.1 Exterior access to shaftways.** Outside openings accessible to the department and which open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

**507.2.2 Interior access to shaftways.** Door or window openings to a hoistway or shaftway from the interior of the building shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible.

**Exception:** Marking shall not be required on shaftway openings which are readily discernible as openings onto a shaftway by the construction or arrangement.

**507.3 Pitfalls.** Installations designed to disable, injure, maim or kill intruders are prohibited. No person shall install and use firearms, sharp or pointed objects, razor wire, explosives, flammable or combustible liquid containers, or dispensers containing highly toxic, toxic, irritant, piercing sounds or other hazardous materials in a manner which may passively or actively disable, injure, maim or kill a firefighter or other emergency responders who enters a building or premises, forcibly or otherwise, for the purpose of controlling or extinguishing a fire, rescuing trapped occupants or rendering other emergency assistance.]

## SECTION FC 508
## FIRE PROTECTION WATER SUPPLIES

**508.1 Required water supply.** For premises requiring the installation of private fire hydrant systems or yard hydrant systems, an approved water supply capable of supplying the required design capacity for fire protection shall be provided.

**508.2 Type of water supply.** A water supply shall consist of pressure tanks, [elevated] gravity tanks, water mains or other approved fixed systems capable of providing the required design capacity.

**508.2.1 Private fire service mains.** Private fire service mains and appurtenances shall be installed in accordance with NFPA 24 and the requirements of the New York City Department of Environmental Protection.

**508.2.2 Water tanks.** Water tanks for private hydrant systems and yard hydrant systems shall be installed in accordance with NFPA 22.

**508.2.3 Yard hydrant systems.** Outdoor amusement [and exhibition places] parks, bulk plants or terminals, lumber yards, trailer camps, industrial parks, and similar occupancies shall be provided with a yard hydrant system installed in [conformance] compliance with the requirements of the construction codes, including the Building Code, this section and [Section 914] FC914. Yard hydrants shall be installed such that the entire area may be reached by 250 feet (76.2 m) of hose from a yard hydrant or a street hydrant supplied from a direct connection to a city water main or other approved water supply.

**508.3 Design capacity.** The design capacity of the water supply shall be determined by an approved method.

**508.4 Water supply test.** Upon completion of the installation of a private fire hydrant system and yard hydrant system, a flow test shall be conducted to verify that the system provides the minimum design capacity required by [Section 508.3] FC508.3. Certification of the water supply test shall be submitted to the commissioner by a registered design professional.

**508.5 Private fire hydrant systems.** Private fire hydrant systems shall comply with the requirements of [Sections] FC 508.5.1 through 508.5.6.

**508.5.1 Where required.** Where the front entrance of a building is more than 250 feet (76.2 m) from a hydrant on a public street, as measured by an approved route, private fire hydrants and mains shall be provided as required by the commissioner.

**508.5.2 Inspection, testing and maintenance.** Private fire hydrant systems shall be subject to periodic tests as required by the commissioner. Private fire hydrant systems shall be maintained in good working order at all times and shall be repaired when defective. Additions, repairs, alterations and servicing shall comply with approved standards.

**508.5.2.1 Department flow tests.** The department may periodically inspect and test private fire hydrant systems, at the risk of the owner, for proper operation and unobstructed flow of such hydrant system.

**508.5.3 Private fire service mains and water tanks.** Private fire service mains and water tanks shall be periodically inspected, tested and maintained in accordance with NFPA 25 at the following intervals:

1. Private fire hydrants (all types): Inspection annually and after each operation; flow test and maintenance annually.

2. Fire service main piping: Inspection of exposed, annually; flow test every 5 years.

3. Fire service main piping strainers: Inspection and maintenance after each use.

**508.5.4 Obstructions.** Posts, fences, vegetation, rubbish containers, vehicles and other items shall not be installed, planted, placed, parked or stored near fire hydrants, fire department [inlet] connections or fire protection system control valves in a manner that would obscure the location of such fire hydrants, connections or valves, or that would hinder immediate access thereto by firefighting personnel.

**508.5.5 Clear space around hydrants.** A 3-foot (914 mm) radius clear space shall be maintained around the circumference of fire hydrants to allow unobstructed operation of the hydrant operating nut, except as otherwise required or approved.

**508.5.6 Physical protection.** Where fire hydrants are subject to impact by motor vehicles, posts that comply with the requirements of the New York City Department of Environmental Protection shall be installed. Notwithstanding the requirements of [Section 508.5.5] FC508.5.5, these posts may be installed no less than 2 feet (610 mm) from the hydrant if they do not obstruct the use of a 24-inch (610-mm) wrench on the hydrant operating nut.

## SECTION FC 509
## RESERVED
## [FIRE COMMAND CENTER

**509.1 Installation and maintenance.** Where required by this code or the construction codes, including the Building Code, a fire command center for department operations shall be provided. The location and accessibility of the fire command center shall be approved by the department. The fire command center shall be installed according to the construction codes, including the Building Code. A layout of the fire command center and all operational features shall be submitted for approval prior to installation. The fire command center shall be maintained in accordance with NFPA 72.]

## SECTION FC 510
## [FIRE DEPARTMENT ACCESS TO EQUIPMENT]
## FIRE PROTECTION AND UTILITY EQUIPMENT IDENTIFICATION AND ACCESS

**510.1 Identification.** Fire protection equipment shall be identified in an approved manner. Rooms containing controls for [air-conditioning] ventilation systems, sprinkler risers and valves, or other fire detection, [suppression] extinguishing or control elements shall be identified for the use of the department. Approved signs required to identify fire protection equipment and equipment location, shall be constructed of durable materials, permanently installed and conspicuously posted.

**510.2 Safe access.** Fire protection devices, equipment and systems, including fire detection systems and fire extinguishing systems, shall be readily accessible for inspection, operation and maintenance. Storage, trash and other materials or objects shall not be placed or kept in such a manner that would prevent such equipment from being readily accessible. Sprinkler and standpipe system control valves located at a height of 7 feet (2134 mm) or more above the floor shall be provided with [permanent] fixed ladders, chains and wheels, or other approved means to provide ready access.

**510.3 Natural gas shutoff tools.** Natural gas utilities shall provide the department with suitable tools for the operation of outdoor gas service line valves for a building or structure or other outdoor emergency shutoff device or equipment. The number of such tools required to supply the department's needs shall be determined by the commissioner.

**510.4 Utility identification.** Where required by the department, water, natural gas, electric or other utility service shutoff valves and disconnect switches to a building, structure, premises, device, equipment or system shall be provided with a durable and conspicuous marking that identifies the building, structure, premises, device, equipment or system such shutoff valve or disconnect switch serves.

## SECTION FC 511
## IN-BUILDING AUXILIARY RADIO COMMUNICATION SYSTEMS

**511.1 General.** The design, installation, operation and maintenance of in-building auxiliary radio communication systems dedicated for fire department use, whether required by the Building Code or installed voluntarily, shall comply with this section and the rules.

**511.2 Design and installation.** In-building auxiliary radio communication systems for fire department use shall be designed and installed in accordance with the construction codes, including the Building Code, and the Electrical Code.

**511.2.1 Installer qualifications.** In-building auxiliary radio communication systems for fire department use shall be installed by a master electrician licensed by the Department of Buildings and such other qualifications as may be prescribed by rule.

**511.2.2 Installation acceptance.** In-building auxiliary radio communication systems for fire department use shall be tested for department acceptance in compliance with the requirements of this section and the rules.

**511.2.2.1 Commissioning test.** Upon completion of installation of an in-building auxiliary radio communication system for fire department use, a commissioning test shall be conducted in accordance with Annex O of NFPA 1 by a person holding a Federal Communication Commission general radio telephone operator license and such other qualifications as may be prescribed by rule.

**511.2.2.2 Department acceptance test.** Upon successful completion of the commissioning test, the owner shall submit to the department a detailed report of the results of the commissioning test and request a department acceptance test. The department acceptance test shall serve to demonstrate the system is functioning

satisfactorily and is ready for department use. The in-building auxiliary radio communication system shall be demonstrated in the presence of a department representative by a representative of the owner. Upon satisfactory completion of the department acceptance test, the department shall issue a permit for such system.

**511.3 Operation and maintenance**. The operation and maintenance of in-building auxiliary radio communication systems for fire department use shall be in accordance with this section and the rules.

**511.3.1 General.** In-building auxiliary radio communication systems for fire department use shall be maintained in good working order.

**511.3.2 Out-of-service systems.** The department shall be notified immediately if an in-building auxiliary radio communication system for fire department use, or part thereof, is out of service. A tag identifying the system as out of service shall be placed on the fire command center or other approved location when the system is out of service.

## SECTION FC 512
## ROOFTOP SOLAR PANEL INSTALLATIONS

**512.1 General.** The design, installation, operation and maintenance of solar panel systems, including photovoltaic and thermal systems, on the rooftops of buildings and structures, shall be in accordance with this section, the Electrical Code and the construction codes, including the Building Code, Mechanical Code and Plumbing Code.

**512.2 Flat-roofed buildings and structures 100 feet or less in height.** Solar panel installations shall not obstruct any rooftop area access to which is required pursuant to FC504.4, except that solar panel installations may obstruct the clear path required by FC504.4.4 as follows:

1. if the installation is provided with a hinged mechanism or other device for which a certificate of approval has been issued that enables the installation to be safely swung, slid, lifted, collapsed or otherwise moved out of the clear path, and that is designed to allow for operation by one person, without the use of a tool; or

2. on any building with a rooftop width or depth of 25 feet (7620 mm) or less, where the design of a solar panel installation necessitates coverage of all or substantially all of the rooftop across the full width or length thereof, the commissioner may authorize permanent obstructions that encroach upon and thereby reduce the clear path width within such area when necessary to accommodate the presence of hatches; scuttles and skylights; bulkheads; attic ventilators; chimneys and plumbing vents; and heating, ventilation and air conditioning equipment or other rooftop building service equipment.

**512.3 Pitched-roofed buildings and structures 100 feet or less in height.** Solar panel installations shall be designed, installed, operated and maintained in accordance with this section on rooftops of buildings and structures 100 feet (30 480 mm) or less in height with a slope exceeding 20 degrees, except detached Group U buildings and structures.

**512.3.1 Hip roofs.** Solar panel installations shall provide a 3 foot (914 mm) wide clear access area along the ridge on each roof slope upon which solar panels are installed.

**512.3.2 Ventilation**. Solar panels shall not be installed closer than 3 feet (914 mm) to the ridge line.

**512.4 Photovoltaic solar panel installations.** Photovoltaic solar panel installations shall be designed, installed, operated and maintained in compliance with the requirements of this section.

**512.4.1 Location of photovoltaic solar panel installations on pitched roofs**. Direct current conduit, wiring systems, and raceways for photovoltaic circuits installed on pitched roofs subject to the requirements of FC512.3 shall be located along hips and valleys, away from the ridge, and on outside walls, to maximize ventilation opportunities. Conduit runs between sub-arrays and to direct current combiner boxes shall be installed in a manner that minimizes the total amount of conduit on the roof by taking the shortest path from the array to the direct current combiner box, except as necessary to minimize the tripping hazard. The direct current combiner boxes shall be located such that conduit runs are minimized in the pathways between arrays.

**512.4.2 Photovoltaic solar panel installation markings.** Indoor and outdoor direct current conduit, enclosures, raceways, cable assemblies, junction boxes, combiner boxes, and main service and other disconnects shall have durable, retroreflective and, if outdoors, weatherproof, markings, in white capital letters with a height of not less than 3/8 inch (9.5 mm) on a red background, reading "WARNING: PHOTOVOLTAIC POWER SOURCE." Continuous installations, including conduit, raceways, enclosures and cable assemblies, shall be marked every 10 feet (3048 mm), within 1 foot (305 mm) of all turns or bends, and within 1 foot (305 mm) above and below all penetrations of roof or ceiling assemblies and all walls.

# CHAPTER 6
# BUILDING SERVICES AND SYSTEMS

## SECTION FC 601
## GENERAL

**601.1 Scope.** This chapter shall govern the design, installation, operation and maintenance of [fuel-fired appliances, devices, equipment and systems, emergency power systems, electrical systems and equipment, refrigerating systems, elevator recall, stationary lead-acid battery systems and commercial cooking exhaust hoods] selected devices, equipment and systems used or designed to be used to provide building services, including battery, commercial cooking, elevator recall, emergency power, heating and refrigerating systems.

**601.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**601.3 General.** Fuel-fired appliances, devices, equipment and systems, emergency [and standby] power systems, electrical systems and equipment, refrigerating systems, elevator recall, [stationary lead-acid] battery systems and commercial cooking [exhaust hoods] systems shall be designed, installed, operated and maintained in accordance with this chapter.

**601.4 Supervision.** Fuel oil storage systems, refrigerating systems and battery systems shall be supervised in accordance with FC 601.4.1 through 601.4.3.

**601.4.1 Fuel oil storage and transfer.** A stationary fuel oil storage tank, and related piping, that is installed on the lowest floor of a building and that transfers fuel oil through piping to another stationary fuel oil storage tank, or to fuel-oil burning equipment, installed above such floor, shall be under the general supervision of a certificate of fitness holder. The periodic inspection and testing of such tanks and piping pursuant to FC603.1.9 shall be conducted under the personal supervision of such certificate of fitness holder.

**601.4.2 Refrigerating systems**. Refrigerating systems shall be supervised by a person holding a certificate of qualification in accordance with FC606.1.1 and FC Table 606.1.1.

**601.4.3 Battery systems.** Battery systems subject to compliance with the requirements of FC608 shall be under the general supervision of a person holding a certificate of fitness.

## SECTION FC 602
## DEFINITIONS

**602.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**[BATTERY, LEAD ACID.** A group of electrochemical cells interconnected to supply a nominal voltage of DC power to a suitably connected electrical load. The number of cells connected in series determines the nominal voltage rating of the battery. The size of the cells determines the discharge capacity of the entire battery.]

**[BATTERY, VALVE-REGULATED LEAD-ACID (VRLA).** A lead-acid battery consisting of sealed cells furnished with a valve that opens to vent the battery whenever the internal pressure of the battery exceeds the ambient pressure by a set amount. In VRLA batteries, the liquid electrolyte in the cells is immobilized in an absorptive glass mat (AGM cells or batteries) or by the addition of a gelling agent (gel cells or gelled batteries).]

**[BATTERY, VENTED (FLOODED) LEAD-ACID.** A lead-acid battery consisting of cells that have electrodes immersed in liquid electrolyte. Flooded lead-acid batteries have a provision for the user to add water to the cell and are equipped with a flame-arresting vent which permits the escape of hydrogen and oxygen gas from the cell in a diffused manner such that a spark, or other ignition source, outside the cell will not ignite the gases inside the cell.]

**BATTERY SYSTEM, STATIONARY LEAD ACID.** A system which consists of three interconnected subsystems:

1. A lead-acid battery.

2. A battery charger.

3. A collection of rectifiers, inverters, converters, and associated electrical equipment as required for a particular application.

**BATTERY TYPES**

**Lithium-ion battery.** A storage battery in which an electrical current is generated by lithium ions embedded in a carbon graphite or nickel metal-oxide substrate placed in a high-viscosity carbonate mixture or gelled polymer electrolyte.

**Lithium metal polymer battery.** A storage battery in which an electrical current is generated by the interaction between lithiated positive active material electrically separated from metallic lithium or lithiated negative active material, and nonaqueous liquid or polymerized electrolytes.

**Nickel cadmium (Ni-Cd) battery.** An alkaline storage battery in which the positive active material is nickel oxide, the negative active material contains cadmium, and the electrolyte is potassium hydroxide.

**Nonrecombinant battery.** A storage battery in which, under conditions of normal use, hydrogen and oxygen gases created by electrolysis are vented into the air outside of the battery.

**Recombinant battery.** A storage battery in which, under conditions of normal use, hydrogen and oxygen gases created by electrolysis are converted into water inside the battery instead of venting into the air outside of the battery.

**Stationary storage battery.** A storage battery designed for use in a stationary installation, in which electrochemical cells are interconnected to supply a nominal voltage of direct current power. The nominal voltage rating of a stationary storage battery is a function of the number of cells connected in a series, and the discharge capacity is a function of the size of the cells. Stationary storage batteries are characterized by their ability to be restored to a fully charged condition by reversing the flow of the electric current after discharge.

**Valve-regulated lead-acid (VRLA) battery.** A lead-acid battery consisting of sealed cells furnished with a valve that opens to vent the battery whenever the internal pressure of the battery exceeds the ambient pressure by a set amount. In VRLA batteries, the liquid electrolyte in the cells is immobilized in an absorptive glass mat (AGM cells or batteries) or by the addition of a gelling agent (gel cells or gelled batteries).

**Vented (flooded) lead-acid battery.** A lead-acid battery consisting of cells that have electrodes immersed in liquid electrolyte. Flooded lead-acid batteries have a provision for the user to add water to the cell and are equipped with a flame-arresting vent which permits the escape of hydrogen and oxygen gas from the cell in a diffused manner such that a spark, or other ignition source, outside the cell will not ignite the gases inside the cell.

**CERTIFICATE OF QUALIFICATION.** A written statement issued by the commissioner certifying that the person to whom it is issued has passed an examination as to his or her

qualifications to direct, control and supervise the operation of a refrigerating system, for which such certificate is required by this code or the rules.

**CITYWIDE-STANDARD KEY.** See [Section 502.1] FC502.1.

**COMMERCIAL COOKING APPLIANCES.** Appliances used in a commercial food service establishment for heating or cooking food and which produce grease vapors, steam, fumes, smoke or odors that are required to be removed through a local exhaust ventilation system. Such appliances shall include deep fat fryers; upright broilers; griddles; broilers; steam-jacketed kettles; hot-top ranges; under-fired broilers (charbroilers); ovens; barbecues; rotisseries; and similar appliances. For the purpose of this definition, a food service establishment shall include any building[,] or structure [or portion thereof] used for the preparation and serving of food, other than commercial cooking appliances in carts or other mobile stands operated by street vendors.

**HOOD.** An air-intake device used to capture by entrapment, impingement, adhesion or similar means, grease and similar contaminants before they enter a duct system.

**Type I.** A kitchen hood for collecting and removing grease vapors and smoke.

**REFRIGERANT.** The fluid used for heat transfer in a refrigerating system; the refrigerant absorbs heat and transfers it at a higher temperature and a higher pressure, usually with a change of state.

**REFRIGERATING SYSTEM.** A combination of interconnected refrigerant-containing parts constituting one closed refrigerant circuit in which a refrigerant is circulated for the purpose of extracting then expelling heat.

## SECTION FC 603
## FUEL-FIRED APPLIANCES AND EQUIPMENT

**603.1 Installation.** Nonportable fuel-fired appliances, devices, equipment and systems shall be designed, installed, operated and maintained in accordance with the construction codes, including the Fuel Gas Code and the Mechanical Code.

**603.1.1 Manufacturer's instructions.** In addition to the requirements of this code and other applicable laws, rules and regulations, the installation shall be made in accordance with the manufacturer's instructions. Where it becomes necessary to change, modify, or alter a manufacturer's instructions in any way, written approval shall first be obtained from the manufacturer.

**603.1.2 Approval.** The design, construction and installation of fuel-fired appliances, devices, equipment and systems shall be in accordance with the construction codes, including the Fuel Gas Code and the Mechanical Code.

**603.1.3 Electrical wiring and equipment.** Electrical wiring and equipment used in connection with oil-burning equipment shall be installed and maintained in accordance with [Section 605] FC605 and the Electrical Code.

**603.1.4 Fuel oil.** The grade of fuel oil used in a burner shall be that for which the burner is approved and as stipulated by the burner manufacturer and approved by the Department of Buildings. Oil containing gasoline shall not be used. Waste crankcase oil shall not be used, except when such waste oil is mixed with number six fuel oil in bulk or waste oil recovery plants, the resultant mixture meets the minimum specifications for number six fuel oil set forth in the Building Code, and the use of such waste oil complies with all laws, rules and regulations relating to smoke and other emissions and is approved by the Department of Environmental Protection.

**603.1.5 Access.** The installation shall be readily accessible for cleaning hot surfaces; removing burners; replacing motors, controls, air filters, chimney connectors, draft regulators, and other working parts; and for adjusting, cleaning and lubricating parts.

**603.1.6 Testing, diagrams and instructions.** After installation of the oil-burning equipment, operation and combustion performance tests shall be conducted to determine that the burner is in proper operating condition and that all accessory equipment, controls, and safety devices function properly in accordance with the requirements of the Department of Buildings and the Department of Environmental Protection.

**603.1.6.1 Diagrams.** Contractors installing industrial oil-burning systems shall furnish not less than two copies of diagrams showing the main oil lines and controlling valves, one copy of which shall be posted at the oil-burning equipment and another at an approved location that will be accessible in case of emergency.

**603.1.6.2 Instructions.** After completing the installation, the installer shall instruct the owner or operator in the proper operation of the equipment. The installer shall also furnish the owner or operator with the name and telephone number of persons to contact for technical information or assistance and routine or emergency services.

**603.1.7 Clearances.** Working clearances between oil-fired appliances and electrical panelboards and equipment shall be in accordance with the Electrical Code. Clearances between oil-fired equipment and oil supply tanks shall be in accordance with the construction codes, including the Building Code and the Mechanical Code.

**603.1.8 Supervision of operation.** Every stationary oil-fired device, equipment or system that is not fully automatic or requires preheating of the oil shall be operated by or under the personal supervision of a person holding a certificate of fitness or a person holding a [high pressure] <u>high-pressure</u> boiler operating engineer's license issued by the Department of Buildings. In addition to providing personal supervision, such person shall be present at the device, equipment or system during startup. A stationary oil-fired device, equipment or system that is subject to annual inspection pursuant to [Section 28-303.1 of the Building Code] <u>Article 303 of Title 28 of the Administrative Code</u> may be operated under the general supervision of a certificate of fitness holder or a [high pressure] <u>high-pressure</u> boiler operating engineer license holder.

<u>**603.1.9 Fuel oil transfer maintenance.** The fuel oil storage tanks and piping systems in which fuel oil is transferred from a stationary fuel oil storage tank installed on the lowest</u>

floor of a building to another stationary fuel oil storage tank, or to fuel-oil burning equipment, installed above such floor, shall be inspected for evidence of leaks, and stationary tank float switches shall be tested to ensure that they are in good working order, on not less than a weekly basis.

**603.2 Chimneys.** Masonry chimneys shall be constructed in accordance with the construction codes, including the Building Code. Factory-built chimneys shall be installed in accordance with the construction codes, including the Mechanical Code. Metal chimneys shall be constructed and installed in accordance with the construction code, including the Building Code and the Mechanical Code.

**603.3 Fuel oil storage systems.** Fuel oil storage and piping systems shall be installed in accordance with the construction codes, including the Mechanical Code. Fuel oil storage shall be subject to the permit requirements set forth in [Section 105.6] FC105.6.

**603.3.1 Portable fire extinguisher.** In all occupancies other than Group R-3 occupancies, stationary fuel oil-burning equipment, including boilers, emergency generators, furnaces, hot water heaters and space heaters, shall be provided with a dry chemical type portable fire extinguisher with at least a 20-B:C rating, or a carbon dioxide type portable fire extinguisher with at least a 2-B:C rating. Such portable fire extinguisher shall be located not more than 30 feet (9144 mm) from the fuel oil fired equipment, except that such travel distance may be increased to a maximum of 50 feet (15 240 mm) if a dry chemical portable fire extinguisher with at least a 40-B:C rating, or a carbon dioxide portable fire extinguisher with at least a 4-B:C rating, is provided.

**603.4** Reserved.

**603.5 Heating appliances and equipment.** Heating appliances and equipment shall be listed and shall comply with the requirements of this section.

**603.5.1 Protection of heating element.** The heating element or combustion chamber shall have a permanent device to prevent accidental contact by persons or material.

**603.5.2 Heating appliance and equipment installation.** Heating appliances and equipment shall be installed in accordance with the manufacturer's instructions, the Electrical Code, and the construction codes, including the Building Code, the Mechanical Code and the Fuel Gas Code.

**603.6 Chimney installation.** Chimneys, smokestacks or similar devices for conveying smoke or hot gases to the outer air and the incinerators, stoves, furnaces, fireboxes or boilers to which such devices are connected, shall be maintained so as not to create a fire hazard.

**603.6.1 Masonry chimneys.** Masonry chimneys that, upon inspection, are found to have open mortar joints which will permit smoke or gases to be discharged into the building or structure, or which are cracked as to be dangerous, shall be repaired or relined with a listed chimney liner system installed in accordance with the manufacturer's installation instructions or a flue lining system installed in accordance with the construction codes, including the

Building Code and the Mechanical Code, and appropriate for the intended class of chimney service.

**603.6.2 Metal chimneys.** Metal chimneys which are corroded or improperly supported shall be repaired or replaced.

**603.6.3 Decorative shrouds.** Decorative shrouds installed at the termination of factory-built chimneys shall be removed except where such shrouds are listed and labeled for use with the specific factory-built chimney system and are installed in accordance with the chimney manufacturer's installation instructions.

**603.6.4 Factory-built chimneys.** Existing factory-built chimneys that are damaged, corroded or improperly supported shall be repaired or replaced.

**603.6.5 Connectors.** Existing chimney and vent connectors that are damaged, corroded or improperly supported shall be repaired or replaced.

**603.6.6 Incinerator requirements.** Incinerators shall be maintained and operated in accordance with [Sections] FC 603.6.6.1 and 603.6.6.2.

**603.6.6.1 Spark arrestor.** Incinerators shall be equipped with an effective means for arresting sparks.

**603.6.6.2 Time of burning.** Burning shall take place only during approved hours.

**603.6.7 Discontinuance.** The commissioner may require the operation of an incinerator or other device connected to a chimney to be discontinued immediately upon a determination that the use of the incinerator or other device constitutes an undue fire hazard because of conditions in the surrounding environment.

**603.7 Discontinuing operation of unsafe heating appliances and equipment.** The commissioner may order that measures be taken to prevent the operation of any existing stove, oven, furnace, incinerator, boiler or any other heat-producing appliance, device, equipment or system found to be defective or in violation of code requirements for existing appliances, devices, equipment or systems after giving notice to this effect to any person, owner, firm or agent or operator in charge of the same. The commissioner may take measures to prevent the operation of any appliance, device, equipment or system without notice upon a determination of the existence of an immediate fire hazard or imminent peril to public safety. The defective appliance, device, equipment or system shall remain out of service until all necessary repairs or alterations have been made.

**603.7.1 Unauthorized operation.** It shall be a violation of this code for any person, user, firm or agent to continue the utilization of any appliance, device, equipment or system (the operation of which has been discontinued or ordered discontinued in accordance with [Section 603.7] FC603.7), unless written authority to resume operation is given by the department. Removing or breaking the means by which operation of the appliance, device, equipment or system is prevented shall be a violation of this code.

**603.8** Reserved.

**603.9 Gas meters.** Aboveground gas meters, regulators and piping subject to damage shall be protected by a barrier complying with the requirements of [Section 312] FC312 or otherwise protected in an approved manner.

## SECTION FC 604
## EMERGENCY POWER SYSTEMS

**604.1 Installation.** Emergency power systems shall be designed, installed, operated and maintained in accordance with the Electrical Code and the construction codes, including the Building Code.

**604.2 Where required.** Emergency power systems shall be maintained in accordance with NFPA 110, as modified by FC Appendix B, and NFPA 111, such that the system is capable of supplying service within the time specified for the type and duration of emergency power required by the Electrical Code and the construction codes, including the Building Code.

**604.3 Maintenance.** Emergency power systems shall be maintained such that the system is capable of supplying service within the time specified for the type and duration of emergency power required by the Electrical Code and the construction codes, including the Building Code.

**604.3.1 Schedule.** Inspection, testing and other maintenance of emergency power systems shall be conducted in accordance with an approved schedule established upon completion and approval of the system installation.

**604.3.2 Written record.** Written records of the inspection, testing and other maintenance of emergency power systems shall include the date of service, name of the servicing technician, a summary of conditions noted and a detailed description of any conditions requiring correction and what corrective action was taken. [Such records shall be kept on the premises served by the emergency power system and be available for inspection by any representative of the department.]

**604.3.3 Switch maintenance.** Emergency power system transfer switches shall be included in the maintenance schedule required by [Section 604.3.1] FC604.3.1. Transfer switches shall be maintained free from accumulated dust and dirt. Inspection shall include examination of the transfer switch contacts for evidence of deterioration. When evidence of contact deterioration is detected, the contacts shall be replaced in accordance with the transfer switch manufacturer's instructions.

**604.4 [Operational inspections] Inspection and testing.** Emergency power systems, including all appurtenant components, shall be periodically inspected and tested under load in accordance with NFPA 110, as modified by FC Appendix B, and NFPA 111.

**Exception:** Where the emergency power system is used for standby power or peak load shaving, such use shall be recorded and may substitute for scheduled testing of the emergency power system, provided that appropriate records are maintained of such use.

**604.4.1 Transfer switch test.** The test of the transfer switch shall consist of electrically operating the transfer switch from the normal position to the alternate position and then returning back to the normal position.

**604.5 Supervision.** Inspection, testing and other maintenance shall be conducted under the personal supervision of a person who possesses the required knowledge and training to conduct such maintenance, and who has at least one of the following qualifications:

1. An electrician licensed by the Department of Buildings.

2. An electrician holding a special license issued by the Department of Buildings.

3. A person holding a stationary engineer license, or high-pressure boiler operating engineer's license, issued by the Department of Buildings.

4. A person holding a certificate of qualification [for refrigerating system operating engineer].

5. A person holding a certificate of fitness as [fire safety] <u>an FLS</u> director.

6. A registered design professional.

## SECTION FC 605
## ELECTRICAL EQUIPMENT, WIRING AND HAZARDS

**605.1 Abatement of electrical hazards.** Defective devices, equipment or systems shall not be used and the hazardous conditions shall be corrected or the device, equipment or system shall be removed from the premises. Electrical wiring, devices and other equipment that is damaged or otherwise constitutes an electrical or fire hazard shall not be used, and the hazardous condition shall be corrected or the equipment removed from the premises.

**605.2 Illumination.** Illumination shall be provided for service equipment areas, motor control centers and electrical panelboards.

**605.3 Working space and clearance.** A working space of not less than 30 inches (762 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided in front of electrical service equipment. Where the electrical service equipment is wider than 30 inches (762 mm), the working space shall not be less than the width of the equipment. No storage of any materials shall be located within the designated working space.

**Exceptions:**

1. Where other dimensions are required or allowed by the Electrical Code.

2. Access openings into attics or under-floor areas which provide a minimum clear opening of 22 inches (559 mm) by 30 inches (762 mm).

**605.3.1 Labeling.** Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating ELECTRICAL ROOM or similar approved wording. The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident.

**605.4 Multiplug adapters.** Multiplug adaptors, such as cube adaptors, unfused plug strips or any other device not complying with the requirements of the Electrical Code shall be prohibited.

**605.4.1 Power tap design.** [Relocatable] Portable power taps shall be of the polarized or grounded type, equipped with overcurrent protection, and shall be listed in accordance with UL 1363.

**605.4.2 Power supply.** [Relocatable] Portable power taps shall be directly connected to a permanently installed receptacle.

**605.4.3 Installation.** [Relocatable] Portable power tap cords shall not extend through walls, ceilings, floors, under doors or floor coverings, or be subject to environmental or physical damage.

**605.5 Extension cords.** Extension cords and flexible cords shall not be a substitute for permanent wiring. Extension cords and flexible cords shall not be affixed to buildings or structures, extended through walls, ceilings or floors, or under doors or floor coverings, nor shall such cords be subject to environmental damage or physical impact. Extension cords shall be used only with portable devices.

**605.5.1 Power supply.** Extension cords shall be plugged directly into an approved receptacle, power tap or multiplug adapter and, except for approved multiplug extension cords, shall serve only one portable device.

**605.5.2 Ampacity.** The ampacity of the extension cords shall not be less than the rated capacity of the portable appliance supplied by the cord.

**605.5.3 Maintenance.** Extension cords shall be maintained in good condition without splices, deterioration or damage.

**605.5.4 Grounding.** Extension cords shall be grounded when serving grounded portable devices.

**605.6 Unapproved conditions.** Open junction boxes and open-wiring splices shall be prohibited. Approved covers shall be provided for all switch and electrical outlet boxes.

**605.7 Electrical devices and equipment.** Electrical devices and equipment shall be listed or labeled and installed in accordance with the construction codes and the Electrical Code.

**605.8 Electrical motors.** Electrical motors shall be maintained free from excessive accumulations of oil, dirt, waste and debris.

**605.9 Temporary wiring.** Temporary wiring for electrical power and lighting installations is allowed for a period not to exceed 90 calendar days. Temporary wiring methods shall meet the applicable provisions of the Electrical Code.

**Exception:** Temporary wiring for electrical power and lighting installations is allowed during periods of construction, remodeling, repair or demolition of buildings, structures, equipment or similar activities.

**605.9.1 Attachment to structures.** Temporary wiring attached to a building or structure shall be attached in an approved manner.

**605.10 Portable electric space heaters.** The use of portable electric space heaters shall be in accordance with this section.

**605.10.1 Listed and labeled.** Portable electric space heaters shall be listed and labeled. Portable electric space heaters shall be operated only in locations for which they are listed.

**605.10.2 Power supply.** Portable electric space heaters shall be plugged directly into a receptacle. Extension cords shall not be used for electrical connections for portable electric space heaters.

**605.10.3 Prohibited use.** It shall be unlawful to use portable electric space heaters in the following locations:

1. In any building or occupancy, where the power requirements for the portable electric space heater exceed the rating of the electrical circuit or receptacle from which the heater will draw current.

2. In any occupancy, within 3 feet (914 mm) of any combustible material.

3. In Group I-2 occupancies, except that a portable electric space heater with a heating element designed not to exceed a temperature of 212°F (100°C) may be used in nonsleeping staff and employee areas.

4. In Group R-1 college and university dormitories.

5. In any location considered to be a hazardous location in accordance with the Electrical Code, unless listed for such use.

**605.11 Portable halogen floor lamps.** Portable halogen floor lamps shall be designed, operated and maintained in compliance with the requirements of this section.

**605.11.1 Prohibitions.** It shall be unlawful to:

1. store or use portable halogen floor lamps in Group I-2 occupancies and Group R-1 college and university dormitories.

2. use portable halogen floor lamps for any purpose other than lighting.

3. store or use portable halogen floor lamps that are not designed with an approved glass or wire bulb guard or when such guard is not in place.

**605.11.2 Manufacturer instructions.** Portable halogen floor lamps shall be used in accordance with the manufacturer's instructions.

**605.11.3 Placement.** Portable halogen floor lamps shall be placed in locations where the risk of the lamp being tipped over by occupant traffic or activities, or of igniting curtains, furnishings or other combustible materials, is minimized.

**605.11.4 Bulb replacement and disposal.** Portable halogen floor lamp bulbs shall be replaced and discarded only when the bulb is cool to the touch.

## SECTION FC 606
## REFRIGERATING SYSTEMS

**606.1 General.** Refrigerating systems shall be designed, installed, operated and maintained in accordance with this code and the construction codes, including the Mechanical Code.

**606.1.1 Supervision.** It shall be unlawful to operate any refrigerating system for which a permit is required and which is a system described in FC Table 606.1.1, unless such operation is under either the personal supervision or general supervision, as set forth in FC Table 606.1.1, of a person who has obtained a certificate of qualification for refrigerating system operating engineer. For purposes of this section, personal supervision shall mean that such person is present in the building at all times while the system is in operation and that the operation of such system is under his or her personal direction and control, and general supervision shall mean that such person is responsible at all times for the safe operation of such system when such system is in operation and that such system is operated under his or her general direction and control. Persons providing general or personal supervision as required by this section shall register their work location with the department.

**606.1.2 Operator inspection after repairs.** After any repairs are made to a refrigerating system the operation of which requires supervision by a certificate of qualification holder, the certificate of qualification holder shall check the repairs, together with the functioning of all control devices and the positioning of all valves. Such certificate of qualification holder shall also be present when the system is restarted after repairs.

**606.1.3 Operator logbook**. A logbook or other form of approved recordkeeping shall be maintained for all refrigerating systems whose operation requires either personal or general supervision by a certificate of qualification holder. For systems requiring personal supervision the logbook shall, at a minimum, contain an entry for each shift the system is in operation. For systems requiring general supervision the logbook shall, at a minimum, contain an entry for each day during which the system is in operation.

**606.1.3.1 Logbook entries**. The logbook shall provide information relevant to the operation of the system, including any operating problems or deficiencies and required

periodic tests. The signature of the certificate of qualification holder shall appear next to each entry.

**606.2 Refrigerants.** The use and purity of new, recovered, and reclaimed refrigerants shall be in accordance with the construction codes, including the Mechanical Code.

**606.3 Refrigerant classification.** Refrigerants shall be classified in accordance with the construction codes, including the Mechanical Code.

**606.4 Change in refrigerant type.** Any change in the type of refrigerant in a refrigerating system shall be made in accordance with the construction codes, including the Mechanical Code.

**606.5 Access.** Refrigerating systems having a refrigerant circuit containing more than 200 pounds (91 kg) of Group A1 or 30 pounds (14 kg) of any other group refrigerant shall be accessible to the department at all times as required by the commissioner. Refrigerating systems requiring a permit shall be accessible at all times, and shall, where practicable, be made accessible for department inspection without the use of portable ladders or other portable equipment.

**606.6 Testing of equipment.** Refrigerating equipment and systems having a refrigerant circuit containing more than 200 pounds (91 kg) of Group A1 or 30 pounds (14 kg) of any other group refrigerant shall be subject to periodic testing in accordance with [Section 606.6.1] FC606.6.1. [A written record of required testing shall be maintained on the premises.] Tests of emergency devices or systems required by this chapter shall be conducted by a person holding a certificate of qualification.

**606.6.1 Periodic testing.** The following emergency devices or systems shall be tested at least monthly in accordance with the manufacturer's instructions.

1. Treatment and flaring systems.

2. Valves and appurtenances necessary to the operation of emergency refrigerating system control boxes.

3. Fans and associated equipment intended to operate emergency ventilation systems.

4. Detection and alarm systems.

**FC TABLE 606.1.1 REFRIGERATING SYSTEM OPERATING ENGINEER**

| Installation Date | Refrigerant Group Or Name[a] [(See Note 1)] | Occupancy Type[b] [(See Note 2)] | Application | Pounds Of Refrigerant In System | System Horsepower | System Design[c] [(see Note 3)] | Supervision Required |
|---|---|---|---|---|---|---|---|
| Prior to June 1, 1957 | A1 | Industrial | Human comfort | More than 50 | NA | Not fully automatic | Personal |
| | A1 | Industrial | Human comfort | More than 200 | NA | Fully automatic | Personal |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | A1 | Industrial | Human comfort | More than 50 up to 200 | NA | Fully automatic | General |
| | A1 | All except Industrial | All | More than 50 | NA | Not fully automatic | Personal |
| | A1 | All except Industrial | All | More than 200 | NA | Fully automatic | Personal |
| | A1 | All except Industrial | All | More than 50 up to 200 | NA | Fully automatic | General |
| On or after June 1, 1957 | A1 | Industrial | Human comfort | NA | More than 50 (or kilowatt equivalency) | NA | Personal |
| | A1 | All except Industrial | All | NA | More than 50 (or kilowatt equivalency) | NA | Personal |
| Regardless of when installed | A2, A3, B1, B2, B3 and carbon dioxide | All | All | More than 50 | NA | Not fully automatic | Personal |
| | A2, A3, B1, B2, B3 and carbon dioxide | All | All | More than 200 | NA | Fully automatic | Personal |
| | A1 | Industrial | All except human comfort | More than 50 | NA | Not fully automatic | Personal |
| | A1 | Industrial | All except human comfort | More than 200 | NA | Fully automatic | Personal |
| | A1 and carbon dioxide | Industrial | All except human comfort | More than 50 up to 200 | NA | Fully automatic | General |
| | A1 | All | Human comfort | NA | Aggregate exceeds 100[d] [(see Note 4)] | NA | Personal |

[Notes:]

[1] a. For purposes of this table, refrigerant R-123 shall be treated as a group A1 refrigerant, and carbon dioxide shall not be treated as a group A1 refrigerant.

[2] b. For purposes of this table, "industrial" occupancy refers to occupancy groups F, H and S. For installations constructed under the 1968 Building Code, "industrial" occupancy refers to occupancy groups A, B and D. For installations constructed prior to such 1968 code, "industrial" occupancy refers to that portion of a building used for manufacturing, processing, or storage of materials or products, including, among others, chemical, food, candy, and ice

cream factories, ice making plants, meat packing plants, refineries, perishable food warehouses, and similar occupancies.

[3] c. A fully automatic refrigerating system is one whose regulating and safety devices are automatically activated once the system is in operation.

[4] d. This aggregate provision applies only to systems within a single building which are under the sole direct control of a single occupant, lessee or owner. Systems with a rating of 15 horsepower or less or the kilowatt equivalency thereof are excluded from the aggregate.

**606.7 Emergency signs.** Emergency signs shall be provided in accordance with the construction codes, including the Mechanical Code.

**606.8 Refrigerant detector.** Machinery rooms shall contain a refrigerant detector with an audible and visual alarm as required by the construction codes, including the Mechanical Code for the refrigerant classification.

**606.9 Remote controls.** Remote control of the mechanical equipment and appliances located in the machinery room and the emergency ventilation system shall be provided in accordance with the construction codes, including the Mechanical Code.

**[606.9.1** Reserved.

**606.9.2** Reserved.

**606.9.3 Emergency control box.** Emergency control boxes shall be provided for refrigerating systems required to be equipped with a treatment system, flaring system or ammonia diffusion system.

**606.9.3.1 Location.** Emergency control boxes shall be located outside of the building at an approved accessible location. All portions of the emergency control box shall be 6 feet (1829 mm) or less above the adjoining grade.

**606.9.3.2 Construction.** Emergency control boxes shall be of iron or steel not less than 0.055 inch (1.4 mm) in thickness and provided with a hinged cover and lock.

**606.9.3.3 Operating procedure.** Valves and switches shall be identified in an approved manner as to the sequential procedure to be followed in the event of an emergency.

**606.9.3.4 Identification.** Emergency control boxes shall be provided with a permanent label on the outside cover reading: FIRE DEPARTMENT USE ONLY—REFRIGERANT CONTROL BOX, and including the name of the refrigerant in the system. Hazard identification in accordance with NFPA 704 shall be posted inside and outside of the control box.

**606.9.3.5 Instructions.** Written instructions and information shall be provided and located in the emergency control box designating the following information:

1. Instructions for shutting down and securing the operation of the system in the event of an emergency.

2. The name, address and emergency telephone numbers to obtain emergency service.

3. The location and operation of emergency discharge systems.]

**606.10 Storage, handling and use.** Flammable liquids, combustible liquids, combustible materials and combustible waste, except for quantities of combustible liquids below permit amounts, spare parts, tools, and incidental materials necessary for the safe and proper operation and maintenance of the system, shall not be stored in machinery rooms for refrigerating systems. Storage, use or handling of extra refrigerant or refrigerant oils shall be as required by FC Chapters 27, 30, 32 and 34 and the Mechanical Code.

**606.11 Termination of relief devices**. Pressure relief devices, fusible plugs and purge systems for refrigerating systems containing more than 6.6 pounds (3 kg) of Group A2 or B2 refrigerants, as classified in the Mechanical Code, shall be provided with an approved discharge system as required by [Sections] FC 606.11.1, 606.11.2 and 606.11.3. Discharge piping and devices connected to the discharge side of a fusible plug or rupture member shall have provisions to prevent plugging the pipe in the event of the fusible plug or rupture member functions. The location for the relief valve discharge from systems containing Group A3 or B3 refrigerants shall be approved.

**606.11.1 Flammable refrigerants.** Systems containing flammable refrigerants having a density equal to or greater than the density of air shall discharge vapor to the atmosphere only through an approved treatment system in accordance with [Section 606.11.4] FC606.11.4 or a flaring system in accordance with [Section 606.11.5] FC606.11.5. Systems containing flammable refrigerants having a density less than the density of air shall be [permitted] allowed to discharge vapor to the atmosphere provided that the point of discharge is located [outside of the structure] outdoors and not less than 20 feet (6096 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, ventilation opening or exit.

**606.11.2 Toxic and highly toxic refrigerants.** Systems containing toxic or highly toxic refrigerants shall discharge vapor to the atmosphere only through an approved treatment system in accordance with [Section 606.11.4] FC606.11.4 or a flaring system in accordance with [Section 606.11.5] FC606.11.5.

**606.11.3 Ammonia refrigerant.** Systems containing ammonia refrigerant shall discharge vapor to the atmosphere through an approved treatment system in accordance with [Section 606.11.4] FC606.11.4, a flaring system in accordance with [Section 606.11.5] FC606.11.5, or through an approved ammonia diffusion system in accordance with [Section 606.11.6] FC606.11.6, or by other approved means.

**Exceptions:**

1. Ammonia/water absorption systems containing less than 22 pounds (10 kg) of ammonia and for which the ammonia circuit is located entirely outdoors.

2. When the commissioner determines, on review of an engineering analysis prepared in accordance with [Section 104.7.2] FC104.7.2, that a fire, health or environmental hazard would not result from discharging ammonia directly to the atmosphere.

**606.11.4 Treatment systems.** Treatment systems shall be designed to reduce the allowable discharge concentration of the refrigerant gas to not more than 50 percent of the IDLH at the point of exhaust. Treatment systems shall be in accordance with FC Chapter 37.

**606.11.5 Flaring systems.** Flaring systems for incineration of flammable refrigerants shall be designed to incinerate the entire discharge. The products of refrigerant incineration shall not pose health or environmental hazards. Incineration shall be automatic upon initiation of discharge, shall be designed to prevent blowback, and shall not expose structures or materials to threat of fire. Emergency power shall have the capacity to operate for one and one-half the required time for complete incineration of refrigerant in the system.

**606.11.6 Ammonia diffusion systems.** Ammonia diffusion systems shall include a tank containing 1 gallon of water for each pound of ammonia (4 L of water for each 1 kg of ammonia) that will be released in 1 hour from the largest relief device connected to the discharge pipe. The water shall be prevented from freezing. The discharge pipe from the pressure relief device shall distribute ammonia in the bottom of the tank, but no lower than 33 feet (10 058 mm) below the maximum liquid level. The tank shall contain the volume of water and ammonia without overflowing.

**606.12 Discharge location for refrigerating system machinery room ventilation.** Exhaust from mechanical ventilation systems serving refrigerating machinery rooms capable of exceeding 25 percent of the LFL or 50 percent of the IDLH shall be equipped with approved treatment systems to reduce the discharge concentrations of flammable, toxic or highly toxic refrigerants to those values or lower.

**606.13 Notification of refrigerant discharges.** The commissioner shall be notified immediately when a discharge becomes reportable under state, federal or local regulations in accordance with [Section 2703.3.1] FC2703.3.1.

**606.14 Records.** A written record shall be kept of refrigerant quantities brought into and removed from the premises. [Such records shall be available for inspection by any representative of the department.]

**606.15 Electrical equipment.** Where refrigerants of Groups A2, A3, B2 and B3, as defined in the Mechanical Code, are used, refrigerating system machinery rooms shall conform to the Class I, Division 2 hazardous location classification requirements of the Electrical Code.

**Exception:** Ammonia machinery rooms that are provided with ventilation in accordance with [Section 1106.3] Chapter 11 of the Mechanical Code.

**606.16 Use of Group A3 and B3 refrigerants.** Nothing contained in this section shall be construed to authorize the use of Group A3 or B3 refrigerants, as classified in the Mechanical Code, if otherwise prohibited by the construction codes, including the Mechanical Code.

## SECTION FC 607
## ELEVATORS IN READINESS

**607.1 Phase I emergency recall operation and Phase II emergency [in-service] in-car operation.** Elevators intended to serve the needs of emergency personnel for firefighting or rescue purposes shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with the Building Code.

**607.2 Emergency signs.** All required signage for elevators shall be provided in accordance with the construction codes, including the Building Code.

**[607.3 Elevator keys.** Keys for the elevator car doors and firefighter service keys shall be kept in an approved location for immediate use by the department. Firefighter service key switches shall be operable by citywide-standard key.]

**[607.4] 607.3 Elevators in readiness.** Elevators in every building 75 feet (22 860 mm) or more in height shall be kept ready for immediate use by the department during all hours of the night and day including holidays and weekends. There shall be a competent building attendant available to operate such elevators, except that no attendant shall be required for buildings between 75 and 150 feet (22 860 and 45 720 mm) in height having elevators with Phase I emergency recall operation and Phase II emergency [in-service] in-car operation.

**[607.5] 607.4 Emergency elevator operation and maintenance.** All elevators equipped with Phase I emergency recall operation and Phase II emergency [in-service] in-car operation shall be maintained in proper working order such that the emergency elevator operations are operable at all times. All elevators with Phase I emergency recall operation shall be subjected, at least monthly, to a Phase I recall test. All elevators with Phase II emergency [in-service] in-car operation shall be subjected, at least monthly, to a minimum of a one-floor operation II test. [A written record of the operational status of the elevator shall be made and kept on the premises and made available for inspection by any representatives of the department.]

## [SECTION FC 608
## STATIONARY LEAD-ACID BATTERY SYSTEMS

**608.1 Scope.** Stationary lead-acid battery systems using vented (flooded) lead-acid batteries having an electrolyte capacity of more than 50 gallons (189 L) used for facility standby power, emergency power, or uninterrupted power supplies shall be designed, installed, operated and maintained in accordance with this section. Valve-regulated lead-acid batteries are not subject to the requirements of this section, but shall comply with the requirements of Section 609.

**608.2 Safety venting.** Batteries shall be provided with safety venting caps.

**608.3 Room design and construction.** Enclosure of stationary lead-acid system rooms shall comply with the requirements of the construction codes, including the Building Code. The battery systems are permitted to be in the same room with the equipment they support.

**608.4 Spill control and neutralization.** An approved method and materials for the control and neutralization of a spill of electrolyte shall be provided. The method and materials shall be

capable of controlling and neutralizing a spill from the largest lead-acid battery to a pH between 7.0 and 9.0.

**608.5 Ventilation.** Ventilation shall be provided in accordance with the construction codes, including the Mechanical Code, and the following:

1. The ventilation system shall be designed to limit the maximum concentration of hydrogen to 1.0 percent of the total volume of the room; or

2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (1 cfm/ft$^2$) [(0.0051m$^3$/(s·m$^2$)] of floor area of the room.

**608.6 Signs.** Doors into rooms or buildings containing stationary lead-acid battery systems shall be provided with approved signs. The signs shall state that the room contains lead-acid battery systems, that the battery room contains energized electrical circuits, and that the battery electrolyte solutions are corrosive liquids.

**608.7 Seismic protection.** The battery systems shall be seismically braced in accordance with the Building Code.

**608.8 Smoke detection.** An approved automatic smoke detection system shall be installed in battery rooms in accordance with the construction codes, including the Building Code.]

## SECTION FC 608
## STATIONARY STORAGE BATTERY SYSTEMS

**608.1 Scope.** Stationary storage battery systems having an electrolyte capacity of more than 50 gallons (189 L) for flooded lead acid, nickel cadmium (Ni-Cd) and valve-regulated lead acid (VRLA), or 1,000 pounds (454 kg) for lithium-ion and lithium metal polymer, used for facility standby power, emergency power or uninterrupted power supplies, shall comply with this section and FC Table 608.1.

**FC TABLE 608.1**
**BATTERY REQUIREMENTS**

| REQUIREMENT | NONRECOMBINANT BATTERIES | | RECOMBINANT BATTERIES | | OTHER |
|---|---|---|---|---|---|
| | Flooded Lead Acid Batteries | Flooded Nickel-Cadmium (Ni-Cd) Batteries | Valve Regulated Lead Acid (VRLA) Batteries | Lithium-ion Batteries | Lithium Metal Polymer |
| Safety caps | Venting caps (608.2.1) | Venting caps (608.2.1) | Self-resealing flame-arresting caps (608.2.2) | No caps | No caps |
| Thermal runaway management | Not required | Not required | Required (608.3) | Not required | Required (608.3) |
| Spill control | Required (608.5) | Required (608.5) | Not required | Not required | Not required |
| Neutralization | Required (608.5.1) | Required (608.5.1) | Required (608.5.2) | Not required | Not required |
| Ventilation | Required (608.6.1; 608.6.2) | Required (608.6.1; 608.6.2) | Required (608.6.1; 608.6.2) | Not required | Not required |
| Signage | Required (608.7) | Required (608.7) | Required (608.7) | Required (608.7) | Required (608.7) |
| Seismic protection | Required (608.8) | Required (608.8) | Required (608.8) | Required (608.8) | Required (608.8) |
| Smoke detection | Required | Required | Required | Required (608.9) | Required |

| | | | | | |
|---|---|---|---|---|---|
| | (608.9) | (608.9) | (608.9) | | (608.9) |

**608.2 Safety caps.** Safety caps for stationary storage battery systems shall comply with FC 608.2.1 and 608.2.2.

**608.2.1 Nonrecombinant batteries.** Vented lead acid, nickel-cadmium and other types of nonrecombinant batteries shall be provided with safety venting caps.

**608.2.2 Recombinant batteries.** VRLA batteries shall be equipped with self-resealing flame-arresting safety vents.

**608.3 Thermal runaway.** VRLA and lithium metal polymer battery systems shall be provided with a listed device or other approved method to preclude, detect and control thermal runaway.

**608.4 Room design and construction.** Stationary battery system rooms and enclosures shall be designed and constructed in accordance with the Building Code. Battery systems may be installed in the same room as the equipment to which they provide power.

**608.4.1 Separate rooms.** When stationary battery systems are installed in a separate equipment room accessible only to authorized personnel, the batteries may be installed on an open rack for ease of maintenance.

**608.4.2 Occupied areas.** Only VRLA, lithium-ion, and other types of sealed, nonventing batteries may be installed in an occupied area. Such batteries shall be housed in a noncombustible cabinet to prevent access by unauthorized personnel. Such cabinets shall be located within 10 feet (3048 mm) of the equipment to which the batteries they house provide power.

**608.5 Spill control and neutralization.** An approved method and materials for the control and neutralization of a spill of electrolyte shall be provided in areas containing lead-acid, nickel-cadmium or other types of batteries with free-flowing liquid electrolyte.

**Exception:** VRLA, lithium-ion, lithium metal polymer and other types of sealed batteries with immobilized electrolyte shall not require spill control.

**608.5.1 Nonrecombinant battery neutralization.** For battery systems containing lead-acid, nickel-cadmium or other types of batteries with free-flowing electrolyte, the method and materials shall be capable of neutralizing a spill of the total capacity from the largest cell or block to a pH between 5.0 and 9.0.

**608.5.2 Recombinant battery neutralization.** For VRLA and other types of sealed batteries with immobilized electrolyte, the method and material shall be capable of neutralizing a spill of 3 percent of the capacity of the largest VRLA cell or block in the room to a pH between 5.0 and 9.0.

**Exception:** Lithium-ion and lithium metal polymer batteries shall not require neutralization.

**608.6 Ventilation.** Ventilation of stationary storage battery systems shall comply with FC 608.6.1 and 608.6.2.

**608.6.1 Room ventilation.** Ventilation for flooded lead acid, flooded Ni-Cd and VRLA batteries shall be provided in accordance with the Mechanical Code and the following requirements:

1. The ventilation system shall be designed to limit the maximum concentration of hydrogen to 1 percent of the total volume of the room; or

2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (0.0051 $m^3/s/m^2$) of floor area of the room.

**Exception:** Ventilation is not required for lithium-ion and lithium metal polymer batteries.

**608.6.2 Cabinet ventilation.** When VRLA batteries are installed inside a cabinet, such cabinet shall be approved for use in occupied spaces and shall be mechanically or naturally vented by one of the following methods:

1. The cabinet ventilation shall be designed to limit the maximum concentration of hydrogen to 1 percent of the total volume of the cabinet during the worst-case event of simultaneous "boost" charging of all batteries in the cabinet; or

2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (0.0051 $m^3/s/m^2$) of floor area covered by the cabinet. The room in which the cabinet is installed shall also be ventilated as required in FC608.6.1.

**608.6.3 Ventilation system monitoring.** Mechanical ventilation systems where required by FC 608.6.1 and 608.6.2 shall be supervised by an approved central station or shall initiate an audible and visual signal at a constantly attended on-site location.

**608.7 Signage.** Signs shall be provided in accordance with FC 608.7.1 and 608.7.2.

**608.7.1 Equipment room and building signage.** A durable sign that reads as follows shall be posted on doors into electrical equipment rooms or buildings containing stationary battery systems: "CAUTION: This room contains energized battery systems. Battery electrolyte solutions may be corrosive."

**608.7.2 Cabinet signage.** Cabinets shall have a sign or marking identifying the type of battery system, the electrical rating (voltage and current) of the system, and applicable chemical and fire hazards.

**608.8 Seismic protection.** The battery systems shall be seismically braced in accordance with the Building Code.

**608.9 Smoke detection.** An approved automatic smoke detection system shall be installed in accordance with the Building Code in rooms containing stationary battery systems.

**608.10 Emergency procedures.** Emergency procedures detailing how to shut down the power from the battery system shall be posted on or near the battery system or kept in an approved location on the premises. The procedures shall also include a 24-hour/7-day per week telephone number by which the owner can be contacted to provide additional information to emergency responders.

## [SECTION FC 609
## VALVE-REGULATED LEAD-ACID (VRLA) BATTERY SYSTEMS

**609.1 Scope.** Valve-regulated lead-acid (VRLA) battery systems having an electrolyte capacity of more than 50 gallons (189 L) used for facility standby power, emergency power or uninterrupted power supply (UPS), shall be designed, installed, operated and maintained in accordance with this section.

**609.2 Safety vents.** VRLA batteries shall be equipped with self-resealing flame-arresting safety vents.

**609.3 Thermal runaway.** VRLA battery systems shall be provided with a listed device or other approved method to preclude, detect and control thermal runaway.

**609.4 Room design and construction.** Enclosure of VRLA battery system rooms shall comply with the requirements of the Building Code. The battery systems are permitted to be in the same room with the equipment they support. When VRLA battery systems are installed in a separate equipment room accessible only to authorized personnel, they shall be allowed to be installed on an open rack for ease of maintenance. When a VRLA battery system is situated in an occupied work center, it shall be housed in a noncombustible cabinet or other enclosure to prevent access by unauthorized personnel.

**609.5 Neutralization.** An approved manual method and materials for the neutralization of a release of electrolyte shall be provided. The method and materials shall be capable of controlling and neutralizing a release of 3 percent of the capacity of the largest VRLA cell or block in the room to a pH between 7.0 and 9.0.

**609.6 Room ventilation.** Ventilation shall be provided to limit the maximum concentration of hydrogen to 1 percent of the total volume of the room during the worst-case event of simultaneous "boost" charging of all batteries in the room. Where calculations are not provided to substantiate the ventilation rate, continuous ventilation at a rate of not less than 1 cubic foot per minute per square foot (1 $ft^3/min/ft^2$) [(0.0051 $m^3/(s \cdot m^2)$)] of floor area of the room shall be provided. The ventilation shall be either mechanically or naturally induced.

**609.7 Cabinet ventilation.** Where VRLA batteries are installed inside a cabinet, the cabinet shall be vented. The cabinet ventilation shall limit the maximum concentration of hydrogen to 1 percent of the total volume of the cabinet during the worst-case event of simultaneous "boost" charging of all batteries in the cabinet. Where calculations are not provided to substantiate the

ventilation rate, continuous ventilation at a rate of not less than 1 cubic foot per minute per square foot (1 $ft^3/min/ft^2$) [$0.0051 m^3/(s \cdot m^2)$] of floor area covered by the cabinet shall be provided. The ventilation shall be either mechanically or naturally induced. The room in which the cabinet is installed shall also be ventilated as required in Section 609.6.

**609.8 Signs.** Doors into electrical equipment rooms containing VRLA battery systems shall be provided with approved signs. The signs shall state that the room contains lead-acid battery systems and contains energized electrical circuits. Where VRLA batteries are contained in cabinets in occupied work centers, the cabinet enclosures shall be located within 10 feet (3048 mm) of the equipment that they support. The cabinets shall have exterior labels that identify the manufacturer and model number of the system and electrical rating (voltage and current) of the contained battery system. Within the cabinet there shall be signs that indicate the relevant electrical, chemical and fire hazards.

**609.9 Seismic protection.** The battery systems shall be seismically braced in accordance with the Building Code.

**609.10 Smoke detection.** An approved automatic smoke detection system shall be installed in rooms containing VRLA battery systems in accordance with the Building Code.]

## SECTION FC [610] 609
## COMMERCIAL COOKING [EXHAUST HOODS] SYSTEMS

**[610.1] 609.1 General.** Commercial cooking systems shall be designed, installed, operated and maintained in accordance with this section.

**609.2 Design and installation.** Commercial cooking systems shall be designed and constructed in accordance with the construction codes, including the Building Code and the Mechanical Code, and shall comply with the requirements of this section.

**609.2.1 Fire extinguishing systems.** The fire extinguishing system for commercial cooking systems shall comply with the requirements of FC904.11.

**609.2.2 Commercial cooking exhaust systems.** Commercial cooking exhaust hoods and exhaust ducts shall comply with the requirements of this section.

**609.2.2.1 Exhaust hoods.** Commercial cooking exhaust hoods shall be designed, installed, operated and maintained in accordance with the construction codes, including the Building Code and the Mechanical Code. Type 1 hoods shall be operated and maintained in accordance with [Chapter 9 of this code] this section.

**609.2.2.2 Exhaust ducts.** Commercial cooking exhaust ducts shall be provided with cleanout openings in accordance with Chapter 5 of the Mechanical Code, to allow for cleaning and other maintenance, as required by this section.

**609.2.3 Deep fat fryers.** Deep fat fryers shall be designed and installed in accordance with this section.

**609.2.3.1 Separation.** Deep fat fryers shall be separated from any adjacent cooking equipment that uses an open flame by at least 16 inches (406 mm). In lieu of such separation distance, a 16-inch (406-mm) high by ⅛-inch (3.2-mm) thick steel baffle permanently attached to the longer of the two adjacent cooking appliances may be used. The baffle shall extend to the full depth of the cooking equipment to which it is attached.

**609.2.3.2 High-limit controls.** Deep fat fryers shall be equipped with an independent high-limit control in addition to the adjustable operating control (thermostat). Such high-limit control shall be designed and arranged to shut off the fuel supply, including electrical energy, when the fat temperature reaches not more than 475°F (246°C), 1 inch (25 mm) below the liquid surface.

**609.2.4 Solid fuel cooking.** Solid fuel cooking systems and facilities shall be designed and installed in accordance with the requirements of this section.

**609.2.4.1 Cooking equipment**. Cooking equipment burning solid fuel shall be installed on floors of noncombustible construction that extend 3 feet (914 mm) from the cooking equipment in all directions. Cooking equipment burning solid fuel shall not be installed within 3 feet (914 mm) horizontally of combustible surfaces or construction, or within 6 feet (1829 mm) vertically of such surfaces or construction.

**609.2.4.2 Solid fuel storage.** Solid fuel shall be stored in a dedicated room with walls, floor and ceiling having a minimum fire rating of one hour. The storage room floor shall be noncombustible or surfaced with noncombustible material.

**609.3 Operation.** Commercial cooking systems shall be operated in accordance with this section and FC609.5.

**609.3.1 Unlawful operation.** It shall be unlawful to operate commercial cooking equipment that generates smoke or grease-laden vapors or fumes:

1. without a permit for the operation of the commercial cooking system.

2. without a lawful fire extinguishing system.

3. without a lawful exhaust system.

4. without the required grease filters.

5. while its fire extinguishing system or exhaust system is out of service.

**609.3.2 Supervision.** Commercial cooking equipment shall be attended at all times while in operation.

**609.3.3 Portable commercial cooking equipment markings.** The designated location for portable (wheeled) commercial cooking equipment shall be outlined on the floor in a durable 1-inch (25-mm) wide yellow line markings or other approved means. Such location shall be determined in relation to the location of the fire extinguishing system nozzle protecting such

portable commercial cooking equipment.

**609.3.4 Ventilation system.** Commercial cooking ventilation systems shall be operated and maintained in accordance with this section.

**609.3.4.1 Operation during cooking.** Exhaust systems shall be operated at all times while cooking equipment is in use. The ventilation system into which commercial cooking system exhaust hoods exhaust shall be operating at the required rate of air movement, and approved grease filters shall be in place when equipment under the exhaust hood is in use.

**609.3.4.2 Grease extractors.** When installed, grease extractors shall be operated at all times while cooking equipment is in use.

**609.3.4.3 Maintenance of operational efficiency.** Fixed air supply openings installed to provide make-up air for air exhausted through the exhaust system shall not be restricted by covers, dampers, or any other means that would reduce the operating efficiency of the exhaust system. Commercial cooking hoods shall not be painted.

**609.3.5 Signage.** A sign clearly and concisely summarizing the operation, maintenance and cleaning requirements for commercial cooking systems regulated by this code, together with a schematic drawing depicting the origin, run, and terminus of the exhaust system shall be provided in accordance with this section. Such sign shall be at least 8½ inches (216 mm) by 11 inches (279 mm) in size, posted at or near the main entrance to the cooking area, and laminated or framed under a clear glass or plexiglas cover.

**609.3.6 Staff training.** The owner or operator of commercial cooking equipment shall train all staff in the proper procedure for the use of all components of the grease removal system, cleaning of filters, and the manual operation of the fire extinguishing system. Refresher training in the manual operation of the fire extinguishing system shall be provided at least once every 6 months.

**609.4 Maintenance.** Commercial cooking systems shall be maintained in accordance with this section and FC609.5.

**609.4.1 Exhaust system inspection and cleaning.** The entire exhaust system, including exhaust hoods, grease filters, grease extractors, ducts, exhaust fans, pollution control devices, and other appurtenances, shall be inspected and cleaned at least once every 3 months by a person holding a certificate of fitness. Surfaces shall be cleaned to bare metal. The powder residue or other foreign substance left by saponifying agents or other cleaning materials shall be removed. Flammable cleaning fluids shall not be used. Cleaning fluids shall not be applied to fusible links or other detection devices of the fire extinguishing system.

**Exceptions:**

1. Commercial cooking equipment utilizing solid fuel shall be inspected monthly by a trained and knowledgeable person, and cleaned by a certificate of fitness holder as necessary but not less frequently than once every 3 months.

2. Vertical portions of interior and exterior vertical ducts in excess of three stories in height shall be cleaned at least every 6 months by a person holding a certificate of fitness. Horizontal portions of such ducts, including all elbows, shall be inspected and cleaned in accordance with this section.

**609.4.2 System deactivation.** Unless necessary to accomplish cleaning, components of the fire extinguishing system shall not be rendered inoperable during the cleaning process. If electrical switches, detection devices, or other components of the fire extinguishing system must be deactivated during the cleaning process, such deactivation shall be performed by a licensed master fire suppression piping contractor. Immediately upon completion of the cleaning process the licensed master fire suppression piping contractor shall restore the system to proper operation. Electrical switches that may be accidentally activated during the cleaning process shall be electrically locked out during such process.

**609.4.3 Grease filters.** In addition to the cleaning required by FC609.4.1, grease filters shall be regularly cleaned or replaced by a trained and knowledgeable person, as necessary but at least once per month.

**609.4.4 High-limit controls for deep fat fryers.** All high-limit controls shall be replaced every 3 years with a new or rebuilt unit certified to operate at not more than 475°F (246°C).

**609.5 Solid fuel commercial cooking systems**. In addition to the other requirements of FC609, solid fuel cooking systems shall be operated and maintained in accordance with this section.

**609.5.1 Cooking operations**. Unless otherwise approved by the Commissioner of Buildings, the burning of solid fuel in commercial cooking equipment, such as briquettes, mesquite, hardwood, or charcoal, shall be allowed only for purposes of flavor enhancement. Solid fuel shall be ignited with a match or other approved means. Combustible or flammable liquids shall not be used. Matches shall not be stored in the immediate vicinity of cooking equipment. Solid fuel shall be added to the fire in a safe manner and only in quantities that will not create a flame higher than required. Long-handled tongs, hooks and other required devices shall be provided and used in order to safely add fuel, adjust the fuel, position and control the fire without having to reach into the fire box. The room where solid fuel is stored or used shall be protected throughout by a sprinkler system.

**609.5.2 Solid fuel storage**. Not more than a one-day supply may be kept in the same room as the solid fuel cooking equipment or masonry oven or in the room with the fuel loading or clean-out doors. Solid fuel shall not be stored:

1. within 3 feet (914 mm) of any portion of a solid fuel burning equipment, masonry oven or any other heating or cooking appliance.

2. within 6 feet (1829 mm) of any solid fuel loading opening or door of the solid fuel cooking equipment or masonry oven.

3. above any heating or cooking equipment, flue or vent.

**609.5.3 Water supply.** A water supply with a flexible hose shall be readily available to solid fuel cooking appliances and masonry ovens to cool down any fire that becomes too hot and to completely extinguish any fire before leaving the premises. The water source shall be a fixed pipe system with a hose of adequate length to reach to the combustion and cooking chambers of the appliance. The nozzle shall be equipped with a manual shutoff device, and shall be of the type to provide a fine to medium spray. A full flow or strong stream shall not be used.

**609.5.4 Spent fuel.** Spent fuel, ash, cinders and other fire debris shall be removed from the fire box at regular intervals, but at least once a day, and, once removed, shall not be stored indoors. Adequate long handle rakes, hoes, scrapers and shovels shall be provided for such removal. When being removed from the fire box, the spent fuel shall be wetted down and cooled with water from the required water supply. Metal containers with covers shall be provided for such spent fuel removal. Such metal containers shall be of a minimum 16 gauge construction and shall be limited in size to a capacity not exceeding 20 gallons (75.7 L), so as to facilitate easy handling by any employee assigned to the task and to enable such containers to easily pass through any door or passageway. The spent fuel shall be placed outdoors in a dumpster or heavy metal container used exclusively for this purpose and kept covered at all times. Such dumpster or container shall be kept separate from combustible construction, and stored combustible materials and combustible waste.

**609.6 Portable fire extinguishers**. Portable fire extinguishers shall be readily available for use in the cooking area but in any event no further than 30 feet (9144 mm) of travel distance from the commercial cooking equipment.

**609.6.1 Commercial cooking.** Commercial cooking equipment areas shall be provided with a Class K rated portable fire extinguisher.

**609.6.2 Deep fat fryers.** When a deep fat fryer is installed in a cooking area, Class K portable fire extinguishers shall be provided as follows:

1. For up to four fryers individually having a maximum cooking medium capacity of 80 pounds (36.3 kg) and a maximum surface area of 6 square feet (0.55 $m^2$): One having a minimum 1½ gallon (6 L) capacity.

2. For every additional group of up to four fryers, individually having a maximum cooking medium capacity of 80 pounds (36.3 kg) and a maximum surface area of 6 square feet (0.55 $m^2$) each: One additional Class K portable fire extinguisher having a minimum 1½ gallon (6 L) capacity.

3. For individual fryers having a maximum cooking medium capacity exceeding 80 pounds (36.3 kg) or 6 square feet (0.55 $m^2$) in surface area: Provide Class K portable fire extinguishers in accordance with the portable fire extinguisher manufacturer's recommendations.

**609.6.3 Solid fuel cooking equipment.** When solid fuel cooking equipment is installed in a cooking area, Class K portable fire extinguishers shall be provided as follows:

1. For equipment with individual fireboxes of 5 cubic feet (0.14 $m^3$) or less in volume: One having a minimum 2½ gallon (9 L) capacity, or two having a minimum 1½ gallon (6 L) capacity.

2. For equipment with fireboxes exceeding 5 cubic feet (0.14 $m^3$): Provide Class K portable fire extinguishers in accordance with the portable fire extinguisher manufacturer's recommendations.

**609.7 Recordkeeping.** A record shall be maintained of the following commercial cooking system maintenance in accordance with FC107.7:

1. The inspection and cleaning of the exhaust system required by FC609.4.1, including the date that such inspection and cleaning was conducted, and the name and certificate of fitness number of the certificate of fitness holder or the name of the trained and knowledgeable person conducting such inspection and cleaning.

2. The replacement of deep fat fryer high-limit controls in accordance with FC609.4.4.

3. The servicing of the fire extinguishing system in accordance with FC904.11.6.

## CHAPTER 7
## FIRE-RESISTANCE-RATED CONSTRUCTION

### SECTION FC 701
### GENERAL

**701.1 Scope.** This chapter shall govern the maintenance of fire-resistance-rated construction.

**701.2 General.** Fire-resistance-rated construction shall be maintained in accordance with this chapter.

### SECTION FC 702
### DEFINITIONS

**702.1 Terms defined in FC Chapter 2.** Terms used in this chapter, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown in FC Chapter 2 or elsewhere in this code.

### SECTION FC 703
### FIRE-RESISTANCE-RATED CONSTRUCTION

**703.1 Maintenance.** The required fire-resistance rating of fire-resistance-rated construction[(], including walls, [fire stops] firestops, shaft enclosures, partitions, smoke barriers, [and] floors, fire-resistive coatings and sprayed fire-resistant materials applied to structural members and fire-resistant joint systems[)], shall be maintained. Such elements shall be properly repaired, restored or replaced when damaged, altered, breached or penetrated. Openings made therein for the passage of pipes, electrical conduit, wires, ducts, air transfer openings[,] and holes made for

any reason shall be protected with approved methods capable of resisting the passage of smoke and fire. Openings through fire-resistance-rated assemblies shall be protected by self-closing or automatic-closing doors of approved construction meeting the fire protection requirements for the assembly.

**703.1.1 Fireblocking and draftstopping.** Required fireblocking and draftstopping in combustible concealed spaces shall be maintained to provide continuity and integrity of the construction.

**703.1.2 Smoke barriers and smoke partitions.** Required smoke [barrier] barriers and smoke partitions shall be maintained to prevent the passage of smoke. [and all] All openings protected with approved smoke barrier doors or [leakage-rated (smoke)] smoke dampers shall be maintained in accordance with NFPA 105.

**703.1.3 Fire walls, fire barriers and fire partitions.** Required fire walls, fire barriers and fire partitions shall be maintained to prevent the passage of fire. All openings protected with approved doors, fire dampers or smoke dampers shall be maintained in accordance with NFPA 80.

**703.2 Maintenance of openings.** Fire doors and fire windows shall be maintained in good working order in accordance with NFPA 80. Fire doors and smoke barrier doors shall not be blocked or obstructed or otherwise made inoperable. Fusible links shall be replaced promptly whenever fused, damaged or otherwise rendered inoperable. Fire door assemblies shall not be modified.

**703.2.1 Signs.** Where required by the commissioner, a sign shall be permanently displayed on or near each fire door in letters not less than 1 inch (25 mm) high to read as follows:

1. For doors designed to normally be kept open: FIRE DOOR—DO NOT BLOCK.

2. For doors designed to normally be kept closed: FIRE DOOR—KEEP CLOSED.

**703.2.2 Hold-open devices and closers.** Hold-open devices and automatic door closers, where provided, shall be maintained. During the period that such device is out of service for repairs, the door it operates shall remain in the closed position.

**703.2.3 Door operation.** Swinging fire doors shall close from the full-open position and latch automatically. The door closer shall exert enough force to close and latch the door from any partially open position.

**703.3 Ceilings.** The hanging of decorative material, merchandise displayed for sale or other display items from acoustical ceiling systems that are part of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be prohibited.

**703.4 Testing.** Horizontal and vertical sliding and rolling fire doors shall be inspected and tested annually to confirm proper operation and full closure. [A written record shall be maintained and be made available for inspection by any representative of the department.]

## SECTION FC 704
## FLOOR OPENINGS AND SHAFTS

**704.1 Enclosures.** Interior vertical shafts, including stairways, elevator hoistways, service and utility shafts, that connect two or more stories of a building shall be enclosed or protected as specified in the construction codes, including the Building Code. When openings are required to be protected by the construction codes, including the Building Code, openings into such shafts shall be maintained self-closing or automatic-closing by smoke detection. Existing fusible-link-type automatic door-closing devices are [permitted] allowed if the fusible link rating does not exceed 135°F (57°C).

# CHAPTER 8
# INTERIOR FURNISHINGS, DECORATIONS AND SCENERY

## SECTION FC 801
## GENERAL

**801.1 Scope.** This chapter shall govern furnishings, decorative vegetation, decorations and scenery in buildings and structures.

**801.2 General.** The furnishings, decorative vegetation, decorations and scenery governed by this chapter shall be designed, stored, handled and used in accordance with this chapter.

**801.3 Flame-retardant treatments.** When a material or item is treated with a flame-retardant chemical to meet the requirements of this chapter for a flame-resistant material, such chemical and its method of application shall be approved. Flame-retardant treatments shall be maintained so as to retain the effectiveness of the treatment under conditions encountered in actual use.

**801.4 Fire-retardant coating.** When a material or item is coated with a fire-retardant coating to meet the requirements of this chapter for a flame-resistant material, such coating and its method of application shall be approved. Flame-retardant coatings shall be maintained so as to retain the effectiveness of the coating under conditions encountered in actual use.

**801.5 Prohibited decorative vegetation, decorations and scenery.** It shall be unlawful in Group A, E[, I-1, I-2 nursing homes and hospitals, I-3 and I-4 day care facility] and I occupancies to store or use decorative vegetation, decorations or scenery that consists of or is coated with pyroxylin or similarly hazardous base.

**801.6 Obstructions.** The required width of any portion of a means of egress shall not be obstructed by any furnishing, decorative vegetation, decoration or scenery nor shall such furnishing, decorative vegetation, decoration or scenery obstruct any exit or the visibility thereof.

**801.7 Supervision.** When a material or item is treated with a [flame retardant] flame-retardant chemical to meet the requirements of this chapter for a flame-resistant material, the application of the chemical shall be conducted by or under the personal supervision of a certificate of fitness holder.

**801.8 Certificate of approval.** Any flame-retardant chemical used to render a material flame-resistant to meet the requirements of this chapter shall be of a type for which a certificate of approval has been issued in accordance with [Section FC 112] FC112 and the rules.

## SECTION FC 802
## DEFINITIONS

**802.1 Definitions.** The following terms shall, for the purposes of this chapter and used elsewhere in this code, have the meanings shown herein.

**CONIFER.** Any tree, plant or shrub containing pitch, including hemlock, balsam, pine and fir.

**DECORATION.** Any item that is used for acoustical, aesthetic or artistic enhancement of an interior space, including artwork, banners, curtains, draperies, [hangings, artwork and] decorative greens, fabrics, hangings, and streamers, but not including acoustical materials regulated by the Building Code as an interior finish.

**FIRE-RETARDANT COATING.** An approved coating that, when applied to the surface of scenery in an approved manner, imparts flame resistance and reduces flame spread.

**[FLAME-RETARDANT TREATMENT.** An approved chemical that, when applied to a material in an approved manner, imparts flame resistance to a material.]

**FLAME-RESISTANT MATERIAL.** Material that meets the flame propagation performance criteria [for flame-resistance as set forth in] of NFPA 701, either because it is inherently flame-resistant or because it has been subjected to a flame-retardant treatment.

**FLAME-RETARDANT TREATMENT.** An approved chemical that, when applied to a material in an approved manner, imparts flame resistance to a material.

**FLAME SPREAD.** The propagation of flame over a surface.

**FURNISHING.** Furniture or items other than structural elements, building service equipment or interior finishes that are installed or placed in a building for the human comfort or other use of the occupants.

**INTERIOR FINISH.** Construction materials that form the exposed interior surfaces of a building and that are part of or affixed to walls, fixed or folding partitions, ceilings, and other construction elements.

**NATURAL DECORATIVE GREEN.** A bough of a natural tree or part thereof.

**NATURAL TREE.** Any live tree, plant or shrub, including conifer, that is rooted in soil.

**SCENERY.** Any or all of those devices ordinarily used on a stage in the presentation of a theatrical, artistic, musical or other similar live performance, such as back drops, side tabs, teasers, borders or scrim, rigid flats, set pieces, and all properties, except costumes.

## [SECTION FC 803
## FURNISHINGS

**803.1** Reserved

**803.2 Group A occupancies.** The requirements in Sections 803.2.1 and 803.2.2 shall apply to Group A occupancies.

**803.2.1 Foam plastics.** Exposed foam plastic materials and unprotected materials containing foam plastic used for decorative purposes or exhibit booths shall have a maximum heat release rate of 100 kilowatts (kW) when tested in accordance with UL 1975, except individual foam plastic item or items containing foam plastic where the foam does not exceed 1 pound (0.45 kg) in weight.

**803.2.2 Motion picture screens.** Motion picture screens and supporting construction shall comply with the requirements of Section 306.3.

**803.3 Group E occupancy educational facilities.** The requirements in Sections 803.3.1 and 803.3.2 shall apply to Group E occupancy educational facilities.

**803.3.1 Storage in corridors and lobbies.** Clothing and personal effects shall not be stored in corridors and lobbies.

**Exceptions:**

1. Corridors protected throughout by a sprinkler system, provided the minimum required egress width is maintained.

2. Storage in metal lockers, provided the minimum required egress width is maintained.

**803.3.2 Artwork.** Artwork and educational materials shall be limited on the walls of corridors to not more than 20 percent of the wall area.

**803.4 Group I-4 occupancy day care facilities.** The requirements in Sections 803.4.1 and 803.4.2 shall apply to Group I-4 day care facilities.

**803.4.1 Storage in corridors and lobbies.** Clothing and personal effects shall not be stored in corridors and lobbies.

**Exceptions:**

1. Corridors protected throughout by a sprinkler system, provided the minimum required egress width is maintained.

2. Storage in metal lockers, provided the minimum required egress width is maintained.

**803.4.2 Artwork.** Artwork and educational materials shall be limited on walls of corridors to not more than 20 percent of the wall area.

**803.5 Group I-2 occupancy nursing homes and hospitals.** The requirements in Sections 803.5.1 through 803.5.4 shall apply to Group I-2 nursing homes and hospitals.

**803.5.1 Upholstered furniture.** New or used upholstered furniture placed in a Group I-2 nursing home or hospital on or after the effective date of this code shall be shown to resist ignition by cigarettes as determined by tests conducted in accordance with NFPA 261 and shall have a char length not exceeding 1.5 inches (38 mm).

**Exceptions:**

1. Upholstered furniture owned by the patient in sleeping rooms of a nursing home, provided that a smoke detector is installed in such rooms in accordance with the construction codes, including the Building Code.

2. Upholstered furniture in rooms or spaces protected throughout by a sprinkler system.

**803.5.2 Upholstered furniture heat release rate.** New or used upholstered furniture placed in a Group I-2 nursing home or hospital on or after the effective date of this code shall have limited rates of heat release when tested in accordance with ASTM E 1537 or NFPA 266.

1. The peak rate of heat release for the single upholstered furniture item shall not exceed 250 kW, except upholstered furniture in rooms or spaces protected throughout by a sprinkler system.

2. The total energy released by the single upholstered furniture item during the first 5 minutes of the test shall not exceed 40 megajoules (mJ), except upholstered furniture in rooms or spaces protected throughout by a sprinkler system.

**803.5.3 Mattresses, heat-release rate**. New or used mattresses placed in a Group I-2 occupancy nursing home or hospital on or after the effective date of this code shall have limited rates of heat release when tested in accordance with ASTM E 1590 or NFPA 267.

1. The peak rate of heat release for the mattress shall not exceed 250 kW, except mattresses in rooms or spaces protected throughout by a sprinkler system.

2. The total energy released by the mattress during the first 5 minutes of the test shall not exceed 40 mJ, except mattresses in rooms or spaces protected throughout by a sprinkler system.

**803.5.4 Identification.** Upholstered furniture shall bear the label of an approved agency, confirming compliance with the requirements of Sections 803.5.1 and 803.5.2.

**803.6 Group I-1 occupancy board and care facilities.** The requirements in Sections 803.6.1 through 803.6.3 shall apply to Group I-1 occupancy board and care facilities.

**803.6.1 Upholstered furniture.** New or used upholstered furniture placed in a Group I-1 board and care facility on or after the effective date of this code shall meet the requirements for Class I when tested in accordance with NFPA 260, except upholstered furniture in rooms or spaces protected throughout by a sprinkler system.

**803.6.2 Mattresses.** New or used mattresses placed in a Group I-1 board and care facility on or after the effective date of this code shall have a char length not exceeding 2 inches (51 mm) where tested in accordance with DOC 16 CFR Part 1632, except upholstered furniture in rooms or spaces protected throughout by a sprinkler system.

**803.6.3 Mattresses, heat-release rate.** New or used mattresses placed in a Group I-1 occupancy board and care facility on or after the effective date of this code shall have limited rates of heat release when tested in accordance with ASTM E 1590 or NFPA 267.

1. The peak rate of heat release for the mattress shall not exceed 250 kW, except mattresses in rooms or spaces protected by a sprinkler system.

2. The total energy released by the mattress during the first 5 minutes of the test shall not exceed 40 mJ, except mattresses in rooms or spaces protected throughout by a sprinkler system.

**803.7 Group I-3 occupancy detention and correction facilities.** The requirements in Sections 803.7.1 through 803.7.6 shall apply to Group I-3 occupancy detention and correction facilities.

**803.7.1 Upholstered furniture classification.** New or used upholstered furniture placed in a Group I-3 occupancy detention and correction facility on or after the effective date of this code shall meet the requirements for Class I where tested in accordance with NFPA 260, except upholstered furniture in rooms or spaces protected throughout by a sprinkler system.

**803.7.2 Upholstered furniture heat release rate.** New or used upholstered furniture placed in a Group I-3 occupancy detention and correction facility on or after the effective date of this code shall have limited rates of heat release, as follows:

1. The peak rate of heat release for the single upholstered furniture item shall not exceed 250 kW.

   **Exceptions:**

   1. In Use Condition I, II and III occupancies, as defined in the Building Code, upholstered furniture in rooms or spaces protected by approved smoke detectors that initiate, without delay, an alarm that is audible in that room or space.

   2. Upholstered furniture in rooms or spaces protected throughout by a sprinkler system.

2. The total energy released by the single upholstered furniture item during the first 5 minutes of the test shall not exceed 40 mJ, except upholstered furniture in rooms or spaces protected throughout by a sprinkler system.

**803.7.3 Mattresses, char length.** New or used mattresses placed in a Group I-3 occupancy detention and correction facility on or after the effective date of this code shall have a char length not exceeding 2 inches (51 mm) when tested in accordance with DOC 16 CFR Part 1632, except mattresses in rooms or spaces protected throughout by a sprinkler system.

**803.7.4 Mattresses, heat release rate.** New or used mattresses placed in a Group I-3 occupancy detention and correctional facility on or after the effective date of this code shall have limited rates of heat release when tested in accordance with ASTM E 1590 or NFPA 267, as follows:

1. The peak rate of heat release for the mattress shall not exceed 250 kW, except mattresses in rooms or spaces protected throughout by a sprinkler system.

2. The total energy released by the mattress during the first 5 minutes of the test shall not exceed 40 mJ, except mattresses in rooms or spaces protected throughout by a sprinkler system.

**803.7.5 Wastebaskets.** Wastebaskets and other waste containers shall be of noncombustible or other approved materials.

**803.7.6 Wastebasket lids.** Waste containers with a capacity of more than 20 gallons (76 L) shall be provided with a lid of noncombustible or other approved material.]

## SECTION FC 803
## UPHOLSTERED FURNITURE AND MATTRESSES

**803.1 Upholstered furniture.** Upholstered furniture newly introduced in Occupancy Groups I-1, I-2, I-3 and R-1 college and university dormitories after the effective date of this section shall comply with the resistance to ignition by cigarettes and maximum heat release rate requirements of this section.

**803.1.1 Ignition by cigarettes.** Newly-introduced upholstered furniture in Occupancy Groups I-1, I-2, I-3 and R-1 college and university dormitories shall be shown to resist ignition by cigarettes as determined by tests conducted in accordance with one of the following standards:

1. Mocked-up composites of the upholstered furniture shall have a char length not exceeding 1½ inches (38 mm) when tested in accordance with NFPA 261.

2. The components of the upholstered furniture shall meet the requirements for Class I when tested in accordance with NFPA 260.

**Exception:** The requirements of FC 803.1.1(1) and 803.1.1(2) shall not apply to upholstered furniture owned by the resident of a Group I-2 occupancy, provided such furniture is located in the sleeping room of the resident and such sleeping room is provided with a smoke detector in accordance with the requirements of the Building Code.

**803.1.2 Heat release rate.** Newly-introduced upholstered furniture in Occupancy Groups I-1, I-2, I-3 and R-1 college and university dormitories shall have limited rates of heat release when tested in accordance with ASTM E 1537 or California Technical Bulletin 133, as follows:

1. The peak rate of heat release for the single upholstered furniture item shall not exceed 80 kW, except upholstered furniture in rooms or spaces protected throughout by a sprinkler system.

2. The total energy released by the single upholstered furniture item during the first 10 minutes of the test shall not exceed 25 megajoules (MJ), except upholstered furniture in rooms or spaces protected throughout by a sprinkler system.

   **Exception:** The exceptions set forth in FC 803.1.2(1) and 803.1.2(2) for upholstered furniture in rooms or spaces protected throughout by a sprinkler system shall not apply to Occupancy Group I-3.

**803.1.3 Listing and labeling.** Upholstered furniture shall be listed and labeled in compliance with the requirements of FC 803.1.1 and 803.1.2.

**803.2 Mattresses.** Mattresses newly introduced in Occupancy Groups I-1, I-2, I-3 and R-1 college and university dormitories after the effective date of this section shall comply with the resistance to ignition by cigarettes and maximum heat release rate requirements of this section.

**803.2.1 Ignition by cigarettes.** Newly-introduced mattresses in Occupancy Groups I-1, I-2, I-3, and R-1 college and university dormitories shall be shown to resist ignition by cigarettes as determined by tests conducted in accordance with 16 CFR Part 1632 and shall have a char length not exceeding 2 inches (51 mm).

**803.2.2 Heat-release rate.** Newly-introduced mattresses shall have limited rates of heat release when tested in accordance with ASTM E 1590 or California Technical Bulletin 129, as follows:

1. The peak rate of heat release for the single mattress shall not exceed 100 kW, except mattresses in rooms or spaces protected throughout by a sprinkler system.

2. The total energy released by the mattress during the first 10 minutes of the test shall not exceed 25 MJ, except mattresses in rooms or spaces protected throughout by a sprinkler system.

   **Exception:** The exceptions set forth in FC 803.2.2(1) and 803.2.2(2) for mattresses in rooms or spaces protected throughout by a sprinkler system shall not apply to Occupancy Group I-3.

**803.2.3 Listing and labeling.** Mattresses shall be listed and labeled in compliance with the requirements of FC 803.2.1 and 803.2.2.

## SECTION FC 804
## DECORATIVE VEGETATION

**804.1 Natural trees and cut natural trees.** Natural trees and cut natural trees shall be stored, sold, displayed and maintained in accordance with [Sections 804.1.1 through 804.1.6] FC 804.1.1 through 804.1.6.

**804.1.1 Indoor display of cut natural trees.** Cut natural trees may be displayed in a building, except in Group A, B, E, [I-1, I-2, I-3, I-4] I, M, R-1 and R-2 occupancies and any building or structure used for a public gathering. Notwithstanding the foregoing occupancy restrictions, cut natural trees may be displayed in houses of worship and dwelling units in Group R-2 apartment house occupancies.

**804.1.2 Indoor storage of cut natural trees.** It shall be unlawful to store cut natural trees in any building, except in connection with a display [permitted] allowed under [Section 804.1.1] FC804.1.1.

**804.1.3 Indoor storage and display of natural trees.** Natural trees, except conifers, may be stored and displayed in a building, provided they are maintained in a healthy condition and are not allowed to become dry. It shall be unlawful to store or display natural trees that are conifers in any building.

**804.1.4 Support devices.** Cut natural trees for display in any building shall have the trunk bottoms cut off at least [0.5] ½ inch (12.7 mm) above the original cut and shall be placed in a support device. The support device shall be of a type that is stable, holds the tree in an upright position and meets all of the following criteria:

1. The device shall hold the tree securely and be of adequate size to avoid tipping over of the tree.

2. The device shall be capable of containing a minimum 2-day supply of water.

3. The water level, when full, shall cover the tree stem at least 2 inches (51 mm). The water level shall be maintained above the fresh cut and checked at least once daily.

**804.1.5 Dryness.** Natural trees and cut natural trees shall be removed from the building whenever the needles or leaves fall off readily when a tree branch is shaken or if the needles are brittle and break when bent between the thumb and index finger. Trees shall be checked daily for dryness.

**804.1.6 Retail sale of cut natural trees**. Merchants of cut natural trees, including Christmas trees, shall, at the time of retail sale of each such tree, attach to the tree a printed tag containing appropriate instructions for its safe and lawful display and disposal.

**804.2** Reserved.

**804.3 Open flames.** Candles and other open flames shall not be used or maintained on or near decorative vegetation. Natural cut trees shall be kept a distance at least equal to the height of the tree from heat [vents and any] sources, including fireplaces, portable heaters and vents, and open-flame or heat-producing devices.

**804.3.1 Electrical fixtures and wiring.** [It shall be unlawful to use, allow or maintain unlisted electrical lighting, wiring or other items on decorative vegetation.] Electrical wiring and lighting used on natural cut trees and decorative vegetation shall be listed. It shall be unlawful to use electrical wiring and lighting on metal artificial trees.

**804.4 Artificial vegetation.** Artificial decorative vegetation, including artificial trees, shall be flame resistant [or flame retardant]. Alternatively, the artificial decorative vegetation shall have a maximum heat release rate of 100 kW when tested in accordance with NFPA 289, using a 20 kW ignition source. Such flame resistance or [flame retardance] maximum heat release rate shall be certified by a testing laboratory, or by the manufacturer in an approved manner. Documentation of such certification shall be submitted to the department upon request and as required by the rules.

**[804.4.1 Electrical fixtures and wiring.** It shall be unlawful to use, allow or maintain unlisted electrical lighting, wiring or other items on decorative vegetation. The use of electrical wiring and lighting on metal artificial trees is prohibited.]

**804.5 Natural decorative greens.** Natural decorative greens shall be stored and displayed in a building in accordance with [Sections 804.5.1 through 804.5.4] FC 804.5.1 through 804.5.4.

**804.5.1 Storage.** It shall be unlawful to store natural decorative greens in any building, except merchandise for sale or displayed for sale which does not contain conifers.

**804.5.2 Display**. Natural decorative greens may be displayed in buildings on a temporary basis. The display of natural decorative greens in Group A, E, I, and M occupancies, in common areas of Group R-1, R-2 and B occupancies, and any building or structure used for a public gathering, except display of works of art in museums and houses of worship, shall comply with the restrictions set forth in [Section 804.5.3] FC804.5.3.

**804.5.3 Restrictions on display.** It shall be unlawful to display in any building natural decorative greens that:

1. Contain pitch, such as hemlock, balsam, pine or Spanish moss.

2. Are displayed at a location less than 3 feet (914 mm) from stuffed furniture, rugs, or other combustible material or contain combustible decorations.

3. Are on a combustible framework or displayed in conjunction with combustible material unless such material is flame resistant.

**804.5.4 Dryness.** Any natural decorative green shall be removed from [the] a building at the first sign of deterioration or dryness. Natural decorative greens shall be checked at least daily for dryness.

## SECTION FC 805
## DECORATIONS AND SCENERY

**805.1 Decorations.** Except as otherwise specifically provided for in this chapter, in Group A, E, I, M occupancies, and Group R-1 college and university dormitories, common areas in Group B, R-1[,] and R-2 [and B] occupancies, and any building or structure used as a place [for] of public gathering, [curtains, draperies, hangings and] decorations shall be flame resistant [in accordance with Section 805.1.3 and NFPA 701. In Groups I-1 and I-2 occupancies, decorations shall be flame resistant unless the decorations are so limited in number or size that the hazard of fire or fire spread is not present. This section shall not apply to decorations being displayed solely for sale in any building or as a work of art in any museum or art gallery].

**Exceptions:**

1. Acoustical or other decorative materials consisting of foam plastics with a maximum heat release rate of 100 kW when tested in accordance with UL 1975.

2. Artwork in a museum or art gallery.

3. Artwork on the walls of building hallway corridors in Group B office and Group R-2 occupancies, provided that the wall area covered by such artwork does not exceed 20 percent of any wall in any occupancy not protected throughout by a sprinkler system or 50 percent of any wall in any occupancy protected throughout by a sprinkler system, and the artwork is affixed in a manner that prevents it from moving freely.

4. Artwork and educational materials in classrooms in Group E and I-4 occupancies, and on the walls of corridors in such occupancies, provided that the corridor wall area covered by such artwork and materials does not exceed 20 percent of any wall, and the artwork and materials are affixed in a manner that prevents them from moving freely.

5. Curtains, draperies, hangings and other decorative materials suspended from walls of sleeping units and dwelling units in Occupancy Group R-1 dormitories protected throughout by a sprinkler system, where the total amount of such materials does not exceed 25 percent of the aggregate area of walls.

6. Decorations displayed for sale.

7. Guest rooms in hotels and motels.

8. Decorations in houses of worship, including wood used for screening or ornamental purposes.

9. Decorations in private offices in commercial buildings.

**805.1.1** [Reserved.] **Fabric partitions.** In Group B and M occupancies, fabric partitions suspended from the ceiling and not supported by the floor shall be inherently noncombustible or shall be treated to meet the flame propagation performance criteria in accordance with FC 805.1.3 and NFPA 701.

**805.1.2 [Flame-resistant] Trim and decorative materials.** The type and quantity of interior trim allowed shall be as set forth in [Section 805] Chapter 8 of the Building Code. The quantity of flame resistant materials used in decorations when combined with combustible trim shall not exceed 10 percent of the [aggregate area of walls and ceilings] specific wall or ceiling area to which it is attached.

**805.1.3 Acceptance criteria and reports.** Where required to be flame resistant, decorations shall [be capable of passing Test 1 or 2, as described in] meet the flame propagation performance criteria of NFPA 701. Certification of compliance shall be prepared by a certificate of fitness holder and made available to department representatives in accordance with the rules.

**805.1.4 Motion picture screens.** Motion picture screens and supporting construction shall comply with the requirements of FC306.3.

**805.2 Scenery**. All scenery in Group A occupancies shall be made of [noncombustible materials,] materials [having a Class A flame-spread rating, or materials that have been] that are inherently noncombustible, have a Class A flame-spread rating, or rendered flame resistant by the application of a fire-retardant coating, except that the commissioner may authorize the use of scenery not complying with any of the above requirements where provision is made to ensure an equivalent level of fire safety. Foam plastic materials used for scenery shall comply with the maximum heat release rate set forth in Exception 1 to FC805.1.

**[805.2.1 Foam plastics.** Foam plastic materials used for scenery shall have a maximum heat release rate of 100 kilowatts (kW) when tested in accordance with UL 1975, except individual foam plastic items or items containing foam plastic where the foam plastic does not exceed 1 pound (0.45 kg) in weight.]

## SECTION FC 806
## INTERIOR [FINISH] FINISHES

**806.1 General.** The quantity and type of interior finishes shall comply with the requirements of Chapter 8 of the Building Code.

**806.2 Foam plastic signs.** Foam plastic signs that are not interior finishes shall have a maximum heat release rate of 150 kW when tested in accordance with UL 1975.

# CHAPTER 9
# FIRE PROTECTION SYSTEMS

## SECTION FC 901

## GENERAL

**901.1 Scope.** This chapter shall govern the design, installation, operation and maintenance, including inspection and testing, of fire protection devices, equipment and systems, and other fire protection measures for the control and extinguishment of fire.

**901.1.1 General.** Fire protection systems shall be designed, installed, operated and maintained in accordance with this chapter and the reference standards set forth in FC Table [901.6] 901.6.1.

**901.2 Design and installation documents.** The commissioner may require design and installation documents and calculations to be submitted for review for all fire protection systems. Design and installation documents required or regulated by this code or the rules shall be submitted for review and approval prior to installation, and shall certify that the design complies with the requirements of this code and the rules.

**901.3 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**901.4 Design and installation.** Fire protection systems shall be designed and installed in accordance with [Sections] FC 901.4.1 through 901.4.5.

**901.4.1 Required fire protection systems.** Fire protection systems shall be designed and installed in accordance with the construction codes, including the Building Code, and, as applicable, this code and the rules, and the applicable referenced standards listed in this code. Required systems shall be extended or altered as necessary to maintain and continue protection whenever the building or structure is altered. Alterations to fire protection systems shall be performed in compliance with the requirements of this code, the rules, and the construction codes, as applicable. Buildings and structures shall be provided with such fire hose, portable fire extinguishers and other means of preventing and extinguishing fires as the commissioner may direct.

**901.4.2 Fire protection systems not required by code.** Any fire protection system or portion thereof not required by this code, the rules or the construction codes, including the Building Code, may be installed to provide partial or complete protection of a building or structure, provided such system meets the requirements of this code, the rules and the construction codes, including the Building Code, as applicable. Where the design and installation of such fire protection system is governed by this code or the rules, the commissioner may modify such requirements, consistent with the interests of fire safety, upon a determination that such modification will promote public safety by encouraging the installation of such systems.

**901.4.3 Additional fire protection systems.** Where [the material or] an existing or proposed storage, handling or use of a material or the conduct of an operation [to be conducted] in a particular occupancy gives rise to special hazards in addition to the normal hazards of the occupancy, or where the commissioner determines that [access to] size, design and arrangement of the occupancy would unduly delay the ability of firefighting personnel to [respond] gain access to the hazard, the commissioner may require additional [safeguards] fire protection or other fire safety measures. Such [safeguards] measures may include[, but

shall not be limited to,] the following: automatic fire detection systems, fire alarm systems, fire extinguishing systems, standpipe systems, or portable or fixed extinguishers. [Fire protection equipment shall be installed in accordance with the construction codes, including the Building Code.] Where a certificate of occupancy limits the commissioner's authority to order the installation of such additional systems or the implementation of such additional measures, the commissioner may apply to the Board of Standards and Appeals for a modification of such certificate of occupancy, and such application shall be granted upon a showing that such additional systems or measures will reasonably mitigate the special hazard or delayed access.

**901.4.4 Prohibition of deceptive equipment.** It shall be unlawful to install or maintain any device that has the physical appearance of fire protection equipment but that does not perform the fire protection function, in any building, structure or premises where it may be confused with actual fire protection equipment.

**901.4.5 Certificate of approval.** The following fire protection devices, equipment and systems shall be of a type for which a certificate of approval has been issued in accordance with this code, or which was approved by the Department of Buildings or the Board of Standards and Appeals prior to the effective date of this section, unless such approval by the Department of Buildings or the Board of Standards and Appeals is amended or repealed by the commissioner:

1. Pre-engineered non-water fire extinguishing systems, including systems installed in connection with commercial cooking systems.

2. Prefabricated hoods and grease filters installed in connection with commercial cooking systems.

3. Fire department [siamese] connections, standpipe system hose outlets and pressure reducing valves.

4. Fire alarm [system] control units, and medical gas, toxic, highly toxic and flammable gas detection system control panels.

**901.5 Installation acceptance testing.** Fire detection and alarm systems, fire extinguishing systems, private fire hydrant systems, yard hydrant systems, standpipe systems, fire pump systems, private fire service mains and all other fire protection systems and appurtenances thereto shall be subject to acceptance tests as set forth in the installation standards specified in this code. Where required by the construction codes, including the Building Code, this code or the rules, such tests shall be conducted, at the owner's risk, by his or her representative before a representative of the department.

**901.5.1 Occupancy.** It shall be unlawful to occupy any portion of a building or structure until any required fire detection system, fire alarm system, standpipe system and fire extinguishing systems have been tested and approved.

**901.6 Maintenance.** Fire protection systems shall be maintained in good working order at all times. Any fire protection system that is not in good working order shall be repaired or replaced

as necessary to restore such system to good working order, or, where authorized by the Building Code, removed from the premises.

**901.6.1 Standards.** Fire protection systems shall be inspected, tested, serviced and otherwise maintained in accordance with this section, the rules and the referenced standards listed in FC Table 901.6.1. Where required by this section, such inspection, testing and maintenance shall additionally comply with the rules. Where applicable, the requirements of the reference standards listed in FC Table 901.6.1 shall be in addition to those requirements specified in the rules.

**FC TABLE 901.6.1**
**FIRE PROTECTION SYSTEM MAINTENANCE STANDARDS**

| SYSTEM | STANDARD |
|---|---|
| Portable fire extinguishers | NFPA 10 |
| Low, medium and high expansion foam systems | NFPA 11 and NFPA 25 |
| Carbon dioxide fire extinguishing system | NFPA 12 |
| Halon 1301 fire extinguishing systems | NFPA 12A |
| Foam water sprinkler and spray systems | NFPA 16 and NFPA 25 |
| Dry chemical fire extinguishing systems | NFPA 17 |
| Wet chemical fire extinguishing systems | NFPA 17A |
| Water based fire protection systems | NFPA 25 |
| Fire alarm systems | NFPA 72 |
| Water mist fire extinguishing systems | NFPA 750 |
| Clean agent fire extinguishing systems | NFPA 2001 |
| Aerosol fire extinguishing systems | NFPA 2010 |

**901.6.2 Records.** Records of all system inspections, tests, servicing and other maintenance required by this code, the rules or the referenced standards shall be maintained [on the premises for a minimum of 3 years and made available for inspection by any department representative] in accordance with FC107.7.

**901.6.2.1 Standpipe and sprinkler systems.** In addition to those records required by NFPA 25, an approved card bearing the dates of each inspection, certificate of fitness number and signature of the certificate of fitness holder shall be posted on the premises near the main water supply control valve. A detailed inspection report relative to conditions of water supply, gravity and pressure tanks and levels therein, valves, risers, piping, sprinkler heads, hose valves, hose and nozzles, [siamese] fire department connections, alarms, fire pumps, obstructions, and conditions of all other system equipment and appurtenances shall be completed monthly by the certificate of fitness holder. All defects or violations shall be noted on the inspection report.

**901.6.3 Supervision.** A person holding a certificate of fitness for the following fire protection systems shall personally supervise the [Inspection] inspection, testing, servicing and other maintenance [of the following fire protection systems shall be performed under the personal supervision of a person holding a certificate of fitness.] required by this code or the rules with respect to the system supervised by such certificate of fitness holder:

1. Sprinkler systems.

   **Exception:** Buildings classified in Group R-3 occupancies.

2. Standpipe systems.

3. Foam fire extinguishing systems.

4. Fire alarm systems.

5. Private fire hydrant systems.

6. Yard hydrant systems.

**901.6.3.1 Servicing of portable fire extinguishers.** It shall be unlawful for any person engaged in the business of servicing portable fire extinguishers to service portable fire extinguishers without a portable fire extinguisher servicing company certificate. Any person that services portable fire extinguishers shall hold a certificate of fitness, except that a person training for such certificate of fitness may service portable fire extinguishers under the personal supervision of a certificate of fitness holder. Nothing in this section shall preclude portable fire extinguishers that are maintained on a premises for use at such premises from being serviced by the owner or occupant of the premises, or an employee of such owner or occupant, who possesses a certificate of fitness for portable fire extinguisher servicing and the tools, materials, equipment and facility necessary to perform such services.

**901.6.3.2 Portable fire extinguisher sales.** It shall be unlawful for any person to engage in the business of selling portable fire extinguishers door to door to owners of buildings or businesses for use on their premises without a portable fire extinguisher sales company certificate. Persons performing such services for or on behalf of licensed portable fire extinguisher sales companies shall possess a certificate of fitness for portable fire extinguisher sales.

**Exception:** Sale to owners of Group R-2 and R-3 occupancy buildings.

**901.6.3.3 Commercial cooking exhaust systems.** It shall be unlawful for any person engaged in the business of inspecting and cleaning commercial cooking exhaust systems as required by the provisions of this code to perform such service without a commercial cooking exhaust system servicing company certificate. The inspection and cleaning of commercial cooking exhaust systems required by [Section 904.11] FC904.11 shall be performed by a person holding a certificate of fitness. Nothing in this section shall preclude commercial cooking exhaust systems from being inspected and cleaned by the owner or occupant of the premises, or an employee of such owner or occupant, who possesses a certificate of fitness for inspecting and cleaning commercial cooking exhaust systems and the tools, materials, and equipment necessary to perform such services in accordance with this section.

**901.6.3.4 Smoke detector cleaning and testing.** The cleaning and testing for smoke entry and sensitivity of smoke detectors installed in a [defined] fire alarm system shall be performed by a person holding a certificate of fitness for smoke detector maintenance. Such work shall be performed under the supervision and by employees of a person holding a smoke detector maintenance company certificate, except that such smoke detector cleaning and testing may be performed by an owner or occupant of the premises,

or an employee of such owner or occupant, who possesses a certificate of fitness for smoke detector maintenance, and possesses the tools, instruments or other equipment necessary to perform such services in accordance this code and the rules. All other smoke detector maintenance shall be performed by a person possessing the requisite qualifications and experience, and any applicable license or certificate.

**901.6.3.5 Central station fire alarm monitoring.** It shall be unlawful for any person to operate a central station that monitors fire alarm systems and maintain transmitters in protected premises without a certificate of operation.

**[901.7 Out of service systems.** Where a required fire protection system is out of service, the department shall be notified immediately and unless otherwise directed by the commissioner, either the building shall be evacuated or a fire watch shall be maintained by one or more persons holding a certificate of fitness for fire guard. Any other actions as the commissioner may direct in addition to or in lieu of such measures shall also be undertaken, until the fire protection system has been returned to service. Where utilized, fire guards shall be provided with at least one approved means for notification of the department and their only duty shall be to perform constant patrols of the protected premises and keep watch for fires.

**901.7.1 Impairment coordinator.** The building owner shall assign an impairment coordinator to comply with the requirements of this section. In the absence of a specific designee, the owner shall be considered the impairment coordinator.

**901.7.2 Tag required.** A tag shall be used to indicate that a system, or portion thereof, is out of service.

**901.7.3 Placement of tag.** The tag shall be posted at each fire department connection, system control valve, fire alarm control unit, fire alarm annunciator and fire command center, indicating which system, or part thereof, is out of service. The commissioner shall specify where the tag is to be placed.

**901.7.4 Planned removal from service.** The certificate of fitness holder and the impairment coordinator shall be made aware of and authorize the placing of systems out of service. Before authorizing such action the impairment coordinator shall:

1. Determine the extent and expected duration of the out of service condition.

2. Inspect the areas or buildings involved and assess the increased risks.

3. Make appropriate recommendations to the owner.

4. Notify the department and the responsible person designated by the owner to issue hot work authorizations in accordance with Chapter 26.

5. Notify the central station and insurance carrier.

6. Notify the occupants in the affected areas.

7. Place out of service tags at all required and appropriate locations.

8. Maintain system in service until work is ready to begin.

**901.7.5 Unplanned out of service condition.** The certificate of fitness holder, impairment coordinator, and/or other person responsible for inspecting, maintaining or supervising the operation of a fire protection system who observes a serious defect such as an empty tank, break or major leak in system water piping, inoperative or shut water supply valves, defective siamese connections, or complete or partial shut down of sprinkler and/or standpipe systems, other than a shutdown for scheduled inspection, testing or maintenance, shall immediately report such condition to the owner of the building, and to the department. When a system fails or otherwise goes out of service, the certificate of fitness holder or the impairment coordinator shall take the actions set forth in Section 901.7.4. and such other actions necessary or appropriate to protect the occupants of the building and minimize property damage. When the certificate of fitness holder or other such person observes a minor defect or other condition not presenting a serious safety hazard, he or she shall report the defect or condition to the owner, and if the defect or condition is not corrected within 30 days, shall report it in writing to the department.]

**901.7 Out-of-service systems.** The owner and the impairment coordinator for a standpipe system, sprinkler system or fire alarm system shall comply with the requirements of this section whenever such fire protection system is out of service. The department may direct that, until such fire protection system has been returned to service, fire safety measures appropriate to the size, configuration, occupancy, use and hazards be implemented that are in addition to or in lieu of those required by this section.

**901.7.1 Impairment coordinator.** The building owner shall designate an impairment coordinator to take the actions required by this section when a standpipe system, sprinkler system or fire alarm system is out of service. In the absence of a specific designee, the owner shall be considered the impairment coordinator.

**901.7.2 Fire watch.** Unless otherwise directed by the department, the building shall be evacuated or a fire watch maintained in accordance with this section when a standpipe system, sprinkler system or fire alarm system is out of service. Such fire watch shall be conducted in compliance with the requirements of FC 901.7.2.1 through 901.7.2.3.

**901.7.2.1 Duties and responsibilities.** Persons conducting a fire watch shall:

1. continuously patrol the area affected by the out-of-service fire protection system to which such person has been assigned, keeping constant watch for fires;

2. be provided with at least one approved means for notification of the department and any FLS director, FEP coordinator or FEP staff on the premises;

3. immediately report any fire to the department and notify emergency preparedness staff on the premises;

4. be trained in the use of portable fire extinguishers and equipped with a portable fire extinguisher, or made aware of the location of readily accessible portable fire extinguishers in the area to which such person has been assigned to maintain a fire watch;

5. be responsible for extinguishing fires when they are limited in size and spread such that they can readily be extinguished using a portable fire extinguisher;

6. maintain a record of such fire watch on the premises during the fire watch and for a minimum of 48 hours after the fire watch has concluded; and

7. have no other duties.

**901.7.2.2 Fire guards required.** The fire watch required when a standpipe system, sprinkler system or fire alarm system is out of service shall be maintained in accordance with FC901.7.2.2.1 and this section.

**Exception:** The impairment coordinator or other building staff trained and knowledgeable in conducting a fire watch may conduct a fire watch in lieu of a fire guard during the initial 4 hours of a planned removal from service, or after discovery of an unplanned out-of-service condition, provided that the floor or area in which the fire protection system is out of service does not exceed 50,000 square feet (4645 $m^2$).

**901.7.2.2.1 Fire guards required.** The fire watch required for an out-of-service standpipe system, sprinkler system or fire alarm system shall be maintained by one or more fire guards.

**901.7.2.3 Fire watch coverage.** A sufficient number of fire guards shall be provided such that each floor or area in which the fire protection system is out of service is patrolled at least once an hour. The area to be patrolled by each fire guard shall not exceed more than 50,000 square feet (4645 $m^2$) of floor area. The area patrolled by each fire guard may be further limited by the department depending on the configuration of the premises, impediments to patrol, nature of the occupancy, fire risk, and other fire safety considerations.

**901.7.3 Planned removal from service.** The impairment coordinator shall be made aware in advance of any planned removal from service of a standpipe system, sprinkler system or fire alarm system, or system component, for repair, servicing, alteration, testing and other maintenance of the system or component, or to allow construction to be performed in the area protected by the system without unnecessarily activating it. The impairment coordinator shall authorize and personally supervise the placing of the fire protection system out of service. Before authorizing the placing of the fire protection out of service the impairment coordinator shall:

1. notify the certificate of fitness holder responsible for supervising the maintenance of the standpipe system, sprinkler system or fire alarm system.

2. determine the extent and expected duration of the out-of-service condition.

3. inspect the areas or buildings involved and assess the increased risks.

4. make appropriate recommendations to the owner.

5. notify the department in accordance with FC901.7.5, if required.

6. notify the responsible person designated by the owner to issue hot work authorizations in accordance with FC Chapter 26.

7. notify the central station and insurance carrier.

8. notify the occupants in the affected areas if the duration of time the sprinkler system or fire alarm system will be out of service is estimated to be more than 30 minutes.

9. place a tag at each fire department connection, standpipe and sprinkler system control valve and fire command center, indicating which fire protection system, or part thereof, is out of service.

10. maintain the fire protection system in service until work is ready to begin.

**901.7.4 Unplanned out-of-service condition**. Any person, upon becoming aware of any condition, except a planned removal from service, rendering a standpipe system, sprinkler system or fire alarm system, or part thereof, inoperable in whole or in part, shall notify the owner and the impairment coordinator of such condition. The impairment coordinator shall take the actions set forth in FC901.7.3 and 901.7.5, and such other actions as are necessary or appropriate to protect the occupants of the building and promptly restore the system to service.

**901.7.5 Notification to department**. The department shall be notified that a standpipe system, sprinkler system or fire alarm system is out of service, whether by reason of a planned removal from service or an unplanned out-of-service condition, where required by FC 901.7.5.1 through 901.7.5.3.

**901.7.5.1 Standpipe systems.** Notification shall be made to the department whenever a standpipe system is or will be out of service for any period of time.

**901.7.5.2 Sprinkler systems and fire alarm systems.** Notification that a sprinkler system or fire alarm system, or any part thereof, is or will be out of service shall be made to the department under the following circumstances:

1. The sprinkler system or fire alarm system is or will be out of service on more than one floor of a building; or

2. With respect to a sprinkler system, the work or repairs cannot be completed, and the system restored to service, within 8 hours of the time the system was placed or went out of service; or

3. With respect to a fire alarm system, the work or repairs will require the fire alarm system to be out of service for more than 8 hours in any 24-hour period; or

4. One or more other fire protection systems in the area in which a fire protection system is out of service are or will also be out of service at the same time.

**901.7.5.3 Reporting requirements.** Notification of an out-of-service condition pursuant to this section shall be made by the impairment coordinator to the Department at the applicable telephone number set forth in FC401.2.2. Such notification shall include the following information:

1. The owner or impairment coordinator's name and contact information;

2. The building address;

3. The type of fire protection system that is out of service;

4. Whether the fire protection system is out of service by reason of a planned removal from service (and if so, the reason for placing it out of service) or an unplanned out-of-service condition;

5. If a planned removal from service, the date and time the fire protection system will be placed out of service, and the estimated duration the system will be out of service;

6. If an unplanned out-of-service condition, the estimated duration the system will be out of service;

7. The floors or areas in which the fire protection system is out of service;

8.Whether the other fire protection systems are in good working order; and

9. The name and certificate number of the certificate of fitness holder responsible for supervision of the fire protection system that is out of service.

**901.7.6 Restoring systems to service.** When an [out of service] out-of-service device, equipment or system is restored to [normal working order] service, the impairment coordinator shall:

1. [Conduct] conduct necessary inspections and tests to verify that the affected systems are operational.

[2. Reserved.]

[3]2. [Notify] notify the department.

[4]3. [Notify] notify the owner, central station, insurance carrier, emergency preparedness staff, and, if previously notified, the occupants in the affected areas.

[5]4. [Remove] remove the [out of service] out-of-service tags.

**901.7.7 [Out of service] Out-of-service standpipe systems at construction sites.** The owner, fire safety manager and/or impairment coordinator shall take the following actions whenever a standpipe system at a construction site is out of service:

1. Immediately notify the department of any unplanned [out of service] out-of-service condition, and otherwise comply with the requirements of [Section 901.7.5] FC901.7.4.

2. Notify the department at least 24 hours prior to any planned removal of the standpipe system from service, and otherwise comply with the requirements of [Section 901.7.4] FC901.7.3.

3. Ensure that a fire watch is continuously maintained in compliance with the requirements of [Section 901.7] FC901.7.2 while the standpipe system is out of service.

4. Repair the standpipe system and return it to service in compliance with the requirements of [Sections 901.6 and] FC 901.7.6 and Section 3303.8.1 of the [New York City] Building Code. The construction site may continue to be occupied, and construction, demolition or alteration activities may continue, pending such repair and restoration to service, except:

   4.1. [As] as otherwise provided in Section 3303.8.1 of the [New York City] Building Code; and/or

   4.2. [As] as otherwise directed by the commissioner upon a determination that, in the absence of an operable standpipe system, the conduct of certain construction, demolition or alteration activities would be imminently perilous to life or property; and

   4.3. [That] that in no circumstance shall hot work be conducted on the construction site until such time as the standpipe system is restored to service and the standpipe alarm reactivated.

**901.8 Tampering with or rendering equipment inoperable.** Fire protection systems and related apparatus shall not be tampered with or rendered inoperable, except as set forth in [Section 107.4] FC107.4.

**901.9 Recall of fire protection system components.** A component of a fire protection system regulated by this code that is subject to a voluntary or mandatory recall under federal law shall be replaced with an approved, listed component in compliance with the referenced standards. A record of the replacement of the component shall be maintained in accordance with FC107.7.

## SECTION FC 902
## DEFINITIONS

**902.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**ALARM NOTIFICATION APPLIANCE.** A fire alarm system component, such as a bell, horn, speaker, light, text display or vibration device that issues an audible, tactile, and/or visual alert.

**ALARM SIGNAL.** A signal indicating an emergency requiring immediate action, such as a signal indicative of fire.

**ANNUNCIATOR.** A unit containing one or more indicator lamps, alphanumeric displays, or other equivalent means in which each indication provides status information about a circuit, condition or location.

**AUTOMATIC.** As applied to fire protection devices, any device, equipment or system that initiates system function as a result of a predetermined temperature rise, rate of temperature rise, or combustion products, without the necessity for human intervention.

**CENTRAL STATION.** A facility that receives alarm signals from a protected premises and retransmits or otherwise reports such alarm signals to the department.

**CERTIFICATE OF OPERATION.** A written statement issued by the commissioner approving the operation of a central station, for which such certificate is required by this code or the rules, or the construction codes.

**CLEAN AGENT.** Electrically nonconducting, volatile, or gaseous fire extinguishant that does not leave a residue upon evaporation.

**[COMMERCIAL COOKING SYSTEM**. A system consisting of commercial cooking equipment, exhaust hood, filters, exhaust duct system, fire extinguishing system and other related appurtenances designed to capture grease-laden cooking vapors and exhaust them safely to the outdoors.]

**COMMERCIAL COOKING EXHAUST SYSTEM SERVICING COMPANY CERTIFICATE.** A certificate issued by the commissioner to a person engaged in the business of inspecting and cleaning commercial cooking equipment exhaust systems, which authorizes such person to inspect and clean commercial cooking equipment exhaust systems, for which such certificate is required by this code or the rules.

**COMMERCIAL COOKING SYSTEM**. A system consisting of commercial cooking equipment, exhaust hood, filters, exhaust duct system, fire extinguishing system and other related appurtenances designed to capture grease-laden cooking vapors.

**[DEFINED FIRE ALARM SYSTEM.** A fire alarm system or any sub-system thereof that automatically transmits signals to the department or a central station and that is installed in premises which are required to have a fire alarm system.]

**EMERGENCY ALARM SYSTEM.** A system to provide indication and warning of an emergency condition involving a release of hazardous materials or other hazardous material incident.

**FIRE ALARM BOX, MANUAL.** A manually operated device used to initiate an alarm signal.

**[FIRE ALARM CONTROL UNIT.** A system component that receives inputs from automatic and manual fire alarm devices and is capable of supplying power to detection devices and transponder(s) of off-premises transmitter(s). The control unit is capable of providing a transfer of power to the notification appliances and transfer of condition to relays of devices.]

**FIRE ALARM SIGNAL.** A signal initiated by a fire alarm-initiating device such as a manual fire alarm box, automatic fire detector, water-flow switch, or other device whose activation is indicative of the presence of a fire or fire signature.

**FIRE ALARM SYSTEM.** Any system, including any interconnected fire alarm sub-system, of components and circuits arranged to monitor and annunciate the status of fire alarm or supervisory signal-initiating devices.

**[FIRE AREA.** The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls, or fire-resistance-rated horizontal assemblies of a building.]

**FIRE DETECTOR, AUTOMATIC.** A device designed to detect the presence of a fire signature and to initiate action.

**FIRE EXTINGUISHING SYSTEM.** An approved system of devices and equipment which detects a fire and discharges an approved fire extinguishing agent onto or in the area of a fire. Such term includes automatic systems and, where such systems are authorized by this code or the Building Code, manually activated systems.

**FIRE PROTECTION SYSTEM.** Approved devices, equipment and systems or combinations of systems used to detect a fire, activate an alarm, extinguish or control a fire, control or manage smoke and products of a fire or any combination thereof, including fire extinguishing systems, fire alarm systems, sprinkler systems and standpipe systems.

**IMPAIRMENT COORDINATOR.** The person responsible for ensuring that proper safety precautions are taken when a fire protection system is out of service.

**INITIATING DEVICE.** A system component that originates transmission of a change-of-state condition, such as in a smoke detector, manual fire alarm box, or supervisory switch.

**MULTIPLE-STATION ALARM DEVICE.** Two or more single-station alarm devices that can be interconnected such that actuation of one causes all integral or separate audible alarms to operate. It also can consist of one single-station alarm device having connections to other detectors or to a manual fire alarm box.

**[OUT OF SERVICE] <u>OUT-OF-SERVICE</u> SYSTEM.** A fire protection system that is not fully functional; or whose operation is impaired or is otherwise not in good working order.

**PORTABLE COOKING EQUIPMENT.** Commercial cooking equipment, provided with or installed with wheels.

**PORTABLE FIRE EXTINGUISHER SALES COMPANY CERTIFICATE.** A certificate issued by the commissioner to a person engaged in the business of selling portable fire extinguishers door to door to owners of buildings or business for use on their premises, which authorizes such person to engage in such business and supervise such sales.

**PORTABLE FIRE EXTINGUISHER SERVICING COMPANY CERTIFICATE.** A certificate issued by the commissioner to a person engaged in the business of servicing portable fire extinguishers, which authorizes such person to engage in such business and supervise the provision of such servicing by certificate of fitness holders.

**PRESIGNAL SYSTEM.** A fire alarm system having a feature that allows initial fire alarm signals to sound in a constantly attended central location and for which a human action is subsequently required to achieve a general alarm, or a feature that allows the control equipment to delay the general alarm by more than one minute after the start of the alarm processing.

**PROTECTED PREMISES.** A building, occupancy or structure located in the city that is equipped with a fire alarm system that transmits an alarm signal to the department or a central station that monitors such system for the purposes of reporting fire alarms to the department, whether or not the installation of such system on the premises is required by law.

**SINGLE-STATION SMOKE ALARM.** An assembly incorporating the detector, the control equipment, and the alarm-sounding device in one unit, operated from a power supply either in the unit or obtained at the point of installation.

**SMOKE ALARM.** A single- or multiple-station alarm responsive to smoke and not connected to a system.

**SMOKE DETECTOR.** A listed device that senses visible or invisible particles of combustion.

**SMOKE DETECTOR MAINTENANCE COMPANY CERTIFICATE.** A certificate issued by the commissioner to a person engaged in the business of performing smoke detector cleaning and testing, which authorizes such person to engage in such business and supervise the performance of such cleaning and testing by certificate of fitness holders.

**SPRINKLER SYSTEM.** A fire extinguishing system, other than a mist fire extinguishing system, that utilizes water as the extinguishing agent.

**[STANDPIPE SYSTEM.** Piping installed in a building or structure that serves to transfer water from a water supply to hose connections at one or more locations in a building or structure used for firefighting purposes.]

**STANDPIPE, MULTI-ZONE.** A standpipe system that is vertically subdivided as required by the construction codes, including the Building Code, into zones to limit the maximum operating pressure in the system. Each zone will have its own individual automatic water supply.

**STANDPIPE SYSTEM.** Piping installed in a building or structure that serves to transfer water from a water supply to hose connections at one or more locations in a building or structure used for firefighting purposes.

**SUPERVISORY SIGNAL.** A signal indicating the need for action in connection with the supervision of guard tours, fire extinguishing systems or equipment, fire alarm systems or the maintenance features of related systems.

**SUPERVISORY SIGNAL-INITIATING DEVICE.** An initiating device, such as a valve supervisory switch, water level indicator, or low-air pressure switch on a dry-pipe sprinkler system, that triggers a supervisory signal.

**TROUBLE SIGNAL.** A signal initiated by the fire alarm system or device indicative of a fault in a monitored circuit or component.

**UNNECESSARY ALARM**. An alarm signal transmitted by a fire alarm system which functioned as designed, but for which a department response proved unnecessary. An example of an unnecessary alarm is an alarm triggered by smoke from a lit cigarette in a non-smoking area, when the presence of such smoke does not implicate fire safety concerns.

**UNWARRANTED ALARM.** An alarm signal transmitted by a fire alarm system which failed to function as designed as a result of improper installation, improper maintenance, malfunction, or other factor. Examples of unwarranted alarms are alarms resulting from improper smoke detector placement, improper detector setting for installed location, lack of system maintenance, and control panel malfunction.

## SECTION FC 903
## SPRINKLER SYSTEMS

**903.1 General.** Sprinkler systems shall comply with the requirements of this section.

**903.2 Where required.** Sprinkler systems shall be provided in buildings, structures, premises, or parts thereof, when required by the construction codes, including the Building Code, this code or the rules.

**903.2.1 through and including 903.2.10** Reserved.

**903.2.11 During construction.** Sprinkler systems required during construction, alteration and demolition operations shall be provided in accordance with Chapter 33 of the Building Code and [Section 1414] FC1414.

**903.2.12** Reserved.

**903.2.13 Other required fire extinguishing systems.** In addition to the requirements of [Section 903.2] FC903.2, the provisions indicated in FC Table 903.2.13 also require the installation of a fire extinguishing system for certain buildings and areas.

**FC TABLE 903.2.13 ADDITIONAL REQUIRED FIRE EXTINGUISHING SYSTEMS**

| SECTION | SUBJECT |
|---|---|
| 1208.2 | Dry cleaning [plants] facilities |
| 1208.3 | Dry cleaning machines |
| [1504.1] | [Spray finishing in Group A, E, I or R] |
| 1504.3.3.1 | Spray rooms |
| [1504.6] 1504.3.3.2 | Spray booths [and rooms] |
| [1505.1] 1505.2 | Dip-tank rooms |
| [1505.6.1] 1505.3.4.2 | Dip tanks |
| [1505.8.4] 1505.4.4 | Hardening and tempering tanks |
| 1803.10 | HPM facilities |
| 1803.10.1.1 | HPM work station exhaust |
| 1803.10.2 | HPM gas cabinets |
| 1803.10.3 | HPM corridors |
| 1803.10.4 | HPM exhaust |
| 1803.10.4.1 | HPM noncombustible ducts |
| 1803.10.4.2 | HPM combustible ducts |
| 2106.1 | Class A and B furnaces |
| 2106.2 | Class C and D furnaces |
| 2206.8 | Flammable liquid motor fuel-dispensing areas |
| 2208.7.4 | Indoor CNG compressing, storage and dispensing areas |
| 2209.3.4.2 | Hydrogen motor fuel-dispensing areas under canopies |
| FC Table 2306.2 | [Storage] High-piled storage fire protection |
| 2306.4 | [Storage] High-piled storage |
| 2703.8.4.1 | Gas rooms |
| 2703.8.5.3 | Exhausted enclosures |
| 2704.5 | Indoor storage of hazardous materials |
| 2705.1.8 | Indoor [dispensing] handling and use of hazardous materials |
| 2804.4.1 | Aerosol warehouses |
| 2904.5 | Storage of more than 1,000 cubic feet of loose combustible fibers |
| [3306.5.2.1] | [Storage of smokeless propellant] |
| [3306.5.2.3] | [Storage of small arms ammunition and primers] |
| 3306.7 | Storage of small arm ammunition, powder-actuated tool loads, black powder or smokeless propellant |
| 3404.3.7.5.1 | Flammable and combustible liquid storage rooms |
| 3404.3.8.4 | Flammable and combustible liquid storage warehouses |
| 3405.3.7.3 | Flammable and combustible liquid Group H-2 or H-3 areas |
| [3704.1.2] 3704.1.2.2 | Gas cabinets for highly toxic and toxic gas |
| [3704.1.3] 3704.1.3.1 | Exhausted enclosures for highly toxic and toxic gas |
| 3704.2.2.6 | Gas rooms for highly toxic and toxic gas |
| 3704.3.3 | Outdoor storage for highly toxic and toxic gas |
| [4106.2.2] | [Exhausted enclosures or gas cabinets for silane gas] |
| 4204.1.1 | Pyroxylin plastic storage cabinets and vaults |
| 4204.1.3 | Pyroxylin plastic storage vaults |
| 4204.2 | Pyroxylin plastic storage[ and manufacturing], handling and use |
| Building Code | Sprinkler requirements as set forth in the construction codes, including the Building Code |

For SI: 1 cubic foot = 0.023 $m^3$.

**903.3 Installation requirements.** Except as otherwise provided in this code, sprinkler systems shall be designed and installed in accordance with the construction codes, including the Building Code.

**903.4 Sprinkler system [monitoring] supervision and alarms.** All valves controlling the water supply for sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures, and water-flow switches on all sprinkler systems shall be electrically supervised by the fire alarm system where a fire alarm system is required by Section 907 of the Building Code.

**Exceptions:**

1. Sprinkler systems protecting Group R-3 occupancies.

2. Reserved.

3. Sprinkler systems installed in accordance with NFPA 13R, as modified by FC Appendix B, where a common supply main is used to supply both domestic water and the sprinkler system, and a separate shutoff valve for the sprinkler system is not provided, except where the Building Code requires such sprinkler system to be supervised.

4. Jockey pump control valves that are sealed or locked in the open position.

5. Control valves to commercial kitchen hoods, paint spray booths or dip tanks that are sealed or locked in the open position.

6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.

7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.

**903.5 Maintenance.** Sprinkler systems shall be periodically inspected, tested, serviced and otherwise maintained in accordance with [Section 901.6] FC901.6 and the rules. Except as otherwise provided in [Sections] FC 903.5.1 through [903.5.4] 903.5.3, sprinkler systems shall be inspected and otherwise maintained as follows:

1. Sprinkler systems shall be inspected at least once a month by a person holding a certificate of fitness, employed by the owner, to ensure that all parts of the system are in perfect working order, and that the department connections, if any, are ready for immediate use by the department. A detailed record of each inspection shall be kept for examination by any representative of the department.

2. There shall be one or more employees instructed in the maintenance of sprinkler systems.

3. There shall be kept available at all times in the premises a supply of at least [6] six extra sprinkler heads to replace promptly any fused or damaged sprinklers.

4. Fire department connections shall be hydrostatically tested at least once every 5 years, in accordance with [Section 912.6] FC912.6.

**903.5.1 Sprinkler systems in converted dwellings and single room occupancies.** In any converted dwelling or tenement used in whole or in part for single room occupancy, regardless of occupancy classification, in which a sprinkler system has been installed pursuant to the requirements of the Multiple Dwelling Law, such sprinkler system shall be inspected and otherwise maintained as follows:

1. Sprinkler systems shall be inspected at least once a month by a person employed by the owner, holding a certificate of fitness issued by the department, a fire suppression

contractor license issued by the Department of Buildings, or, for a sprinkler system with not more than [30] thirty sprinkler heads, [holding] a [master] plumber [license issued by the Department of Buildings], to ensure that all parts of the system are in perfect working order, and that the department connections, if any, are ready for immediate use by the department. Such inspection shall include a check of all control valves on the system, including the main supply control valve, making certain the valves are fully open and sealed in such open position; a check of the static pressure in the sprinkler system from a pressure gauge, if installed, located at or near the inspector's test connection, making certain the system design pressure is being maintained; a check that all sprinkler heads are in place; and such other requirements as the commissioner may prescribe. A detailed record of each inspection shall be kept for examination by any representative of the department.

2. There shall be one or more employees instructed in the location and status of the sprinkler system control valves.

3. There shall be kept available at all times in the premises a supply of at least [6] six extra sprinkler heads, to replace promptly any fused or damaged sprinklers, except that a supply of at least [3] three extra sprinkler heads shall be kept available for any sprinkler system installed in accordance with NFPA 13R, as modified by [the Building Code] FC Appendix B.

4. Fire department connections shall be hydrostatically tested at least once every 5 years in accordance with [Section 912.6] FC912.6.

5. Upon order of the commissioner, but at least once every year, a flow test of the sprinkler system shall be conducted. Such test shall be conducted at the owner's risk by his or her representative, who shall be a licensed master plumber or licensed master fire suppression contractor. At least one such flow test shall be conducted before a representative of the department at least once every 5 years. A report of each test, on an approved form, shall be certified by such licensed master plumber or licensed master fire suppression contractor and shall be kept for not less than 5 years and made available for inspection by any representative of the department.

6. The owner or managing agent of any building subject to the requirements of this section shall maintain a record of each inspection and test and a listing of all outstanding violations issued pursuant to this section. Such records and listing shall be made available for inspection by occupants of such residential buildings during regular business hours.

**903.5.2 Sprinkler systems in other R-2 occupancies.** Except as otherwise provided in [Section 903.5.1] FC903.5.1, in Group R-2 occupancies, sprinkler system shall be inspected and otherwise maintained as follows:

1. Sprinkler systems shall be inspected at least once a month by a person employed by the owner, holding a certificate of fitness issued by the department, a fire suppression contractor license issued by the [New York City] Department of Buildings, or, for a sprinkler system with not more than [30] thirty sprinkler heads, [holding] a [master]

plumber [license issued by the New York City Department of Buildings], to ensure that all parts of the system are in perfect working order, and that the department connections, if any, are ready for immediate use by the department. Such inspection shall include a check of all control valves on the system, including the main supply control valve, making certain the valves are fully open and sealed in such open position; a check of the static pressure in the sprinkler system from a pressure gauge, if installed, located at or near the inspector's test connection, making certain the system design pressure is being maintained; a check that all sprinkler heads are in place; and such other requirements as the commissioner may prescribe. A detailed record of each inspection shall be kept for examination by any representative of the department.

2. There shall be one or more employees instructed in the location and status of the sprinkler system control valves.

3. There shall be kept available at all times in the premises a supply of at least [6] <u>six</u> extra sprinkler heads, to replace promptly any fused or damaged sprinklers, except that a supply of at least [3] <u>three</u> extra sprinkler heads shall be kept available for any sprinkler system installed in accordance with NFPA 13R<u>,</u> as modified by [the Building Code] <u>FC</u> <u>Appendix B.</u>

4. Fire department connections shall be hydrostatically tested at least once every 5 years in accordance with [Section 912.6] <u>FC912.6</u>.

5. Upon order of the commissioner, but at least once every year, a flow test of the sprinkler system shall be conducted; provided, however, that where there is a pressure gauge installed at or near the inspector's test location that is checked during the required monthly inspection described in [Section 903.5.2(1)] <u>FC903.5.2(1)</u> to make certain the system design pressure is being maintained, a flow test of the sprinkler system shall be conducted upon order of the commissioner, but at least once every 30 months. Such test shall be conducted at the owner's risk by his or her representative, who shall be a [licensed master] plumber or licensed master fire suppression contractor. At least one such test shall be conducted before a representative of the department at least once every 5 years. A report of each test, on a form prepared by the department, shall be certified by such [licensed master] plumber or licensed master fire suppression contractor and shall be kept for not less than 5 years and made available for inspection by any representative of the department.

6. The owner or managing agent of any building subject to the requirements of this section shall maintain a record of each inspection and test and a listing of all outstanding violations issued pursuant to this section. Such records and listing shall be made available for inspection by occupants of such residential buildings during regular business hours.

**903.5.3 Sprinkler systems in Group R-3 occupancies.** Sprinkler systems in buildings classified in Group R-3 occupancies shall be maintained in perfect working order.

<u>**903.5.4 Sprinkler system control valve signage.** A sign identifying the location of the sidewalk box housing the sprinkler system control valve shall be conspicuously posted on the</u>

exterior wall of the building directly opposite the sidewalk box. Such sign shall have red letters 1 inch (25 mm) in height on a white background and read: "Sprinkler System Shutoff Valve (*indicate distance*) Feet Opposite This Sign" or other approved design.

**903.6 Dry pipe sprinkler system valves.** In addition to the maintenance requirements set forth in [Section 903.5] FC903.5, any dry pipe valve installed in a sprinkler system shall be trip tested at least once every 5 years and whenever the system is altered. Such trip test shall be conducted at the owner's risk, with the control valve fully open and the quick-opening device, if provided, in service, by a [licensed] master fire suppression contractor licensed by the Department of Buildings before a representative of the department.

## SECTION FC 904
## FIRE EXTINGUISHING SYSTEMS

**904.1 General.** Fire extinguishing systems shall be designed, installed, operated and maintained in accordance with this section, [Section 901] FC901 and the applicable referenced standards, including performing all required inspections, testing and servicing.

**904.1.1 Installation acceptance testing**. Fire extinguishing systems shall be subject to acceptance tests as contained in the installation standards set forth in this code and the rules. When a discharge test is not required by the installation standard, the commissioner may require such test when there is evidence that the system will not provide the necessary level of protection. Such tests shall be conducted at the owner's risk by his or her representative before a representative of the department.

**904.1.2 Additional safeguards**. If an area is protected by a fire extinguishing system which uses an extinguishing agent that will make the protected area hazardous by its discharge or thermal decomposition, suitable safeguards shall be provided to ensure prompt evacuation, to prevent entry into such atmospheres, and to provide means for prompt rescue of any trapped personnel. Such safeguards shall include establishment of a trained brigade, equipped with and qualified in the use of self-contained breathing apparatus with [30 minute] 30-minute minimum supply, for prompt search of the protected area.

**Exception:** Self-contained breathing apparatus shall not be required for a clean agent fire extinguishing system installation if:

1. The installation is provided with an alarm system that is connected to an approved central station.

2. The protected area is provided with an approved fixed emergency forced ventilation system able to expel the extinguishing agent. Such emergency forced ventilation system shall have a capacity sufficient to effect at least [20] twenty air changes per hour.

3. The protected area is of a size, design and/or occupied in such a manner that egress will not be impeded.

4. The protected area is not normally occupied by any individual requiring assistance in evacuation.

**904.2 Where required.** Where this code or the rules requires the installation of a fire extinguishing system, other than a sprinkler system, the commissioner shall approve the type of fire extinguishing system to be installed. Fire extinguishing systems installed as an alternative to sprinkler systems otherwise required by this code or the construction codes, including the Building Code, shall be approved by the commissioner. Such a system may be accepted by the commissioner where the nature of the fire hazard is such that water [is not effective] would be ineffective or hazardous as an extinguishing agent, [and the system is acceptable to the Commissioner of Buildings] or the need to preserve the historic, irreplaceable or special nature of the contents of the occupancy militates against the installation of a sprinkler system. Sprinklers shall not be omitted from any room or area merely because it is of fire-resistance-rated construction or contains electrical equipment.

If a system using a fixed amount of extinguishing agent is authorized to be installed in lieu of a required sprinkler system or any other fire extinguishing system otherwise required by law, a connected reserve of charged agent cylinders equal to the primary supply shall be provided. The commissioner may impose additional requirements on the installation of any fire extinguishing system to be installed in lieu of any required sprinkler system. Fire extinguishing systems shall not be considered alternatives for the purposes of exceptions or reductions [permitted] allowed by other requirements of this code.

**904.3 Installation.** Fire extinguishing systems shall be installed in accordance with this section.

**904.3.1 Electrical wiring.** Electrical wiring shall be in accordance with the Electrical Code.

**904.3.2 Actuation.** Fire extinguishing systems shall be provided with a manual means of actuation.

**904.3.3 System interlocking.** Automatic equipment interlocks with fuel shutoffs, ventilation controls, door closers, window shutters, conveyor openings, smoke and heat vents, and other features necessary for proper operation of the fire extinguishing system shall be provided as required by the design and installation standard utilized for the hazard.

**904.3.4 Alarms and warning signs.** Where alarms are required to indicate the operation of fire extinguishing systems, distinctive audible, visible alarms and warning signs shall be provided to warn of pending agent discharge. Where exposure to automatic-extinguishing agents poses a hazard to persons and a delay is required to ensure the evacuation of occupants before agent discharge, a separate warning signal shall be provided to alert occupants once agent discharge has begun.

**904.3.5 Monitoring.** Where a building fire alarm system is installed, fire extinguishing systems shall be monitored by such fire alarm system.

**904.4 Installation acceptance inspection and testing.** Fire extinguishing systems shall be inspected and tested in accordance with this section prior to the installation acceptance testing required by [Section 904.1.1] FC904.1.1.

**904.4.1 Inspection.** Prior to conducting final acceptance tests, the following items shall be inspected:

1. Hazard specification for consistency with design hazard.

2. Type, location and spacing of automatic- and manual- initiating devices.

3. Size, placement and position of nozzles or discharge orifices.

4. Location and identification of audible and visible alarm devices.

5. Identification of devices with proper designations.

6. Operating instructions.

**904.4.2 Alarm testing.** Notification appliances, connections to fire alarm systems, and connections to an approved central station shall be tested in accordance with this section and [Section 907] FC907 to verify proper operation.

**904.4.2.1 Audible and visible signals.** The audibility and visibility of notification appliances signaling agent discharge or system operation, where required, shall be verified.

**904.4.3 Monitor testing.** Connections to central stations shall be tested to verify proper identification and retransmission of alarms from fire extinguishing systems.

**904.5 Wet chemical systems.** Wet chemical fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with [Sections] FC 901, 904.1.1 and 904.4, NFPA 17A, as modified by FC Appendix B, and their listing.

**904.5.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis. Tests shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing agent containers shall be weighed to verify the required amount of agent. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals specified by the manufacturer.

**904.5.2 Fusible link maintenance.** Fixed temperature- sensing elements shall be maintained to ensure proper operation of the system.

**904.5.3 Commercial cooking installations.** Wet chemical fire extinguishing systems installed to protect a commercial cooking operation shall additionally comply with the requirements of [Section 904.11] FC904.11.

**904.6 Dry chemical systems.** Dry chemical fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with [Sections] FC 901, 904.1.1 and 904.4, NFPA 17, as modified by FC Appendix B, and their listing.

**904.6.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess that the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis. Tests shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing agent containers shall be checked to verify that the system has not been discharged. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals specified by the manufacturer.

**904.6.2 Fusible link maintenance.** Fixed temperature-sensing elements shall be maintained to ensure proper operation of the system.

**904.7 Foam systems.** Foam fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with [Sections] FC 901, 904.1.1 and 904.4, NFPA 11, as modified by FC Appendix B, [Section B101.1, NFPA 11A as modified by Appendix B,] and NFPA 16, as modified by FC Appendix B, and their listing.

**904.7.1 Maintenance.** At least once a month, an inspection shall be conducted by a certificate of fitness holder to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system, shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on an annual basis.

**904.7.2 Commercial cooking installations**. Foam fire extinguishing systems installed to protect a commercial cooking operation shall additionally comply with the requirements of [Section 904.11] FC904.11.

**904.8 Carbon dioxide systems.** Carbon dioxide fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with [Section 901, Section 904.1.1, 904.4] FC 901, 904.1.1 and 904.4, NFPA 12, as modified by FC Appendix B, and their listing. Total flooding carbon dioxide fire extinguishing systems shall not be installed to protect hazards within normally occupied areas. Existing total flooding carbon dioxide fire extinguishing systems installed to protect normally occupied areas prior to the effective date of this code may be continued in service until July 1, 2013, after which they shall be removed from service, and a replacement fire extinguishing system shall be installed, where required, in accordance with the Building Code, this code or other applicable laws, rules and regulations.

**904.8.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.

**904.8.2 High-pressure cylinders.** High-pressure cylinders shall be weighed and the date of the last hydrostatic test shall be verified at 6-month intervals. Where a container shows a loss in original content of more than 10 percent, the cylinder shall be refilled or replaced.

**904.8.3 Low-pressure containers.** The liquid-level gauges of low-pressure containers shall be observed at one-week intervals. Where a container shows a content loss of more than 10 percent, the container shall be refilled to maintain the minimum gas requirements.

**904.8.4 System hoses.** System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested. At five-year intervals, all hoses shall be tested.

**904.8.4.1 Test procedure.** Hoses shall be tested at not less than 2,500 pounds per square inch (psi) (17 238 kPa) for high-pressure systems and at not less than 900 psi (6206 kPa) for low-pressure systems.

**904.8.5 Auxiliary equipment.** Auxiliary and supplementary components, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, shall be manually operated at 12-month intervals to ensure that such components are in proper operating condition.

**904.8.6 Safety precautions.** All areas whose atmospheres will be made hazardous by the discharge of carbon dioxide shall be provided with:

1. Exit and exit routes that are kept clear at all times.

2. Lighting and exit directional signs in accordance with the construction codes, including the Building Code.

3. Only outward swinging, self-closing doors at exits, and panic hardware on any such doors that are secured with a locking or latching device.

4. A fixed emergency forced ventilation system able to clear the area. Such emergency forced ventilation shall have sufficient capacity to accomplish at least 6 air changes per hour.

5. Such other safety equipment as may be prescribed by the commissioner.

**904.8.7 Detection, activation, alarm and control.** Detection, pre-discharge alarms and discharge alarms shall be provided within and outside the protected area and such other areas

that are made hazardous by a carbon dioxide discharge. Such alarms shall be audible and visible.

**904.8.7.1 Automatic operation.** The carbon dioxide fire extinguishing system shall be activated by an automatic cross-zoned detection system in which activation of a detection device in one zone shall sound a local alarm and transmit an alarm to an approved central station, and activation of a detection device in the cross zone shall initiate the predischarge warning signal and after a time delay, initiate the discharge of carbon dioxide. The predischarge warning signal time delay shall be of sufficient duration to allow for evacuation from the protected area. Distinct alarms shall indicate the activation of a detector in one zone, the activation of a detector in a cross zone (predischarge alarm) and the discharge of carbon dioxide. Such alarms shall be continued until the atmosphere has been returned to normal except that the alarm for the detector in one zone may be discontinued when the alarm for the cross-zone detector is activated.

**Exceptions:**

1. A carbon dioxide fire extinguishing system activated solely by manual means may be installed only if approved. Such a system may be approved upon a showing satisfactory to the commissioner of the need for such a system.

2. A detection system that is not cross-zoned may be approved upon a showing satisfactory to the commissioner of the need for such a detection and activation system.

**904.8.7.2 Manual operation.** A manual pull station shall be provided which, upon activation, transmits an alarm to an approved central station, overrides any delay other than the predischarge delay, and causes the carbon dioxide to discharge. Activation of a carbon dioxide fire extinguishing system by means of a manual pull station shall result in a complete predischarge delay sequence prior to system discharge.

**904.8.7.3 Abort systems.** Abort systems may be installed, but shall be limited to systems activated by smoke detectors. Abort controls shall be located in the protected area near the means of egress for the area, and shall be designed to cause the discharge of carbon dioxide after a time delay unless the abort control is reactivated for another cycle of delay. Abort controls shall not interfere with transmission of local alarms or central station alarms.

**904.8.7.4 Power supply.** Power supply to the alarm system shall be in accordance with applicable requirements of the construction codes, including the Building Code and the Electrical Code.

**904.8.8 Pressure relief venting.** The protected area enclosure shall be provided with suitable pressure relief venting which vents outdoors.

**Exception:** Such venting shall not be required when a registered design professional certifies that the walls, ceilings and floors comprising the protected space have sufficient porosity and leakage to prevent damage to the integrity of such space upon discharge of

the extinguishing agent, and that the inert gas agent leakage into other non-flooded rooms and spaces will not reach dangerous concentrations.

**904.8.9 Commercial cooking installations.** Carbon dioxide fire extinguishing systems installed to protect commercial cooking operations shall additionally comply with the requirements of [Section 904.11] FC904.11.

**904.9 Halon systems.** [Halon] It shall be unlawful to install a halon fire extinguishing [systems] system. Existing halon fire extinguishing systems shall be [installed,] periodically inspected, tested and otherwise maintained in accordance with [Section 901, Section 904.1.1, Section 904.4] FC 901, 904.1.1 and 904.4, NFPA 12A and their listing.

**904.9.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.

**904.9.2 Containers.** The extinguishing agent quantity and pressure of containers shall be checked at least on a semiannual basis. Where a container shows a loss in original weight of more than 5 percent or a loss in original pressure (adjusted for temperature) of more than 10 percent, the container shall be refilled or replaced. The weight and pressure of the container shall be recorded on a tag attached to the container.

**904.9.3 System hoses.** System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested. At 5-year intervals, all hoses shall be tested.

**904.9.3.1 Test procedure.** For Halon 1301 systems, hoses shall be tested at not less than 1,500 psi (10 343 kPa) for 600 psi (4137 kPa) charging pressure systems and not less than 900 psi (6206 kPa) for 360 psi (2482 kPa) charging pressure systems. For Halon 1211 hand-hose line systems, hoses shall be tested at 2,500 psi (17 238 kPa) for high-pressure systems and 900 psi (6206 kPa) for low-pressure systems.

**904.9.4 Auxiliary equipment.** Auxiliary and supplementary components, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, shall be manually operated at 12-month intervals to ensure such components are in proper operating condition.

**904.10 Clean agent systems.** Clean agent fire extinguishing systems shall be installed, periodically inspected, tested and otherwise maintained in accordance with [Section 901, Section 904.1.1, Section 904.4] FC 901, 904.1.1 and 904.4, NFPA 2001, as modified by FC Appendix B, and their listing. The use of a clean agent fire extinguishing system shall be limited to automatic total flooding systems.

**904.10.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the

installation, operation, and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.

**904.10.2 Containers.** The extinguishing agent quantity and pressure of the containers shall be checked at 6-month intervals. Where a container shows a loss in original weight of more than 5 percent or a loss in original pressure, adjusted for temperature, of more than 10 percent, the container shall be refilled or replaced. The weight and pressure of the container shall be recorded on a tag attached to the container.

**904.10.3 System hoses.** System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested. All hoses shall be tested at 5-year intervals.

**904.10.4 System alarm and activation.** Audible and visible alarms shall be installed both inside and outside the protected area to signal the activation of an automatic detection device and the operation of the fire extinguishing system. Such signals shall continue until the atmosphere has been returned to normal. Activation of a single automatic detection device shall sound a local alarm and transmit an alarm to an approved central station. Unless the alarm is cancelled by an abort system as set forth in [Section 904.10.5] FC904.10.5, activation of a second automatic detection device shall, within 30 seconds, initiate the discharge of clean agent. Power supply to the alarm system shall be in accordance with the construction codes, including the Building Code, the Electrical Code and NFPA 2001, as modified by FC Appendix B.

**904.10.4.1 Warning and instruction signs.** Warning and instruction signs shall be posted at entrances to and within the protected area subject to flooding.

**904.10.5 Abort systems**. Abort systems may be installed only on systems activated by smoke detectors. Abort controls shall be manually operated, shall be located in the protected area, and shall cause the dumping of the clean agent after a 2-minute delay unless the abort control is reactivated for another cycle of delay. A manual pull station shall be provided which, upon activation, shall transmit an alarm to an approved central station, override the delay and cause the clean agent to dump immediately. Abort controls shall not interfere with transmission of local alarms or central station alarms.

**904.10.6 Means of egress.** Where the protected area is normally occupied, provision shall be made for adequate clear routes of exit with doors opening in direction of travel. Emergency lighting shall be provided for such exits. Exit directional signs shall clearly indicate the path of egress.

**904.10.7 Fixed emergency forced ventilation**. When the protected area is normally occupied, a fixed emergency forced ventilation system sufficient to accomplish at least six air changes per hour of the flooded protected area shall be provided unless all of the following apply:

1. The clean agent fire extinguishing system is used to extinguish a Class A fire.

2. The design concentration does not exceed the "no observable adverse effect level" for halocarbon agents, or "no effect level" for inert gas agents as defined in NFPA 2001, as modified by FC Appendix B.

3. If other than inert gas agents are used, the quantity of the thermal decomposition products formed from such agents is below the dangerous toxic load (DTL) for humans as described in Meldrum's "Toxicology of Substances in Relation to Major Hazards: Hydrogen Fluoride" (HMSO, London, 1993). Upon request, documentation of hazard assessment of thermal decomposition products formed from such agents shall be filed with the department.

**904.10.8 Pressure relief venting**. Clean agent fire extinguishing systems using inert gas agents shall be provided with suitable pressure relief venting for the flooded protected area that discharges outdoors.

**Exception:** Such venting shall not be required when a registered design professional certifies that the walls, ceilings and floors comprising the protected space have sufficient porosity and leakage to prevent damage to the integrity of such space upon discharge of the extinguishing agent, and that the inert gas agent leakage into other non-flooded rooms and spaces will not reach dangerous concentrations.

**904.11 Commercial cooking systems.** [Commercial] The fire extinguishing system for commercial cooking systems shall be designed and installed, and periodically inspected, tested and otherwise maintained in accordance with the construction codes, including the Building Code, [and shall comply with the requirements of Section 901, Section 904.1.1, Section 904.4] FC 901, 904.1.1 and 904.4, and this section. The fire extinguishing system for commercial cooking systems shall be of an approved type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Preengineered wet chemical fire extinguishing systems shall be tested in accordance with UL 300 and listed and labeled for the intended application. Dry chemical fire extinguishing systems shall not be installed to protect commercial cooking equipment and exhaust systems. Other types of fire extinguishing systems shall be listed and labeled for specific use as protection for commercial cooking operations. The system shall be installed in accordance with this code, its listing and the manufacturer's installation instructions. Fire extinguishing systems of the following types shall be installed in accordance with the referenced standard indicated, as follows:

1. Carbon dioxide fire extinguishing systems, NFPA 12, as modified by FC Appendix B.

2. Foam-water sprinkler system or foam-water spray systems, NFPA 16, as modified by FC Appendix B.

3. Wet chemical fire extinguishing systems, NFPA 17A, as modified by FC Appendix B.

**904.11.1 Manual system operation.** A manual activation device shall be located at or near a means of egress from the cooking area[,] and a minimum of 10 feet (3048 mm) and a maximum of 20 feet (6096 mm) from the kitchen exhaust system. The manual activation device shall be located a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1219 mm) above the floor at its center. The manual activation shall require a maximum

force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to activate the fire extinguishing system. A sign or marking on or adjacent to the manual activation device shall clearly identify the commercial cooking equipment being protected.

**Exception:** Sprinkler systems shall not be required to be equipped with a manual activation device.

**904.11.2 System interconnection.** The activation of the fire extinguishing system shall automatically shut down the fuel and electrical power supply to the cooking equipment. The fuel and electrical supply reset shall be manual.

**904.11.3** Reserved.

**904.11.4 Acceptance testing.** Upon completion of the installation of a commercial cooking system, such system shall be tested at the owner's risk, by his or her representative, to confirm proper installation and operation of the system in compliance with the requirements of the construction codes, including the Mechanical Code, and this code. The owner's representative shall furnish the necessary equipment required to conduct the test. No permit shall be issued for the operation of a commercial cooking system until satisfactory performance of the fire extinguishing system is demonstrated, including compliance with the following requirements:

[1. A performance test of the exhaust system conducted before a representative of the department, in accordance with Section 507.16 of the Mechanical Code. The test shall verify that the exhaust airflow rate and makeup airflow meet the standards set forth in the construction codes, including the Mechanical Code, and verify proper operation as specified in this chapter.]

[2] 1. A performance test of the fire extinguishing system conducted before a representative of the department, in accordance with the applicable installation standard set forth in this chapter and its listing.

[3] 2. Chimneys serving masonry ovens shall be proved tight by a smoke test. A report of such test shall be prepared by the installer and made available for inspection by a representative of the department at the time the performance tests of the exhaust system and fire extinguishing system are witnessed by such department representative.

[**904.11.5 Commercial cooking equipment.** Commercial cooking equipment shall be attended at all times while in operation and shall comply with the requirements of Sections 904.11.5.1 through 904.11.5.5.

**904.11.5.1 Unlawful operation.** It shall be unlawful to operate commercial cooking equipment that generates smoke or grease-laden vapors or fumes under any of the following conditions:

1. Without a permit for the operation of a commercial cooking system.

2. Without a lawfully installed fire extinguishing system.

3. Without a lawfully installed exhaust system.

4. While its fire extinguishing system or exhaust system is out of service.

**904.11.5.2 Portable fire extinguishers**. Portable fire extinguishers shall be provided within a 30-foot (9144 mm) travel distance of commercial cooking equipment. Cooking equipment involving vegetable or animal oils and fats shall be protected by a Class K rated portable fire extinguisher.

**904.11.5.3 Deep fat fryers.** Deep fat fryers shall be separated from any adjacent cooking equipment that uses an open flame by at least 16 inches (406.4 mm). In lieu of such separation distance, a 16-inch (406.4 mm) high by ⅛-inch (3.2 mm) thick steel baffle permanently attached to the longer of the two cooking appliances may be used. The baffle shall extend to the full depth of the cooking equipment it is attached to.

**904.11.5.3.1 Deep-fat fryer high-limit controls.** Deep-fat fryers shall be equipped with an independent high-limit control in addition to the adjustable operating control (thermostat). Such high-limit control shall be designed and arranged to shut off the fuel supply, including electrical energy, when the fat temperature reaches not more than 475°F (246°C), 1 inch (25.4 mm) below the liquid surface. All high-limit controls shall be replaced every 3 years with a new or rebuilt unit certified to operate at not more than 475°F (246°C). A record of such replacement shall be maintained at the premises and made available for inspection by any representative of the department upon request.

**904.11.5.4 Portable cooking equipment.** The proper positioning of portable cooking equipment (equipment on wheels) shall be outlined on the floor in a durable 1-inch (25.4 mm) wide yellow line or other approved means.

**904.11.5.5 Staff training.** The owner or operator of commercial cooking equipment shall train all staff in the proper procedures for the use of all components of the grease removal system, cleaning of filters, and the manual operation of the fire extinguishing system. At least once every 6 months the owner or operator of the premises shall review the instructions for manual operation of the fire extinguishing system with all staff.

**904.11.6 Operation and maintenance.** Commercial cooking systems shall be operated and maintained in accordance with this section.

**904.11.6.1 Ventilation system.** The ventilation system in connection with hoods shall be operated at the required rate of air movement, and approved grease filters shall be in place when equipment under a kitchen grease hood is used. Exhaust systems shall be operated at all times while cooking equipment is being used. Fixed air supply openings installed to provide make-up air for air exhausted through the exhaust system shall not be restricted by covers, dampers, or any other means that would reduce the operating efficiency of the exhaust system. Commercial cooking hoods shall not be painted.

**904.11.6.2 Grease extractors.** Where grease extractors are installed, they shall be operated when the commercial cooking equipment is used.

**904.11.6.3 Exhaust system inspection and cleaning.** The entire exhaust system, including but not limited to hoods, filters, grease removal devices, ducts, fans, pollution control devices, and other appurtenances, shall be inspected and cleaned at least once every three months under the personal supervision of a person holding a certificate of fitness. Surfaces shall be cleaned to bare metal and no powder or other foreign substance shall remain in the exhaust system after cleaning. Flammable cleaning fluids shall not be used. If saponifying agents are used, residues shall be removed. Cleaning fluids shall not be applied on fusible links or other detection devices of the fire extinguishing system. Electrical switches that may be accidentally activated during the cleaning process shall be electrically locked out during such process.

**Exception**: Vertical portions of interior and exterior vertical ducts in excess of three stories in height shall be cleaned at least every six months by a person holding a certificate of fitness. Horizontal portions of such ducts, including all elbows, shall be inspected and cleaned in accordance with Section 904.11.6.3.

**904.11.6.3.1 Filters.** Filters shall be cleaned or replaced as frequently as necessary, but at least once per month, by a properly trained employee of the owner or by a person holding a certificate of fitness. No exhaust system shall be operated without filters installed while cooking equipment is being used.

**904.11.6.3.2 Spark arrestors.** Any spark arrestor provided in conjunction with a solid fuel cooking operation shall be inspected monthly and shall be cleaned as required to maintain free of debris and unobstructed.

**904.11.6.3.3 System deactivation.** Unless necessary to accomplish cleaning, components of the fire extinguishing system shall not be rendered inoperable during the cleaning process. If electrical switches, detection devices, or other components of the fire extinguishing system must be deactivated during the cleaning process, such deactivation shall be performed by a licensed master fire suppression piping contractor. Immediately upon completion of the cleaning process the licensed master fire suppression piping contractor shall restore the system to proper operation.]

**904.11.5 Staff training.** At least once every 6 months the owner or operator of the premises shall review with all kitchen staff the manual operation of the fire extinguishing system.

**[904.11.6.4] 904.11.6 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess that the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis. At a minimum, the semiannual inspection, testing and servicing shall include:

1. Verification that the hazard has not changed.

2. Verification that the fire extinguishing system has not been altered.

3. Examination of all detectors, agent and gas containers, releasing devices, piping, hose assemblies, nozzles, and all auxiliary equipment.

4. Verification that the agent distribution piping is not obstructed.

5. Verification that the extinguishing agent container and/or auxiliary pressure containers have been, as applicable, inspected, [re-tested] retested and marked in conformance with the requirements of the United States Department of Transportation.

6. A test of the system's automatic and manual releasing devices, including any associated equipment.

7. A test of the gas and electric power source shutoff devices.

8. Preparation and submission to the owner of a written report of any system defects.

9. Upon satisfactory completion of the semiannual inspection and correction of all defects, providing the owner with an inspection, testing and service compliance tag. Such tag shall indicate the date issued, the name and license number of the licensed master fire suppression piping contractor issuing the tag, and that the system was found to be in compliance with the requirements of this section.

**[904.11.6.5] 904.11.6.1 Fusible link and sprinkler head replacement.** Fusible links and foam water sprinkler heads shall be replaced at least annually, and other protection devices shall be serviced or replaced in accordance with the manufacturer's instructions.

**Exception:** Frangible bulbs are not required to be replaced annually.

**[904.11.6.6 Recordkeeping.** Records shall be maintained as set forth in Section 901 and as follows:

1. A record of the inspection and cleaning of the exhaust system required by Section 904.11.6.3 shall be maintained at the premises and made available for inspection by any representative of the department upon request. Such record shall indicate the date that such inspection and cleaning was conducted, and the name and certificate of fitness number of the individual supervising such inspection and cleaning.

2. A record indicating the name of the person or firm doing the servicing and the dates when filters were cleaned or replaced shall be maintained at the premises and made available for inspection by any representative of the department upon request.

3. Upon satisfactory completion of the semiannual inspection as required by Section 904.11.6.4 and the correction of all system defects, the licensed master fire suppression piping contractor shall issue an inspection, testing and service

compliance tag. Such tag shall be posted in a conspicuous location on the premises. A new compliance tag shall be posted for each required semiannual inspection.

4. A record of the periodic inspection of all portable fire extinguishers shall be maintained as required in Section 906.

5. A record of the replacement of deep fat fryer high-limit controls shall be maintained in accordance with Section 904.11.5.3.1.]

**904.11.6.2 Recordkeeping.** Records shall be maintained as set forth in FC901.6.2. Upon satisfactory completion of each semiannual inspection required by FC904.11.6, and the correction of all system defects, the master fire suppression piping contractor licensed by the Department of Buildings shall issue and post in a conspicuous location in the cooking area an inspection, testing and servicing compliance tag. A new compliance tag shall be issued and posted for each required semiannual inspection.

**[904.11.6.7 Postings.** Postings required by this section shall be clearly and concisely written, at least 8½ inches (215.9 mm) by 11 inches (279.4 mm) in size, and posted under glass or laminated. The following information shall be posted:

1. A complete set of cleaning and operating instructions covering all components of the cooking equipment and exhaust system and a schematic drawing or sketch showing the origin, run, and terminus of the exhaust system. Such posting shall be at the main entrance or other approved entrance to the cooking area. 167

2. Instructions for manual operation of the fire extinguishing system with a statement that the fire extinguishing system shall be manually activated prior to using a portable fire extinguisher. Such posting shall be near the portable fire extinguisher.]

**904.11.6.3 Signage.** Instructions for manual operation of the fire extinguishing system, including a statement that the fire extinguishing system shall be manually activated prior to using a portable fire extinguisher, shall be posted, under glass or laminated, near the system's manual activation device. Information shall be clearly and concisely written, and the posting shall be at least 8½ inches (216 mm) by 11 inches (279 mm) in size.

**[904.11.7 Solid fuel cooking operations**. Unless otherwise approved by the Commissioner of Buildings, the burning of solid fuel in commercial cooking equipment, such as briquettes, mesquite, hardwood, or charcoal, shall be permitted only for purposes of flavor enhancement. Solid fuel shall be ignited with a match or other approved means. Combustible or flammable liquids shall not be used. Matches shall not be stored in the immediate vicinity of cooking equipment. Solid fuel shall be added to the fire only as required, shall be done in a safe manner and in quantities that will not create a flame higher than required. Long handled tongs, hooks and other required devices shall be provided and used in order to safely add fuel, adjust the fuel, position and control the fire, without having to reach into the fire box. The room where solid fuel is used or stored shall be protected throughout by a sprinkler system.

**904.11.7.1 Solid fuel storage.** Solid fuel shall be stored in a dedicated room with walls, floor and ceiling having a minimum fire rating of one hour. The storage room floor shall be non-combustible or covered with non-combustible material. Not more than a one-day supply may be kept in the same room as the solid fuel cooking appliance or masonry oven or in the room with the fuel loading or clean-out doors.

Solid fuel shall not be stored:

1. Within 3 feet (911.4 mm) of any portion of a solid fuel burning appliance, masonry oven or any other heating or cooking appliance.

2. Within 6 feet (1828.8 mm) of any solid fuel loading opening or door of the solid fuel cooking appliance or masonry oven.

3. Above any heating or cooking appliance, flue or vent.

**904.11.7.2 Solid fuel cooking equipment**. Cooking equipment burning solid fuel shall be installed on floors of noncombustible construction that extend 3 feet (911.4 mm) from the cooking equipment in all directions. Combustible surfaces or construction shall not be permitted within 3 feet (911.4 mm) of the sides or 6 feet (1828.8 mm) above any such cooking equipment.

**904.11.7.3 Water supply.** A water supply with a flexible hose shall be provided near solid fuel cooking appliances and masonry ovens to cool down any fire that becomes too hot and to completely extinguish any fire before leaving the premises. The water source shall be a fixed pipe system with a hose of adequate length to reach to the combustion and cooking chambers of the appliance. The nozzle shall be fitted with a manual shut-off device, and shall be of the type to provide a fine to medium spray. A full flow or strong stream shall not be used.

**904.11.7.4 Spent fuel.** Spent fuel, ash, cinders and other fire debris shall be removed from the fire box at regular intervals, but at least once a day, and, once removed, shall not be stored indoors. Adequate long handle rakes, hoes, scrapers and shovels shall be provided for such removal. When being removed from the fire box, the spent fuel shall be sprinkled adequately with water from the required water supply to cool it and to control the dust. Dedicated metal containers (minimum 16 gauge) with covers shall be provided for such removal. Each container of spent fuel, ash, cinder and other debris so removed shall not exceed 20 gallons (75.7 L) capacity, shall be sized to easily pass through any passageway to the outside and shall be capable of being handled easily by any employee assigned this task. The spent fuel shall be placed outside in heavy metal containers or a dumpster used exclusively for this purpose and shall be separated from all combustible construction and combustible materials. The containers shall be covered at all times.]

**904.12 Water-mist systems**. Water-mist fire extinguishing systems shall be installed, periodically inspected, tested and maintained in accordance with [Section 901, Section 904.4] FC 901 and 904.4, NFPA 750, as modified by FC Appendix B, and their listing. All devices and appurtenances shall be listed and installed in conformance to the terms of the listing.

**904.12.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on an annual basis.

**904.13 Aerosol fire extinguishing systems**. Aerosol fire extinguishing systems shall be installed, periodically inspected, tested and maintained in accordance with FC 901 and 904.4, NFPA 2010, as modified by FC Appendix B, and their listing. All devices and appurtenances shall be listed and installed in conformance to the terms of the listing.

**904.13.1 Maintenance.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on an annual basis.

## SECTION FC 905
## STANDPIPE SYSTEMS

**905.1 General.** Standpipe systems shall be provided where required by the construction codes, including the Building Code, this code or the rules. Fire hose threads used in connection with standpipe systems shall be approved by the commissioner. The location of fire department hose connections shall be approved by the commissioner. Standpipe systems in buildings used for high-piled combustible storage shall be in accordance with FC Chapter 23.

**905.1.1 Standpipe system operator**. In buildings with a multi-zone standpipe system, such system shall be continuously under the personal supervision of a person holding a certificate of fitness, who shall be immediately available to assist the department in the operation of such system.

**905.2 Installation standards.** Standpipe systems shall be installed in accordance with the construction codes, including the Building Code.

**905.3 through and including 905.6** Reserved.

**905.7 Cabinets.** Cabinets containing firefighting equipment, such as standpipes, fire hose, portable fire extinguishers and water supply control valves, shall not be obstructed from use or obscured from view.

**905.8** Reserved.

**905.9 Valve supervision.** Valves controlling water supplies shall be supervised in the open position so that a change in the normal position of the valve will generate a supervisory signal at the central station required by [Section 903.4] FC903.4. Where a fire alarm system is provided, a signal shall also be transmitted to the fire alarm system control panel.

**Exceptions:**

1. Valves to underground key or hub valves in roadway boxes provided by the municipality or public utility do not require supervision.

2. Valves locked in the normal position and inspected as provided in this code in buildings not equipped with a fire alarm system.

**905.10 During construction.** Standpipe systems required during construction, alteration and demolition operations shall be provided in accordance with Chapter 33 of the Building Code and [Section 1413] FC1413.

**905.11** Reserved.

**905.12 Maintenance.** Standpipe systems shall be maintained, including all required inspection, testing and servicing, in accordance with this section, [Section 901.6] FC901.6 and NFPA 25.

**905.12.1 Standpipe hydrostatic pressure and flow tests.** Upon order of the commissioner, but at least once every 5 years, the standpipe system shall be subjected to a hydrostatic pressure test and a flow test to demonstrate its suitability for department use. These tests shall be conducted in compliance with the requirements of the rules and shall be conducted at the owner's risk, by his or her representative before a representative of the department.

**[905.12.2 Pressure-reducing valves.** Upon order of the commissioner, but at least once every 3 years, standpipe systems with pressure-reducing valves installed shall be flow tested to demonstrate proper adjustment of such valves.]

## SECTION FC 906
## PORTABLE FIRE EXTINGUISHERS

**906.1 Where required.** Portable fire extinguishers shall be installed in the following locations.

1. In all Group A, B, E, F, H, I, M, R-1, R-2 adult homes and enriched housing, and S occupancies.

2. Within 30 feet (9144 mm) of commercial cooking equipment.

3. In areas where flammable or combustible liquids are manufactured, stored, handled and used, including dispensing, in quantities requiring a permit pursuant to [Section 105.6] FC105.6.

4. On each floor of structures under construction, alteration or demolition, except detached Group R-3 occupancies, in accordance with [Section 1415.1] FC1415.1.

5. Where required by the sections indicated in FC Table 906.1.

6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the commissioner.

7. Where required by other provisions of this code or the rules.

**FC TABLE 906.1**
**ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS**

| SECTION | SUBJECT |
|---|---|
| 303.5 | Tar kettles and asphalt melters |
| [304.4.3] | [Outdoor storage of combustible waste] |
| 307.4 | Open fires |
| 307.5 | [Barbecues on residential properties] Portable outdoor barbecues |
| [308.6.5] 308.3.1.5 | Flaming food and beverages in Group A occupancies |
| 309.4 | Powered industrial trucks |
| 315.3.4 | Outdoor storage of combustible material |
| 603.3.1 | Fuel oil-burning equipment |
| 1105.2 | Aircraft towing vehicles |
| 1105.3 | Aircraft welding apparatus |
| 1105.4 | Aircraft-fueling vehicles |
| 1105.5 | Aircraft hydrant-fueling vehicles |
| 1105.6 | Aircraft fuel-dispensing stations |
| 1107.7 | Heliports and helistops |
| 1110.6.2 | Helicopter lift operations |
| 1208.4 | Dry cleaning [plants] facilities |
| 1415.1 | Buildings, structures, premises and facilities under construction, alteration or demolition |
| 1417.3 | Roofing operations |
| 1418.1 | [Ammunition] Powder-actuated tool loads at a construction site |
| 1504.4.10 | Spraying spaces |
| [1504.6.4]1504.5.5 | [Spray-finishing operations] Limited spraying areas |
| [1505.5] 1505.5.3 | Dip-tank [operations] rooms and spaces |
| [1507.10] 1506.4.6 | Powder coating [operations] rooms and spaces |
| 1510.1.2 | Floor finishing operations |
| 1908.8 | Storage of wood chips and other wood waste materials |
| 1909.5 | Exterior lumber storage |
| 2003.5 | Organic-coating areas |
| 2106.3 | Industrial furnaces |
| 2205.5 | Automotive liquid motor fuel-dispensing facilities |
| [2208.7.4.1] 2208.7.4.2 | CNG motor fuel-dispensing facilities |
| 2210.6.4 | Marine liquid motor fuel-dispensing facilities |
| 2211.6 | Repair garages |
| 2306.10 | [Rack] High-piled storage |
| 2404.12 | Tents and other membrane structures |
| 2508.2 | Tire rebuilding/storage |
| 2604.2.6 | Welding and other hot work |
| 2707.9.3 | Transportation of flammable and combustible liquids in cargo tanks |
| 2903.6 and 2906.6.4 | Combustible fibers |
| 3309.9.1 | Special effects |
| 3403.2.1 | Flammable and combustible liquids, general |
| 3404.3.3.1 | Indoor storage of flammable and combustible liquids |
| 3404.3.7.5.2 | Liquid storage rooms for flammable and combustible liquids |
| 3405.4.9 | Solvent distillation units |
| 3406.2.7 | Construction sites—flammable and combustible liquids storage |
| 3406.4.10.1 | Bulk plants and terminals for flammable and combustible liquids |
| 3406.8.1(20) | Vapor recovery and processing equipment at bulk plants and terminals |
| 3506.5 | Sterilizers using flammable gas containing ethylene oxide |
| 3808.2 | LPG |

**906.2 General requirements.** Portable fire extinguishers shall be selected, installed and maintained in accordance with this section and NFPA 10.

**[Exception] Exceptions:**

1. The travel distance to reach a portable fire extinguisher shall not apply to the spectator seating portions of Group A-5 occupancies.

2. In Group I-3, portable fire extinguishers may be provided at staff locations.

**906.2.1 Maintenance**. Portable fire extinguishers shall be maintained in accordance with [Section 901.6] FC901.6 and this section.

**906.2.1.1 Monthly inspection.** An inspection to verify that the portable fire extinguishers are readily available and in good working order shall be conducted at least once a month. The person conducting such inspections shall keep records of all portable fire extinguishers inspected, including the date the inspection was performed, the person performing the inspection, and those portable fire extinguishers found to require corrective action. Such recordkeeping shall be either kept on a tag or label securely attached to the portable fire extinguisher, on an inspection checklist maintained on file or by an approved electronic method that provides a permanent record.

**Exception:** An inspection to verify that the portable fire extinguishers are readily available and in good working order shall be conducted at least once every 3 years for dry-chemical or halogenated agent portable fire extinguishers that are monitored by a listed and approved electronic monitoring device complying with all of the following requirements:

1. The electronic monitoring device shall continuously confirm the proper location and charge of each portable fire extinguisher so monitored.

2. Loss of power to the electronic monitoring device or other interruption of the proper functioning of such device shall initiate a trouble signal at an approved location on the premises at which the portable fire extinguisher being monitored is installed.

3. The portable fire extinguisher being monitored shall be located indoors or in cabinets outdoors. The portable fire extinguisher being monitored shall not be in a corrosive environment.

4. The periodic inspection of the portable fire extinguisher shall include inspection and testing of the electronic monitoring device.

5. An electronic record that the electronic monitoring of the portable fire extinguisher is being maintained, and that the portable fire extinguisher is properly located and charged, shall be maintained in accordance with FC107.7.

**906.2.1.2 Servicing.** Annual servicing and recharging shall be performed by a person or company meeting the requirements of [Section 901.6.3.1] FC901.6.3.1. Records of servicing and recharging of portable fire extinguishers shall be provided and maintained

in accordance with NFPA 10. The required tag or label for servicing shall also include the following information:

1. The name and certificate of fitness number of the person who serviced the portable fire extinguisher.

2. The month and year the portable fire extinguisher was serviced.

3. The name, street address and telephone number of the portable fire extinguisher servicing company, if any, servicing the portable fire extinguisher.

**906.2.1.3 Hydrostatic testing.** Periodic hydrostatic testing of portable fire extinguishers shall be done in accordance with NFPA 10.

**906.3 Size and distribution.** [For occupancies that involve primarily Class A fire hazards, the minimum sizes and distribution shall comply with Table 906.3(1). Portable fire extinguishers for occupancies involving flammable or combustible liquids with depths of less than or equal to 0.25-inch (6.35 mm) shall be selected and placed in accordance with Table 906.3(2). Portable fire extinguishers for occupancies involving flammable or combustible liquids with a depth of greater than 0.25-inch (6.35 mm) or involving combustible metals shall be selected and placed in accordance with NFPA 10. Extinguishers for Class C fire hazards shall be selected and placed on the basis of the anticipated Class A or Class B hazard.] The size and distribution of portable fire extinguishers shall be in accordance with FC 906.3.1 through 906.3.4.

**906.3.1 Class A fire hazards.** The minimum size, number and placement of portable fire extinguishers in occupancies in which there is a Class A fire hazard risk (ordinary combustible materials) shall be in accordance with FC Table 906.3.1.

**[906.3.1] 906.3.1.1 Sprinklered areas**. In buildings classified as Group A-3 occupancy houses of worship and Group B occupancy office buildings that are protected throughout by a sprinkler system, the maximum floor area per unit of A required by FC Table [906.3(1)] 906.3.1 may be doubled.

**906.3.2 Class B fire hazards.** The minimum size, number and placement of portable fire extinguishers in occupancies in which there is a Class B fire hazard risk (flammable or combustible liquids with depths of less than or equal to 0.25-inch (6.35 mm)) shall be in accordance with FC Table 906.3.2. The minimum size, number and placement of portable fire extinguishers in occupancies in which there is a Class B fire hazard risk (flammable or combustible liquids with depths greater than 0.25-inch (6.35 mm)) shall be in accordance with NFPA 10.

**906.3.3 Class C fire hazards.** The minimum size, number and placement of portable fire extinguishers in which there is a Class C fire hazard risk (energized electrical equipment) shall be in accordance with NFPA 10.

**906.3.4 Class D fire hazards.** The minimum size, number and placement of portable fire extinguishers in occupancies in which there is a Class D fire hazard risk (combustible metals) shall be in accordance with NFPA 10.

**FC TABLE [906.3(1)] 906.3.1**
**PORTABLE FIRE EXTINGUISHERS FOR CLASS A FIRE HAZARDS**

| | LIGHT (Low) HAZARD OCCUPANCY[d] | ORDINARY (Moderate) HAZARD OCCUPANCY[d] | EXTRA (High) HAZARD OCCUPANCY[d] |
|---|---|---|---|
| Minimum Rated Single Extinguisher | 2-A[c] | 2-A | 4-A[a] |
| Maximum Floor Area Per Unit of A | 3,000 square feet[e] | 1,500 square feet | 1,000 square feet |
| Maximum Travel Distance to Extinguisher | 75 feet | 75 feet | 75 feet |

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 $m^2$, 1 gallon = 3.785 L.
a. Two [2.5]2½-gallon water-type extinguishers shall be deemed the equivalent of one 4-A rated extinguisher.
b. Reserved.
c. Two water-type extinguishers each with a 1-A rating shall be deemed the equivalent of one 2-A rated extinguisher for Light (Low) Hazard Occupancies.
d. For the purposes of FC Table [906.3(1)] 906.3.1, the terms "Light (Low) Hazard", "Ordinary (Moderate) Hazard" and "Extra (High) Hazard" shall be as defined in NFPA 10.
e. In [areas] occupancies classified as Groups [A3] A-3, B, or E which are protected throughout by a sprinkler system, the maximum floor area per unit of A may be doubled.

**FC TABLE [906.3(2)] 906.3.2**
**FLAMMABLE OR COMBUSTIBLE LIQUIDS WITH DEPTHS OF LESS THAN OR EQUAL TO 0.25-INCH[a]**

| TYPE OF HAZARD | BASIC MINIMUM PORTABLE FIRE EXTINGUISHER RATING | MAXIMUM TRAVEL DISTANCE TO PORTABLE FIRE EXTINGUISHERS (feet) |
|---|---|---|
| Light (Low) | 5-B<br>10-B | 30<br>50 |
| Ordinary (Moderate) | 10-B<br>20-B | 30<br>50 |
| Extra (High) | 40-B<br>80-B | 30<br>50 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.
**[NOTE.]** a. For requirements on water-soluble flammable liquids and alternative sizing criteria, see NFPA 10[, Sections 3-3 and 3-4].

**906.4 Cooking grease fires.** Portable fire extinguishers provided for the protection of cooking grease fires shall be of an approved type compatible with the fire extinguishing system agent and in accordance with [Section 904.11.5] FC609.6.

**906.5 Conspicuous location.** Portable fire extinguishers shall be located in conspicuous locations where they will be readily accessible and immediately available for use. These locations shall be along normal paths of travel, unless the commissioner determines that the hazard posed indicates the need for placement away from normal paths of travel.

**Exceptions:**

1. Portable fire extinguishers subject to theft, malicious use or damage may be located in locations approved by the commissioner.

2. In rooming houses and single room occupancies, as defined in the New York State Multiple Dwelling Law, with over 15 sleeping rooms, a 2-A rated portable fire extinguisher may be kept in the apartment of the manager or the building superintendent.

**906.6 Unobstructed and unobscured.** Portable fire extinguishers shall not be obstructed or obscured from view. In rooms or areas in which visual obstruction cannot be completely avoided, signs or other markings shall be provided to indicate the locations of portable fire extinguishers.

**906.7 Hangers and brackets.** Hand-held portable fire extinguishers, not housed in cabinets, shall be installed on the hangers or brackets supplied. Hangers or brackets shall be securely anchored to the mounting surface in accordance with the manufacturer's installation instructions.

**906.8 Cabinets.** Cabinets used to house portable fire extinguishers shall be readily identifiable and shall not be locked.

**Exceptions:**

1. Portable fire extinguishers subject to theft, malicious use or damage, if provided with an approved means of ready access.

2. Portable fire extinguishers in Group I-3 occupancies and in mental health areas in Group I-2 occupancies may be locked or located in staff locations, provided the staff of the institution has ready access to the cabinet or other storage location.

**906.9 [Height above floor] Extinguisher installation.** The installation of portable fire extinguishers shall be in accordance with FC 906.9.1 through 906.9.3.

**906.9.1 Extinguishers weighing 40 pounds or less.** Portable fire extinguishers having a gross weight not exceeding 40 pounds (18 kg) shall be installed so that [their tops are] the top of the extinguisher is not more than 5 feet (1524 mm) above the floor.

**906.9.2 Extinguishers weighing more than 40 pounds.** Hand-held portable fire extinguishers having a gross weight exceeding 40 pounds (18 kg) shall be installed so that [their tops are] the top of the extinguisher is not more than 3.5 feet (1067 mm) above the floor.

**906.9.3 Floor clearance.** The clearance between the floor and the bottom of installed hand-held portable fire extinguishers shall not be less than 4 inches (102 mm).

**906.10 Wheeled units.** Wheeled portable fire extinguishers shall be [conspicuously located] kept in a designated location that is readily accessible.

## SECTION FC 907
## FIRE ALARM AND DETECTION SYSTEMS

**907.1 General.** This section [covers] governs the operation and maintenance of fire alarm systems and their components.

**907.1.1 Design and installation documents.** Design and installation documents for fire alarm systems shall be submitted to the department for review and approval prior to system installation. Design and installation documents shall include such design and installation details as may be required by the construction codes, including the Building Code.

**907.2 Where required.** An approved manual, automatic, or manual and automatic fire alarm system shall be provided where required by the construction codes, including the Building Code or this code. An approved automatic fire detection system shall be installed in accordance with

the construction codes, including the Building Code, and NFPA 72, as modified by FC Appendix B.

**907.3 [Reserved.] Fire command center.** Where required by this code or the construction codes, including the Building Code, a fire command center shall be provided for a building, structure or premises.

**907.3.1 Location.** The location and layout of the fire command center shall be approved by the department. A plan identifying the proposed location and layout of the fire command center, including the location, model and certificate of approval number of the fire alarm system control panel, shall be submitted to the department for approval prior to installation.

**907.3.2 Fire alarm system control panel.** The fire alarm system control panel shall be of a type for which a certificate of approval has been issued, and shall be installed in accordance with the Building Code.

**907.3.3 Maintenance.** The fire alarm system control panel shall be maintained in accordance with NFPA 72, as modified by FC Appendix B.

**907.4 Manual fire alarm boxes.** Manual fire alarm boxes shall be installed in accordance with the construction codes, including the Building Code.

**907.4.1 through and including 907.4.4** Reserved.

**907.4.5 Protective covers.** The commissioner may require the installation of manual fire alarm box protective covers to prevent malicious false alarms or provide the manual fire alarm box with protection from physical damage. The protective cover shall comply with the requirements of the construction codes, including the Building Code.

**907.5 through and including 907.7** Reserved.

**907.8 Presignal system.** [Presignal systems shall not be installed unless approved by the commissioner.] Where a presignal system is installed, personal supervision shall be provided at an approved location, in order that the alarm signal can be activated in the event of fire or other emergency.

**907.9 through and including 907.12** Reserved.

**907.13 Access.** Access shall be provided to each detector for periodic inspection, testing and other maintenance.

**907.14 Fire extinguishing systems.** Fire extinguishing systems shall be connected to the building fire alarm system where a fire alarm system is required or is otherwise installed.

**907.15 Monitoring.** Where required by this code, the rules or by the construction codes, including the Building Code, such monitoring by a central station shall be performed in compliance with the requirements of [NFPA 72 and] the rules.

**Exception:** [Supervisory service] Central station monitoring is not required for:

1. Single- and multiple-station smoke alarms required by Section 907.2.10 of the Building Code.

2. Smoke detectors in Group I-3 occupancies.

3. Sprinkler systems in Group R-3 occupancies.

**907.16 Automatic telephone-dialing devices.** Automatic telephone-dialing devices used to transmit an emergency alarm shall not be connected to any department telephone number unless approved by the commissioner.

**907.17 Acceptance [tests] testing.** Upon completion of the installation of a fire alarm system, including alarm notification appliances and circuits, alarm-initiating devices and circuits, supervisory-signal initiating devices and circuits, signaling line circuits, and primary and secondary power supplies, such system shall be tested at the owner's risk, by his or her representative, before a representative of the department, to confirm its proper installation and operation of the system in compliance with the requirements of the Building Code and this code.

**907.18 Record of completion.** A record of completion in accordance with NFPA 72, as modified by FC Appendix B, this code and the rules, verifying that the system has been installed in accordance with the approved design and installation documents and specifications shall be provided by the installing contractor.

**907.19 Instructions.** Inspection, testing, operation and maintenance instructions, as built design and installation documents and equipment specifications shall be provided on site at an approved location.

**907.20 Inspection, testing and other maintenance.** Fire alarm and fire alarm detection systems shall be operated and maintained in accordance with this code, [Section 901] FC901, the rules and NFPA 72, as modified by FC Appendix B.

**907.20.1** Reserved.

**907.20.2 Testing.** Testing shall be performed in accordance with the schedules in NFPA 72, as modified by FC Appendix B, or more frequently where required by the commissioner. [Where automatic testing is performed at least weekly by a remotely monitored fire alarm control unit specifically listed for the application, the system may be manually tested on an annual basis.]

**Exception:** Devices or equipment that are inaccessible for safety considerations shall be tested during scheduled shutdowns where approved by the commissioner, but not less than every 18 months.

**907.20.3 Detector sensitivity.** Detector sensitivity shall be checked in compliance with the manufacturer's instructions and NFPA 72, as modified by FC Appendix B, and the rules. Detectors which are connected to a fire alarm system that automatically transmit signals to

the department or to a central station shall, as applicable, also be checked in compliance with the rules.

**907.20.4 Method.** To [ensure] verify that each smoke detector is within its listed and marked sensitivity range, it shall be tested using [either a] one of the following methods or types of equipment, and detectors found to have a sensitivity outside the listed and marked sensitivity range shall be cleaned and recalibrated or replaced:

1. A calibrated test method[,];

2. [the] The manufacturer's calibrated sensitivity test instrument[,];

3. [listed] Listed control equipment arranged for the purpose[,];

4. [a] A smoke detector/control unit arrangement whereby the detector causes a signal at the control unit where its sensitivity is outside its acceptable sensitivity range; or

5. [other] Another calibrated sensitivity test method acceptable to the commissioner.

[Detectors found to have a sensitivity outside the listed and marked sensitivity range shall be cleaned and recalibrated or replaced.]

**Exceptions:**

1. Detectors listed as field adjustable shall be [permitted] allowed to be either adjusted within the listed and marked sensitivity range and cleaned and recalibrated or they shall be replaced.

2. This requirement shall not apply to single-station smoke alarms.

**907.20.4.1 Testing device.** [Detector] Smoke detector sensitivity shall not be tested or measured using a device that administers an unmeasured concentration of smoke or other aerosol into the detector.

**907.20.5 Maintenance.** The owner shall [be responsible for ensuring that the] maintain fire and life safety systems [are maintained] in good working order at all times. Service personnel shall possess the qualifications set forth in NFPA 72, as modified by FC Appendix B, and the rules, for inspecting, testing, servicing and otherwise maintaining such systems. [A written record shall be maintained and shall be made available to the commissioner.] When required by the rules, a smoke detector maintenance log book and an alarm log book shall be maintained.

**907.20.6 Smoke detector maintenance**. The owner of any premises, or part thereof, monitored by a fire alarm system or sub-system thereof, whether required or not required by this code, which automatically [transmit] transmits signals to the department or to a central station, shall be responsible for preventing unnecessary and unwarranted alarms as set forth in rules. Cleaning and testing of smoke detectors shall be performed [and records maintained

of smoke detectors installed in a defined fire alarm system] as set forth in [required by] the rules.

## SECTION FC 908
## EMERGENCY ALARM SYSTEMS

**908.1 Group H occupancies.** Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided as required in FC Chapter 27.

**908.2 Group H-5 occupancy.** Emergency alarms for notification of an emergency condition in an HPM facility shall be provided as required in [Section 1803.12] FC1803.12. A continuous gas detection system shall be provided for HPM gases in accordance with [Section 1803.13] FC1803.13.

**908.3 Highly toxic and toxic materials.** Where required by [Section 3704.2.2.10] FC3704.2.2.10, a gas detection system shall be provided for indoor storage and use of highly toxic and toxic compressed gases.

**908.4 Ozone gas-generator rooms.** A gas detection system shall be provided in ozone gas-generator rooms in accordance with [Section 3705.3.2] FC3705.3.2.

**908.5 Repair garages.** A flammable-gas detection system shall be provided in repair garages for vehicles fueled by non-odorized gases in accordance with [Section 2211.7.2] FC2211.7.2.

**908.6 Refrigerating systems.** Refrigerating system machinery rooms shall be provided with a refrigerant detector in accordance with [Section 606.8] FC606.8 and the Mechanical Code.

**908.7 Carbon monoxide.** Carbon monoxide alarms and carbon monoxide detectors shall be installed where required by the construction codes, including the Building Code and, where applicable, the requirements of the New York City Department of Housing Preservation and Development.

**908.8 Medical gas systems.** Medical gas systems shall comply with the requirements of [Section 3006.4] FC3006.4 and the construction codes, including the Building Code.

**908.9 Flammable gas.** Flammable gas detection systems shall be as set forth in the construction codes, including the Building Code, this code or the rules.

**908.9.1 Flammable gas distribution piping.** Areas within buildings and structures containing flammable gas distribution piping operating at levels above 15 pounds per square inch (psig)(103.4 kPa) shall be provided with an approved flammable gas detection-alarm system.

**908.10 Maintenance**. Emergency alarm and detection systems [addressed] governed by this section shall be inspected, tested, serviced and otherwise maintained in accordance with the manufacturer's specifications. Those approved for connection to a fire alarm system or which will transmit an alarm to a central station shall additionally comply with the requirements of

NFPA 72, as modified by FC Appendix B, and the rules governing the operation and maintenance of such systems.

**908.10.1 Carbon monoxide**. Carbon monoxide detectors shall be inspected, tested, serviced and otherwise maintained in compliance with the requirements of the construction codes, including the Building Code, and, where applicable, the requirements of the New York City Department of Housing Preservation and Development. Those connected to a fire alarm system or which will transmit an alarm to a central station shall additionally comply with the requirements of [Section 901.6] FC901.6, NFPA 72, as modified by FC Appendix B, NFPA 720 and the rules governing the operation and maintenance of such systems.

## SECTION FC 909
## SMOKE CONTROL SYSTEMS

**909.1 Smoke control systems.** Smoke control systems, including stairwell pressurization, shall be provided as required by the construction codes, including the Building Code, and shall be designed, installed and tested as required by such codes.

**909.1.1 Smoke control system maintenance.** Smoke control systems shall be maintained in good working order. Periodic testing, inspection and other maintenance shall be performed in accordance with the manufacturer's instructions and [Sections] FC 909.1.1.1 through 909.1.1.3.

**909.1.1.1 Schedule.** A written maintenance program, including periodic inspection and testing, shall be established and implemented immediately upon installation of the smoke control system.

**909.1.1.2 Recordkeeping.** A logbook or other approved form of recordkeeping documenting each inspection and test shall [be maintained on the premises and made available for inspection by any department representative. The written record shall] include the date of the maintenance, identification of servicing personnel, description of any operating defects or deficiencies, notifications made, [and] corrective action taken, including parts replaced, and/or other information prescribed by the department by rule.

**909.1.1.3 Testing.** Operational testing of the smoke control system shall include all components of the system, including initiating devices, fans, dampers, controls, doors and windows.[.] Dedicated smoke control systems shall be tested semiannually. Nondedicated smoke control systems shall be tested annually. All systems shall be tested under both normal power and emergency power.

**909.2 Post-fire smoke purge systems.** Post-fire smoke purge systems shall be provided as required by the construction codes, including the Building Code, and shall be designed, installed and tested as required by such codes.

**909.2.1 Post-fire smoke purge system maintenance.** Post-fire smoke purge systems shall be maintained in good working order. A record of inspections and tests shall be maintained [on the premises and made available for inspection by any department representative] in accordance with FC107.7.

## SECTION FC 910
## SMOKE AND HEAT VENTS

**910.1 General.** [Where required by the construction codes, including the Building Code, this code or the rules or otherwise installed, smoke and heat vents, mechanical smoke exhaust systems, and draft curtains shall comply with the requirements of the construction codes, including the Building Code] Smoke and heat vents or, where approved by the Commissioner of Buildings, mechanical smoke exhaust systems, and draft curtains shall be installed when required by the construction codes, including the Building Code, this code or the rules, and shall be designed and installed in accordance with the construction codes, including the Building Code.

**[910.2 Where required.** Approved smoke and heat vents shall be installed where required by the construction codes, including the Building Code, this code or the rules.

**910.3** Reserved.

**910.4 Mechanical smoke exhaust.** Where approved by the Commissioner of Buildings, engineered mechanical smoke exhaust shall be an acceptable alternative to smoke and heat vents. Mechanical smoke exhaust shall comply with the requirements of the construction codes, including the Building Code.]

**[910.5] 910.2 Maintenance.** Automatically and manually operated heat vents and engineered mechanical smoke exhaust systems shall be inspected periodically and an operational test of each shall be conducted at least once every 12 months. A record of each inspection and test shall be maintained as required by [Section 901.6] FC 107.7 and 901.6.2.

**Exception:** Gravity operated drop out vents need only be inspected.

## SECTION FC 911
## EXPLOSION CONTROL

**911.1 General.** Explosion control shall be provided in the following locations:

1. Where a structure, room or space is occupied for purposes involving explosion hazards as set forth in FC Table 911.1.

2. Where quantities of hazardous materials specified in FC Table 911.1 exceed the maximum allowable quantities set forth in FC Table 2703.1.1(1).

Such areas shall be provided with explosion (deflagration) venting, explosion (deflagration) prevention systems, or barricades in accordance with this section and NFPA 69 or NFPA 495, as applicable. Deflagration venting shall not be utilized as a means to protect buildings from detonation hazards.

**FC TABLE 911.1**
**EXPLOSION CONTROL REQUIREMENTS**

| MATERIAL | CLASS | EXPLOSION CONTROL METHODS | |
|---|---|---|---|
| | | Barricade construction | Explosion (deflagration) venting or explosion (deflagration) prevention systems |
| **Hazard Category** | | | |
| Combustible dusts[a] | — | Not required | Required |
| Cryogenic fluids | Flammable | Not required | Required |
| Explosives | Division 1.1 | Required | Not required |
| | Division 1.2 | Required | Not required |
| | Division 1.3 | Not required | Required |
| | Division 1.4 | Not required | Required |
| | Division 1.5 | Required | Not required |
| | Division 1.6 | Required | Not required |
| Flammable gas | Gaseous | Not required | Required |
| | Liquefied | Not required | Required |
| Flammable liquids | IA[b] | Not required | Required |
| | IB[c] | Not required | Required |
| Organic peroxides[e] | Unclassified Detonable | Required | Not permitted |
| | I | Required | Not permitted |
| Oxidizer liquids and solids | 4 | Required | Not permitted |
| Pyrophoric material[e] | Detonable | Required | Not permitted |
| Pyrophoric gases[e] | Nondetonable | Not required | Required |
| Unstable (reactive)[e] | 4 | Required | Not permitted |
| | 3 detonable | Required | Not permitted |
| | 3 nondetonable | Not required | Required |
| Water-reactive liquids and solids[e] | 3 detonable | Required | Not permitted |
| | 3 nondetonable | Not required | Required |
| | 2 detonable | Required | Not permitted |
| | 2 nondetonable | Not required | Required |
| **Special Uses** | | | |
| Grain processing | — | Not required | Required |
| Where explosion hazards exist[d] | Detonation | Required | Not permitted |
| | Deflagration | Not required | Required |

a. Combustible dusts that are generated during manufacturing or processing. See definition of Combustible Dust in FC Chapter 2.
b. Storage or use.
c. In open use or dispensing.
d. Rooms containing dispensing and use of hazardous materials when an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.
e. Unclassified detonable organic peroxides (see FC Chapter 39), detonable pyrophoric materials (see FC Chapter 41), detonable unstable (reactive) materials (see FC Chapter 43) and detonable water-reactive materials (see FC Chapter 44) are considered as explosives for purposes of storage.

**911.2 Required deflagration venting.** Areas that are required to be provided with deflagration venting shall comply with the following requirements:

1. Walls, ceilings and roofs exposing surrounding areas shall be designed to resist a minimum internal pressure of 100 pounds per square foot (psf) (4788 Pa). The minimum internal design pressure shall not be less than five times the maximum internal relief pressure specified in [Section 911.2(5)] FC911.2(5).

2. Deflagration venting shall be provided only in exterior walls and roofs.

**Exception:** Where sufficient exterior wall and roof venting cannot be provided because of inadequate exterior wall or roof area, deflagration venting shall be allowed by specially designed shafts vented to the exterior of the building.

3. Deflagration venting shall be designed to prevent unacceptable structural damage. Where relieving a deflagration, vent closures shall not produce projectiles of sufficient velocity and mass to cause life threatening injuries to the occupants or other persons on the property or adjacent public streets.

4. The aggregate clear area of vents and venting devices shall be governed by the pressure resistance of the construction assemblies specified in [Section 911.2(1)] FC911.2(1) and the maximum internal pressure allowed by [Section 911.2(5)] FC911.2(5).

5. Vents shall be designed to withstand loads in accordance with the construction codes, including the Building Code. Vents shall consist of any one or any combination of the following to relieve at a maximum internal pressure of 20 pounds per square foot (958 Pa), but not less than the loads required by the construction codes, including the Building Code:

   5.1. Exterior walls designed to release outward.

   5.2. Hatch covers.

   5.3. Outward swinging doors.

   5.4. Roofs designed to uplift.

   5.5. Venting devices listed for the purpose.

6. Vents designed to release from the exterior walls or roofs of the building when venting a deflagration shall discharge directly outdoors where an unoccupied space not less than 50 feet (15 240 mm) in width is provided between the exterior walls of the building and the property line.

   **Exception:** Vents complying with the requirements of [Section 911.2(7)] FC911.2(7).

7. Vents designed to remain attached to the building when venting a deflagration shall be so located that the discharge opening shall not be less than 10 feet (3048 mm) vertically from window openings and exits in the building and 20 feet (6096 mm) horizontally from exits in the building, from window openings and exits in adjacent buildings on the same property, and from the property line.

8. Vent lines shall discharge outdoors.

**911.3 Explosion prevention systems.** Explosion prevention systems shall be of an approved type and installed in accordance with this code and NFPA 69. Where the building or structure or part thereof is provided with a fire alarm system, explosion prevention system alarms shall be transmitted to the fire alarm system control panel and to an approved central station.

**911.4 Barricades.** Barricades shall be designed and installed in accordance with NFPA 495.

## SECTION FC 912
## FIRE DEPARTMENT CONNECTIONS

**912.1 Installation.** Fire department connections shall be installed in accordance with the construction codes, including the Building Code.

**912.2 Location.** The location of fire department connections shall be [approved] in accordance with the Building Code.

**912.2.1 Visible location.** Fire department connections shall be located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department [vehicle] apparatus access, or as otherwise approved by the commissioner.

**912.2.2 Distance from hydrant.** Fire department connections shall be located at a distance from the nearest fire hydrant as required by the Building Code.

**912.3 Access.** Immediate access to fire department connections shall be maintained at all times, [and] without obstruction by fences, posts, bushes, trees, rubbish containers, vehicles, walls or [any] other objects. [object for a minimum of 3 feet (914 mm).]

**Exception:** Access to fire department connections may be obstructed by a fence, provided that such fence has an approved access gate complying with the design, installation, operation and maintenance requirements of FC912, including signage complying with FC912.4, and a means of emergency operation.

**912.3.1 Locking fire department connection caps.** The commissioner may require locking caps on fire department connections for sprinkler and standpipe systems.

**912.3.2 Clear space around connections.** A working space of not less than 36 inches (914 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided and maintained in front of and around wall-mounted and free-standing fire department connections, except as otherwise required or approved.

**912.3.3 Physical protection.** Where fire department connections are subject to impact by a motor vehicle whose normal operation brings it into proximity with such connections, such as when fire department connections are located curbside or adjacent to loading or parking areas, vehicle impact protection shall be provided in accordance with FC312.

**912.4 Marking.** Wall hydrants and fire pump test headers located on the exterior of buildings shall be conspicuously marked to indicate their function. Fire department connections shall be marked as follows:

1. Fire department connections serving a standpipe system shall be provided with caps painted red, and shall have the word "STANDPIPE" in letters 1 inch ([25.4] 25 mm) high and 1/8 inch (3.2 mm) deep cast in the body or on a non-ferrous metal plate secured to the connections or mounted on the wall in a visible location, except that caps of fire

department connections used for combination standpipe and sprinkler systems shall be painted yellow and the words shall read: "COMBINATION STANDPIPE AND SPRINKLER SYSTEMS."

2. Fire department connections serving a sprinkler system protecting an entire building or structure shall be provided with caps painted green and shall have the word "SPRINKLER" in letters 1 inch ([25.4] 25 mm) high and 1/8 inch (3.2 mm) deep cast in the body or on a non-ferrous metal plate secured to the connections or mounted on the wall in a visible location, except that caps of fire department connections used for combination standpipe and sprinkler systems shall be painted yellow and the words shall read: "COMBINATION STANDPIPE AND SPRINKLER SYSTEMS."

3. Fire department connections serving a non-automatic sprinkler system shall have the entire connection painted silver.

4. Fire department connections serving a sprinkler system protecting only a portion of a building or structure shall have durable metal signs securely fastened to, or above, the connection indicating the portion of the building or structure protected.

**912.5 Backflow protection.** The potable water supply to all sprinkler systems and standpipe systems shall be protected against backflow as required by the construction codes, including the Plumbing Code, and the requirements of the [New York City] Department of Environmental Protection.

**912.6 Maintenance.** Sprinkler system and standpipe system fire department connections shall be periodically inspected, tested, serviced and otherwise maintained in accordance with [Section 901.6] FC901.6 and NFPA 25. Upon order of the commissioner, but at least once every 5 years, such fire department connections shall be subjected to a hydrostatic pressure test to demonstrate their suitability for department use. The test shall be conducted in accordance with the rules and at the owner's risk, by his or her representative before a representative of the department.

## SECTION FC 913
## FIRE PUMPS

**913.1 General.** Where provided, fire pumps shall be installed in accordance with this section, the construction codes, including the Building Code, and NFPA 20.

**913.2 Protection against interruption of service.** The fire pump, driver, and controller shall be protected in accordance with NFPA 20 against possible interruption of service through damage caused by explosion, fire, flood, earthquake, rodents, insects, windstorm, freezing, vandalism and other adverse conditions.

**913.3 Temperature of pump room.** Suitable means shall be provided for maintaining the temperature of a pump room or pump house, where required, above 40°F (5°C).

**913.3.1 Engine manufacturer's recommendation.** Temperature of the pump room, pump house or area where engines are installed shall never be less than the minimum recommended

by the engine manufacturer. The engine manufacturer's recommendations for oil heaters shall be followed.

**913.4 Valve supervision.** Where provided, the fire pump suction, discharge and bypass valves, and the isolation valves on the backflow prevention device or assembly shall be supervised open by a fire alarm system and monitored by an approved central station.

**913.4.1 Test outlet valve supervision.** Fire pump test outlet valves shall be supervised in the closed position.

**913.5 Operation and maintenance.** Fire pumps shall be operated and maintained in compliance with the requirements of this section, [Section 901.6] FC901.6 and NFPA 25, including all required inspection, testing and servicing.

**913.5.1 Acceptance test.** Acceptance testing shall be done in accordance with [Section 901.5] FC901.5 and NFPA 20. Acceptance tests shall be conducted at the owner's risk by his or her representative before a representative of the department.

**913.5.2 Generator sets.** Engine generator sets supplying emergency power to fire pump assemblies shall be periodically tested in accordance with [Section 604] FC604 and the Electrical Code.

**913.5.3 Transfer switches.** Automatic transfer switches shall be periodically tested in accordance with [Section 604] FC604 and the Electrical Code.

**913.5.4 Pump room environmental conditions.** Tests of pump room environmental conditions, including heating, ventilation and illumination shall be made to ensure proper manual or automatic operation of the associated equipment.

**913.6 Fire pump supervision**. The following fire pump operations shall be electrically supervised by the fire alarm system in accordance with the Electrical Code and NFPA 20; and monitored by a central station in accordance with this code and the rules:

1. Pump running.

2. Pump power failed.

3. Pump phase reversal.

## SECTION FC 914
## YARD HYDRANT SYSTEMS

**914.1 General.** Yard hydrant systems shall be installed where required by the construction codes, including the Building Code, this code, including [Section 508.2.3] FC508.2.3, or the rules.

**914.2 Operation and maintenance.** Yard hydrant systems shall be operated and maintained in accordance with [Section 901.6] FC901.6 and NFPA 25.

**914.3 Supervision**. At all times when the area served by the yard hydrant system is in use, the system shall be under the personal supervision of a certificate of fitness holder, who shall be available to assist the department in the operation of such system.

## CHAPTER 10
## MEANS OF EGRESS

### SECTION FC 1001
### GENERAL

**1001.1 Scope.** This chapter shall govern the maintenance of means of egress from all buildings, structures and premises in all occupancy classifications.

**1001.2 General.** Buildings, structures and premises, or parts thereof, shall be provided with a means of egress system as required by the construction codes, including the Building Code. The maintenance of means of egress from all buildings, structures and premises and all occupancies shall be in accordance with this chapter.

### SECTION FC 1002
### DEFINITIONS

**1002. 1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**EMERGENCY ESCAPE AND RESCUE OPENING.** An operable window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

**EXIT.** That portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives as required to provide a protected path of egress travel between the exit access and the exit discharge. Exits include vertical exits, exterior exit doors at [ground] <u>the</u> level <u>of exit discharge</u>, <u>vertical</u> exit enclosures, exit passageways, exterior exit stairs, exterior exit ramps and horizontal exits, but do not include access [stairs] <u>stairways</u>, aisles, exit access doors opening to corridors or corridors. This term shall include the locations on a premises at which egress may be had from an enclosed outdoor space.

**EXIT ACCESS.** That portion of a means of egress system that leads from any occupied portion of a building, structure or premises to an exit.

**EXIT DISCHARGE.** That portion of a means of egress system between the termination of an exit and a public way.

<u>**EXIT DISCHARGE, LEVEL OF.** The story at the point at which an exit terminates and an exit discharge begins.</u>

**MEANS OF EGRESS.** A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building, structure or premises to a public way. A means of egress consists of three separate and distinct parts: the exit access, the exit and the exit discharge.

## SECTIONS FC 1003 THROUGH AND INCLUDING SECTION FC 1024 RESERVED

## SECTION FC 1025 EMERGENCY ESCAPE AND RESCUE

**1025.1 General.** Emergency escape and rescue openings as required by the Building Code shall be provided in Group R occupancies.

**1025.2** Reserved.

**1025.3** Reserved.

**1025.4 Operational constraints.** Emergency escape and rescue openings and windows or other openings onto fire escapes, as that term is defined in the New York State Multiple Dwelling Law, shall be operational from the inside of the room without the use of keys or tools. Bars, grilles, grates or similar devices are [permitted] allowed to be placed over emergency escape and rescue openings and windows or other openings onto fire escapes, provided the minimum net clear opening size complies with the requirements of the construction codes, including the Building Code and the New York State Multiple Dwelling Law, and such devices are releasable or removable from [the] inside of the room without the use of a key, tool or force greater than that which is required for normal operation of the escape and rescue opening, window or other opening.

**1025.5 Certificate of approval.** Bars, grilles, grates or similar devices placed over emergency escape and rescue openings, and windows or other openings onto fire escapes, shall be of a type for which a certificate of approval has been issued in accordance with this code and the rules.

## SECTION FC 1026 RESERVED

## SECTION FC 1027 MAINTENANCE OF THE MEANS OF EGRESS

**1027.1 General.** The means of egress for buildings, structures or premises, or parts thereof, shall be maintained in accordance with the construction codes, including the Building Code and this section.

**1027.2 Prohibition.** It shall be unlawful to obstruct or impede access to any required means of egress, including any exit, exit access or exit discharge.

**1027.3 Unobstructed and unimpeded egress required.** All required means of egress, including each exit, exit access and exit discharge, shall be continuously maintained free from obstructions and impediments to immediate use in the event of fire or other emergency.

**1027.3.1 Door hardware.** Door hardware and other devices and physical components of the means of egress shall be maintained in good working order at all times.

**1027.3.2 Security devices.** [It shall be unlawful for a security device to emit any substance that could obscure a means of egress in any building, structure or premises.] Security devices affecting means of egress shall be subject to the approval of the Commissioner of Buildings in consultation with the commissioner.

**1027.3.3 Snow and ice.** All required means of egress shall be maintained free from the accumulation of snow and ice.

**1027.3.4 Overcrowding.** Premises shall not be caused, allowed or maintained in such a manner as to become overcrowded, such that the number of persons present on the premises and/or their location thereon obstructs or impedes access to any means of egress.

**[1027.4] 1027.3.5 Furnishings and decorations.** Furnishings, decorations or other objects shall not be placed so as to obstruct exits, access thereto, egress therefrom, or visibility thereof. Furnishings and decorations shall not be placed in building hallway corridors or elevator lobbies except as authorized by FC1027.4 or other provision of this code. Hangings and draperies shall not be placed over exit doors or otherwise be located to conceal or obstruct an exit except as authorized by the commissioner. Mirrors shall not be placed on exit doors. Mirrors shall not be placed in or adjacent to any exit in such a manner as to confuse the direction of exit.

**[1027.4.1] 1027.3.6 Corridor storage.** It shall be unlawful to store combustible materials or combustible waste in corridors except as authorized by FC1027.4 or other provision of this code or by the commissioner by rule.

**1027.3.7 Fire escapes.** Access to fire escapes shall be maintained in accordance with FC1027.6.

**1027.4 Residential building hallway corridor and elevator lobby furnishings, decorations and storage.** This section governs the placement of furnishings and decorations, and storage of combustible materials in building hallway corridors (excluding hallways within dwelling units) and in elevator lobbies above the street level, in Group R-2 buildings and occupancies. The department may by rule prohibit any type of building hallway corridor or elevator lobby furnishing, decoration or storage allowed by this section, or by order direct removal from a particular premises of any such furnishing, decoration or stored item, upon a determination that the size, materials or location of such furnishing, decoration or stored item presents an undue fire hazard.

**1027.4.1 Incidental furnishings.** A building hallway corridor or elevator lobby may be furnished with a console table, console bench, mirror, and umbrella stand, provided that the minimum required egress width is maintained. All such furnishings must be incidental to

hallway use in that the purpose of such furnishings is primarily decorative and/or for the convenience of persons passing through the hallways. Incidental furnishings shall not include furniture used to hold or store clothing or other combustible items, or storage in the hallway of furniture, such as beds and dining room tables, whose primary purpose is not decorative or for the temporary accommodation of passersby.

**1027.4.2 Draperies, area rugs and decorative greens.** Draperies, area rugs and decorative greens shall be installed and maintained in building hallway corridors in compliance with the requirements of FC Chapter 8, including the requirement that they be inherently noncombustible or flameproofed by an approved method, and the prohibition against the display in building hallway corridors of Christmas trees and other conifers, and wreathes made of conifers.

**1027.4.3 Artwork.** The walls of building hallway corridors may be decorated with combustible artwork, including artworks made of paper, canvas, wood or fabric, when in compliance with the requirements of FC805.1.

**1027.4.4 Carpeting.** Carpeting and other interior finishes shall comply with the requirements of Chapter 8 of the Building Code.

**1027.4.5 Personal property.** Bicycles, baby strollers, clothing and other items of personal property, excluding those set forth in FC 1027.4.1 through 1027.4.4, shall not be stored in building hallway corridors, except as may be authorized or allowed by the department.

**1027.4.6 Rubbish.** Household rubbish, including trash cans, shall not be stored in building hallway corridors. All such items shall be stored in compactor rooms or other lawful storage areas.

**[1027.5 Existing window gates and other restrictions.** Bars, grilles, grates or similar devices installed on windows and other openings onto fire escapes prior to the effective date of this code shall be in accordance with the applicable laws, rules and regulations in effect at the time of installation, and Section 1025.4.]

**[1027.6 Maintenance of window gates and other restrictions.** Bars, grilles, grates or similar devices placed over emergency escape and rescue openings, and windows or other openings onto fire escapes shall be maintained in good working order.]

**1027.5 Educational and day care building hallway corridor and elevator lobby decorations and storage.** Artwork and other decorations shall be displayed and maintained in the corridors and lobbies of Group E and I-4 occupancies in accordance with FC Chapter 8. Clothing and personal effects shall not be stored in corridors and lobbies of such occupancies, unless stored in metal lockers or in corridors protected throughout by a sprinkler system and the minimum required egress width is maintained.

**1027.6 Fire escapes.** Fire escapes, and access thereto, shall be maintained in a safe and operational condition, and continuously maintained free from obstructions and impediments to immediate use in the event of fire or other emergency.

**1027.6.1 Maintenance.** All fire escape components shall be painted or otherwise protected from deterioration and all moving parts shall be maintained in good working order.

**1027.6.2 Window gates.** Bars, grilles, grates or similar devices placed over windows or other openings onto fire escapes shall be maintained in good working order.

**1027.6.3 Air conditioners**. An air conditioner shall not be installed in a window providing access to a fire escape unless such fire escape may be accessed from another window in the same room that is unobstructed and of the size required for such purpose by the Building Code, New York State Multiple Dwelling Law, or other applicable law, rule or regulation. Air conditioners installed in windows adjoining fire escapes shall not obstruct the path of egress on the fire escape.

**1027.6.4 Fire escape ladders.** The operation of a fire escape ladder, including a drop ladder that is lowered vertically to the ground, or a counterbalanced stair ladder which swings to the ground, shall not be obstructed by awnings, stationary furniture, portable fueled space heaters, parked cars, or other obstructions. Where construction work is being performed at a location adjoining a fire escape, provision shall be made for safe egress from the fire escape ladder.

**1027.7 Nonexit door identification.** Any door that is not an exit or otherwise part of the means of egress from a building, structure or premises, but which, by reason of its proximity or similar construction, can be confused with an exit door or other door that is part of the means of egress, shall be identified with an approved sign that reads "Not An Exit" and identifies the room into which the nonexit door provides access.

# CHAPTER 11
# AVIATION FACILITIES AND OPERATIONS

## SECTION FC 1101
## GENERAL

**1101.1 Scope.** This chapter shall govern the design, installation, operation and maintenance of aviation facilities, including aircraft landing sites, airports, heliports, helistops, helicopter landings, seaplane bases and helicopter lift operations.

**1101.2 Regulations not covered.** Except as otherwise provided in this chapter or any other federal, state or local law, rule or regulation, aviation facilities and related operations shall be operated or conducted in accordance with nationally recognized standards.

**1101.3 General.** Aircraft landing sites, airports, heliports, helistops and seaplane bases shall be designed, installed, operated and maintained in accordance with this chapter. Aviation operations, including helicopter landings, helicopter lift operations and hot air balloon operations, shall be conducted in accordance with this chapter.

**1101.4 Permits.** Permits shall be obtained for aircraft fueling vehicles, [seaplane base operations,] helicopter landing operations, helicopter lift operations and hot air balloon operations, as set forth in [Section 105.6] FC105.6.

## SECTION FC 1102
## DEFINITIONS

**1102.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**AIRCRAFT LANDING SITE.** An area of land or water or a structural surface that is designed or used for the landing or takeoff of aircraft, other than helicopters, and any appurtenant areas, but which is not designed or used for fueling, defueling, maintenance, repairs or storage of such aircraft.

**AIRCRAFT OPERATION AREA.** Any area used or intended for use for the parking, taxiing, takeoff, landing or other aviation-related operations.

**AIRPORT.** An area of land or structural surface that is designed or used for the landing and takeoff of aircraft with an overall length greater than 39 feet (11 887 mm) and an overall exterior fuselage width greater than 6.6 feet (2012 mm), and any appurtenant areas that are designed or used for aviation facilities and operations.

**AVIATION FACILITY.** Any premises upon which an aircraft landing site, airport, heliport, helistop, seaplane base or other aviation-related operation is located or conducted.

**DISCHARGE AREA.** Any portion of a premises or other location to which an external load is to be delivered by helicopter.

**EXTERNAL LOAD**. Cargo transported by, but not within, the helicopter.

**HELICOPTER LIFT OPERATION**. The movement of an external load with the use of a helicopter.

**HELIPORT.** An area of land or water or a structural surface that is designed or used for the landing and takeoff of helicopters, and any appurtenant areas which are designed or used for heliport facilities and operations.

**HELISTOP.** An area of land or water or a structural surface that is designed or used for the landing or takeoff of helicopters, but which is not designed or used for fueling, defueling, maintenance, repairs or storage of helicopters, including any staging or other appurtenant areas.

**HOT AIR BALLOON OPERATION**. The filling of balloons with hot air for purposes of display or flight.

**HYDRANT-FUELING VEHICLE.** A type of aircraft fueling vehicle that is equipped to transfer fuel between a fuel hydrant and an aircraft.

**SEAPLANE BASE.** An area of water that is used for the landing or takeoff of airplanes, and any appurtenant areas of land or water designed or used for fueling, defueling, maintenance, repair or storage of seaplanes.

**STAGING AREA.** Any portion of a premises or other location from where an external load is to be lifted by helicopter.

## SECTION FC 1103
## GENERAL PRECAUTIONS

**1103.1 Sources of ignition.** It shall be unlawful to use or maintain an open flame, flame-producing device or other source of ignition in an aircraft hangar or other location within 50 feet (15 240 mm) of an aircraft-fueling or defueling operation.

**1103.2 Smoking.** It shall be unlawful to smoke in an aircraft hangar or other location used for aircraft fueling or defueling, cleaning, paint removal or painting operations. "No Smoking" signs shall be provided in accordance with [Section 310] FC310.

**1103.3 Maintenance.** The aircraft operation area and related areas shall be kept free from combustible waste at all times.

**1103.4 Fire apparatus access roads.** Fire apparatus access roads shall be provided and maintained in accordance with FC Chapter 5 and the construction codes, including the Building Code. Fire apparatus access roads and aircraft parking positions shall be designed in a manner so as to preclude the possibility of fire vehicles traveling under any portion of a parked aircraft.

**1103.5 Dispensing of flammable and combustible liquids.** Flammable and combustible liquids shall be dispensed and otherwise stored, handled and used in accordance with this chapter and FC Chapter 34. Automotive liquid motor fuel-dispensing facilities shall be designed, installed, operated and maintained in accordance with FC Chapter 22.

**1103.6 Combustible material storage.** Combustible materials stored in aircraft hangars shall be stored in approved locations and containers.

**1103.7 Hazardous material storage.** Hazardous materials shall be stored in accordance with FC Chapter 27.

## SECTION FC 1104
## AIRCRAFT MAINTENANCE

**1104.1 Transferring flammable and combustible liquids.** Flammable and combustible liquids shall not be dispensed into or removed from a container, tank, vehicle or aircraft, except in approved locations.

**1104.2 Application of flammable and combustible liquid finishes.** The application of flammable or Class II combustible liquid finishes shall be conducted in an approved location, using methods and procedures in accordance with FC Chapter 15.

**1104.3 Cleaning parts.** Class IA flammable liquids shall not be used to clean aircraft, aircraft parts or aircraft engines. Cleaning with other flammable and combustible liquids shall be in accordance with [Section 3405.3.6] FC3405.3.6.

**1104.4 Spills.** The following actions shall be taken in response to spills of flammable and combustible liquids and other hazardous materials, in addition to the procedures set forth in [Section 1106.11] FC1106.11.

**1104.4.1 Cessation of work.** Activities in the affected area not related to the mitigation of the spill shall cease until the spilled material has been removed or the hazard has been mitigated.

**1104.4.2 Vehicle movement.** Aircraft or other vehicles shall not be moved through the spill area until the spilled material has been removed or the hazard has been mitigated.

**1104.4.3 Mitigation.** Spills shall be reported, documented and mitigated in accordance with this chapter and [Section 2703.3] FC2703.3, and any other applicable law, rule or regulation.

**1104.5 Running engines.** Aircraft engines shall not be operated in aircraft hangars, except in approved engine test areas.

**1104.6 Open flame.** Repair of aircraft requiring the use of open flames, spark-producing devices or the heating of parts above 500°F (260°C) shall only be performed outdoors or in an area complying with the requirements of the construction codes, including the requirements of the Building Code for a Group F-1 occupancy.

## SECTION FC 1105
## PORTABLE FIRE EXTINGUISHERS

**1105.1 General.** Portable fire extinguishers suitable for flammable or combustible liquid and electrical-type fires shall be provided as set forth in [Sections] FC 1105.2 through 1105.7, and [Section] 906. Portable fire extinguishers required by this section shall be inspected and maintained in accordance with [Section 906] FC906.

**1105.2 [On towing] Towing vehicles.** Vehicles used for towing aircraft shall be equipped with a minimum of one listed portable fire extinguisher complying with the requirements of [Section 906] FC906 and having a minimum rating of 20-B:C.

**1105.3 [On welding] Welding apparatus.** Welding apparatus shall be equipped with a minimum of one listed portable fire extinguisher complying with the requirements of [Section 906] FC906 and having a minimum rating of 2-A:20-B:C.

**1105.4 [On aircraft-fueling] Aircraft-fueling vehicles.** Aircraft-fueling vehicles shall be equipped with a minimum of two listed portable fire extinguishers complying with the requirements of [Section 906] FC906, each having a minimum rating of 20-B:C. A portable fire extinguisher shall be readily accessible from either side of the vehicle.

**1105.5 [On hydrant-fueling] Hydrant-fueling vehicles.** Hydrant-fueling vehicles shall be equipped with a minimum of one listed portable fire extinguisher complying with the requirements of [Section 906] FC906, and having a minimum rating of 20-B:C.

**1105.6 [At fuel-dispensing] Fuel-dispensing stations.** Portable fire extinguishers shall be provided as follows:

1. Where the open-hose discharge capacity of the fueling system is not more than 200 gallons per minute (13 L/s), a minimum of two listed portable fire extinguishers complying with the requirements of [Section 906] FC906 and having a minimum rating of 20-B:C shall be provided.

2. Where the open-hose discharge capacity of the fueling system is more than 200 gallons per minute (13 L/s) but not more than 350 gallons per minute (22 L/s), a minimum of one listed wheeled portable fire extinguisher complying with the requirements of [Section 906] FC906 and having a minimum [extinguishing] rating of 80-B:C, and a minimum agent capacity of 125 pounds (57 kg), shall be provided.

3. Where the open-hose discharge capacity of the fueling system is more than 350 gallons per minute (22 L/s), a minimum of two listed wheeled portable fire extinguishers complying with the requirements of [Section 906] FC906 and having a minimum rating of 80-B:C each, and a minimum agent capacity of 125 pounds (57 kg) of each, shall be provided.

**1105.6.1 Location of portable fire extinguishers.** Portable fire extinguishers at aircraft fuel-dispensing stations shall be located such that pumps or dispensers are not more than 75 feet (22 860 mm) from one such extinguisher.

**1105.7 Fire extinguisher access.** Portable fire extinguishers required by this chapter shall be accessible at all times. Where necessary, provisions shall be made to clear accumulations of snow, ice and other forms of weather-related obstructions.

**1105.7.1 Cabinets.** Cabinets and enclosed compartments used to house portable fire extinguishers shall be clearly marked with the words "FIRE EXTINGUISHER" in letters at least 2 inches (51 mm) high. Cabinets and compartments shall be readily accessible at all times.

## SECTION FC 1106
## AIRCRAFT AND MOTOR VEHICLE FUELING

**1106.1 Motor vehicle fuel-dispensing facilities.** Motor vehicle fuel-dispensing facilities at aviation facilities shall be designed, installed, operated and maintained in accordance with FC Chapter 22.

**1106.2 Aircraft-fueling systems.** Aircraft-fueling systems shall be designed and constructed in accordance with NFPA 407.

**Exception[**:]**:** Aircraft fueling systems may be designed and constructed as a full service automotive liquid motor vehicle fuel-dispensing facility in accordance with FC Chapter 22, subject to such conditions as the commissioner may require.

**1106.3 Design of aircraft-fueling vehicles.** Aircraft-fueling vehicles shall be designed in accordance with [Section 1106] FC1106 and NFPA 407.

**1106.3.1 Transfer apparatus.** Aircraft-fueling vehicles shall be equipped and maintained with an approved transfer apparatus.

**1106.3.1.1 Internal combustion type.** Where such transfer apparatus is operated by an individual unit of the internal-combustion-motor type, such power unit shall be located as remotely as practicable from pumps, piping, meters, air eliminators, water separators, hose reels, and similar equipment, and shall be housed in a separate compartment from any of the aforementioned items. The fuel tank in connection therewith shall be suitably designed and installed, and the maximum fuel capacity shall not exceed 5 gallons (19 L) where the tank is installed on the engine. The exhaust pipe, muffler and tail pipe shall be shielded.

**1106.3.1.2 Gear operated.** Where operated by gears or chains, the gears, chains, shafts, bearings, housing and all parts thereof shall be of an approved design and shall be installed and maintained in an approved manner.

**1106.3.1.3 Vibration isolation.** Flexible connections for the purpose of eliminating vibration are allowed if the material used therein is designed, installed, operated and maintained in an approved manner, provided such connections do not exceed 24 inches (610 mm) in length.

**1106.3.2 Pumps.** Pumps of a positive-displacement type shall be provided with a bypass relief valve set at a pressure of not more than 35 percent in excess of the normal working pressure of such unit. Such units shall be equipped and maintained with a pressure gauge on the discharge side of the pump.

**1106.3.3 Dispensing hoses and nozzles.** Hoses shall be designed for the transferring of hydrocarbon liquids and shall not be any longer than necessary to provide efficient fuel transfer operations. Hoses shall be equipped with an approved shutoff nozzle. Fuel-transfer nozzles shall be self-closing and designed to be actuated by hand pressure only. Notches and other devices shall not be used for holding a nozzle valve handle in the open position. Nozzles shall be equipped with a bonding cable complete with proper attachment for aircraft to be serviced.

**1106.3.4 Protection of electrical equipment.** Electric wiring, switches, lights and other sources of ignition, when located in a compartment housing piping, pumps, air eliminators, water separators, hose reels or similar equipment, shall be enclosed in a vapor-tight housing. Electrical motors located in such a compartment shall be of a type approved for use as specified in the Electrical Code.

**1106.3.5 Venting of equipment compartments.** Compartments housing piping, pumps, air eliminators, water separators, hose reels and similar equipment shall be adequately ventilated at floor level or within the floor itself.

**1106.3.6 Accessory equipment.** Ladders, hose reels and similar accessory equipment used for aircraft-fueling operations shall be of an approved type, as follows:

1. Ladders constructed of noncombustible material are allowed to be used with or attached to aircraft-fueling vehicles, provided the manner of attachment or use of such ladders is approved and does not constitute an additional fire or accident hazard in the operation of such fueling vehicles.

2. Hose reels used in connection with fueling vehicles shall be constructed of noncombustible materials and shall be provided with a packing gland or other device which will preclude fuel leakage between reels and fuel manifolds.

**1106.3.7 Electrical bonding provisions.** Transfer apparatus shall be metallically interconnected with tanks, chassis, axles and springs of aircraft-fueling vehicles.

**1106.3.7.1 Bonding cables.** Aircraft-fueling vehicles shall be provided and maintained with a substantial heavy-duty electrical cable of sufficient length to be bonded to the aircraft to be serviced. Such cable shall be metallically connected to the transfer apparatus or chassis of the aircraft-fueling vehicle on one end and shall be provided with a suitable metal clamp on the other end, to be fixed to the aircraft.

**1106.3.7.2 Bonding cable protection.** The bonding cable shall be bare or have a transparent protective sleeve and be stored on a reel or in a compartment provided for no other purpose. It shall be carried in such a manner that it will not be subjected to sharp kinks or accidental breakage under conditions of general use.

**1106.3.8 Smoking.** [Smoking] <u>It shall be unlawful to smoke</u> in aircraft-fueling vehicles [is prohibited]. Signs to this effect shall be conspicuously posted in the driver's compartment of all fueling vehicles.

**1106.3.9 Smoking equipment.** Smoking equipment such as cigarette lighters and ash trays shall not be provided in aircraft-fueling vehicles.

**1106.4 Operation, maintenance and use of aircraft-fueling vehicles.** The operation, maintenance and use of aircraft-fueling vehicles shall be in accordance with [Sections] <u>FC</u> 1106.4.1 through 1106.4.5 and other applicable provisions of this chapter.

**1106.4.1 Proper maintenance.** Aircraft-fueling vehicles and all related equipment shall be properly maintained and kept in good repair. [Accumulations of oil] <u>Oil</u>, grease, fuel and other flammable or combustible waste [are prohibited] <u>shall not be allowed to accumulate</u>. Maintenance and servicing of such equipment shall be accomplished in approved areas.

**1106.4.2 Vehicle integrity.** Tanks, pipes, hoses, valves and other fueling equipment shall be maintained leak free at all times.

**1106.4.3 Removal from service.** Aircraft-fueling vehicles and related equipment which are in violation of [Section] FC 1106.4.1 or 1106.4.2 shall be immediately defueled, removed from service and properly repaired or disposed of.

**1106.4.4 Identification of operator.** Aircraft-fueling vehicles that are operated by a person, firm or corporation other than the permittee or the permittee's authorized employee shall be provided with a legible sign visible from outside the vehicle showing the name of the person, firm or corporation operating such unit.

**1106.4.5 Training.** Aircraft-fueling vehicles shall be attended and operated by competent personnel familiar with the safety hazards of each type of fuel used at the facility.

**1106.5 Fueling and defueling.** Aircraft-fueling and defueling operations shall be conducted in accordance with [Sections] FC 1106.5.1 through 1106.5.4.

**1106.5.1 Positioning of aircraft-fueling vehicles.** Aircraft-fueling vehicles shall not be parked or otherwise allowed to stop or stand in a position where such vehicle would obstruct egress from an aircraft, including emergency exits. Aircraft-fueling vehicles shall not be parked or otherwise [permitted] allowed to stop or stand under any portion of an aircraft.

**Exception:** Aircraft-fueling vehicles shall be allowed to be located under aircraft wings during underwing fueling of turbine-engine powered aircraft.

**1106.5.1.1 Fueling vehicle egress.** A clear path shall be maintained for aircraft-fueling vehicles to allow ready access to and egress from the fueling area.

**1106.5.1.2 Aircraft vent openings.** A clear space of at least 10 feet (3048 mm) shall be maintained between aircraft fuel-system vent openings and an aircraft-fueling vehicle.

**1106.5.1.3 Parking.** Prior to leaving the cab, the operator of an aircraft-fueling vehicle shall set the parking brake. At least two chock blocks not less than 5 inches by 5 inches by 12 inches (127 mm by 127 mm by 305 mm) in size and dished to fit the contour of the tires shall be utilized and positioned in such a manner so as to preclude movement of the vehicle in any direction.

**1106.5.2 Electrical bonding.** Aircraft-fueling vehicles shall be electrically bonded to the aircraft being fueled or defueled. Bonding connections shall be made prior to making fueling connections and shall not be disconnected until the fuel-transfer operations are completed and the fueling connections have been removed. Where a hydrant service vehicle or cart is used for fueling, the hydrant coupler shall be connected to the hydrant system prior to bonding the fueling equipment to the aircraft.

**1106.5.2.1 Conductive hose.** In addition to the bonding cable required by [Section 1106.5.2] FC1106.5.2, conductive hose shall be used for all fueling operations.

**1106.5.2.2 Bonding conductors on transfer nozzles.** Transfer nozzles shall be equipped with approved bonding conductors which shall be clipped or otherwise positively

engaged with the bonding attachment provided on the aircraft adjacent to the fuel tank cap prior to removal of the cap.

**Exception:** In the case of overwing fueling where no appropriate bonding attachment adjacent to the fuel fill port has been provided on the aircraft, the fueling operator shall touch the fuel tank cap with the nozzle spout prior to removal of the cap. The nozzle shall be kept in contact with the fill port until fueling is completed.

**1106.5.2.3 Funnels.** It shall be unlawful to use funnels in aircraft-fueling operations.

**1106.5.3 Training.** All personnel engaged in fuel storage and aircraft-fueling operations shall receive appropriate hazard and fire safety training relating to such storage and fueling operation, including training in the use of fire extinguishing equipment. The owner or operator of the aviation facilities shall maintain on the premises a record of all such training [and make such records available for inspection by any department representative] in accordance with FC107.7.

**1106.5.4 Transfer personnel.** During fuel-transfer operations, a qualified person shall be in control of each transfer nozzle and another qualified person shall be in immediate control of the fuel-pumping equipment to shut off or otherwise control the flow of fuel from the time fueling operations are begun until they are completed.

**Exceptions:**

1. For underwing refueling, the person stationed at the point of fuel intake is not required.

2. For overwing refueling, the person stationed at the fuel pumping equipment shall not be required when the person at the fuel dispensing device is within 75 feet (22 800 mm) of the emergency shutoff device, is not on the wing of the aircraft and has a clear and unencumbered path to the fuel pumping equipment; and, the fuel dispensing line does not exceed 50 feet (15 240 mm) in length.

**1106.5.4.1 Monitoring during fueling.** The fueling operator shall monitor the panel of the fueling equipment and the aircraft control panel during pressure fueling or shall monitor the fill port during overwing fueling.

**1106.6 Emergency fuel shutoff.** Emergency fuel shutoff controls and procedures shall comply with the requirements of [Sections] FC 1106.6.1 through 1106.6.4.

**1106.6.1 Accessibility.** Emergency fuel shutoff controls shall be readily accessible at all times when the fueling system is being operated.

**1106.6.2 Notification of the department.** The owner or operator of the aviation facility shall establish a procedure by which the department will be notified in the event of an emergency involving the activation of an emergency fuel shutoff control.

**1106.6.3 Determining cause.** Prior to reestablishment of normal fuel flow, the cause of emergency fuel shutoff conditions shall be determined and corrected.

**1106.6.4 Testing.** Emergency fuel shutoff devices shall be operationally tested at intervals not exceeding [three] 3 months. The fueling-system operator shall maintain suitable records of these tests. [These records shall be maintained on the premises and made available for inspection by any representative of the department.]

**1106.7 Protection of hoses.** Before an aircraft-fueling vehicle is moved, fuel transfer hoses shall be properly placed on the approved reel or in the compartment provided, or stored on the top decking of the fueling vehicle if proper height rail is provided for security and protection of such equipment. Fuel-transfer hose shall not be looped or draped over any part of the fueling vehicle, except as herein provided. Fuel-transfer hose shall not be dragged when a fueling vehicle is moved from one fueling position to another.

**1106.8 Loading and unloading of aircraft-fueling vehicles.** Aircraft-fueling vehicles shall be loaded only at an approved loading rack, except that aircraft-fueling vehicles may be loaded from the fuel tanks of an aircraft during defueling operations. Such loading racks shall be in accordance with FC Chapter 34.

**1106.8.1 Unloading of aircraft-fueling vehicles.** The fuel cargo of such vehicles shall be unloaded only by approved transfer apparatus into the fuel tanks of aircraft, approved underground storage tanks or approved aboveground storage tanks.

**1106.9 Passengers.** Passenger traffic is not allowed during the time that fuel transfer operations are in progress.

**1106.10 Sources of ignition.** It shall be unlawful to smoke, or light or maintain an open flame, within 50 feet (15 240 mm) of any location where fuel is being transferred. Electrical and motor-driven devices shall not be connected to or disconnected from an aircraft at any time fueling operations are in progress on such aircraft.

**1106.11 Fuel spill prevention and procedures.** Fuel spill prevention and the procedures for handling spills shall comply with the requirements of [Sections] FC 1106.11.1 through 1106.11.7.

**1106.11.1 Fueling equipment maintenance.** Aircraft fueling equipment shall be maintained and kept free from leaks. Fueling equipment that malfunctions or leaks shall be immediately defueled, removed from service and properly repaired or disposed of.

**1106.11.2 Transporting fuel nozzles.** Fuel nozzles shall be carried utilizing appropriate handles. Dragging fuel nozzles along the ground is prohibited.

**1106.11.3 Drum fueling.** Fueling from drums or other containers is prohibited.

**1106.11.4 Fuel spill procedures.** The owner or operator of the aviation facility shall establish comprehensive procedures to implement in the event of a fuel spill, which shall include the following actions:

1. Upon observation of a fuel spill, the aircraft-fueling operator shall immediately stop the delivery of fuel by releasing hand pressure from the fuel flow-control valve.

2. Failure of the fuel control valve to stop the continued spillage of fuel shall be cause for the activation of the appropriate emergency fuel shutoff device.

3. A supervisor shall respond to the fuel spill area immediately.

**1106.11.5 Notification of the department.** The department shall be notified of any fuel spill which is considered a hazard to people or property or which meets one or more of the following criteria:

1. Any dimension of the spill is greater than 10 feet (3048 mm).

2. The spill area is greater than 50 square feet (4.65 $m^2$).

3. The release of fuel is continuing.

**1106.11.6 Investigation required.** An investigation shall be conducted by the owner or operator of the aviation facility into the cause of all spills requiring notification of the department, the response thereto by the persons in charge of the aircraft fueling operation and other aviation facility personnel. Should it be determined that corrective measures are necessary to prevent future incidents of the same nature, such measures shall be implemented in a timely manner.

**1106.11.7 Multiple fuel delivery vehicles.** Simultaneous delivery of fuel from more than one aircraft-fueling vehicle to a single aircraft-fueling manifold is prohibited unless proper backflow prevention devices are installed to prevent fuel flow into the aircraft-fueling vehicles.

**1106.12 Aircraft engines and heaters.** Aircraft onboard engines and combustion heaters shall be shut down prior to commencing fueling operations and shall remain off until the fueling operation is completed.

**Exception:** In an emergency, a single jet engine is allowed to be operated with the onboard engine running during fueling operations where all of the following conditions are met:

1. The emergency shall have resulted from an onboard failure of the aircraft's auxiliary power unit.

2. Restoration of auxiliary power to the aircraft by ground support services is not available.

3. The engine to be operated is either at the rear of the aircraft or on the opposite side of the aircraft from the fueling operations.

4. The emergency operation is in accordance with a written procedure approved by the commissioner.

**1106.13 Vehicle and equipment restrictions.** During aircraft-fueling operations, only aircraft-fueling vehicles or other equipment actively involved in the fueling operation are allowed within 50 feet (15 240 mm) of the aircraft being fueled. Other aircraft-fueling vehicles or equipment are prohibited in this area until the fueling operation is complete.

**Exception:** Aircraft-fueling operations utilizing single-point refueling with a sealed, mechanically locked fuel line connection and the fuel is not a [Class I] flammable liquid.

**1106.13.1 Overwing fueling.** Vehicles or equipment shall not be allowed beneath the trailing edge of the wing when aircraft fueling takes place over the wing and the aircraft fuel-system vents are located on the upper surface of the wing.

**1106.14 Electrical equipment.** Electrical equipment, including but not limited to, battery chargers, ground or auxiliary power units, fans, compressors or tools, shall not be operated, nor shall they be connected or disconnected from their power source, during fueling operations.

**1106.14.1 Other equipment.** Electrical or other spark-producing equipment shall not be used within 10 feet (3048 mm) of fueling equipment, aircraft fill or vent points, or spill areas unless [that] <u>such</u> equipment is intrinsically safe and approved for use in an explosive atmosphere.

**1106.15** Reserved.

**1106.16 Lightning.** The commissioner may require the owner or operator of an aviation facility to establish criteria for the suspension and resumption of aircraft-fueling operations and other written procedures to implement in the event of lightning flashes at or near the aviation facility.

**1106.17 Fuel-transfer locations.** [Aircraft-fueling] <u>It shall be unlawful to conduct aircraft-fueling</u> operations [shall be prohibited] indoors.

**Exception:** In aircraft hangars designed in accordance with the Building Code for Group F-1 occupancies, aircraft fuel-transfer operations are allowed where:

1. [Necessary] <u>Such operation is necessary</u> to accomplish aircraft fuel-system maintenance operations. Such operations shall be performed in accordance with nationally recognized standards; or

2. The fuel being used has a flash point greater than 100°F (37.8°C).

**1106.17.1 Position of aircraft.** Aircraft being fueled shall be positioned such that any fuel system vents and other fuel tank openings are a minimum of:

1. Twenty-five feet (7620 mm) from buildings or structures other than jet bridges; and

2. Fifty feet (15 240 mm) from air intake vents for boiler, heater or incinerator rooms.

**1106.17.2 Fire equipment access.** Access for fire service equipment to aircraft shall be maintained during aircraft-fueling operations.

**1106.18 Defueling operations.** The requirements for aircraft-fueling operations contained in this section shall also apply to aircraft-defueling operations. Additional procedures shall be established by the owner or operator of the aviation facility to prevent overfilling of the cargo tank or other vehicle used in the defueling operation.

**1106.19 Maintenance of aircraft-fueling hose.** Aircraft-fueling hoses shall be maintained in accordance with [Sections] FC 1106.19.1 through 1106.19.4.

**1106.19.1 Inspections.** Hoses used to fuel or defuel aircraft shall be inspected periodically to ensure their serviceability and suitability for continued service.[ The owner or operator of the aviation facility shall maintain records of all inspections and tests performed on fueling hoses.]

**1106.19.1.1 Daily inspection.** Hoses shall be inspected daily. This inspection shall include a complete visual scan of the exterior for evidence of damage, blistering or leakage. Each coupling shall be inspected for evidence of leaks, slippage or misalignment.

**1106.19.1.2 Monthly inspection.** A more thorough inspection, including pressure testing, shall be performed on each hose on a monthly basis. This inspection shall include examination of the fuel delivery inlet screen for rubber particles, which may indicate deterioration of the hose lining.

**1106.19.2 Damaged hose.** Hose that has been damaged shall be immediately removed from service.

**1106.19.3 Repairing hose.** Hoses are allowed to be repaired by removing the damaged portion and recoupling the undamaged end. When recoupling hoses, only couplings designed and approved for the size and type of hose in question shall be used. Hoses repaired in this manner shall be visually inspected and hydrostatically tested prior to being placed back in service.

**1106.19.4 New hose.** New hose shall be visually inspected prior to being placed into service.

**1106.20 Aircraft-fueling vehicles parking.** Unattended aircraft-fueling vehicles shall be parked in areas that provide for both the unencumbered dispersal of vehicles in the event of an emergency and the control of leakage such that adjacent buildings and storm drains are not contaminated by leaking fuel.

**1106.20.1 Parking area design.** Parking areas for aircraft-fueling vehicles shall be designed and utilized such that a clearance of 10 feet (3048 mm) is maintained between each parked vehicle for department access. In addition, a minimum clearance of 50 feet (15 240 mm) shall be maintained between aircraft-fueling vehicles and parked aircraft and structures other

than those used for the maintenance of aircraft-fueling vehicles. Aircraft-fueling vehicles shall not be stored [in a building or structure] indoors.

**1106.21 Radar equipment.** Aircraft-fueling operations shall be prohibited while the weather-mapping radar of that aircraft is operating. Aircraft-fueling or other operations in which flammable liquids, vapors or mists may be present shall not be conducted within 300 feet (91 440 mm) of an operating aircraft surveillance radar. Aircraft-fueling operations shall not be conducted within 300 feet (91 440 mm) of airport flight traffic surveillance radar equipment. Aircraft-fueling or other operations in which flammable liquids, vapors or mists may be present shall not be conducted within 100 feet (30 480 mm) of airport ground traffic surveillance radar equipment.

**1106.21.1 Direction of radar beams.** The beam from ground radar equipment shall not be directed toward fuel storage or loading racks.

**Exceptions:**

1. Fuel storage and loading racks in excess of 300 feet (91 440mm) from airport flight traffic surveillance equipment.

2. Fuel storage and loading racks in excess of 100 feet (30 480 mm) from airport ground traffic surveillance equipment.

## SECTION FC 1107
## HELISTOPS AND HELIPORTS

**1107.1 General.** Helistops and heliports shall be maintained in accordance with this section. Helistops and heliports on buildings or structures shall be constructed in accordance with the construction codes, including the Building Code.

**1107.2 Clearances.** The touchdown area shall be surrounded on all sides by a clear area having minimum average width at roof level of 15 feet (4572 mm) but no width less than 5 feet (1524 mm). The clear area shall be maintained.

**1107.3 Flammable and Class II combustible liquid spillage.** Landing areas on buildings or structures shall be maintained so as to confine flammable or Class II combustible liquid spillage to the landing area itself, and provisions shall be made to drain such spillage away from exits or stairways serving the helicopter landing area or from a structure housing such exit or stairway.

**1107.4 Exits.** Exits and stairways shall be maintained in accordance with the construction codes, including the Building Code.

**1107.5 Standpipe systems.** Where a building with a rooftop helistop or heliport is equipped with a standpipe system, the system shall be extended to the roof level on which the helistop or heliport is located. All portions of the helistop and heliport area shall be within 150 feet (45 720 mm) of a standpipe system outlet connection.

**1107.6 Foam protection.** Foam fire-protection capabilities shall be provided for rooftop heliports as required by the construction codes, including the Building Code. Such systems shall be designed, installed, operated and maintained in accordance with FC Chapter 9.

**1107.6.1 Initial foam fire extinguishing system test.** Upon installation, a foam fire extinguishing system shall be tested in accordance with FC Chapter 9. The test shall be conducted at the owner's risk by his or her representative before a representative of the department.

**1107.6.2 Periodic foam fire extinguishing system test.** The foam fire extinguishing system shall be inspected, tested and maintained in accordance with FC Chapter 9. Additionally, the foam fire extinguishing system shall be tested at least once every [two] 2 years, as required in [Section 3406.4.10.7] FC3406.4.10.7.

**1107.7 Portable fire extinguishers.** A minimum of one portable fire extinguisher having a minimum 80-B:C rating shall be provided for each permanent takeoff and landing area and for the aircraft parking areas. Installation, inspection and maintenance of these portable fire extinguishers shall be in accordance with [Section 906] FC906.

**1107.8 Federal approval.** Before operating helicopters from helistops and heliports, approval shall be obtained from the Federal Aviation Administration and any other federal, state or city authority having jurisdiction.

## SECTION FC 1108
## SEAPLANE BASE OPERATIONS

**1108.1 General.** Seaplane bases shall be operated in accordance with [this section.] the requirements of FC 1101 through 1106, as applicable. Notwithstanding any provision of this code to the contrary, a waterfront liquid motor fuel dispensing facility used for the fueling of seaplanes shall be deemed to constitute a marine liquid motor fuel dispensing facility.

**[1108.2 Hours of operation.** Seaplane bases shall be operated during daylight hours only, under visual flight rules, and shall be further restricted to the hours of 8 am through 8 pm, Monday through Friday, except as authorized by the commissioner.

**1108.3 Arrival and departure notification.** Aircraft arriving at or departing from a seaplane base shall make such notifications prior to such arriving or departing as the commissioner may require.

**1108.4 Emergency procedures manual.** The permit holder shall prepare an emergency procedures manual and obtain the approval of the department and the mayor's office of emergency management for such manual prior to commencing a seaplane base operation. An approved copy of the manual shall be maintained at the seaplane base facility at an approved location.]

## SECTION FC 1109
## HELICOPTER LANDING OPERATIONS

**1109.1 General.** Helicopter landing operations, at other than an approved heliport or helistop, shall be conducted in accordance with this section.

**1109.2 Permit application.** The owner or operator of the helicopter conducting the helicopter landing operation shall make a permit application to the department at least 20 calendar days prior to the proposed landing. The permit applications shall be on such form and include such information and documentation as the commissioner may require, including the following:

1. A site map of the area in which the helicopter landing operation is proposed to be conducted.

2. Proof of a liability and casualty insurance policy in an amount to be determined by the commissioner but not less than two million dollars. Such insurance policy shall cover the permit holder and the permit holder's employees, agents and contractors for any loss, damage or injury to persons or property by reason of the conduct of the helicopter landing operation, or the failure to comply with any requirement of this chapter or the rules, or the terms and conditions of the permit.

3. A copy of the pilot's license issued by the Federal Aviation Administration.

4. A copy of the aircraft's airworthiness certificate issued by the Federal Aviation Administration.

5. An affidavit of the property owner authorizing the helicopter landing operation on their property.

**1109.3 Required clearances.** The location at which the helicopter landing operations are to be conducted is subject to the approval of the department. The commissioner may specify the open space clearances to be provided.

## SECTION FC 1110
## HELICOPTER LIFT OPERATIONS

**1110.1 General.** Helicopter lift operations shall be conducted in accordance with this section.

**1110.1.1 Department of Buildings approval.** Helicopter lift operations shall not be conducted except when the [commissioner] Commissioner of [buildings] Buildings has authorized such operation.

**1110.2 Permit application.** The owner or operator of the helicopter used to conduct the lift operation shall make application to the department for a permit at least 20 calendar days prior to the proposed lift operation. The permit application shall be on such form and include such information and documentation as the commissioner may require, including the following:

1. A site map of the area in which the lifting operation is proposed to be conducted.

2. Proof of a liability and casualty insurance policy in an amount to be determined by the commissioner but not less than five million dollars. Such insurance policy shall cover the

permit holder and the permit holder's employees, agents and contractors from any loss, damage or injury to persons or property by reason of the conduct of the lift operation, or the failure to comply with any requirement of this chapter or the rules, or the terms and conditions of the permit.

3. A copy of the pilot's license issued by the Federal Aviation Administration.

4. A copy of the aircraft's airworthiness certificate issued by the Federal Aviation Administration.

5. An affidavit of the property owner authorizing the helicopter lift operation on their property.

**1110.3 Helicopter fueling.** It shall be unlawful to fuel helicopters in the staging or discharge area.

**1110.3.1 Portable fuel tanks.** Portable fuel tanks or drums within or on the exterior of the helicopter are prohibited. Auxiliary fuel storage tanks may be used provided they are an integral part of the aircraft's fuel system and of a type meeting the requirements of the Federal Aviation Administration.

**1110.4 Smoking.** It shall be unlawful to smoke within 100 feet (30 480 mm) of a fuel storage area or fueling operation. It shall be unlawful to smoke within 100 feet (30 480 mm) of the helicopter staging area or discharge area while lift operations are being conducted.

**1110.5 Staging and discharge areas.** The location of the staging and discharge areas, and their distance from any buildings or other impediments to flight, shall be subject to the approval of the commissioner, and shall be arranged and operated as set forth in [Sections] FC 1110.5.1 and 1110.5.2.

**1110.5.1 Emergency access.** Entrances to and exits from any premises or other location wherein lifting operations are being conducted shall be safeguarded in accordance with applicable laws, rules and regulations, but shall not be obstructed in a manner that prevents access or egress in the event of an emergency.

**1110.5.2 Restricted locations.** Bulk plants or terminals or other premises where hazardous operations or occupancies are maintained shall not be used as a staging area or discharge area unless approved by the commissioner.

**1110.6 Fire protection.** An adequate supply of water shall be provided at the location where lifting operations are conducted. When the discharge area or other area of the lifting operation requires the use of a fire pump or other auxiliary equipment to augment the water supply, such equipment shall be under the personal supervision of a certificate of fitness holder.

**1110.6.1 Foam protection.** An air foam nozzle, pick-up tube and a minimum of 5 gallons (19 L) of foam, suitable for the fuel hazard presented, shall be available on site.

**1110.6.2 Portable fire extinguishers.** Both the staging area and discharge area shall be provided with a minimum of [2] two portable fire extinguishers each having a minimum 80-B:C rating.

**1110.6.3 Department monitoring.** Lift operations [permitted] allowed pursuant to this section may be monitored by representatives of the department to ensure compliance with the requirements of this chapter and the rules. Such representatives shall be allowed within the perimeter of the lift operation for such purpose.

**1110.7 Communication.** Radio and/or other two-way wireless communication shall be maintained between the helicopter pilot and the ground at all times during the lift operation. The department representatives monitoring the lifting operation shall be provided with the ability to monitor such communications.

**1110.8 Discontinuance.** Department representatives may temporarily suspend or cancel any lifting operation if, in their judgment, conditions exist that endanger public safety.

## SECTION FC 1111
## HOT AIR BALLOON OPERATIONS

**1111.1 General.** Hot air balloon operations shall be conducted in accordance with this section.

**1111.1.1 Storage, handling and use of flammable gas.** The storage, handling and use of LPG or other flammable gas for hot air balloon operations shall additionally be conducted in accordance with [Chapters] FC Chapters 35 and 38, as applicable, and the rules.

**1111.2 Permit application.** The owner or operator of the hot air balloon, or in the case of an event involving multiple owners or operators of hot air balloons, the sponsor of such event, shall make application to the department for a permit at least 20 calendar days prior to any anticipated or scheduled operation. Permit applications shall be on such form and include such information and documentation as the commissioner may require, including the following:

1. A site map of the area in which the hot air balloon operation is proposed to be conducted.

2. Proof of a liability and casualty insurance policy in an amount to be determined by the commissioner but not less than two million dollars. Such insurance policy shall cover the permit holder and the permit holder's employees, agents and contractors from any loss, damage or injury to persons or property by reason of the conduct of the lifting operation, or the failure to comply with any requirement of this chapter or the rules, or the terms and conditions of the permit.

3. A copy of the pilot's license issued by the Federal Aviation Administration.

4. A copy of the aircraft's airworthiness certificate issued by the Federal Aviation Administration.

5. An affidavit of the property owner authorizing the hot air balloon operation on their property.

6. All information and documentation required for issuance of a permit for LPG storage, handling and use in connection with the hot air balloon operation pursuant to FC Chapter 38 and the rules.

**1111.3 Required clearances.** The location at which hot air balloon operations are to be conducted are subject to the approval of the department, provided, however, that a balloon shall not be secured or filled unless there is at least 150 feet (45 720 mm) of open space in all directions when measured from the center of the balloon.

**1111.4 Securing of balloons.** Balloons shall have at least a three-point tie down to substantially immovable objects.

**1111.5 Weather conditions.** Hot air balloon operations shall be conducted only under weather conditions conducive to such operation and in no circumstance when prevailing winds exceed 15 miles (24.135 km) per hour.

**1111.6 Discontinuance**. Department representatives may temporarily suspend or cancel any hot air balloon operation if, in their judgment, conditions exist that endanger public safety.

## CHAPTER 12
## DRY CLEANING

### SECTION FC 1201
### GENERAL

**1201.1 Scope.** This chapter shall govern the design, installation, operation and maintenance of dry cleaning facilities.

**1201.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**1201.3 General.** Dry cleaning facilities shall be designed, installed, operated and maintained in accordance with this chapter.

**1201.4 Supervision.** Dry cleaning facilities using Class II or III solvents in dry cleaning systems shall be under the general supervision of a certificate of fitness holder. Such certificate of fitness holder shall be an employee of the dry cleaning facility. The certificate of fitness holder shall monitor the equipment and facilities, ensure that the equipment and facilities are operated and maintained in accordance with this section, and instruct all employees who use or supervise the use of equipment in the proper operation and maintenance of such equipment.

**Exception[.]:** Dry cleaning facilities may be operated under the general supervision of a person who is not an employee of the dry cleaning facility, provided that such person:

1. Holds a certificate of fitness.

2. Is an authorized representative of the manufacturer of the dry cleaning equipment, and provides the owner of the dry cleaning facility with appropriate proof of such authority.

3. Instructs all employees of the dry cleaning facility who use or supervise the use of the equipment in the proper operation and maintenance of the equipment.

4. Personally conducts a monthly inspection of the equipment and facility to ensure that they are being operated and maintained in accordance with this section.

5. Records each monthly inspection in a logbook maintained on the premises by the owner of the dry cleaning facility, by making the following entries: the date of the inspection, the name, address, and certificate of fitness number and expiration date of the person conducting the inspection and the certification that the equipment and facility are being operating and maintained in accordance with this section.

**1201.4.1 Proof of qualification.** Photocopies of the certificates of fitness of all persons responsible for the supervision of a dry cleaning facility, and of the proof that such person is an authorized representative of the manufacturer, where applicable, shall be maintained on the premises and made available for inspection by any representative of the department.

## SECTION FC 1202
## DEFINITIONS

**1202.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**DRY CLEANING.** The process of removing dirt and stains or otherwise cleaning apparel, textiles, rugs and other items with nonaqueous liquid solvents.

**DRY CLEANING FACILITY.** A facility in which dry cleaning and associated operations are conducted, including the office, receiving area and storage rooms.

**DRY CLEANING ROOM.** An occupiable space within a building used for dry cleaning, the installation, storage and/or use of dry cleaning equipment and/or the storage of dry cleaning solvents.

**DRY CLEANING SYSTEM.** Equipment used to perform dry cleaning, including immersion or agitation in solvent of the items to be cleaned, and the extraction of solvent from such items.

## SECTION FC 1203
## CLASSIFICATIONS

**1203.1 Dry cleaning solvent classifications.** Dry cleaning solvents shall be classified according to their flash points as follows:

1. Class I solvents are flammable liquids having a flash point below 100°F (38°C).

2. Class II solvents are combustible liquids having a flash point at or above 100°F (38°C) and below 140°F (60°C).

3. Class IIIA solvents are combustible liquids having a flash point at or above 140°F (60°C) and below 200°F (93°C).

4. Class IIIB solvents are combustible liquids having a flash point at or above 200°F (93°C).

5. Class IV solvents are liquids that are neither flammable nor combustible.

**1203.2 Classification of dry cleaning systems and facilities.** Dry cleaning systems shall be classified based on the use of solvents as follows:

1. Type I—systems using Class I solvents.

2. Type II—systems using Class II solvents.

3. Type III-A—systems using Class IIIA solvents.

4. Type III-B—systems using Class IIIB solvents.

5. Type IV—systems using Class IV solvents in which dry cleaning is not conducted by the public.

6. Type V—systems using Class IV solvents in which dry cleaning is conducted by the public.

**1203.2.1 Multiple solvents.** Dry cleaning facilities using more than one class of dry cleaning system shall be classified based on the numerically lowest type of system.

**1203.2.2 Spotting and pretreating operations.** Spotting and pretreating operations conducted in accordance with [Section 1206] FC1206 shall not affect the classification of the dry cleaning system or facility.

**1203.3 Design.** Dry cleaning facilities shall be designed and constructed in accordance with the construction codes, including the Building Code, and located in accordance with the Zoning Resolution, including Sections 32-15(A) and 32-25(D).

## SECTION FC 1204
## GENERAL REQUIREMENTS

**1204.1 Prohibited dry cleaning systems.** It shall be unlawful to install, operate or maintain a Type I dry cleaning system.

**1204.1.1 Allowed use of Class I solvents.** Class I solvents stored, handled and used in the amounts authorized by [Section 1206] FC1206 are allowed in dry cleaning facilities.

**1204.2 Building services and systems.** Building services and systems shall be designed, installed, operated and maintained in accordance with this section, FC Chapter 6 and the construction codes, including the Building Code.

**1204.2.1 Ventilation.** Ventilation shall be provided in accordance with the construction codes, including [Section 502] Chapter 5 of the Mechanical Code, and United States Department of Labor regulations, as set forth in 29 CFR Section 1910.1000, as applicable.

**1204.2.2 Heating.** In Type II dry cleaning facilities, heating shall be by indirect means using steam or hot water.

**1204.2.3 Electrical wiring and equipment.** Electrical wiring and equipment in dry cleaning rooms or other portions of the facility exposed to flammable vapors shall be installed in accordance with the Electrical Code.

**1204.2.4 Bonding and grounding.** Storage tanks, treatment tanks, filters, pumps, piping, ducts, dry cleaning units, stills, tumblers, drying cabinets and other dry cleaning equipment, where not inherently electrically conductive, shall be bonded together and grounded. Isolated equipment shall be grounded.

**1204.2.5 Smoking prohibited**. It shall be unlawful to smoke in a dry cleaning facility. "NO SMOKING" signs in compliance with the requirements of FC310 shall be [provided in accordance with Section 310] conspicuously posted.

## SECTION FC 1205
## OPERATING AND MAINTENANCE REQUIREMENTS

**1205.1 General.** Dry cleaning systems shall be operated and maintained in compliance with the requirements of this section, the manufacturer's specifications and the construction codes, including the Building Code.

**1205.1.1 Written instructions.** The manufacturer's manuals for the installation, operation and maintenance of the equipment shall be maintained on the premises and made available for inspection by any representative of the department.

**1205.1.1.1 Type II, III-A, III-B and IV systems.** Type II, III-A, III-B and IV dry cleaning systems shall be operated in accordance with the instructions provided by the manufacturer. The owner shall ensure that all persons operating dry cleaning equipment comply with such instructions.

**1205.1.1.2 Type V systems.** Operating instructions for customer use of Type V dry cleaning systems shall be conspicuously posted in a location near the dry cleaning equipment. A telephone number shall be provided for emergency assistance.

**1205.1.2 Equipment identification.** The manufacturer shall permanently affix to dry cleaning equipment nameplates indicating the class of solvent for which each piece of equipment is designed. The name of the dry cleaning solvent approved for use in dry

cleaning equipment shall be clearly and conspicuously marked or posted at the fill connection of the equipment.

**1205.1.3 Prohibited operations.** It shall be unlawful to dry clean by immersion and agitation in open systems.

**1205.1.4 Prohibited use of solvent.** Only solvents of a type listed for a particular piece of equipment shall be used in [that] such equipment.

**1205.1.5 Equipment maintenance and housekeeping.** Proper operating practices and maintenance shall be observed in order to prevent the leakage of solvent or the accumulation of lint. The handling of waste generated by dry cleaning operations and the maintenance of facilities shall comply with the requirements of this section.

**1205.1.5.1 Floors.** Class I and II liquids as defined in [Section 3402] FC3402 shall not be used for cleaning floors.

**1205.1.5.2 Filters.** Filter residue and other waste containing solvent shall be stored in covered metal containers and disposed of lawfully.

**1205.1.5.3 Lint.** Lint and other waste shall be removed from traps daily, deposited in approved waste cans and disposed of lawfully. Lint traps shall remain in place while the dry cleaning equipment is in operation.

**1205.1.5.4 Customer areas.** In Type V dry cleaning systems, customer areas shall be kept free of rubbish and other combustible waste.

**1205.2 Type II systems.** Type II dry cleaning systems shall be operated in accordance with the following additional requirements.

**1205.2.1 Inspection of items.** Items to be dry cleaned shall be searched thoroughly, and foreign materials, including matches and metallic substances, shall be removed.

**1205.2.2 Transfer.** In removing dry cleaned items from the washer, provision shall be made to minimize the dripping of solvent onto the floor. Where items are transferred from a washer to a drain tub, a nonferrous metal drip apron shall be placed so that the apron rests on the drain tub and the cylinder of the washer.

**1205.2.3 Ventilation.** A mechanical ventilation system shall be installed in dry cleaning rooms and in drying rooms in accordance with the construction codes, including the Mechanical Code. The ventilation system shall operate automatically when the dry cleaning equipment is in operation and shall have manual controls at an approved location.

**1205.3 Type III, IV and V systems.** Type III, IV and V dry cleaning systems shall be provided with an automatically activated exhaust ventilation system as required and in accordance with the construction codes, including the Mechanical Code.

**1205.4 Periodic inspection and testing.** All dry cleaning equipment using Class II or III solvents shall be inspected and tested on at least an annual basis. The owner of the dry cleaning facility shall remove from service any equipment that is found to be defective, and shall promptly repair such equipment or remove it from the premises. Such equipment shall not be returned to service until it has been inspected and tested. All such inspection and testing shall be performed by a person holding a certificate of fitness.

**1205.4.1 Inspection reports.** The individual performing the inspection and testing of equipment shall prepare a written report identifying any defects in the condition and operation of the equipment and/or certifying that the equipment can be safely operated in accordance with this chapter. A certification that all equipment in service is in proper working order in accordance with this chapter shall be maintained on the premises for 3 years and made available for inspection by any representative of the department.

**1205.5 Filling and emptying**. The filling and emptying of dry cleaning equipment with Class II or III solvents shall be performed by a certificate of fitness holder. Each filling and emptying of dry cleaning equipment with a Class II or III solvent shall be recorded in a logbook. Such records shall include the date of the filling or emptying, the type and amount of dry cleaning solvent, the equipment filled or emptied, and the name and certificate number of the certificate of fitness holder who performed the filling or emptying. [The records shall be maintained on the premises for 3 years and made available for inspection by any representative of the department.]

## SECTION FC 1206
## SPOTTING AND PRETREATING

**1206.1 General.** The storage, handling and use of dry cleaning solvents for spotting and pretreating operations in any dry cleaning facility shall comply with the requirements of this section, based on the classification of the solvent.

**1206.2 Class I solvents.** The maximum quantity of Class I solvents allowed at any dry cleaning facility shall be 1 gallon (4 L). Class I solvents shall be stored in approved metal containers or safety cans of not more than 2 quarts (2 L) capacity.

**1206.3 Class II and III solvents.** Spotting and pretreating, including scouring and brushing, shall be conducted with Class II or III solvents. The maximum quantity of Class II or III solvents allowed at any work station shall be 1 gallon (4 L). In an occupancy other than a Group H-2 occupancy, the aggregate quantities of solvents shall not exceed the maximum allowable quantity per control area for use-open systems.

**1206.3.1 Spotting tables.** Scouring, brushing or spotting tables on which items are soaked in solvent shall have a liquid-tight top with a curb on all sides not less than 1 inch (25 mm) high. The top of the table shall be pitched to ensure thorough draining to a [1.5-inch (38 mm)] <u>1½-inch (38-mm)</u> drain connected to an approved container.

**1206.3.2 Special handling.** Items that may be damaged from being washed in the washing equipment may be manually cleaned in scrubbing tubs. Scrubbing tubs shall comply with the following requirements:

1. Only Class II or III liquids shall be used.

2. The total amount of solvent used in such tubs shall not exceed 3 gallons (11 L).

3. Scrubbing tubs shall be secured to the floor.

4. Scrubbing tubs shall be provided with permanent [1.5- inch (38 mm)] 1½-inch (38-mm) drains. Such drains shall be provided with a trap and shall be connected to an approved container.

**1206.3.3 Ventilation.** Scrubbing tubs, scouring, brushing or spotting operations shall be located such that solvent vapors are captured and exhausted by the ventilating system.

**1206.3.4 Bonding and grounding.** Metal scouring, brushing and spotting tables and scrubbing tubs shall be permanently and effectively bonded and grounded.

**1206.4** Reserved.

**1206.5 Prohibited spotting and pretreating operation.** It shall be unlawful to store, handle or use any Class I, Class II or Class III solvent for spotting or pretreating operations in any Type V dry cleaning facility or in connection with the use of any Type V dry cleaning system.

## SECTION FC 1207
## DRY CLEANING SYSTEMS

**1207.1 General equipment requirements.** Dry cleaning systems, including dry cleaning units, washing equipment, stills, drying cabinets, tumblers, and their appurtenances, including pumps, piping, valves, filters and solvent coolers, shall be designed, installed, operated and maintained in accordance with NFPA 32, the manufacturer's specifications, and the construction codes, including the Building Code.

**1207.2 Type II systems.** Type II dry cleaning and solvent tank storage rooms shall not be located below grade or above the lowest floor level of the building and shall comply with the requirements of [Sections] FC 1207.2.1 through 1207.2.3.

**Exception:** Solvent storage tanks installed underground, in vaults or in special enclosures in accordance with FC Chapter 34.

**1207.2.1 Firefighting access.** Type II dry cleaning facilities shall be located so that access is provided and maintained from at least one side for firefighting and fire control purposes in accordance with [Section 503] FC503 and the construction codes, including the Building Code.

**1207.2.2 Means of egress.** Type II dry cleaning rooms shall have not less than two means of egress through doors located at opposite ends of the room, at least one of which shall lead directly to the outdoors.

**1207.2.3 Spill control and secondary containment.** Curbs, drains, or other provisions for spill control and secondary containment shall be provided in accordance with [Section 2704.2] FC2704.2 to collect solvent leakage and fire protection water and direct it to a safe location.

**1207.3 Solvent storage tanks.** Solvent storage tanks for Class II, IIIA and IIIB liquids shall conform to the requirements of FC Chapter 34 and be located underground, or outdoors, aboveground.

**Exception:** Indoor storage tanks in compliance with the requirements of NFPA 32 and FC Chapter 34.

## SECTION FC 1208
## FIRE PROTECTION

**1208.1 General.** Where required by this section, fire protection devices, equipment and systems shall be designed, installed, operated and maintained in accordance with FC Chapter 9 and the construction codes, including the Building Code.

**1208.2 Sprinkler system.** Dry cleaning facilities containing Type II, Type III-A or Type III-B dry cleaning systems shall be protected throughout by a sprinkler system.

**1208.3 Fire extinguishing systems.** Type II dry cleaning systems in Type II dry cleaning facilities shall be protected by a fire extinguishing system.

**1208.4 Portable fire extinguishers.** Portable fire extinguishers shall be provided and maintained in accordance with this section and [Section 906] FC906. A minimum of two 2-A:10-B:C rated portable fire extinguishers shall be provided near the doors inside dry cleaning rooms containing Type II, Type III-A and Type III-B dry cleaning systems.

# CHAPTER 13
# COMBUSTIBLE DUST-PRODUCING OPERATIONS

## SECTION FC 1301
## GENERAL

**1301.1 Scope.** This chapter shall govern combustible dust-producing operations, and the equipment and processes utilized in connection with such operations in order to minimize and mitigate dust explosion hazards.

**1301.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**1301.3 General.** Combustible dust-producing operations shall be conducted in accordance with this chapter. All devices, equipment, systems and processes utilized in connection with such operations shall be designed, installed, operated and maintained in accordance with this chapter.

## SECTION FC 1302

## DEFINITIONS

**1302.1 Definition.** The following term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

**COMBUSTIBLE DUST.** Finely divided solid material that is 420 microns or less in diameter, will pass through a U.S. standard No. 40 sieve and, when dispersed in air in sufficient concentrations, can be ignited by a flame, spark or other source of ignition.

## SECTION FC 1303
## PRECAUTIONS

**1303.1 Sources of ignition.** It shall be unlawful to smoke, or use heating or other devices employing an open flame or spark-producing equipment, in areas where combustible dust is generated, processed or otherwise stored, handled or used.

**1303.2 Housekeeping.** Accumulation of combustible dust shall be kept to a minimum indoors. Accumulated combustible dust shall be collected by vacuum cleaning or other means that will not place combustible dust into suspension in air. Forced air or similar methods shall not be used to remove dust from surfaces. When a normally inaccessible area such as a duct or cockloft is made accessible for purposes of an alteration, repair or other reason, any accumulation of combustible dust shall be removed from such area.

## SECTION FC 1304
## EXPLOSION PROTECTION

**1304.1 Standards.** [Prevention and control of dust explosions shall be in compliance] Measures shall be taken to prevent and control dust explosions wherever combustible dust-producing operations are conducted. Such measures shall comply with the applicable operation and maintenance requirements of the codes and standards listed in FC Table 1304.1.

### FC TABLE 1304.1
### EXPLOSION PROTECTION STANDARDS

| STANDARD | SUBJECT |
|---|---|
| NFPA 61 | Prevention of Fires and Dust Explosions in [Agriculture] Agricultural and Food [Products] Processing Facilities |
| NFPA 69 | Explosion Prevention Systems |
| NFPA 85 | Boiler and Combustion Systems Hazards Code |
| NFPA 120 | [Coal Preparation Plants] Fire Prevention and Control in Coal Mines |
| NFPA 484 | [Standard for] Combustible Metals[, Metal Powders, and Metal Dusts] |
| NFPA 654 | [Chemical, Dye, Pharmaceutical and Plastics] Prevention of Fires and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids |
| NFPA 655 | [Sulfur] Prevention of Sulfur Fires and Explosions |
| Electrical Code | Electrical Installations |

# CHAPTER 14
# FIRE SAFETY DURING CONSTRUCTION, ALTERATION AND DEMOLITION

## SECTION FC 1401
## GENERAL

**1401.1 Scope.** This chapter shall govern fire safety measures during the construction, alteration, or demolition of buildings, structures, premises and facilities.

**1401.2 General.** Buildings, structures, premises and facilities undergoing construction, alteration or demolition shall comply with the fire safety measures set forth in this chapter, and shall additionally comply with the requirements of NFPA 241 as to measures not specifically addressed herein.

**1401.3 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**1401.4 Prohibitions.** It shall be unlawful at a construction site to store, handle or use portable fueled heating devices or equipment:

1. For purposes of human comfort or any other purpose other than construction-related curing and drying.

2. Utilizing a flammable liquid as a fuel.

## SECTION FC 1402
## DEFINITIONS

**1402.1 Definitions.** The following term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

**CONSTRUCTION SITE.** Any location at which a building, structure, premises or facility is undergoing construction, alteration or demolition.

## SECTION FC 1403
## PORTABLE FUELED SPACE HEATERS

**1403.1 Design.** Portable fueled space heaters shall be designed, listed and labeled in accordance with the construction codes, including the Mechanical Code and the Fuel Gas Code, this code, and standards promulgated by the commissioner by rule, as applicable. Portable fueled space heaters shall be installed, operated and maintained in accordance with this chapter, the terms of the listing, and manufacturer's specifications.

**1403.2 Portable oil-fueled heaters.** Portable oil-fueled space heaters may be stored, handled and used at construction sites for construction-related curing and drying purposes during the heating season beginning on October 15 and ending on May 30 of the following year, and at such other times of year as may be authorized by permit. Such heaters shall be stored, handled and used in accordance with this code and the rules.

**1403.3 Portable gas-fueled heaters.** Portable gas-fueled space heaters utilizing liquefied petroleum gas (LPG), compressed natural gas (CNG) and piped natural gas may be stored, handled and used at construction sites for construction-related curing and drying purposes during the heating season beginning on October 15 and ending on May 30 of the following year, and at such other times of year as may be authorized by permit. Such heaters shall be stored, handled and used in accordance with this code and the rules.

**1403.4 Refueling.** Refueling operations shall be conducted in accordance with [Section 3405] FC3405. Portable fueled space heaters shall be shut down and cool to the touch before refueling.

**1403.5 Installation.** Clearance to combustibles from portable fueled space heaters shall be maintained in accordance with the manufacturer's specifications. When in operation, portable fueled space heaters shall be fixed in place and protected from overturning, movement or damage in accordance with the manufacturer's specifications.

**1403.5.1 Protection of heating element.** The heating element or combustion chamber shall have a permanent device to prevent accidental contact by persons or material.

**1403.6 Supervision.** The handling and use of portable fueled space heaters shall be under the personal supervision of a person holding a certificate of fitness. The storage of portable fueled space heaters, and the fuel therefore, shall be under the general supervision of a certificate of fitness holder.

## SECTION FC 1404
## PRECAUTIONS AGAINST FIRE

**1404.1 Smoking prohibited.** Smoking [shall be] is prohibited at all construction sites. [Signs shall be posted in accordance with Section 310.]

**1404.1.1 Areas affected.** At construction sites required by the Building Code to be enclosed with a fence, including buildings under construction or demolition, smoking shall be prohibited within the area enclosed by such fence, including in construction trailers and other indoor or outdoor areas. At construction sites not required by the Building Code to be enclosed with a fence, including existing buildings undergoing interior alterations, smoking shall be prohibited in those areas of the building in which work is to be conducted under the work permit issued by the Department of Buildings.

**1404.1.2 Signage.** "No Smoking" signs complying with FC310 shall be conspicuously posted at construction sites at the following locations and such other locations as are necessary to provide notice to a person entering upon or working at the site of the prohibition against smoking:

1. at construction sites required by the Building Code to be enclosed with a fence, on all sliding and swinging gate openings, and any other openings allowing for access to the site by persons or vehicles;

2. at the entrances to any building or structure under construction or demolition;

3. on each floor at stairway, elevator and hoistway access points of any building undergoing alteration, construction or demolition; and

4. at any indoor or outdoor areas on the construction site at which persons congregate.

**1404.2 Waste disposal.** Combustible waste, including rubbish and construction and demolition material, shall not be [accumulated] allowed to accumulate within buildings and shall be removed from [buildings at the end of each work shift, but] a building at least once a day. Accumulations of combustible waste not stored in containers in accordance with FC304.3 and in a manner that obstructs movement on the floor, or containing flammable or combustible liquid residues, shall be removed from a building at the end of each work shift. Combustible waste, including rubbish and construction and demolition material, shall be removed from the premises or stored in noncombustible containers.

**1404.3 Open fires.** It shall be unlawful to ignite or maintain an open fire at a construction site, except for the use of coke-fueled salamanders in accordance with FC 307.1 and 307.6, and the rules.

**1404.4 Spontaneous ignition.** Materials susceptible to spontaneous ignition, such as oily rags, shall be stored in a container listed for such use.

**1404.5 Fire watch**. The commissioner may require, [for] at a demolition [operations] site, and at other construction sites that are unusually hazardous in nature, that [persons holding a certificate of fitness as] a fire watch be maintained by fire [guard] guards [be provided to serve as an on-site fire watch. Fire guard personnel shall be provided with at least one approved means for notification of the department and their sole duty shall be to perform constant patrols and watch for the occurrence of fire]. The fire guards conducting such fire watch shall have the duties and responsibilities set forth in FC901.7.2.1.

**1404.6 Cutting and welding.** Operations involving the use of cutting and welding shall be performed in accordance with FC Chapter 26.

**1404.7 Electrical.** Temporary wiring for electrical power and lighting installations at construction sites shall comply with the requirements of the Electrical Code.

**1404.8 Fire-resistance-rated construction.** Fire walls, fire barriers, and spray-on fire protection of structural members required by the Building Code for the completed building, shall be given construction priority. Required fire doors, with automatic closing devices, shall be installed on openings as soon as practicable. Required fire walls, fire barriers and fire doors shall be left in place in buildings undergoing alteration or demolition until construction operations necessitate their removal.

## SECTION FC 1405
## FLAMMABLE AND COMBUSTIBLE LIQUIDS

**1405.1 Storage, handling and use of flammable and combustible liquids.** Storage, handling and use of flammable and combustible liquids shall be in accordance with [Section 3404] FC

3406.2 and such other provisions of FC Chapter 34 as may be applicable to the specific construction site material or operation.

**1405.2** [**Class I and Class II liquids.** The storage, handling and use of flammable and combustible liquids at construction sites shall be in accordance with Section 3406.2.] **Ventilation.** Adequate ventilation shall be provided for operations involving the application of materials containing flammable solvents.

**1405.3 Housekeeping.** Flammable and combustible liquid storage areas shall be maintained clear of vegetation and combustible waste. Such storage areas shall not be used for the storage of combustible materials.

**1405.4 Precautions against fire.** Sources of ignition and smoking shall be prohibited in flammable and combustible liquid storage areas. [Signs] "No Smoking" signs in compliance with the requirements of FC310 shall be conspicuously posted [in accordance with Section 310].

**1405.5 Handling at point of final use.** Class I and II liquids shall be stored in approved safety containers.

**1405.6 Leakage and spills.** Leaking containers shall be immediately repaired or taken out of service. Spills shall be cleaned up immediately and all liquid and waste material disposed of lawfully.

## SECTION FC 1406
## FLAMMABLE GASES AND OXYGEN

**1406.1 Flammable gases.** The storage, handling and use of flammable gases shall comply with the requirements of FC Chapters 26, 35 and 38, as applicable.

**1406.2 Oxygen.** The storage, handling and use of oxygen shall comply with the requirements of [Sections] FC 1406.2.1 through 1406.2.3, and FC Chapters 26 and 30, as applicable.

**1406.2.1 Portable liquid oxygen containers.** The storage, handling and use of portable liquid oxygen containers shall be in accordance with [Sections] FC 1406.2.1.1 through 1406.2.1.9.

**1406.2.1.1 Design and installation documents.** A sketch showing the following information shall be submitted to the department for approval in connection with an application for a permit for oxygen storage[.]:

1. Number and size of containers.

2. Enclosure, manifold and service piping construction.

3. Location of risers and outlets.

4. Location of all equipment and devices including vaporizers, valves and safety relief devices.

**1406.2.1.2 Indoor storage restrictions.** Not more than one liquid oxygen container having a maximum water capacity of 6.2 cubic feet (0.176 $m^3$) may be [installed] stored indoors. Such container shall be connected for use with a flammable gas. Storage in excess of one liquid oxygen container shall be located outdoors.

**1406.2.1.3 Ventilation.** The room used for the storage, handling and use of a liquid oxygen container shall be equipped with ventilation direct to the outdoors, and shall not contain any combustible material or flammable gas.

**1406.2.1.4 Manifolds and vaporizers.** Manifolds and vaporizers shall be constructed of materials suitable for oxygen service at a pressure of 250 psig (1724 kPa). Such manifolds and vaporizers shall have a minimum bursting pressure of 1,000 psig (6895 kPa) and shall be protected with safety relief devices which will relieve at or below 500 psig (3448 kPa).

**1406.2.1.4.1 Test.** The assembled vaporizer and manifold shall be pressure tested at 500 psig (3448 kPa) with an [oil free] oil-free and [non-flammable] nonflammable material as the testing medium.

**1406.2.1.5 Service piping from the oxygen manifold.** Service piping from the oxygen manifold shall be copper tubing, stainless steel, wrought iron or steel, and shall run vertically [outside the building] outdoors to the floor or floors being serviced, where outlets may be provided for hose connections to approved torches. The service piping shall be properly secured, protected from damage from mechanical injury and properly labeled. Any connection between service piping and the manifold shall be made using not more than 5 feet (1524 mm) of hose capable of withstanding pressure up to at least 1,000 psig (6895 kPa).

**1406.2.1.5.1 Service pressure.** Service piping shall be suitable for 250 psig (1724 kPa) service unless an intervening pressure regulator is provided at the manifold, and shall withstand a test of two times the maximum operating pressure, using an [oil free] oil-free and [non-flammable] nonflammable material as the testing medium.

**1406.2.1.6 Hose and connectors.** Hose and connectors capable of withstanding pressure up to at least 1,000 psig (6895 kPa) and of a design suitable for oxygen service at a pressure of 250 psig (1724 kPa) shall be used to connect the outlets on the service piping to the blowpipes. Hose shall be rejected for use if it shows excessive wear, loose connections, leaks or burns; hose subjected to a flash back in use shall be tested to twice the service pressure, but not less than 200 psig (1379 kPa), before being returned to service.

**1406.2.1.7 Signs.** Signs shall be posted in the vicinity of liquid oxygen container storage and use, reading: DANGER-LIQUID OXYGEN-NO SMOKING-NO OPEN FLAMES.

**1406.2.1.8 Operating instructions.** Legible operating instructions shall be posted near any liquid oxygen manifold.

**1406.2.1.9 Affidavit.** An affidavit shall be provided by the installer and/or contractor to certify that the vaporizer, valves, piping, hose and safety devices are of an approved type, that they meet the specifications for bursting test and design pressure, and that they have been satisfactorily tested in accordance with this section.

**1406.2.2 Oxygen trailers.** The storage and use of oxygen trailers shall be in accordance with [Sections] FC 1406.2.2.1 through 1406.2.2.5.

**1406.2.2.1 Design, construction, testing and maintenance.** Oxygen trailer containers shall be designed, constructed, tested and maintained in accordance with the United States Department of Transportation specifications and regulations.

**1406.2.2.2 Instructions.** Legible operating instructions shall be posted in the trailer and on or near any oxygen manifold used indoors.

**1406.2.2.3 License plates.** Oxygen trailers shall at all times have affixed to them a motor vehicle license plate as issued in accordance with New York State or other applicable motor vehicle license plate laws, rules or regulations.

**1406.2.2.4 Notification.** The owner or operator of an oxygen trailer shall notify the department, in writing, of the delivery of the trailer to a construction site, at least 48 hours in advance of such delivery. Such notification shall include:

1. Contractor's name, address and telephone number.

2. Location of the construction site.

3. Quantity and frequency of oxygen delivery to the construction site.

4. Expected duration of oxygen storage and use at the construction site.

**1406.2.2.5 Oxygen trailers having a capacity exceeding 20,000 SCF (566 $m^3$).** The distance between oxygen trailers having a total aggregate capacity exceeding 20,000 SCF (566 $m^3$) and exposures shall be in accordance with NFPA [50] 55.

**1406.2.3 Supervision.** The handling and use of portable liquid oxygen containers and oxygen trailers shall be under the personal supervision of a certificate of fitness holder. The storage of liquid oxygen containers and oxygen trailers shall be under the general supervision of a certificate of fitness holder.

**1406.3 Discontinued torch operations.** When oxygen and acetylene torch operations are not in use, including when such operations are discontinued for the workday, the oxygen and acetylene containers shall be removed from the work area and moved to an approved storage area or removed from the premises.

**Exception:** Brief interruptions in work of not more than 2 hours, including lunch breaks and coffee breaks.

**1406.3.1 Torch operation container floor storage.** Oxygen and acetylene containers used for torch operations may be stored on the floors on which the torch work is being conducted only in an unoccupied building and only in an approved storage area. Oxygen or acetylene containers, other than those necessary for the day's torch operations, shall be considered as reserve storage, and shall not be stored on such floors.

**1406.3.1.1 Storage location.** Oxygen and acetylene storage areas on the floors on which the torch work is being conducted shall comply with the distance to exposure requirements of FC3504.1.3.

**1406.3.1.2 Maximum storage quantities.** The maximum quantity of acetylene containers stored on any floor shall not exceed 3,500 SCF (99.12 $m^3$).

**1406.3.1.3 Storage cabinet.** Oxygen and acetylene containers shall be located within a compressed gas storage cabinet designed and secured to prevent unauthorized entry. The storage cabinet shall be conspicuously marked with a hazard identification sign as set forth in FC2703.5.

**1406.4 Reserve oxygen and acetylene containers.** The storage of reserve oxygen and acetylene containers at a construction site shall comply with the requirements of FC 1406.4.1 through 1406.4.4, and FC1406.5.

**1406.4.1 Storage location.** Oxygen and acetylene container storage areas shall comply with the distance to exposure requirements of FC3504.2.1.

**1406.4.2 Storage cabinet.** Oxygen and acetylene containers shall be located within a compressed gas storage cabinet designed and secured to prevent unauthorized entry. The storage cabinet shall be conspicuously marked with a hazard identification sign as set forth in FC2703.5.

**1406.4.3 Indoor acetylene storage.** Indoor reserve storage of acetylene containers shall be allowed only when outdoor storage is unavailable on the premises, the building is unoccupied, the containers are stored on the ground floor of the building, and the total quantities stored do not exceed 3,500 SCF (99.12 $m^3$).

**1406.4.4 Outdoor acetylene storage.** Outdoor reserve acetylene container storage areas shall not exceed 3,500 SCF (99.12 $m^3$). More than one outdoor storage area may be authorized on the premises provided the distance from each outdoor storage area to each exposure identified in FC Chapter 35 complies with the requirements of FC Chapter 35.

**1406.5 Maximum aggregate indoor acetylene storage quantities.** The aggregate of the indoor storage of acetylene authorized by FC 1406.3.1.2 and 1406.4.3 shall not exceed 15,000 SCF (424.8 $m^3$).

## SECTION FC 1407
## EXPLOSIVE MATERIALS

**1407.1 Storage and handling.** Explosive materials shall be stored, handled and used in accordance with [Section 1418] FC1418 and FC Chapter 33.

**1407.2 Blasting operations.** Blasting operations shall be conducted in accordance with FC Chapter 33.

**1407.3 Demolition using explosives.** Fire hoses and nozzles for use by demolition personnel, connected to an approved water supply under pressure, shall be provided and maintained at the demolition site whenever explosives are used for demolition. Such fire hoses, nozzles and water supply shall be available prior to explosives arriving at the site. Such fire hoses and nozzles shall be capable of a continuous flow of 180 gallons (681 L) per minute with a minimum reach of 35 feet (10 668 mm) from the nozzle and be capable of being brought to bear anywhere on the construction site. Hose shall be pressure tested to withstand at least 600 pounds per square inch gauge (psig)(2413 kPa).

## SECTION FC 1408
## CONSTRUCTION SITE FIRE SAFETY MANAGER

**1408.1 Fire safety manager.** Where a site safety manager or site safety coordinator is required by the Building Code, the owner shall designate a person to be the fire safety manager for the construction site. Such person shall hold a certificate of fitness as a construction site fire safety manager. The fire safety manager may be the site safety manager or site safety coordinator required by the Building Code, except that a separate fire safety manager shall be designated for a building under construction when such building reaches a height of twenty stories or more than 250 feet (76 200 mm), has a lot coverage of 200,000 square feet (1860 $m^2$) or greater, or as otherwise prescribed by rule. For purposes of this section, below grade stories shall be used to determine number of stories and building height.

> **Exception:** Construction sites at which an existing building is undergoing alteration, the alteration work is limited to the façade, and no hot work is being performed.

> **1408.1.1 Fire safety manager duties.** The fire safety manager shall be responsible for ensuring compliance with the requirements of this code, including this chapter, and the rules. The fire safety manager shall conduct an inspection of the construction site and all fire safety measures on at least a daily basis, and maintain a record of same in a bound log book or other approved system of recordkeeping.[ The log book or other approved recordkeeping shall be made available for inspection by any representative of the department.] Where fire watch service is provided, the fire safety manager shall be responsible for the general supervision of the fire guards.

**1408.2 Pre-fire plans.** The fire safety manager shall develop and maintain at the construction site an approved pre-fire plan, and make it available for examination by any representative of the department. The department shall be notified of any changes in site conditions materially affecting the procedures set forth in such plan.

**1408.3 Training.** The fire safety manager shall ensure that construction site personnel are acquainted with the operation of portable fire extinguishers and other fire protection equipment on the construction site.

**1408.4 Fire protection devices.** The fire safety manager shall ensure that all fire protection equipment and systems are readily available and periodically inspected and tested, and maintained in accordance with this code, the rules and the Building Code.

**1408.5 Hot work operations.** The fire safety manager shall be responsible for supervising the issuance of authorizations for hot work operations in accordance with FC Chapter 26.

**1408.6 Impairment of fire protection systems.** The fire safety manager or impairment coordinator shall comply with the requirements of [Section 901] FC901 in the event of impairment of any fire protection system.

**1408.7 Temporary covering of fire protection devices.** Coverings placed on or over fire protection devices to protect them from damage during construction processes shall comply with the requirements of FC Chapter 9 and shall be immediately removed upon the completion of the construction processes in the room or area in which the devices are installed.

## SECTION FC 1409
## FIRE ALARM REPORTING

**1409.1 Emergency telephone.** A telephone not requiring a coin to operate, or [other] another approved, clearly identified means to notify the department, shall be provided [at] on site in an approved location. The street address of the construction site and the emergency telephone number of the fire department shall be posted adjacent to the telephone or other approved device.

## SECTION FC 1410
## ACCESS FOR FIREFIGHTING

**1410.1 Required access**. Approved vehicle access for fire apparatus shall be provided to all construction sites. Vehicle access shall be provided to within 100 feet (30 480 mm) of temporary or permanent fire department connections. Vehicle access shall be provided by either temporary or permanent roads, capable of supporting vehicle loading under all weather conditions. Vehicle access shall be maintained until permanent fire apparatus access roads are available.

**1410.2 Key boxes.** Key boxes shall be provided as required by FC Chapter 5 and the Building Code.

## SECTION FC 1411
## MEANS OF EGRESS AND ELEVATORS

**1411.1 Stairways.** Stairways at construction sites shall be provided, maintained, and made available for department use in accordance with the construction codes, including the Building Code. Stairways providing egress from the building or structure under construction or alteration, and other components of the means of egress, shall be given construction priority.

**1411.2 Maintenance.** Required means of egress shall be maintained during construction, alteration and demolition in accordance with this code and the Building Code.

**1411.3 Elevators.** Elevators at construction sites shall be provided, maintained, and made available for department use in accordance with the construction codes, including the Building Code.

## SECTION FC 1412
## WATER SUPPLY FOR FIRE PROTECTION

**1412.1 Water supply**. An approved water supply for fire protection, either temporary or permanent, shall be made available prior to hazardous materials or combustible material arriving at the site. Any water source intended for firefighting operations, including standpipe outlets, street hydrants and yard hydrants, shall not be used for construction, alteration or demolition purposes, unless approved.

## SECTION FC 1413
## STANDPIPES

**1413.1 Standpipe systems.** Standpipe systems for use at construction sites shall be provided, maintained, and made available for department use in accordance with this code, and the construction codes, including the Building Code.

**1413.2 Demolition operations.** Where a building or structure with an existing standpipe system is being demolished, such system shall be maintained for the use of the department in accordance with the construction codes, including the Building Code.

## SECTION FC 1414
## SPRINKLER SYSTEM

**1414.1 Sprinkler systems.** Sprinkler systems for use at construction sites shall be provided, maintained, and made available for department use, in accordance with this code, and the construction codes, including the Building Code.

**1414.2 Completion before occupancy.** In buildings or structures where a sprinkler system is required by this code or the construction codes, including the Building Code, it shall be unlawful to occupy any portion of a building or structure until the sprinkler system installation has been tested and approved.

**1414.3 Operation of valves.** Sprinkler control valves shall be operated only by authorized personnel. Such operation shall be under the general supervision of the fire safety manager where one is required pursuant to [Section 1408] FC1408. When the sprinkler system valves are being regularly closed and opened to facilitate connection of newly completed or disconnected segments, the sprinkler control valves shall be inspected at the end of each work day to ascertain that the system is in good working order.

## SECTION FC 1415
## PORTABLE FIRE EXTINGUISHERS

**1415.1 Where required.** Buildings or structures under construction, alteration or demolition shall be provided with not less than one approved portable fire extinguisher in accordance with [Section 906] FC906 and sized for not less than ordinary hazard as follows:

1. At each stairway on all floor levels where combustible materials are being stored or combustible waste is being generated.

2. At the entrance of each storage and construction shed.

3. Additional portable fire extinguishers shall be provided where flammable and combustible liquids are stored, handled and used.

4. Cranes fueled by liquid motor fuel or flammable gas shall be provided with a portable fire extinguisher with a minimum 10-B:C rating located either in the crane's cab or in its immediate vicinity.

## SECTION FC 1416
## INTERNAL-COMBUSTION-POWERED EQUIPMENT

**1416.1 Conditions of use.** Internal-combustion-powered construction equipment shall be used in accordance with the following requirements:

1. Equipment shall be located so that exhausts do not discharge against combustible material.

2. Exhausts shall be piped to the outdoors.

3. Equipment shall not be refueled while in operation.

4. Fuel for equipment shall be stored in an approved [outdoor] area, and shall be moved in approved containers not to exceed 5 gallons (19 L).

## SECTION FC 1417
## SAFEGUARDING ROOFING OPERATIONS

**1417.1 General.** Roofing operations utilizing heat-producing systems or other ignition sources shall be performed by a competent person. Roofing operations involving hot work shall comply with the requirements of FC Chapters 26, 35 and 38, as applicable.

**1417.2 Tar kettles.** Tar kettles shall be handled and used in accordance with [Section 303] FC303.

**1417.3 Portable fire extinguishers for roofing operations.** Portable fire extinguishers shall be provided in accordance with [Section 906] FC906. There shall be not less than one multi-purpose portable fire extinguisher with a minimum 3-A 40-B:C rating on the roof being covered or repaired.

**1417.4 Prohibited operations.** It shall be unlawful to install any roofing material using a torch on a roof of combustible construction, or otherwise engage in roofing operations on roofs of combustible construction using hot work equipment.

## SECTION FC 1418
## [SMALL ARMS AMMUNITION FOR] POWDER-ACTUATED [TOOLS] TOOL LOADS

**1418.1 Storage, handling and use.** Small arms ammunition shall be stored, handled and used for powder-actuated [tools] tool loads at a construction site, as follows:

1. The main store of [small arms ammunition] powder-actuated tool loads shall be kept in [a] an approved locked metal box [interlined with ½ inch (12.7 mm) of non-combustible insulating material].

2. The [small arms ammunition] powder-actuated tool load storage box shall be kept away from heat and shall not be stored in the same storage area or storage facility containing compressed gases or flammable liquids.

3. The storage area or storage facility in which the locked metal [small arms ammunition] powder-actuated tool load box is stored shall bear a permanent sign bearing the words "DANGER-AMMUNITION" in 2-inch ([50.8]51-mm) white letters on a red background.

4. Powder-actuated tools shall not be used in an explosive atmosphere.

5. The certificate of fitness holder shall establish a safe zone behind a work area in which powder-actuated tools are to be used by evacuating the area or placing a barrier constructed of ½ inch (12.7 mm) steel plate.

6. At least one portable fire extinguisher having a minimum 2-A rating shall be provided in the area where [small arms ammunition is] powder-actuated tool loads are stored.

7. Storage of powder-actuated tool loads shall comply with the requirements of NFPA 495. Storage shall be limited to not more than seven hundred fifty thousand powder-actuated tool loads per premises unless larger quantities are authorized by the department.

**1418.1.1 Supervision.** Powder-actuated tools [utilizing small arms ammunition] shall be used only by a certificate of fitness holder. [Small arms ammunition] Powder-actuated tools shall be handled only by a certificate of fitness holder. Storage of [small arms ammunition] powder-actual tools shall be under the general supervision of a certificate of fitness holder.

## SECTION FC 1419
## FIRST RESPONDER BOX

**1419.1 First responder box.** The department may require that a box be provided at a construction site for first responder use that contains keys as set forth in FC506.2.2, the pre-fire plan, permits, logbooks and such other documents required by this code or the rules to be maintained on the premises. Such box shall be in an approved location and, if locked, shall be openable by use of a citywide standard key.

# CHAPTER 15
# FLAMMABLE FINISHES

## SECTION FC 1501
## GENERAL

**1501.1 Scope.** This chapter shall govern the following operations, and the design, installation, operation and maintenance of any building, structure or premises wherein such operations are conducted:

1. The application of flammable [or combustible paint, varnish, lacquer, stain, fiberglass resins or other flammable or combustible liquid applied] finishes to articles or materials by means of spray apparatus [in continuous or intermittent processes].

2. [Dip-tank operations in which articles or materials are passed through] The application of flammable finishes by dipping or immersing articles or materials into the contents of tanks, vats or containers of flammable or combustible liquids[, including] for coating, finishing, treatment and similar processes.

3. The application of [combustible powders when applied by] flammable finishes utilizing powder spray guns, electrostatic powder spray guns, fluidized beds or electrostatic fluidized beds to apply combustible powders.

4. Floor finishing operations.

5. The application of flammable finishes consisting of dual-component coatings or Class I or II liquids when applied by brush or roller in quantities exceeding 1 gallon (4 L).

[6. Spraying and dipping operations.]

**1501.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**1501.3 General.** Flammable finishing operations governed by this chapter shall be conducted in accordance with this chapter. The buildings[, structures] and premises in which such flammable finishing operations are conducted shall be designed, installed, operated and maintained in accordance with this chapter.

**1501.4 Supervision.** The following finishing operations shall be conducted by or under the personal supervision of a certificate of fitness holder:

1. Spray-finishing and dipping operations.

2. Floor finishing operations requiring a permit.

**1501.5 Certificate of approval.** Pre-manufactured spray rooms and pre-manufactured spray booths that circulate heated air shall be of a type for which a certificate of approval has been

issued in accordance with this code, or which was previously approved by the Department of Buildings or the Board of Standards and Appeals, unless such approval is amended or repealed by the commissioner.

## SECTION FC 1502
## DEFINITIONS

**1502.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**DETEARING.** A process for rapidly removing excess wet coating material from a dipped or coated object or material by passing it through an electrostatic field.

**DIP TANK.** A tank, vat or other container of flammable or combustible liquid in which articles or materials are immersed for the purpose of coating, finishing, treating and similar processes.

**ELECTROSTATIC FLUIDIZED BED.** A container holding powder coating material that is aerated from below so as to form an air-supported expanded cloud of such material which is electrically charged with a charge opposite to the charge of the object to be coated. Such object is transported through the container immediately above the charged and aerated materials in order to be coated.

**FLAMMABLE FINISHES.** Material coatings in which the material being applied is a flammable liquid, combustible liquid, combustible powder or flammable or combustible gel [coatings] coating.

**FLAMMABLE VAPOR AREA.** The interior of any room, booth or area, including spray rooms, spray booths, exhaust ducts and drying rooms, or other areas in which, as a result of flammable finishing operations, the concentration of flammable constituents (vapor, gas, fume, mist or dust) in air exceeds 25 percent of their lower flammable limit (LFL).

**FLOOR FINISHING OPERATION.** Any activity involving the surfacing or finishing of a floor, including but not limited to cleaning, stripping, sealing, painting, varnishing, lacquering, staining and waxing.

**FLUIDIZED BED.** A container holding powder coating material that is aerated from below so as to form an air-supported expanded cloud of such material through which the preheated object to be coated is immersed and transported.

**[LIMITED SPRAYING] LIMITED-SPRAYING SPACE.** An area in which spraying operations for touch-up or spot painting of a surface area of 9 square feet ($0.84m^2$) or less per workpiece are conducted.

**RESIN APPLICATION AREA.** An area where reinforced plastics are used to manufacture products by hand lay-up or spray-fabrication methods.

**ROLL COATING.** The process of coating, spreading and impregnating fabrics, paper or other materials as they are passed directly through a tank or trough containing flammable or

combustible liquids, or over the surface of a roller revolving partially submerged in a flammable or combustible liquid.

[**SPRAY AREA.** A room or other area in which spraying operations are conducted that generate flammable vapors or combustible residues, dusts or deposits, including spray spaces, spray booths, spray rooms, ducts exhausting from spraying processes, any area in the direct path of spray, any area containing dangerous quantities of air-suspended powder, combustible residue, dust, deposits, vapor or mists as a result of spraying operations or other such areas approved for spraying operations.]

**SPRAY BOOTH.** A mechanically ventilated appliance of varying dimensions and construction provided to enclose or accommodate a spraying operation and to confine and limit the escape of spray vapor and residue and to exhaust it safely.

**SPRAY ROOM.** A room designed to accommodate spraying operations constructed in accordance with the Building Code[ and separated from the remainder of the building by a minimum 1-hour fire barrier]. The room enclosure shall be at least 2-hour fire-resistant rated.

[**SPRAY SPACE.** The interior of spray booths, the interior of exhaust ducts or any area in the direct path of spray operations.]

**SPRAYING SPACE.** The interior of a spray room, spray booth, exhaust duct, or other area in which, as a result of flammable finishing operations, surfaces are exposed to flammable vapors or mists or combustible dust, and are susceptible to accumulation of flammable or combustible residues or deposits.

[**VAPOR AREA.** An area containing flammable vapors in the vicinity of dip tanks, drain boards or associated drying, conveying or other equipment during operation or shutdown periods, the dimensions of which are as determined by the commissioner, taking into consideration the characteristics of the liquid, the degree of sustained ventilation and the nature of the operations.]

## SECTION FC 1503
## PROTECTION OF OPERATIONS

**1503.1 General.** Operations covered by this chapter shall be protected as required by this section and the Electrical Code.

**1503.2 Sources of ignition.** Protection against sources of ignition shall be provided in accordance with [Sections] FC 1503.2.1 through 1503.2.8.

**1503.2.1 Electrical wiring and equipment.** Electrical wiring and equipment shall comply with the requirements of this chapter and the Electrical Code.

**1503.2.1.1 [Spray spaces and vapor areas] Flammable vapor areas.** Electrical wiring and equipment in [spray spaces and] flammable vapor areas shall be of an explosion-proof type approved for use in such hazardous locations. Such areas shall be considered to be Class I, Division 1 or Class II, Division 1 hazardous locations in accordance with the Electrical Code.

**[1503.2.1.2 Electrical wiring and equipment in resin application areas.** Electrical wiring and equipment located in resin application areas shall be in accordance with the Electrical Code.]

**[1503.2.1.3] 1503.2.1.2 Areas subject to deposits of residues.** Electrical equipment in [the vicinity of spray areas and dip tanks or associated drain boards or] flammable vapor areas and drying operations which are subject to splashing or dripping of liquids shall be specifically approved for locations containing deposits of readily ignitable residue and explosive vapors.

**Exceptions:**

1. [This provision shall not apply to wiring] Wiring in rigid conduit[,] and threaded boxes or fittings not containing taps, splices or terminal connections.

2. [This provision shall not apply to electrostatic] Electrostatic equipment [allowed by Section 1506] complying with the requirements of FC1507.

**[1503.2.1.3.1] 1503.2.1.2.1 Resin application areas.** In resin application areas, electrical wiring and equipment that is subject to deposits of combustible residues shall be listed for such exposure and shall be installed as required for hazardous (classified) locations. Electrical wiring and equipment not subject to deposits of combustible residues shall be installed as required for ordinary hazard locations.

**[1503.2.1.4] 1503.2.1.3 Areas adjacent to spray booths.** Electrical wiring and equipment located outside of, but within 5 feet (1524 mm) horizontally and 3 feet (914 mm) vertically of openings in a spray booth or a spray room shall be approved for Class I, Division 2 or Class II, Division 2 hazardous locations, whichever is applicable.

**[1503.2.1.5] 1503.2.1.4 Areas subject to overspray deposits.** Electrical equipment in [spray] flammable vapor areas located such that deposits of combustible residues could readily accumulate thereon shall be specifically approved for locations containing deposits of readily ignitable residue and explosive vapors in accordance with the Electrical Code.

**Exceptions:**

1. Wiring in rigid conduit and threaded boxes or fittings not containing taps, splices or terminal connections.

2. [Boxes or fittings not containing taps, splices or terminal connections.

3.] Equipment [allowed by Sections 1504 and 1506] complying with the requirements of FC 1504 and 1507 and FC Chapter 21.

**[1503.2.1.6 Flexible power cords.** The use of flexible power cords may be used as authorized by the Electrical Code.]

**1503.2.2 Open flames and sparks.** Open flames and spark-producing devices shall not be located in [spray spaces or] flammable vapor areas and shall not be located within 20 feet (6096 mm) of such areas unless separated by a permanent partition.

> **Exception:** Drying and baking apparatus complying with the requirements of [Section 1504.7.2] FC1504.3.4.2.

**1503.2.3 Hot surfaces.** Heated surfaces having a temperature sufficient to ignite vapors shall not be located in flammable vapor areas. Space-heating appliances, steam pipes or hot surfaces in [a spray area or a resin application area] flammable vapor areas shall be located such that they are not subject to accumulation of deposits of combustible residues.

> **Exception:** Drying apparatus complying with the requirements of [Section 1504.7.2] FC1504.3.4.2.

**1503.2.4 Equipment enclosures.** Equipment or apparatus that is capable of producing sparks or particles of hot metal that would fall into a [spray space or] flammable vapor area shall be totally enclosed.

**1503.2.5 Grounding.** Metal parts of spray booths, exhaust ducts and piping systems conveying Class I or II liquids shall be electrically grounded in accordance with the Electrical Code. Metallic parts located in resin application areas, including but not limited to exhaust ducts, ventilation fans, spray application equipment, workpieces and piping, shall be electrically grounded.

**1503.2.6 Smoking prohibited.** It shall be unlawful to smoke in [a powder coating area, organic peroxide and dual-component coating area, any spray space, limited spraying space, or vapor area] flammable vapor areas and hazardous material storage rooms associated with flammable finishing operations. "No Smoking" signs complying with the requirements of [Section 310] FC310 shall be conspicuously posted in such areas [and other locations].

**1503.2.7 Hot work warning signs.** Welding, cutting and other hot work operations shall not be conducted in or adjacent to [spray areas or dipping or coating operations] flammable vapor areas. Durable signs bearing the following warning shall be conspicuously posted in the vicinity of [spray areas and dipping or coating operations] flammable vapor areas and flammable finishing material storage rooms:

NO WELDING
THE USE OF WELDING OR CUTTING
EQUIPMENT IN OR NEAR THIS AREA
IS DANGEROUS BECAUSE OF FIRE
AND EXPLOSION HAZARDS.

**1503.2.8 Powered industrial trucks.** Powered industrial trucks used in electrically classified areas shall be listed for such use.

**1503.3 Storage, handling and use of flammable and combustible liquids.** [The storage, handling and use of flammable] Flammable and combustible liquids shall be stored, handled and used in accordance with this section and FC Chapter 34.

**1503.3.1 Use.** Containers supplying spray nozzles shall be of a closed type or provided with metal covers which are kept closed. Containers not resting on floors shall be on noncombustible supports or suspended by wire cables. Containers supplying spray nozzles by gravity flow shall not exceed 10 gallons (37.9 L) in capacity.

**1503.3.2 Valves.** Containers and piping to which a hose or flexible connection is attached shall be provided with a shutoff valve at the connection. Such valves shall be kept shut when hoses are not in use.

**1503.3.3 Pumped liquid supplies.** Where flammable or combustible liquids are supplied to spray nozzles by positive displacement pumps, pump discharge lines shall be provided with an approved relief valve discharging to pump suction or a safe detached location.

**1503.3.4 Liquid transfer.** Where a flammable liquid is transferred from one portable container to another, a bond shall be provided between the two containers. At least one container shall be grounded. Piping systems for Class I and Class II liquids shall be permanently grounded.

**1503.3.5 Class I liquids as solvents.** Class I liquids used as solvents shall be used in spray gun and equipment cleaning machines which have been listed and approved for the purpose or shall be used in spray booths or spray rooms in accordance with [Sections 1503.3.5.1 and 1503.3.5.2] FC 1503.3.5.1 and 1503.3.5.2.

**1503.3.5.1 Listed devices.** Cleaning machines for spray guns and equipment shall not be located in areas open to the public and shall be separated from ignition sources in accordance with their listings or by a distance of 3 feet (914 mm), whichever is greater. The quantity of solvent used in a machine shall not exceed the design capacity of the machine.

**1503.3.5.2 Within spray booths and spray rooms.** Mechanical ventilation equipment shall be operated when solvents are used for cleaning spray nozzles and auxiliary equipment and for a period of time thereafter to allow for the exhaust of the vapors within spray booths and spray rooms.

**1503.3.6 Class II and Class III liquids.** Solvents used outside of spray booths, spray rooms or listed and approved spray gun and equipment cleaning machines shall be restricted to Class II and Class III liquids.

**1503.4 Operations and maintenance.** [Spray] Flammable vapor areas, exhaust fan blades and exhaust ducts shall be kept free from the accumulation of deposits of combustible residues. Where excessive residue accumulates in [booths, ducts, discharge points or other spray] such areas, spraying operations shall be discontinued until the accumulation is removed from such areas and properly disposed of.

**1503.4.1 Tools.** Scrapers, spuds and other tools used for cleaning purposes shall be constructed of non-sparking materials.

**1503.4.2 Residue.** Residue removed during cleaning and debris contaminated with residue shall be immediately removed from the premises and disposed of lawfully.

**1503.4.3 Waste cans.** Approved metal waste cans equipped with self-closing lids shall be provided wherever rags or waste are impregnated with finishing material. Such rags and waste shall be deposited therein immediately after being utilized. The contents of waste cans shall be properly disposed of at the end of each work shift and at least once daily.

**1503.4.4 Solvent recycling.** Solvent distillation equipment used to recycle and clean dirty solvents shall comply with the requirements of [Section 3405.4] FC3405.4.

## SECTION FC 1504
## SPRAY FINISHING

**[1504.1 Location of spray-finishing operations.** Spray-finishing operations conducted in buildings used for Group A, E, I or R occupancies shall be located in a spray room protected throughout by a sprinkler system, and separated vertically and horizontally from other areas in accordance with the Building Code. In other occupancies, spray-finishing operations shall be conducted in a spray room, spray booth or limited spraying space approved for such use.

**1504.1.1 Spray rooms.** Spray rooms shall be constructed and designed in accordance with this section and the construction codes, including the Building Code, and shall comply with the requirements of Sections 1504.2, 1504.3, 1504.4, 1504.5 and 1504.6.

**1504.1.1.1 Floor.** Combustible floor construction in spray rooms shall be covered by approved, noncombustible, nonsparking material, except that combustible coverings, such as thin paper or plastic and strippable coatings, may be utilized over noncombustible materials to facilitate cleaning operations in spray rooms.

**1504.1.1.2 Certificate of approval.** Pre-manufactured spray rooms shall be of a type for which a certificate of approval has been issued in accordance with this code, or which was previously approved by the Department of Buildings or the Board of Standards and Appeals, unless such approval is amended or repealed by the commissioner.

**1504.1.2 Spray booths.** The design and construction of spray booths shall be in accordance with Sections 1504.1.2.1 through 1504.1.2.7, Sections 1504.2 through 1504.6, and NFPA 33.

**1504.1.2.1 Construction.** Spray booths shall be constructed of approved noncombustible materials. Aluminum shall not be used. Where walls or ceiling assemblies are constructed of sheet metal, single-skin assemblies shall be no thinner than 0.0478 inch (18 gage) (1.2 mm) and each sheet of double-skin assemblies shall be no thinner than 0.0359 inch (20 gage) (0.9 mm). Structural sections of spray booths are allowed to be sealed with latex-based or similar caulks and sealants.

**1504.1.2.2 Surfaces.** The interior surfaces of spray booths shall be smooth and shall be constructed so as to permit the free passage of exhaust air from all parts of the interior and to facilitate washing and cleaning, and shall be designed to confine residues within the booth. Aluminum shall not be used.

**1504.1.2.3 Floor.** Combustible floor construction in spray booths shall be covered by approved, noncombustible, non-sparking material, except that combustible coverings, such as thin paper or plastic and strippable coatings, may be utilized over noncombustible materials to facilitate cleaning operations in spray booths.

**1504.1.2.4 Means of egress.** Means of egress shall be provided in accordance with the construction codes, including the Building Code.

**Exception:** Means of egress doors from pre-manufactured spray booths shall not be less than 30 inches (762 mm) in width by 80 inches (2032 mm) in height.

**1504.1.2.5 Clear space.** Spray booths shall be installed so that all parts of the booth are readily accessible for cleaning. A clear space of not less than 3 feet (914 mm) shall be maintained on all sides of the spray booth. This clear space shall be kept free of any storage or combustible construction.

**Exceptions:**

1. This requirement shall not prohibit locating a spray booth closer than 3 feet (914 mm) to or directly against an interior partition, wall or floor/ceiling assembly, that has a fire-resistance-rating of not less than 1 hour, provided the spray booth can be adequately cleaned and maintained.

2. This requirement shall not prohibit locating a spray booth closer than 3 feet (914 mm) to an exterior wall or a roof assembly provided the wall or roof is constructed of noncombustible material and provided the spray booth can be adequately cleaned and maintained.

**1504.1.2.6 Size.** The aggregate area of spray booths in a building shall not exceed the lesser of 10 percent of the area of any floor of the building or the basic area allowed for a Group H-2 occupancy without area increases, as set forth in the construction codes, including the Building Code. The area of an individual spray booth in a building shall not exceed the lesser of the aggregate size limit or 1,500 square feet (139 m2).

**Exception:** One individual booth not exceeding 500 square feet (46 m2).

**1504.1.2.7 Certificate of approval.** Pre-manufactured spray booths shall be of a type for which a certificate of approval has been issued in accordance with this code, or which was previously approved by the Department of Buildings or the Board of Standards and Appeals, unless such approval is amended or repealed by the commissioner.

**1504.1.3 Spray spaces.** Spray spaces shall be designed and constructed in accordance with the construction codes, including the Building Code, and Sections 1504.1.3.1, 1504.2, 1504.3, 1504.4, 1504.5 and 1504.6 of this code.

**1504.1.3.1 Floor.** Combustible floor construction in spray spaces shall be covered by approved, noncombustible, nonsparking material, except that combustible coverings, such as thin paper or plastic and strippable coatings, may be utilized over noncombustible materials to facilitate cleaning operations in spray spaces.

**1504.1.4 Limited spraying spaces.** Limited spraying spaces shall comply with the requirements of Sections 1504.1.4.1 through 1504.1.4.4.

**1504.1.4.1 Job size.** The aggregate surface area to be sprayed shall not exceed 9 square feet (0.84 m2).

**1504.1.4.2 Frequency.** Spraying operations shall not be of a continuous nature.

**1504.1.4.3 Ventilation.** Positive mechanical ventilation shall be provided in accordance with Section 502.7.2 of the Mechanical Code. Such system shall meet the requirements of this code for handling flammable vapors. Explosion venting is not required.

**1504.1.4.4 Electrical wiring.** Electrical wiring within 10 feet (3048 mm) of the floor and 20 feet (6096 mm) horizontally of the limited spraying space shall be designed for Class I, Division 2 locations in accordance with the Electrical Code.

**1504.2 Ventilation.** Mechanical ventilation of spray areas shall be provided in accordance with Sections 502.7 and 510 of the Mechanical Code.

**1504.2.1 Operation.** Mechanical ventilation shall be kept in operation at all times while spraying operations are being conducted and for a sufficient time thereafter to allow vapors from drying coated articles and finishing material residue to be exhausted. Spraying equipment shall be interlocked with the ventilation of the spray area such that spraying operations cannot be conducted unless the ventilation system is in operation.

**1504.2.2** Reserved.

**1504.2.3** Reserved.

**1504.2.4 Ventilation obstruction.** Articles being sprayed shall be positioned in a manner that does not obstruct collection of overspray.

**1504.3 Filters.** Air intake filters that are part of a wall or ceiling assembly shall be listed as Class I or Class II in accordance with UL 900. Exhaust filters shall be provided.

**1504.3.1 Supports.** Supports and holders for filters shall be constructed of noncombustible materials.

**1504.3.2 Attachment.** Overspray collection filters shall be readily removable and accessible for cleaning or replacement.

**1504.3.3 Maintaining air velocity.** Visible gauges, audible alarms or pressure-activated devices shall be installed to indicate or ensure that the required air velocity is being maintained.

**1504.3.4 Filter rolls.** Spray booths equipped with a filter roll that is automatically advanced when the air velocity is reduced to less than 100 linear feet per minute (51 m/s) shall be arranged to shut down the spraying operation if the filter roll fails to advance automatically.

**1504.3.5 Filter disposal.** Discarded filter pads shall be immediately removed from the premises or placed in a noncombustible container with a tight-fitting lid, and disposed of lawfully.

**1504.3.6 Spontaneous ignition.** Spray booths using dry filters shall not be used for spraying materials that are highly susceptible to spontaneous heating and ignition. Filters shall be changed prior to spraying materials that could react with other materials previously collected. Examples of potentially reactive combinations include lacquer when combined with varnishes, stains or primers.

**1504.3.7 Waterwash spray booths.** Waterwash spray booths shall be of an approved design so as to prevent excessive accumulation of deposits in ducts and residue at duct outlets. Such booths shall be arranged so that air and overspray are drawn through a continuously flowing water curtain before entering an exhaust duct to the outdoors.

**1504.4 Different coatings.** Spray booths, spray rooms and spray spaces shall not be alternately utilized for different types of coating materials where the combination of materials is conducive to spontaneous ignition, unless all deposits of one material are removed from the booth, room or space and exhaust ducts prior to spraying with a different material.

**1504.5 Illumination.** Where spray spaces, spray rooms or spray booths are illuminated through glass panels or other transparent materials, only fixed lighting units shall be utilized as a source of illumination.

**1504.5.1 Glass panels.** Panels for light fixtures or for observation shall be of heat-treated glass, wired glass or hammered-wire glass and shall be sealed to confine vapors, mists, residues, dusts and deposits to the spray area. Panels for light fixtures shall be separated from the fixture to prevent the surface temperature of the panel from exceeding 200oF (93oC).

**1504.5.2 Exterior fixtures.** Light fixtures attached to the walls or ceilings of a spray area, but which are outside of any classified area and are separated from the spray area by vapor-tight glass panels, shall be suitable for use in ordinary hazard locations. Such fixtures shall be serviced from outside the spray area.

**1504.5.3 Integral fixtures.** Light fixtures that are an integral part of the walls or ceiling of a spray area are allowed to be separated from the spray area by glass panels that are an integral part of the fixture. Such fixtures shall be listed for use in Class I, Division 2 or Class II,

Division 2 locations, whichever is applicable, and also shall be suitable for accumulations of deposits of combustible residues. Such fixtures are allowed to be serviced from inside the spray area.

**1504.5.4 Portable electric lamps.** Portable electric lamps shall not be used in spray areas during spraying operations. Portable electric lamps used during cleaning or repairing operations shall be of a type approved for hazardous locations.

**1504.6 Fire protection.** Spray booths and spray rooms shall be protected throughout by a fire extinguishing system. Such fire extinguishing system shall also protect exhaust plenums, exhaust ducts and both sides of dry filters when such filters are used.

**1504.6.1 Protection of sprinklers.** Sprinkler systems installed in spray areas shall be protected from accumulation of residue from spraying operations in an approved manner. Sprinkler heads shall be inspected at least once per week and cleaned as needed. Bags used as a protective covering shall be 0.003-inch-thick (0.076 mm) polyethylene or cellophane or shall be thin paper. Sprinkler heads contaminated by overspray particles shall be replaced with new sprinkler heads.

**1504.6.2 Automated spray application operations.** Where protecting automated spray application operations, fire extinguishing systems shall be equipped with an approved interlock feature that will, upon discharge of the system, automatically stop the operation of spraying operations and workpiece conveyors into and out of the spray area. Where the building is equipped with a fire alarm system, discharge of the fire extinguishing system shall also activate the building alarm notification appliances.

**1504.6.2.1 Alarm station.** A manual fire alarm and emergency system shutdown station shall be installed to serve each spray area. When activated, the station shall accomplish the functions indicated in Section 1504.6.2. At least one such station shall be readily accessible to operating personnel. Where access to this station is likely to involve exposure to danger, an additional station shall be located adjacent to an exit from the area.

**1504.6.3 Ventilation interlock prohibited.** Makeup air and spray area exhaust systems shall not be interlocked with the fire alarm system and shall remain in operation during a fire alarm condition.

**Exception:** Where the type of fire extinguishing system used requires that ventilation be discontinued, makeup air and exhaust systems shall shut down and dampers shall close.

**1504.6.4 Portable fire extinguishers.** Portable fire extinguishers complying with the requirements of Section 906 shall be provided for spray areas in accordance with the requirements for an extra (high) hazard occupancy.

**1504.7 Drying operations.** Spray booths and spray rooms shall not be used for the purpose of drying by arrangements which could cause an increase in the surface temperature of the spray booth or spray room, except in accordance with Sections 1504.7.1 through 1504.7.2.3.

**1504.7.1 Spraying procedure.** The spraying procedure shall use low-volume spray application.

**1504.7.2 Drying apparatus.** Fixed drying apparatus shall comply with the requirements of this chapter and the applicable provisions of Chapter 21. When recirculation ventilation is provided in accordance with Section 1504.2.2, the heating system shall not be within the recirculation air path.

**1504.7.2.1 Interlocks.** The spraying apparatus, drying apparatus and ventilating system for the spray booth or spray room shall be equipped with interlocks arranged to:

1. Prevent operation of spraying apparatus while drying operations are in progress.

2. Purge spray vapors from the spray booth or spray room for a period of not less than 3 minutes before drying apparatus is rendered operable.

3. Have the ventilating system maintain a safe atmosphere within the spray booth or spray room during the drying process and automatically shut off drying apparatus in the event of a failure of the ventilating system.

4. Shut off the drying apparatus automatically if the air temperature within the booth exceeds 200oF (93oC).

**1504.7.2.2 Portable infrared apparatus.** When portable infrared drying apparatus is used, electrical wiring and portable infrared drying equipment shall comply with the requirements of the Electrical Code. Electrical equipment located within 18 inches (457 mm) of floor level shall be approved for Class I, Division 2 hazardous locations. Metallic parts of drying apparatus shall be electrically bonded and grounded. During spraying operations, portable drying apparatus and electrical connections and wiring thereto shall not be located within spray booths, spray rooms or other areas where spray residue would be deposited thereon.

**1504.7.2.3 Sources of ignition.** Except as otherwise specifically provided in this section, drying or baking units utilizing a heating system having open flames or which are capable of producing sparks, shall not be installed in a spray area.]

**1504.1 General.** Spraying operations involving the use of flammable or combustible liquids in continuous or intermittent processes shall be conducted in accordance with this section and FC 1503 and 1507, as applicable.

**1504.2 Location.** Except in Group A, E, I and R occupancies, spraying operations shall be conducted in a spray room or a spray booth complying with the applicable requirements of FC 1504.3, unless the extent of such operations allows them to be conducted in a limited-spraying space in accordance with FC1504.5. In Group A, E, I and R occupancies, spray-finishing operations shall be conducted in a spray room in compliance with the applicable requirements of FC1504.3.

**Exceptions:**

1. Approved automobile undercoating spray operations and spray-on automotive lining operations, utilizing liquids having a flashpoint above 140ºF (60°C), when conducted in areas with approved natural or mechanical ventilation.

2. The application of resin in the manufacturing of reinforced plastics in accordance with FC1509.

**1504.2.1 Below grade areas.** Spray rooms and spray booths shall not be located in basements, cellars or other areas below grade.

**1504.3 Design and installation.** Spray rooms and spray booths shall be designed and installed in compliance with the requirements of FC 1504.3.1 through 1504.3.7, as applicable.

**1504.3.1 Construction of spray rooms.** Spray rooms shall be designed and installed in compliance with the requirements of the Building Code and Mechanical Code, including vertical and horizontal separation from other spaces. Spray rooms shall additionally comply with the requirements of this section.

**1504.3.2 Construction of spray booths.** Spray booths shall be designed and installed in compliance with the requirements of the Building Code and Mechanical Code, NFPA 33 and this section.

**1504.3.2.1 Materials.** Spray booths shall be constructed of approved noncombustible materials. Aluminum shall not be used. Where walls or ceiling assemblies are constructed of sheet metal, single-skin assemblies shall be no thinner than 0.0478 inch (18 gage) (1.2 mm) and each sheet of double-skin assemblies shall be no thinner than 0.0359 inch (20 gage) (0.9 mm). Structural sections of spray booths may be sealed with latex-based or similar caulks and sealants. The interior surfaces of spray booths shall be smooth and shall be constructed so as to permit the free passage of exhaust air from all parts of the interior and to facilitate washing and cleaning, and shall be designed to confine residues within the booth.

**1504.3.2.2 Clear space.** Spray booths shall be installed so that all parts of the booth are readily accessible for cleaning and other maintenance. A clear space of not less than 3 feet (914 mm) shall be maintained on all sides of the spray booth.

**Exception.** A clear space of less than 3 feet (914 mm) may be maintained from an interior partition, wall or floor/ceiling assembly with a fire-resistance-rating of not less than 1 hour, or an exterior wall or roof assembly of a noncombustible wall or roof.

**1504.3.2.3 Size.** The aggregate area of spray booths in a building shall not exceed the lesser of 10 percent of the area of any floor of the building or the floor area allowed for a Group H-2 occupancy by the Building Code, as set forth in Table 503 of the Building Code, excluding any area increases allowed by Section 506 of the Building Code. The area of an individual spray booth in a building shall not exceed the lesser of the aggregate size limit or 1,500 square feet (139 $m^2$).

**Exception:** A single spray booth not exceeding 500 square feet (46 $m^2$) is allowed irrespective of the results of the required calculations.

**1504.3.2.4 Waterwash spray booths.** Waterwash spray booths shall be of an approved design so as to prevent excessive accumulation of deposits in ducts and residue at duct outlets. Such booths shall be arranged so that air and overspray are drawn through a continuously flowing water curtain before being exhausted outdoors.

**1504.3.2.5 Means of egress.** Means of egress doors from pre-manufactured spray booths shall not be less than 30 inches (762 mm) in width by 80 inches (2032 mm) in height.

**1504.3.3 Fire protection**. Spray rooms and spray booths shall be protected by a fire extinguishing system in compliance with the requirements of this section.

**1504.3.3.1 Spray rooms.** Spray rooms shall be protected throughout by a sprinkler system. Such sprinkler system shall also protect exhaust plenums, exhaust ducts and both sides of dry filters when such filters are used.

**1504.3.3.2 Spray booths.** Spray booths shall be protected throughout by a fire extinguishing system. Such fire extinguishing system shall also protect exhaust plenums, exhaust ducts and both sides of dry filters when such filters are used.

**1504.3.3.3 Automated spraying operations.** The fire extinguishing system for each spray room or spray booth designed for automatic spraying operations shall be equipped with an interlock in accordance with FC1504.3.5(7) and with a manual shutdown device. Such manual shutdown device shall be located within the path of emergency egress from such spray room or spray booth, shall be readily accessible to personnel supervising the spraying operation, and when activated, shall initiate the same functions as the automatic interlock.

**1504.3.4 Drying operations.** Spray rooms and spray booths shall not be used for drying operations that could cause an increase in the surface temperature of the spray room or spray booth, unless such operations are conducted in compliance with the requirements of FC 1504.3.4.1, 1504.3.4.2 and 1504.3.5.

**1504.3.4.1 Spraying procedure.** The spraying procedure shall use low-volume spray application.

**1504.3.4.2 Drying and baking apparatus.** Fixed drying and baking apparatus shall comply with the requirements of this chapter and the applicable provisions of FC Chapter 21. When recirculation ventilation is provided in accordance with FC1504.3.7.1, the heating system shall not be within the recirculation air path.

**1504.3.5 Interlocks.** The spraying apparatus, drying apparatus and ventilating system for the spray room or spray booth shall be equipped with interlocks designed to automatically:

1. prevent operation of spraying apparatus while drying operations are in progress.

2. prevent the operation of the drying apparatus until the spray room or spray booth has been purged of vapors for a period of at least 3 minutes.

3. shut down the drying apparatus in the event that the ventilation system fails to operate within the spray room or spray booth during the drying process.

4. shut down the drying apparatus if the air temperature within the spray room or spray booth exceeds 200°F (93°C).

5. prevent the spraying operation unless the ventilation system is in operation.

6. shut down the spraying operation in a spray booth equipped with a filter roll when the filter roll fails to automatically advance when the air velocity falls below the minimum design level.

7. shut down the spraying operation, drying operation and workpiece conveyors into and out of the flammable vapor area, and notify the building fire alarm system, upon activation of the fire extinguishing systems protecting an automated spraying operation.

**1504.3.6 Illumination.** Only fixed luminaires protected by a glass panel shall be utilized as a source of illumination in spray rooms and spray booths. Such luminaires and glass panels shall comply with the requirements of FC 1504.3.6.1 through 1504.3.6.3, as applicable.

**1504.3.6.1 Glass panels.** Panels for light fixtures or for observation shall be of heat-treated glass, wired glass or hammered-wire glass, and shall be sealed to confine vapor, gas, fume, mists or dust to the flammable vapor area. Panels for luminaires shall be separated from the luminaire to prevent the surface temperature of the panel from exceeding 200°F (93°C).

**1504.3.6.2 Exterior luminaires.** Luminaires approved for use in ordinary hazard locations may be used when the luminaire is attached to an exterior wall or ceiling of a spray room or spray booth, but is separated and protected from the flammable vapor area by a vapor-tight glass panel. Such luminaires shall be serviced exclusively from outside the flammable vapor area.

**1504.3.6.3 Integral luminaires.** Luminaires approved for use in hazardous locations shall be used when the luminaire is an integral part of the walls or ceiling of a spray room or spray booth. Such luminaires shall be listed for use in Class I, Division 2 or Class II, Division 2 locations, as applicable. Such luminaires may be serviced from inside the flammable vapor area.

**1504.3.7 Ventilation.** Mechanical ventilation of flammable vapor areas shall be provided in accordance with Chapter 5 of the Mechanical Code and this section.

**1504.3.7.1 Recirculation.** Air exhausted from spraying operations shall not be recirculated, except as authorized by the Mechanical Code.

**1504.3.7.2 Prohibition.** Makeup air and flammable vapor area exhaust systems shall not be interlocked with the fire alarm system. The ventilation system shall remain in operation upon activation of the building fire alarm system.

**Exception:** Where the type of fire extinguishing system used requires that ventilation be discontinued, makeup air and exhaust systems shall shut down and dampers shall close.

**1504.3.7.3 Filters.** Spray rooms and spray booths shall be provided with exhaust filters. Air intake filters are not required, but if part of a spray room or spray booth wall or ceiling assembly shall be listed as Class I or Class II in accordance with UL 900.

**1504.3.7.3.1 Supports.** Supports and holders for filters shall be constructed of noncombustible materials.

**1504.3.7.3.2 Attachment.** Overspray collection filters shall be readily removable and accessible for cleaning or replacement.

**1504.3.7.3.3 Monitoring air velocity.** One or more devices shall be provided to monitor the air velocity of the air being exhausted from a spray room or spray booth and to provide an indication, alarm or system shutdown if the required velocity is not being maintained. The device monitoring the air flow shall visually display the pressure of the exhausted air, activate an alarm and/or shut down the spraying operation.

**1504.4 Operation and maintenance.** Facilities in which spraying operations and drying operations are conducted shall be operated and maintained in compliance with the requirements of this section.

**1504.4.1 Spraying of incompatible materials.** Spray rooms and spray booths shall not be utilized for spraying operations utilizing alternating incompatible materials, unless all deposits of one material are removed from the room or booth and exhaust ducts, and dry filters replaced, prior to spraying with the incompatible material.

**1504.4.2 Filter disposal.** Discarded exhaust filters shall be immediately removed from the spray room or spray booth and disposed of in accordance with FC304.3.1.

**1504.4.3 Sprinkler head protection.** Sprinkler heads installed in spraying spaces shall be protected in an approved manner from accumulation of residue from spraying operations. Sprinkler heads shall be inspected at least once per week and cleaned as needed. Bags used as a protective covering shall be of 0.003-inch-thick (0.076-mm-thick) polyethylene or cellophane or shall be of thin paper. Sprinkler heads contaminated by overspray particles shall be replaced with new sprinkler heads.

**1504.4.4 Floor protection.** Combustible floor construction in spraying spaces shall be covered by an approved, noncombustible, nonsparking material, except that combustible coverings, such as thin paper or plastic and strippable coatings, may be utilized over the

noncombustible, nonsparking floor covering material on combustible floors, and on noncombustible floors, to facilitate cleaning operations in spraying spaces.

**1504.4.5 Portable electric lamps.** Portable electric lamps shall not be stored or used in the flammable vapor area.

**Exception:** Portable electric lamps of a type approved for hazardous locations may be used to provide additional lighting for cleaning or maintenance in such areas.

**1504.4.6 Portable infrared apparatus.** Portable electrical equipment located within 18 inches (457 mm) of floor level shall be approved for Class I, Division 2, hazardous locations. Metallic parts of drying apparatus shall be electrically bonded and grounded. During spraying operations, portable drying apparatus and electrical connections and wiring thereto shall not be located within spray booths, spray rooms or other spraying space.

**1504.4.7 Continuous ventilation.** Mechanical ventilation shall be kept in operation at all times while spraying operations are being conducted and for a sufficient time thereafter to allow vapors from drying coated articles and finishing material residue to be exhausted.

**1504.4.8 Obstruction of exhaust ventilation.** Articles being sprayed shall be positioned in a manner that does not obstruct collection of overspray.

**1504.4.9 Hazardous and combustible material storage.** The clear space around spray booths pursuant to FC1504.3.2.2 shall be kept free of hazardous material and combustible material storage.

**1504.4.10 Portable fire extinguishers.** Spraying spaces shall be provided with portable fire extinguishers for an extra (high) hazard occupancy in accordance with FC906.

**1504.5 Limited-spraying spaces.** Spray finishing operations may be conducted in a limited-spraying space when the spraying operations are limited in size and frequency and are conducted in a properly ventilated and electrically wired space in compliance with the requirements of FC 1504.5.1 through 1504.5.5.

**1504.5.1 Job size.** The surface area of any workpiece to be sprayed shall not exceed 9 square feet (0.84 $m^2$).

**1504.5.2 Frequency.** Spraying operations shall not be of a continuous nature and shall be incidental to the operation of the facility.

**1504.5.3 Ventilation.** Positive mechanical ventilation shall be provided in accordance with Chapter 5 of the Mechanical Code. Such system shall meet the requirements of the Mechanical Code for flammable vapor areas. Explosion venting is not required.

**1504.5.4 Electrical wiring.** Electrical wiring within 10 feet (3048 mm) of the floor and 20 feet (6096 mm) horizontally of the limited-spraying space shall be designed for Class I, Division 2 locations in accordance with the Electrical Code.

**1504.5.5 Portable fire extinguisher.** Limited-spraying space shall be provided with a portable fire extinguisher in accordance with FC1504.4.10.

## SECTION FC 1505
## [DIPPING] DIP-TANK OPERATIONS

**1505.1 General.** Dip-tank operations shall be conducted in accordance with this section and FC1503.

**[1505.1] 1505.2 Location[ of dip-tank operations].** In Group A, I and R occupancies, [Dip-tank] dip-tank operations shall be conducted in [buildings used for Group A, I or R occupancies shall be located in] a room designed for that purpose, protected throughout by a sprinkler system, and separated vertically and horizontally from other areas by construction having a fire resistance rating of not less than 2 hours, in accordance with the construction codes, including the Building Code.

**[1505.2 Ventilation of vapor areas.** Vapor areas shall be provided with mechanical ventilation in accordance with Section 502.7.4 of the Mechanical Code.]

**1505.3 [Construction of dip tanks.] Design and installation.** Dip tanks shall be designed and installed in compliance with the requirements of FC 1505.3.1 through 1505.3.6.

**1505.3.1 Construction.** Except as otherwise provided in FC1505.4 with respect to hardening and tempering tanks, dip [Dip] tanks shall be constructed in accordance with this section, and NFPA 34. Dip tanks, including drain boards, shall be constructed of noncombustible material and their supports shall be sturdily constructed of [heavy] metal, reinforced concrete or masonry.

[**1505.3.1**] **1505.3.1.1 Overflow.** Dip tanks greater than 150 gallons (568 L) in capacity or 10 square feet (0.93 [$m_2$] $m^2$) in liquid surface area shall be equipped with a trapped overflow pipe leading to an approved outdoor location. The bottom of the overflow connection shall not be less than 6 inches (152 mm) below the top of the tank.

[**1505.3.2**] **1505.3.1.2 Bottom drains.** Dip tanks greater than 500 gallons (1893 L) in liquid capacity shall be equipped with bottom drains that are arranged to automatically and manually drain the tank quickly in the event of a fire unless the viscosity of the liquid at normal atmospheric temperature makes this impractical. Manual operation shall be from a safe, accessible location. Where gravity flow is not practicable, automatic pumps shall be provided. Such drains shall be [trapped and] provided with traps and shall discharge to a closed, vented salvage tank or [to an] other approved location [outdoors].

**Exception:** Dip tanks containing Class IIIB combustible liquids where the liquids are not heated above room temperature, and the process area is protected throughout by a sprinkler system.

**[1505.3.3] 1505.3.2 Dipping liquid temperature control.** Protection against the accumulation of vapors, self-ignition and excessively high temperatures shall be provided for

dip tanks in which dipping liquids [that] are heated directly or heated by the surfaces of the object being dipped.

**[1505.4 Conveyors.** Dip tanks utilizing a conveyor system shall be arranged such that in the event of fire, the conveyor system shall automatically cease motion and the required tank bottom drains shall open.

**1505.5 Portable fire extinguishers.** Areas in the vicinity of dip tanks shall be provided with portable fire extinguishers complying with the requirements of Section 906 and suitable for flammable and combustible liquid fires as specified for extra (high) hazard occupancies.

**1505.6 Fire extinguishing equipment.** A fire extinguishing system or dip tank covers in accordance with Section 1505.7 shall be provided for the following dip tanks:

1. Dip tanks less than 150 gallons (568 L) in capacity or 10 square feet (0.93 $m^2$) in liquid surface area.

2. Dip tanks containing a liquid with a flash point below 110°F (43°C), used in such manner that the liquid temperature could equal or be greater than its flash point from artificial or natural causes, and having both a capacity of more than 10 gallons (37.9 L) and a liquid surface area of more than 4 square feet (0.37 $m^2$).

**1505.6.1 Fire extinguishing system.** A fire extinguishing system shall be provided for dip tanks with a 150-gallon (568 L) or more capacity, or 10 square feet (0.93 $m^2$) or larger in a liquid surface area. Fire extinguishing system design shall be in accordance with NFPA 34.

**1505.7 Dip tank covers.** Dip tank covers allowed by Section 1505.6 shall be capable of manual operation and shall be automatic-closing by approved automatic-closing devices designed to operate in the event of fire.

**1505.7.1 Construction.** Covers shall be constructed of noncombustible material or be of a tin-clad type with enclosing metal applied with locked joints.

**1505.7.2 Supports.** Chain or wire rope shall be utilized for cover supports or operating mechanisms.

**1505.7.3 Closed covers.** Covers shall be kept closed when tanks are not in use.

**1505.8 Hardening and tempering tanks.** Hardening and tempering tanks shall comply with the requirements of Sections 1505.3 through 1505.5 but shall be exempt from other provisions of Section 1505.

**1505.8.1 Location.** Tanks shall be located as far as practical from furnaces and shall not be located on or near combustible floors.

**1505.8.2 Hoods.** Tanks shall be provided with a noncombustible hood and vent or other approved venting means, terminating outdoors to serve as a vent in case of a fire. Such vent

ducts shall be treated as flues, and proper clearances shall be maintained from combustible materials.

**1505.8.3 Alarms.** Tanks shall be equipped with a high-temperature limit switch arranged to sound an alarm when the temperature of the quenching medium reaches 50°F (10°C) below the flash point.

**1505.8.4 Fire protection.** Hardening and tempering tanks greater than 500 gallons (1893 L) in capacity or 25 square feet (2.3 $m^2$) in liquid surface area shall be protected by a fire extinguishing system.

**1505.8.5 Use of air pressure.** Air under pressure shall not be used to fill or agitate oil in tanks.]

**1505.3.3 Dip tank covers.** Dip tank covers, if provided, shall be capable of manual operation and shall be automatic-closing by approved automatic-closing devices designed to operate in the event of fire. Dip tank covers shall be kept closed when tanks are not in use.

**1505.3.3.1 Materials.** Dip tank covers shall be constructed of noncombustible material or be of a tin-clad type designed in the same manner as fire doors.

**1505.3.3.2 Supports.** Chain or wire rope shall be utilized for cover supports or operating mechanisms.

**1505.3.4 Fire protection.** Dip-tank operations shall be protected in compliance with the requirements of FC 1505.3.4.1 and 1505.3.4.2.

**1505.3.4.1 Fire extinguishing equipment.** A fire extinguishing system shall be provided for the following dip tanks unless such dip tanks are provided with a dip tank cover in accordance with FC1505.3.3:

1. Dip tanks less than 150 gallons (568 L) in capacity or 10 square feet (0.93 $m^2$) in liquid surface area.

2. Dip tanks containing a liquid with a flash point below 110°F (43°C), used in such manner that the liquid temperature could equal or be greater than its flash point from artificial or natural causes, and having both a capacity of more than 10 gallons (37.9 L) and a liquid surface area exceeding 4 square feet (0.37 $m^2$).

**1505.3.4.2 Fire extinguishing system.** Dip tanks with a capacity of 150 gallons (568 L) or more, or a liquid surface area of 10 square feet (0.93 $m^2$) or more shall be protected by a fire extinguishing system. Such fire extinguishing system shall be designed in accordance with NFPA 34.

**1505.3.5 Interlocks.** Dip tanks utilizing a conveyor system shall be arranged such that in the event of fire, the conveyor system shall automatically cease motion and the required tank bottom drains shall open.

**1505.3.6 Ventilation.** Mechanical ventilation of flammable vapor areas shall be provided in accordance with Chapter 5 of the Mechanical Code.

**1505.4 Hardening and tempering tanks.** Hardening and tempering tanks shall be designed and installed in compliance with the requirements of FC 1505.4.1 through 1505.4.5. Except as provided therein, hardening and tempering tanks shall not be subject to the requirements for dip tanks set forth in FC1505.

**1505.4.1 Construction.** Hardening and tempering tanks shall be constructed in accordance with FC 1505.3.1, 1505.3.1.1, 1505.3.1.2, 1505.3.2 and 1505.3.5.

**1505.4.2 Location.** Hardening and tempering tanks located in a room containing an industrial furnace shall be positioned to minimize the ignition risk from such furnace, and such tanks shall not be located on a combustible floor.

**1505.4.3 Hoods.** Hardening and tempering tanks shall be provided with a noncombustible hood and vent or other approved ventilation system that terminates outdoors. Such exhaust hood and vent shall serve to provide a path for heat and flames in the event of a fire in the tank. Such vent ducts shall be designed as flues, and clearances shall be maintained from combustible materials to minimize their ignition risk.

**1505.4.4 Fire extinguishing system**. Hardening and tempering tanks with a capacity exceeding 500 gallons (1893 L) or a liquid surface area exceeding 25 square feet (2.3 $m^2$) shall be protected by a fire extinguishing system.

**1505.4.5 High temperature alarm.** Hardening and tempering tanks shall be equipped with a high-temperature limit switch arranged to sound an alarm when the temperature of the quenching medium reaches 50$^o$F (10$^o$C) below its flash point.

**1505.5 Operation and maintenance.** Facilities in which dipping operations are conducted shall be operated and maintained in compliance with the requirements of this section.

**1505.5.1 Sources of ignition.** Protection against sources of ignition shall be provided in accordance with FC1503.2.

**1505.5.2 Use of compressed air.** Compressed air shall not be used to fill the tank or agitate tank contents.

**1505.5.3 Portable fire extinguishers.** Dip tank rooms and areas shall be provided with portable fire extinguishers complying with the requirements of FC906 and rated for flammable and combustible liquid fires in extra (high) hazard environments.

**[1505.9] 1505.6 Flow-coating operations.** Flow-coating operations shall [comply] be conducted in compliance with the design, installation, operation and maintenance requirements for dip tanks. [The area of] For such purposes, the sump and any areas on which paint flows shall be considered to be the area of a dip tank. [**1505.9.1 Paint supply.** Paint] Finishing products shall be supplied by a gravity tank not exceeding 10 gallons (37.9 L) in capacity or by direct low-

pressure pumps arranged to shut down automatically in case of fire by means of approved [heat-actuated] heat-activated devices.

**[1505.10] 1505.7 Roll-coating operations.** Roll-coating operations shall comply with the requirements of [Section 1505.9] FC1505.6. In roll-coating operations utilizing flammable or combustible liquids, sparks from static electricity shall be prevented by electrically bonding and grounding all metallic rotating and other parts of machinery and equipment and by the installation of static collectors or by maintaining a conductive atmosphere such as a high relative humidity.

## [SECTION FC 1506
## ELECTROSTATIC APPARATUS

**1506.1 General.** Electrostatic apparatus and devices used in connection with paint-spraying and paint-detearing operations shall be of an approved type.

**1506.2 Location.** Transformers, power packs, control apparatus and all other electrical portions of the equipment, except high-voltage grids and electrostatic atomizing heads and connections, shall be located outside of the spray area or vapor area, or shall comply with the requirements of Section 1503.2.

**1506.3 Construction of equipment.** Electrodes and electrostatic atomizing heads shall be of approved construction, rigidly supported in permanent locations and effectively insulated from ground. Insulators shall be nonporous and noncombustible.

**1506.4 Clear space.** A space of at least twice the sparking distance shall be maintained between goods being painted or deteared and electrodes, electrostatic atomizing heads or conductors. A sign stating the sparking distance shall be conspicuously posted near the assembly.

**1506.5 Emergency shutdown.** Electrostatic apparatus shall be equipped with automatic controls operating without time delay to disconnect the power supply to the high-voltage transformer and signal the operator under any of the following conditions:

1. Stoppage of ventilating fans or failure of ventilating equipment from any cause.

2. Stoppage of the conveyor carrying articles past the high-voltage grid.

3. Occurrence of a ground or an imminent ground at any point of the high-voltage system.

4. Reduction of clearance below that required in Section 1506.4.

**1506.6 Ventilation interlock.** Hand electrostatic equipment shall be interlocked with the ventilation system for the spray area so that the equipment cannot be operated unless the ventilating system is in operation.

**1506.7 Protection for automated liquid electrostatic spray application equipment.** Automated liquid electrostatic spray application equipment shall be protected by the installation

of an approved, supervised flame detection apparatus that shall, in the event of ignition, react to the presence of flame within 0.5 second and shall accomplish all of the following:

1. Activation of a local alarm in the vicinity of the spraying operation and activation of the building alarm system, if such system is provided.

2. Shutting down of the coating material delivery system.

3. Termination of all spray application operations.

4. Stopping of conveyors into and out of the spray area.

5. Disconnection of power to the high-voltage elements in the spray area and disconnection of power to the system.

**1506.8 Barriers.** Booths, fencing, railings or guards shall be placed about the equipment such that either by their location or character, or both, isolation of the process is maintained from plant storage and personnel. Railings, fencing and guards shall be of conductive material, adequately grounded, and shall be at least 5 feet (1524 mm) from processing equipment.

**1506.9 Signs.** Durable signs shall be conspicuously posted to provide the following information:

1. Designate the process zone as dangerous with respect to fire and accident.

2. Identify the grounding requirements for all electrically conductive objects in the spray area, including persons.

3. Restrict access to qualified personnel only.

**1506.10 Ventilation.** The spray area shall be ventilated in accordance with Section 1504.2.

**1506.11 Maintenance.** Insulators shall be kept clean and dry. Drip plates and screens subject to paint deposits shall be removable and taken to a safe place for cleaning.

**1506.12 Fire protection.** Areas used for electrostatic spray finishing with fixed equipment shall be protected throughout by a fire extinguishing system.]

## SECTION FC [1507] 1506
## POWDER COATING

**[1507.1] 1506.1 General.** Operations using finely ground particles of protective finishing material applied in dry powder form by fluidized bed, electrostatic fluidized bed, powder spray guns or electrostatic powder spray guns shall [comply with the requirements of] be conducted in accordance with this section. When stationary electrostatic equipment is utilized, such operations shall additionally be conducted in accordance with FC1507.

**[1507.2] 1506.2 Location [and construction of powder coating rooms and booths].** Powder coating operations shall be conducted in [enclosed rooms constructed of noncombustible

materials, enclosed powder coating facilities which are ventilated, or ventilated spray booths complying with the requirements of Section 1504.1.2] spray rooms or spray booths located in accordance with FC1504.

[**Exception:** Listed spray-booth assemblies that are constructed of other materials shall be allowed.]

**[1507.3 Sources of ignition.** When parts are heated prior to coating, the temperature of the parts shall not exceed the ignition temperature of the powder to be used. Precautions shall be taken to minimize the possibility of ignition by static electrical sparks through static bonding and grounding, where possible, of powder transport, application and recovery equipment. Sources of ignition shall additionally comply with the requirements of Section 1503.2.

**1507.4 Ventilation.** Exhaust ventilation and powder recovery systems shall be provided in accordance with of Section 502.7.6 of the Mechanical Code.

**1507.5 Drying, curing and fusion equipment.** Drying, curing and fusion equipment shall comply with the requirements of Chapter 21.

**1507.6 Operation and maintenance.** Powder coating areas shall be kept free from the accumulation of powder coating dusts, including horizontal surfaces such as ledges, beams, pipes, hoods, booths and floors.

**1507.6.1 Cleaning.** Surfaces shall be cleaned in such a manner so as to avoid scattering dusts to other places or creating dust clouds. Vacuum sweeping equipment shall be of a type approved for use in hazardous location.

**1507.6.2 Spark-producing metals.** Iron or spark-producing metals shall be prevented from being introduced into the powders being applied by magnetic separators, filter-type separators, or by other approved means.

**1507.7 Fixed electrostatic-spraying equipment.** In addition to Section 1507, Section 1506 shall apply to fixed electrostatic equipment used in powder coating operations.

**1507.8 Fire protection.** Areas used for powder coating shall be protected throughout by a fire extinguishing system.

**1507.9 Additional protection for fixed systems.** Automated powder application equipment shall be protected by the installation of an approved, supervised flame detection apparatus that shall react to the presence of flame within 0.5 second and shall accomplish all of the following:

1. Shutting down of energy supplies (electrical and compressed air) to conveyor, ventilation, application, transfer and powder collection equipment.

2. Closing of segregation dampers in associated ductwork to interrupt airflows from application equipment to powder collectors.

3. Activation of an alarm that is audible throughout the powder coating room or booth.

**1507.10 Portable fire extinguishers.** Portable fire extinguishers complying with the requirements of Section 906 shall be provided for areas used for powder coating in accordance with the requirements for extra (high) hazard occupancy.]

**1506.3 Design and installation.** Powder coating operations shall be conducted in powder coating rooms and powder coating booths designed and installed in compliance with the requirements of this section.

**1506.3.1 Construction of powder coating rooms.** Powder coating rooms shall be constructed of noncombustible materials.

**1506.3.2 Construction of powder coating booths.** Powder coating booths shall be constructed in accordance with FC1504.3.2, except that booth assemblies listed for such purpose and constructed in accordance with such listing may be constructed of materials other than as required by FC1504.3.2.1.

**1506.3.3 Fire protection.** Powder coating rooms and booths shall be protected by fire protection systems in accordance with this section.

**1506.3.3.1 Fire extinguishing system.** Powder coating rooms and booths shall be protected throughout by a fire extinguishing system.

**1506.3.3.2 Flame detection system.** Automated powder coating application equipment shall be protected by an approved, supervised flame detection device capable of detecting the presence of flame within ½ second, that shall, upon activation, automatically initiate the following actions:

1. Shut down electrical power and compressed air supply to the powder coating operation, including the conveyor, ventilation, application, transfer and powder collection systems.

2. Close segregation dampers in associated ductwork to interrupt airflows from application equipment to powder collectors.

3. Activate a local alarm audible within the powder coating room or booth and surrounding area.

**1506.3.4 Drying, curing and fusion equipment.** Drying, curing and fusion equipment shall comply with the requirements of FC Chapter 21.

**1506.3.5 Ventilation.** Exhaust ventilation and powder recovery systems shall be provided in accordance with Chapter 5 of the Mechanical Code.

**1506.4 Operation and maintenance.** Facilities in which powder coating operations are conducted shall be operated and maintained in compliance with the requirements of this section.

**1506.4.1 Housekeeping.** Powder coating areas, including horizontal surfaces such as ledges, beams, pipes, hoods, booths and floors, shall be kept free from the accumulation of powder coating dusts.

**1506.4.2 Cleaning.** Surfaces shall be cleaned in such a manner as to avoid scattering dust or creating a dust cloud. Vacuum cleaning equipment shall be of a type approved for use in a hazardous location.

**1506.4.3 Spark-producing metals.** Magnetic separators, filter-type separators, or other approved means shall be installed or used to prevent iron or other spark-producing metals from being introduced into the powders or the powder-coating operation.

**1506.4.4 Preheating parts.** The temperature of the parts heated prior to coating shall not exceed the ignition temperature of the powder to be used.

**1506.4.5 Sources of ignition.** Protection against sources of ignition shall be provided in accordance with FC1503.2. Static bonding and grounding or other appropriate precautions shall be taken to minimize the possibility of ignition by static electrical sparks generated by powder transport, application and recovery systems.

**1506.4.6 Portable fire extinguishers.** Powder coating rooms and booths shall be provided with portable fire extinguishers complying with the requirements of FC906 and rated for flammable and combustible liquid fires in extra (high) hazard environments.

## SECTION FC 1507
## ELECTROSTATIC SPRAY-FINISHING EQUIPMENT

**1507.1 General.** Electrostatic spray-finishing equipment used in connection with paint-spraying and paint-detearing operations shall be of an approved type, and shall be designed, installed, operated and maintained in accordance with this section.

**1507.2 Location and clear space.** A space of at least twice the maximum potential sparking distance shall be maintained between the workpiece being painted or deteared and any electrodes, electrostatic atomizing heads or conductors.

**Exception:** Such distance is not required to be maintained between workpieces and portable electrostatic spray-finishing equipment listed for use in Class I, Division 1 locations.

**1507.3 Design and installation.** Electrostatic spray-finishing equipment used in connection with paint-spraying and paint-detearing operations shall be designed and installed in compliance with the requirements of this section.

**1507.3.1 Construction.** Electrodes and electrostatic atomizing heads shall be of approved construction, rigidly braced or otherwise supported to prevent movement and insulated from grounding by nonporous and noncombustible insulators.

**Exception:** Such bracing and insulation is not required to be provided for portable electrostatic spray-finishing equipment listed for use in Class I, Division 1 locations.

**1507.3.1.1 Separation.** Electrostatic spray-finishing equipment shall be separated from other areas and operations by means of booths, fencing, railings or other barriers. Fencing, railings or other barriers shall be of conductive material, adequately grounded, and shall be placed not less than 5 feet (1524 mm) from the electrostatic spray-finishing equipment.

**Exception:** Such barrier and separation distance is not required to be provided for portable electrostatic spray-finishing equipment listed for use in Class I, Division 1 locations.

**1507.3.2 Fire protection.** Electrostatic spray finishing operations shall be protected by fire protection systems in compliance with the requirements of this section.

**1507.3.2.1 Fire extinguishing system.** Spraying areas shall be protected throughout by a fire extinguishing system complying with FC Chapter 9.

**1507.3.2.2 Flame detection system.** Automated liquid electrostatic spray-finishing operation areas shall be protected by the installation of an approved, supervised flame detection system capable of detecting the presence of flame within ½ second, which shall, upon activation, automatically initiate the following actions:

1. Shut down electrical power to the electrostatic spray-finishing equipment, including the coating material delivery system and the conveyors into and out of the flammable vapor area, and terminating all spray-finishing operations.

2. Activate a local alarm in the spraying area, and the building fire alarm system if such a system is provided.

**1507.3.3 Interlocks.** Electrostatic spray-finishing equipment shall be provided with emergency shut down devices and interlocks in compliance with the requirements of this section.

**1507.3.3.1 Emergency shutdown.** Electrostatic spray-finishing equipment shall be equipped with automatic controls operating without time delay to disconnect the power supply to the high-voltage transformer and signal the operator under any of the following conditions:

1. Stoppage of ventilating fans or failure of ventilating equipment from any cause.

2. Stoppage of the conveyor carrying articles past the high-voltage grid.

3. Occurrence of a ground fault or an imminent ground fault at any point of the high-voltage system.

4. Reduction of clearance below that required in FC1507.2.

**1507.3.3.2 Ventilation interlock.** Electrostatic spray-finishing equipment utilizing hand-held sprayers shall be interlocked with the ventilation system for the spraying area so that the equipment cannot be operated unless the ventilating system is in operation.

**1507.3.4 Ventilation.** Mechanical ventilation in the flammable vapor area shall be provided in accordance with Chapter 5 of the Mechanical Code.

**1507.4 Operation and maintenance.** Facilities in which electrostatic spray-finishing operations are conducted shall be operated and maintained in compliance with the requirements of this section and FC 1503.3 and 1503.4, and FC 1507.4.1 through 1507.4.3.

**1507.4.1 Cleaning.** Insulators shall be kept clean and dry. Drip plates and screens upon which paint is deposited shall be removable and shall be regularly removed and cleaned. Grounding connections for the electrostatic spray-finishing equipment shall be regularly cleaned so as to prevent overspray.

**1507.4.2 Signage.** Durable signs that provide the following cautions and information shall be conspicuously posted:

1. Designate the process zone as dangerous with respect to fire and accident.

2. Restrict access to qualified personnel only.

3. Indicate the grounding requirements for all electrically conductive objects in the flammable vapor area, including persons working in that area.

4. Indicates the maximum potential sparking distance as set forth in FC1507.2.

**1507.4.3 Sources of ignition.** Transformers, power packs, control apparatus and all other electrical components of the electrostatic spray-finishing equipment, except high-voltage grids and electrostatic atomizing heads and connections, shall be located outside of the flammable vapor area or shall comply with the requirements of FC1503.2.

## [SECTION FC 1508
## AUTOMOBILE UNDERCOATING

**1508.1 General.** Automobile undercoating spray operations conducted in areas with approved natural or mechanical ventilation shall not be required to comply with the requirements of Section 1504 when approved and where utilizing Class IIIA or IIIB combustible liquids.]

## SECTION FC [1509] 1508
## ORGANIC PEROXIDES AND DUAL-COMPONENT COATINGS

**[1509.1 Contamination prevention.** Organic peroxide initiators shall not be contaminated with foreign substances.

**1509.2 Equipment.** Spray guns and related handling equipment used with organic peroxides shall be of a type manufactured for such use.

**1509.3 Pressure tanks.** Separate pressure vessels and inserts specifically for the application shall be used for the resin and for the organic peroxide, and shall not be interchanged. Organic peroxide pressure tank inserts shall be constructed of stainless steel or polyethylene.

**1509.4 Residue control.** Materials shall not be contaminated by dusts and overspray residues resulting from the sanding or spraying of finishing materials containing organic peroxides.

**1509.5 Spilled material.** Spilled organic peroxides shall be promptly removed so there are no residues. Spilled material absorbed by using a noncombustible absorbent shall be promptly removed from the premises and disposed of lawfully.

**1509.6 Use of organic peroxide coatings.** Spraying operations involving the use of organic peroxides and other dual-component coatings shall be conducted in spray booths complying with the requirements of Section 1504.1.2 that are protected throughout by a sprinkler system.

**1509.7 Storage.** The storage of organic peroxides shall be in accordance with Chapter 39.

**1509.8 Handling.** Handling of organic peroxides shall be conducted in a manner that avoids shock and friction that produces decomposition and violent reaction hazards.

**1509.9 Mixing.** Organic peroxides shall not be mixed directly with accelerators or promoters.

**1509.10 Sources of ignition.** Only nonsparking tools shall be used in areas where organic peroxides are stored, mixed or applied. Such areas shall comply with the requirements of Section 1503.2.]

**1508.1 General.** Spraying operations involving the use of organic peroxides and other dual-component coatings shall be conducted in accordance with this section and FC1503.

**1508.2 Design and construction.** Spraying operations involving the use of organic peroxides and other dual-component coatings shall be conducted in a facility designed and installed in accordance with this section.

**1508.2.1 Construction.** Spraying operations shall be conducted in spray booths complying with the requirements of FC1504.3.2.

**1508.2.2 Fire extinguishing systems.** Spray booths shall be protected throughout by a sprinkler system.

**1508.2.3 Equipment.** Spray guns and related equipment shall be of a type manufactured for such use.

**1508.2.4 Pressure tanks.** Separate pressure vessels and inserts shall be used for the application of the resin and the organic peroxide, and shall not be interchanged. Organic peroxide pressure tank inserts shall be constructed of stainless steel or polyethylene.

**1508.3 Operation and maintenance.** Facilities in which spraying operations involving the use of organic peroxides and other dual-component coatings are conducted shall be operated and maintained in compliance with the requirements of this section and FC 1503.3 and 1503.4, and FC 1508.3.1 through 1508.3.8.

**1508.3.1 Contamination prevention.** Organic peroxide initiators shall not be contaminated with foreign substances.

**1508.3.2 Spilled material.** Spilled organic peroxides shall be promptly removed so there are no residues. Spilled material absorbed by using a noncombustible absorbent shall be promptly removed from the premises and disposed of lawfully.

**1508.3.3 Residue control.** Materials shall not be contaminated by dusts and overspray residues resulting from the sanding or spraying of finishing materials containing organic peroxides.

**1508.3.4 Handling.** Handling of organic peroxides shall be conducted in a manner that avoids shock and friction that produces decomposition and violent reaction hazards.

**1508.3.5 Mixing.** Organic peroxides shall not be mixed directly with accelerators or promoters.

**1508.3.6 Personnel qualifications.** Personnel working with organic peroxides and dual-component coatings shall be specifically trained to work with these materials.

**1508.3.7 Storage.** The storage of organic peroxides shall be in accordance with FC Chapter 39.

**1508.3.8 Sources of ignition.** Only nonsparking tools shall be used in areas where organic peroxides are stored, mixed or applied.

## [SECTION FC 1510
## FLOOR FINISHING OPERATIONS

**1510.1 Scope.** All floor finishing operations using Class I or Class II liquids shall comply with the requirements of Sections 1510.1.1 and 1510.1.2. Floor finishing operations exceeding 168 square feet (15.6 $m^2$) and using Class I or Class II liquids shall additionally comply with the requirements of Sections 1510.2 through 1510.5.

**1510.1.1 Prohibitions.** It shall be unlawful to:

1. Use flammable floor finishing products with a flash point below 80°F (27°C) indoors.

2. Smoke, use or maintain open flames, including torches, in rooms or other indoor areas in which floor finishing products are being stored and/or in which floor finishing operations are being conducted.

3. Conduct floor finishing operations in rooms or other indoor areas occupied by anyone other than the individuals engaged in such operations.

**1510.1.2 General requirements.** All floor finishing operations shall comply with the following requirements:

1. Floor finishing operations shall be conducted in accordance with the manufacturer's instructions for the storage, handling and use of floor finishing products.

2. Flammable or combustible liquids or mixtures, other than floor finishing products, stored, handled or used in connection with floor finishing operations shall be stored, handled or used in accordance with Chapter 34.

3. Floor finishing product containers shall be closed when not in use.

4. Empty containers of floor finishing products and all other floor finishing product waste and residue shall be removed from the premises not less than once a day.

5. Gas burners, pilot lights, electrical devices, electronic devices and other sources of ignition in vapor areas shall be shut off prior to commencing work.

6. At least one portable fire extinguisher with a minimum rating of 20-B shall be immediately accessible during floor finishing operations. The travel distance to such extinguisher shall not exceed 30 feet (9144 mm).

7. Quantities of floor finishing products at a site shall not exceed the amount necessary for that day's operations. In no event shall such quantity exceed 20 gallons (76 L).

**1510.2 Business operation.** Floor finishing operations shall not be conducted while an establishment is open to the public.

**1510.3 Ventilation.** To prevent the accumulation of flammable vapors, mechanical ventilation at a minimum rate of 1 cubic foot per minute per square foot [0.00508 m3/(s × m2)] of area being finished shall be provided. Such ventilation shall be by approved temporary or portable means. Vapors shall be exhausted outdoors. Such ventilation equipment shall be kept in operation while the floor finishing operations are conducted and for a period of time thereafter to allow for the exhaust of the vapors.

**1510.4 Mechanical system operation.** Heating, ventilation and air-conditioning systems shall not be operated during refinishing operations or within 4 hours of the application of flammable or combustible liquids.

**1510.5 Sources of ignition.** No electrical equipment or device that is a potential source of ignition of floor finishing product vapors, including switches and outlets, shall be operated during floor finishing operations. Precautions shall be taken prior to commencing work to prevent inadvertent operation of such equipment or devices, such as shutting down electrical power, unplugging equipment and taping over switches and outlets.

**1510.6 Retail sale.** Floor finishing products with a flash point below 80°F (27°C) shall be provided with a conspicuous and durable tag bearing the words, "WARNING: INDOOR USE OF THIS PRODUCT IS PROHIBITED IN NEW YORK CITY." A sign shall be conspicuously posted in the area in which the floor finishing product is displayed, warning that the product is prohibited for indoor use in New York City.]

## SECTION FC [1511] 1509
## INDOOR MANUFACTURING OF REINFORCED PLASTICS

**[1511.1] 1509.1 General.** Indoor manufacturing processes involving spray or hand application of reinforced plastics and using more than 5 gallons (19 L) of resin in a 24-hour period shall be conducted in accordance with this section and FC1508.

**[1511.2 Resin application equipment.** Equipment used for spray application of resin shall be designed, installed, operated and maintained in accordance with Sections 1509 and 1511.]

**1509.2 Design and installation.** Indoor manufacturing processes involving spray or hand application of reinforced plastics shall be conducted in a facility designed and installed in compliance with the requirements of this section.

**[1511.3] 1509.2.1 Fire protection.** Resin application areas shall be protected throughout by a sprinkler system. The sprinkler system design shall not be less than that required for Ordinary Hazard, Group 2, with a minimum design area of 3,000 square feet (279 $m^2$). Where the materials or storage arrangements are required by other regulations to be provided with a higher level of sprinkler system protection, the higher level of sprinkler system protection shall be provided.

**1509.2.2 Ventilation.** Mechanical ventilation shall be provided in resin application areas in accordance with Chapter 5 of the Mechanical Code. The ventilation rate shall be adequate to maintain the concentration of flammable vapors in the resin application area at or below 25 percent of the lower flammable limit (LFL).

**Exception:** Mechanical ventilation is not required for buildings that are unenclosed for at least 75 percent of the perimeter.

**1509.2.2.1 Local ventilation.** Local ventilation shall additionally be provided inside of workpieces where personnel will be under or inside of the workpiece.

**1509.2.3 Sources of ignition.** Sources of ignition in resin application areas shall comply with the requirements of FC1503.2.

**[1511.4 Sources of ignition in resin application areas.** Sources of ignition in resin application areas shall comply with the requirements of Section 1503.2.

**1511.5 Ventilation.** Mechanical ventilation shall be provided throughout resin application areas in accordance with Sections 1504.2 and 1504.3. The ventilation rate shall be adequate to maintain the concentration of flammable vapors in the resin application area at or below 25 percent of the lower flammable limit (LFL).

**Exception:** Mechanical ventilation is not required for buildings that are unenclosed for at least 75 percent of the perimeter.

**1511.5.1 Local ventilation.** Local ventilation shall be provided inside of workpieces where personnel will be under or inside of the workpiece.

**1511.6 Storage and use of hazardous materials.** Storage and use of organic peroxides shall be in accordance with Section 1509 and Chapter 39. Storage and use of flammable and combustible liquids shall be in accordance with Chapter 34. Storage and use of unstable (reactive) materials shall be in accordance with Chapter 43.]

**1509.3 Operation and maintenance.** Facilities in which indoor manufacturing processes involving spray or hand application of reinforced plastics are conducted shall be operated and maintained in compliance with the requirements of this section and FC 1503.3 and 1503.4.

**[1511.7] 1509.3.1 Handling of excess catalyzed resin.** A noncombustible, open-top container shall be provided for disposal of excess catalyzed resin. Excess catalyzed resin shall be drained into the container while still in the liquid state. Enough water shall be provided in the container to maintain a minimum 2-inch ([51 mm] 51-mm) water layer over contained resin.

**[1511.8] 1509.3.2 Control of overchop.** In areas where chopper guns are used, exposed wall and floor surfaces shall be covered with paper, polyethylene film[,] or other approved material to allow for removal of overchop. Overchop shall be allowed to cure for not less than 4 hours prior to removal of the wall and floor coverings. Used coverings shall be placed in a noncombustible container and removed from the premises.

**[1511.8.1 Disposal.** Following removal, used wall and floor covering materials required by Section 1511.8 shall be placed in a noncombustible container and removed from the facility.]

**1509.3.3 Storage and use of hazardous materials.** Storage and use of organic peroxides shall be in accordance with FC1508 and FC Chapter 39. Storage and use of flammable and combustible liquids shall be in accordance with FC Chapter 34. Storage and use of unstable (reactive) materials shall be in accordance with FC Chapter 43.

## SECTION FC 1510
## FLOOR FINISHING OPERATIONS

**1510.1 Scope.** All floor finishing operations using Class I or Class II liquids shall be conducted in accordance with FC 1510.1.1 and 1510.1.2. Floor finishing operations exceeding 168 square feet (15.6 $m^2$) and using Class I or Class II liquids shall additionally be conducted in accordance with FC 1510.2 through 1510.5.

**1510.1.1 Prohibitions.** It shall be unlawful to:

1. Use flammable floor finishing products with a flash point below 80°F (27°C) indoors.

2. Smoke, use or maintain open flames, including torches, in rooms or other indoor areas in which floor finishing products are being stored and/or in which floor finishing operations are being conducted.

3. Conduct floor finishing operations in rooms or other indoor areas occupied by anyone other than the individuals engaged in such operations.

**1510.1.2 General requirements.** All floor finishing operations shall comply with the following requirements:

1. Floor finishing operations shall be conducted in accordance with the manufacturer's instructions for the storage, handling and use of floor finishing products.

2. Flammable or combustible liquids or mixtures, other than floor finishing products, stored, handled or used in connection with floor finishing operations shall be stored, handled or used in accordance with FC Chapter 34.

3. Floor finishing product containers shall be closed when not in use.

4. Empty containers of floor finishing products and all other floor finishing product waste and residue shall be removed from the premises not less than once a day.

5. Gas burners, pilot lights, electrical devices, electronic devices and other sources of ignition in flammable vapor areas shall be shut off prior to commencing work.

6. At least one portable fire extinguisher with a minimum rating of 20-B shall be readily accessible during floor finishing operations. The travel distance to such extinguisher shall not exceed 30 feet (9144 mm).

7. Quantities of floor finishing products at a site shall not exceed the amount necessary for that day's operations. In no circumstance shall such quantity exceed 20 gallons (76 L).

**1510.2 Occupancy of premises during operations.** Floor finishing operations shall not be conducted in occupied rooms or other areas. If occupants are allowed to return to the premises in which the floor finishing operations were conducted before the surfaces have dried, fire safety precautions shall be maintained and the occupants shall be given written instructions in regard thereto. Floor finishing operations shall not be conducted in a Group A or Group M occupancy while the premises is open to the public.

**1510.3 Sources of ignition.** No electrical equipment or device that is a potential source of ignition of floor finishing product vapors, including switches and outlets, shall be operated during floor finishing operations. Precautions shall be taken prior to commencing work to prevent inadvertent operation of such equipment or devices, such as shutting down electrical power, unplugging equipment and taping over switches and outlets.

**1510.4 Mechanical system operation.** Heating, ventilation and air-conditioning systems shall not be operated during floor finishing operations and for the period of time thereafter until the surfaces have dried.

**1510.5 Ventilation.** To prevent the accumulation of flammable vapors, mechanical ventilation at a minimum rate of 1 cubic foot per minute per square foot (0.00508 $m^3/s/m^2$) of the area being surfaced or finished shall be provided. Such ventilation shall be by approved temporary or portable means. Vapors shall be exhausted outdoors. Such ventilation equipment shall be kept in operation while the floor finishing operations are being conducted and for a period of time thereafter to allow for the exhaust of the vapors.

**1510.6 Retail sale.** Floor finishing products with a flash point below 80°F (27°C) shall be provided with a conspicuous and durable tag bearing the words, "WARNING: INDOOR USE OF THIS PRODUCT IS PROHIBITED IN NEW YORK CITY." A sign shall be conspicuously posted in the area in which the floor finishing product is displayed, warning that the product is prohibited for indoor use in New York City.

## CHAPTER 16
## FRUIT AND CROP RIPENING

### SECTION FC 1601
### GENERAL

**1601.1 Scope.** This chapter shall govern the design, installation, operation and maintenance of facilities in which ethylene gas is used, other than in self-contained equipment, to promote the ripening of fruits, vegetables and other crops.

> **Exception:** Mixtures of ethylene and one or more inert gases in concentrations which prevent the gas from reaching greater than 25 percent of the lower explosive limit (LEL) when released to the atmosphere.

**1601.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**1601.3 Ethylene generators.** Approved ethylene generators shall be operated and maintained in accordance with [Section 1606] FC1606.

**1601.4 General.** Facilities using ethylene gas to promote the ripening of fruits, vegetables and other crops shall be designed, installed, operated and maintained in accordance with this chapter.

### SECTION FC 1602
### DEFINITIONS

**1602.1 Terms defined in FC Chapter 2.** Terms used in this chapter, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown in FC Chapter 2 or elsewhere in this code.

### SECTION FC 1603

## ETHYLENE GAS

**1603.1 Location.** Ethylene gas shall be discharged only into approved rooms or enclosures designed and constructed for this purpose.

**1603.2 Dispensing.** Valves controlling discharge of ethylene shall provide positive and fail-closed control of flow and shall be set to limit the concentration of gas in air below 1,000 parts per million (ppm).

## SECTION FC 1604
## SOURCES OF IGNITION

**1604.1 Ignition prevention.** Sources of ignition shall be controlled or protected in accordance with this section and FC Chapter 3.

**1604.2 Electrical wiring and equipment.** Electrical wiring and equipment, including [lighting fixtures] luminaires, shall be approved for use in Class I, Division 2, Group C hazardous (classified) locations.

**1604.3 Static electricity.** Devices, equipment and systems, including containers and piping, used to dispense ethylene, shall be bonded and grounded to prevent the discharge of static sparks or arcs.

**1604.4 Lighting.** Lighting shall be by approved electric lamps or [fixtures] luminaires only.

**1604.5 Heating.** Heating shall be by indirect means utilizing low-pressure steam, hot water, or warm air.

> **Exception:** Electric or fuel-fired heaters approved for use in hazardous (classified) locations which are installed and operated in accordance with the Electrical Code, the Mechanical Code or the Fuel Gas Code.

## SECTION FC 1605
## COMBUSTIBLE WASTE

**1605.1 Housekeeping.** Empty boxes, cartons, pallets and other combustible waste shall be removed from ripening rooms or enclosures and properly disposed of at the end of each work shift, but at least once a day.

## SECTION FC 1606
## ETHYLENE GENERATORS

**1606.1 Ethylene generators.** Ethylene generators shall be listed and labeled by an approved testing laboratory and used only in approved rooms in accordance with the ethylene generator manufacturer's instructions. The listing evaluation shall include documentation that the concentration of ethylene gas does not exceed 25 percent of the lower explosive limit (LEL).

**1606.2 Ethylene generator rooms.** Ethylene generators shall be used in rooms having a volume of not less than the minimum room size provided for in the manufacturer's specifications and testing laboratory listing, but in no case less than 1,000 cubic feet (28 $m^3$). Rooms shall have air circulation to ensure even distribution of ethylene gas and shall be free from sparks, open flames or other ignition sources.

## SECTION FC 1607
## WARNING SIGNS

**1607.1 Required warning sign.** Approved warning signs identifying the hazard and indicating the danger involved and necessary precautions shall be posted on all doors and entrances to the premises in accordance with FC Chapter 27.

# CHAPTER 17
# FUMIGATION AND [THERMAL] INSECTICIDAL FOGGING

## SECTION FC 1701
## GENERAL

**1701.1 Scope.** This chapter shall govern fumigation and [thermal] insecticidal fogging operations within buildings and structures.

**1701.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**1701.3 General.** Fumigation and [thermal] insecticidal fogging operations within buildings and structures shall be conducted in accordance with this chapter.

**1701.4 Supervision.** Fumigation and [thermal] insecticidal fogging operations shall be supervised in accordance with [Section] FC 1701.4.1 and 1701.4.2.

**1701.4.1 Fumigation and [thermal] insecticidal fogging operation company certificate.** Persons engaged in the business of fumigation and [thermal] insecticidal fogging operations shall obtain a fumigation and [thermal] insecticidal fogging operation company certificate.

**1701.4.2 Fumigation and [thermal] insecticidal fogging operations.** Fumigation and [thermal] insecticidal fogging operations requiring a permit or a company certificate shall be conducted by or under the personal supervision of a person holding a certificate of fitness.

**1701.5 Compliance with other provisions of law.** Fumigation and [thermal] insecticidal fogging operations shall comply with all applicable federal, state and city laws, rules and regulations.

**1701.6 Prohibitions.** It shall be unlawful to:

1. Use insecticidal fogging liquids with a flash point below 100°F (38°C).

2. Use carbon disulfide and hydrogen cyanide for fumigation unless conducted on a premises used solely for agriculture.

## SECTION FC 1702
## DEFINITIONS

**1702.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**FUMIGANT.** A substance which by itself or in combination with any other substance emits or liberates a gas, fume or vapor utilized for the destruction or control of insects, rats or other vermin or fungi, germs or similar conditions, as distinguished from insecticides and disinfectants which are essentially effective in the solid or liquid phases. Examples are methyl bromide, ethylene dibromide, hydrogen cyanide, carbon disulfide and sulfuryl fluoride.

**FUMIGATION.** The utilization within an enclosed space of a fumigant in concentrations that are hazardous or acutely toxic to humans.

**FUMIGATION AND [THERMAL] INSECTICIDAL FOGGING OPERATION COMPANY CERTIFICATE.** A certificate issued by the commissioner to a person engaged in the business of fumigation and [thermal] insecticidal fogging operations, which authorizes an owner or principal of such business to conduct such fumigation and [thermal] insecticidal fogging operations, for which such certificate is required by this code or the rules.

**[THERMAL] INSECTICIDAL FOGGING.** The utilization of insecticidal liquids passed through [thermal] fog-generating units where, by [means of heat,] pressure and turbulence, and with or without addition of heat, such liquids are transformed and discharged in the form of fog or mist blown into an area to be treated.

## SECTION FC 1703
## FIRE SAFETY REQUIREMENTS

**1703.1 General.** Fumigation and [thermal] insecticidal fogging operations in buildings and structures shall be conducted in compliance with the fire protection and safety requirements of [Sections] FC 1703.2 through [1703.7] 1703.5.

**1703.2 Sources of ignition.** Open flames and similar sources of ignition shall be removed from the space in which fumigation or [thermal] insecticidal fogging operations are being conducted. Heating, where needed, shall be of an approved type.

**1703.2.1 Electricity.** Electricity in any part of the building or structure where operation of switches or electrical devices, equipment and systems could serve as a source of ignition during and for a reasonable time after any fumigation or [thermal] insecticidal fogging operation shall be shut off.

**Exception:** Circulating fans that have been specifically designed for utilization in hazardous atmospheres and installed in accordance with the Electrical Code.

**1703.2.2 Electronic devices.** Electronic devices, including portable equipment and cellular phones, shall be shut off. Telephone lines shall be disconnected from telephones.

**1703.3 Notification.** The department shall be notified in writing at least 48 hours before the building or structure is to be closed in connection with the utilization of any toxic or flammable fumigant. Notification shall give the location of the enclosed space to be fumigated or fogged, the occupancy, the fumigants or insecticides to be utilized, the person or persons responsible for the operation, and the date and time at which the operation will begin. Written notice of any fumigation or [thermal] insecticidal fogging operation shall be given to all affected occupants of the building, structure or portion thereof in which such operations are to be conducted, with sufficient advance notice to allow all such spaces to be vacated in an orderly manner. Such notice shall inform the occupants as to the purposes and anticipated duration of the fumigation operations.

**1703.3.1 Warning signs.** Approved warning signs indicating the danger, type of chemical involved and necessary precautions shall be posted on all doors and entrances to the premises and upon all gangplanks and ladders from the deck, pier or land to the marine vessel <u>or watercraft</u>. Such notices shall be printed in red ink on a white background. Letters in the headlines shall be at least 2 inches (51 mm) in height and shall state the date and time of the operation, the name and address of the person conducting the fumigation or [thermal] insecticidal fogging, the name of the operator in charge, and a warning stating that the occupied premises shall be vacated at least 1 hour before the operation begins and shall not be reentered until the danger signs have been removed by the proper authorities. Advance notice shall be given to all occupants of the building or structure where fumigation and [thermal] insecticidal fogging operations are to be conducted to warn of the hazards of such operation.

**1703.3.2** Reserved.

**1703.3.3 [Watch personnel] <u>Watchperson</u>.** During the period fumigation is in progress, except when fumigation is conducted in a gas-tight vault or tank, [a responsible watchperson] <u>one or more watchpersons</u> shall [remain on duty at the entrance or entrances to the enclosed fumigated space] <u>be provided at each entrance to the space being fumigated to prevent entry into such space</u> until [after] the fumigation is completed and the premises is properly ventilated and safe for occupancy. [Sufficient watchers shall be provided to prevent persons from entering the enclosed space under fumigation.]

**[1703.4 Prohibited thermal insecticidal fogging liquids.** It shall be unlawful to use thermal insecticidal fogging liquids with a flash point below 100°F (38°C).]

**[1703.5] <u>1703.4</u> Wrapping of buildings.** Paper and other similar combustible materials that [are not flame resistant] <u>do not meet the flame propagation performance criteria of NFPA 701</u> shall not be used to wrap or cover a building in excess of that required for the sealing of cracks, casements and similar openings.

**[1703.6] <u>1703.5</u> Ventilation and cleanup.** At the end of the exposure period, fumigators shall safely and properly ventilate the premises and contents; properly dispose of fumigant containers, residues, debris and other waste materials; and clear obstructions from gas-fired appliance vents.

**[1703.7 Flammable fumigants restricted.** It shall be unlawful to use carbon disulfide and hydrogen cyanide for fumigation unless conducted on a premises used solely for agriculture.]

# CHAPTER 18
# SEMICONDUCTOR FABRICATION FACILITIES

## SECTION FC 1801
## GENERAL

**1801.1 Scope.** This chapter shall govern the design, installation, operation and maintenance of semiconductor fabrication facilities and comparable research and development facilities classified as Group H-5 occupancies, and the storage, handling and use of hazardous materials therein.

**1801.2 Application.** The requirements set forth in this chapter are requirements specific only to Group H-5 and shall be applied as exceptions or additions to applicable requirements set forth elsewhere in this code.

**1801.3 Multiple hazards.** Where a material poses multiple hazards, all hazards shall be addressed in accordance with [Section 2701.1] FC2701.1.

**1801.4 General.** Semiconductor fabrication facilities and comparable research and development facilities classified as Group H-5 occupancies shall be designed, installed, operated and maintained in accordance with this chapter. Such facilities and hazardous materials shall additionally comply with the requirements of the construction codes, including the Building Code.

**1801.5 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

## SECTION FC 1802
## DEFINITIONS

**1802.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**CONTINUOUS GAS DETECTION SYSTEM.** A gas detection system where the analytical instrument is maintained in continuous operation and sampling is performed without interruption on a cyclical basis at intervals not to exceed 30 minutes.

**EMERGENCY CONTROL STATION.** An approved location on the premises of a semiconductor fabrication facility staffed by trained personnel that monitor the operation of equipment and systems including alert and alarm signals.

**FABRICATION AREA.** An area within a semiconductor fabrication facility in which processes using hazardous production materials are conducted.

**HAZARDOUS PRODUCTION MATERIAL (HPM).** A solid, liquid or gas associated with semiconductor manufacturing that has a degree-of-hazard rating in health, flammability or [reactivity] instability of Class 3 or 4 as defined in NFPA 704 and which is used directly in research, laboratory or production processes which have, as their end product, materials that are not hazardous.

**HPM FLAMMABLE LIQUID.** An HPM liquid that is defined as either a Class I flammable liquid or a Class II or Class IIIA combustible liquid.

**HPM ROOM.** A room used in conjunction with or serving a Group H-5 occupancy, where HPM is stored or used and which is classified as a Group H-2, H-3 or H-4 occupancy.

**PASS-THROUGH.** An enclosure installed in a wall with a door on each side that allows chemicals, HPM, equipment, and parts to be transferred from one side of the wall to the other.

**SEMICONDUCTOR FABRICATION FACILITY.** A building or structure, or [portion] part thereof, in which electrical circuits or devices, commonly known as semiconductors, are manufactured on solid crystalline substances having electrical conductivity greater than insulators but less than conductors.

**SERVICE CORRIDOR.** A fully enclosed passage, other than one designated as a required means of egress, through which HPM can be moved during handling.

**TOOL.** A device, storage container, workstation, or process machine used in a fabrication area.

**WORKSTATION.** A defined space within a fabrication area in which a specific function, laboratory procedure or research activity relating to semiconductor manufacture is conducted. A workstation may include equipment using HPM, hazardous materials storage cabinets, flammable liquid storage cabinets or gas cabinets, ventilation equipment, fire protection devices, detection devices and electrical devices.

## SECTION FC 1803
## GENERAL SAFETY PROVISIONS

**1803.1 Emergency control station.** An emergency control station shall be maintained in accordance with FC 1803.1.1 through 1803.1.3.

**1803.1.1 Location.** The emergency control station shall be located on the premises at an approved location outside of the fabrication area[, and shall be continuously staffed by trained personnel].

**1803.1.2 Staffing.** Trained personnel shall continuously staff the emergency control station.

**1803.1.3 Signals.** The emergency control station shall monitor signals from emergency equipment and alarm and detection systems, including the following systems, whether required by this code or the construction codes or voluntarily installed[.]:

1. Sprinkler system alarm and monitoring systems.

2. Manual fire alarm systems.

3. Emergency alarm systems.

4. Continuous-gas detection systems.

5. Smoke detection systems.

6. Emergency power systems.

7. Automatic detection and alarm systems for pyrophoric liquids and Class 3 water-reactive liquids required by FC1805.2.3.4.

8. Exhaust ventilation flow alarm devices for pyrophoric liquids and Class 3 water-reactive liquids cabinet exhaust ventilation systems required by FC1805.2.3.4.

**1803.2 Devices, equipment and systems.** Devices, equipment and systems including, containers, piping, tubing, valves and fittings shall comply with the requirements of this section, [Section 2703.2] FC2703.2, and other applicable provisions of this code, and the construction codes, including the Building Code and the Mechanical Code.

**1803.2.1 Additional regulations for HPM supply piping and tubing.** The requirements set forth in [Section 2703.2.2.2] FC2703.2.2.2 shall apply to supply piping and tubing for HPM gases and liquids. Supply piping and tubing for HPM gases and liquids having a health-hazard ranking of 3 or 4 shall be welded throughout, except for connections located within a ventilated enclosure if the material is a gas, or an approved method of drainage or containment is provided for connections if the material is a liquid.

**1803.3 Design and installation requirements.** Semiconductor fabrication facilities shall be designed and installed in accordance with [Sections] FC 1803.3.1 through [1803.3.8] 1803.3.9.

**1803.3.1 Fabrication areas.** Design, installation and location of fabrication areas shall comply with the requirements of the construction codes, including the Building Code.

**1803.3.2 Pass-throughs in exit access corridors.** Pass-throughs in exit access corridors shall be constructed in accordance with the construction codes, including the Building Code.

**1803.3.3 Liquid storage rooms.** Liquid storage rooms shall comply with the requirements of FC Chapter 34 and the construction codes, including the Building Code.

**1803.3.4 HPM rooms.** HPM rooms shall comply with the requirements of the construction codes, including the Building Code.

**1803.3.5 Gas cabinets.** Gas cabinets shall comply with the requirements of [Section 2703.8.6] FC2703.8.6.

**1803.3.6 Exhausted enclosures.** Exhausted enclosures shall comply with the requirements of [Section 2703.8.5] FC2703.8.5.

**1803.3.7 Gas rooms.** Gas rooms shall comply with the requirements of [Section 2703.8.4] FC2703.8.4.

**1803.3.8 Service corridors.** Service corridors shall comply with the requirements of [Section 1805.3] FC1805.3.3 and the Building Code.

**1803.3.9 Cabinets containing pyrophoric liquids or water-reactive Class 3 liquids.** Cabinets in fabrication areas containing pyrophoric liquids or Class 3 water-reactive liquids in containers or in amounts greater than ½ gallon (2 L) shall comply with FC1805.2.3.4.

**1803.4 Emergency plan.** [A fire safety and evacuation] An emergency preparedness plan shall be prepared in accordance with FC Chapter 4.

**1803.5 Maintenance of devices, equipment, systems and processes.** Maintenance of devices, equipment, systems and processes shall comply with the requirements of [Section 2703.2.6] FC2703.2.6.

**1803.6** Reserved.

**1803.7 Electrical wiring and equipment.** Electrical wiring and equipment in HPM facilities shall comply with the requirements of [Sections] FC 1803.7.1 through 1803.7.3.

**1803.7.1 Fabrication areas.** Electrical wiring and equipment in fabrication areas shall comply with the requirements of the Electrical Code.

**1803.7.2 Workstations.** Electrical equipment and devices within 5 feet (1524 mm) of workstations in which flammable or pyrophoric gases or flammable liquids are used shall comply with the requirements of the Electrical Code for Class I, Division 2 hazardous locations. Workstations shall not be energized without adequate exhaust ventilation in accordance with [Section 1803.14] FC1803.14.

**Exception:** Class I, Division 2 hazardous electrical equipment is not required when the air removal from the workstation or dilution will prevent the accumulation of flammable vapors and fumes on a continuous basis.

**1803.7.3 Hazardous production material (HPM) rooms, gas rooms and liquid storage rooms.** Electrical wiring and equipment in HPM rooms, gas rooms and liquid storage rooms shall comply with the requirements of the Electrical Code.

**1803.8 [Exit access corridors and exit enclosures.** Hazardous materials shall not be used or stored in exit access corridors or exit access enclosures.] Reserved.

**1803.9 [Service corridors.** Hazardous materials shall not be used in service corridors.] Reserved.

**1803.10 Sprinkler system.** A sprinkler system shall be provided in accordance with [Sections] FC 1803.10.1 through 1803.10.5, FC Chapter 9 and the Building Code.

**1803.10.1 Workstations and tools.** The design of the sprinkler system in the area shall take into consideration the spray pattern and the effect on the equipment.

**1803.10.1.1 Combustible workstations.** A sprinkler head shall be installed within each branch exhaust connection or individual plenums of workstations of combustible construction. The sprinkler head in the exhaust connection or plenum shall be located not more than 2 feet (610 mm) from the point of the duct connection or the connection to the plenum. When necessary to prevent corrosion, the sprinkler head and connecting piping in the duct shall be coated with approved or listed corrosion-resistant materials. The sprinkler head shall be accessible for periodic inspection in accordance with FC Chapter 9.

**Exceptions:**

1. Alternative fire extinguishing systems shall be allowed where approved. Activation of such systems shall deactivate the related processing equipment.

2. Process equipment that operates at temperatures exceeding 932°F (500°C) and has automatic shutdown capabilities that will interrupt HPM flow for hazardous materials.

3. Exhaust ducts 10 inches (254 mm) or less in diameter from flammable gas storage cabinets that are part of a workstation.

4. Ducts listed or approved for use without internal sprinkler protection.

**1803.10.1.2 Combustible tools.** Where the horizontal surface of a combustible tool is obstructed from ceiling sprinkler discharge, sprinkler protection that covers the horizontal surface of the tool shall be provided.

**Exceptions:**

1. A gaseous fire extinguishing local surface application system shall be allowed as an alternative to sprinklers when approved. Gaseous fire extinguishing systems shall be actuated by infrared (IR) or ultraviolet/infrared (UVIR) optical detectors.

2. Tools constructed of materials that are listed or approved for use without internal fire extinguishing system protection.

**1803.10.2 Gas cabinets and exhausted enclosures.** A sprinkler system shall be provided in gas cabinets and exhausted enclosures containing HPM compressed gases.

**Exception:** Gas cabinets located in a HPM room other than those cabinets containing pyrophoric gases.

**1803.10.3 Pass-throughs in exit access corridors.** Pass-throughs in exit access corridors shall be protected throughout by a sprinkler system.

**1803.10.4 Exhaust ducts for HPM.** A sprinkler system shall be provided in exhaust ducts conveying gases, vapors, fumes, mists or dusts generated from HPM in accordance with this section and the Mechanical Code and the Building Code.

**1803.10.4.1 Metallic and noncombustible nonmetallic exhaust ducts.** A sprinkler system shall be provided in metallic and noncombustible nonmetallic exhaust ducts when the following conditions apply:

1. The largest cross-sectional diameter is equal to or greater than 10 inches (254 mm).

2. The ducts are within the building.

3. The ducts are conveying flammable gases, vapors or fumes.

**1803.10.4.2 Combustible nonmetallic exhaust ducts.** A sprinkler system shall be provided in combustible nonmetallic exhaust ducts when the largest cross-sectional diameter of the duct is equal to or greater than 10 inches (254 mm).

**Exceptions:**

1. Ducts listed or approved for applications without sprinkler system protection.

2. Ducts not more than 12 feet (3658 mm) in length installed below ceiling level.

**1803.10.4.3 Exhaust connections and plenums of combustible workstations.** Fire extinguishing system protection for exhaust connections and plenums of combustible workstations shall comply with the requirements of [Section 1803.10.1] FC1803.10.1.1.

**1803.10.4.4 Exhaust duct sprinkler system requirements.** Sprinkler systems installed in exhaust duct systems shall be hydraulically designed to provide [0.5 gallons] ½ gallon per minute (gpm) (1.9 L/min) over an area derived by multiplying the distance between the sprinklers in a horizontal duct by the width of the duct. Minimum discharge shall be 20 gpm (76 L/min) per sprinkler from the five hydraulically most remote sprinklers.

**1803.10.4.4.1 Sprinkler head locations.** Sprinkler heads shall be installed at 12-foot (3658 mm) intervals in horizontal ducts and at changes in direction. In vertical runs, sprinkler heads shall be installed at the top and at alternate floor levels.

**1803.10.4.4.2 Control valve.** A separate indicating control valve shall be provided for sprinkler heads installed in exhaust ducts.

**1803.10.4.4.3 Drainage.** Drainage shall be provided to remove sprinkler water discharged in exhaust ducts.

**1803.10.4.4.4 Corrosive atmospheres.** Where corrosive atmospheres exist, exhaust duct sprinkler heads and pipe fittings shall be manufactured of corrosion-resistant materials or coated with approved materials.

**1803.10.4.4.5 Maintenance and inspection.** Sprinkler heads in exhaust ducts shall be accessible for inspection and maintenance and shall be inspected and maintained on not less than an annual basis.

**1803.10.5 Sprinkler alarms and supervision.** Sprinkler systems shall be electrically supervised and provided with alarms in accordance with the construction codes, including the Building Code. Sprinkler system alarm and supervisory signals shall be transmitted to the emergency control station.

**1803.11 Manual fire alarm system.** A manual fire alarm system shall be installed throughout buildings containing a Group H-5 occupancy. Activation of the alarm system shall initiate a local alarm and transmit a signal to the emergency control station. Manual fire alarm systems shall be designed and installed in accordance with the construction codes, including the Building Code.

**1803.12 Emergency alarm system.** Emergency alarm systems shall be provided in accordance with this section, [Section 2704.9] FC2704.9 and [Section 2705.4.4] FC2705.4.4. The maximum allowable quantity per control area provisions of [Section 2704.1] FC2704.1 shall not apply to emergency alarm systems required for HPM.

**1803.12.1 Where required.** Emergency alarm systems shall be provided in the areas indicated in [Sections] FC 1803.12.1.1 through 1803.12.1.3.

**1803.12.1.1 Service corridors.** An approved emergency alarm system shall be provided in service corridors, with at least one alarm device in the service corridor.

**1803.12.1.2 Exit access corridors and exit enclosures.** Emergency alarms for exit access corridors and exit enclosures shall comply with the requirements of [Section 2705.4.4] FC2703.10.4.

**1803.12.1.3 Liquid storage rooms, HPM rooms and gas rooms.** Emergency alarms for liquid storage rooms, HPM rooms and gas rooms shall comply with the requirements of [Section 2704.9] FC2704.9.

**1803.12.2 Alarm-initiating devices.** An approved emergency telephone system, local alarm manual pull stations, or other approved alarm-initiating devices are allowed to be used as emergency alarm-initiating devices.

**1803.12.3 Alarm signals.** Activation of the emergency alarm system shall sound a local alarm and transmit a signal to the emergency control station.

**1803.13 Continuous gas detection systems.** A continuous gas detection system shall be provided for HPM gases when the physiological warning properties of the gas are at a higher level than the accepted permissible exposure limit (PEL) for the gas and for flammable gases in accordance with the construction codes, including the Building Code.

**1803.14 Exhaust ventilation systems for HPM.** Exhaust ventilation systems and materials for exhaust ducts utilized for the exhaust of HPM shall comply with the requirements of this section, other applicable provisions of this code, the construction codes, including the Building Code and the Mechanical Code.

**1803.14.1 Where required.** Exhaust ventilation systems shall be provided in the following locations in accordance with this section and the construction codes, including the Building Code:

1. Fabrication areas: Exhaust ventilation for fabrication areas shall comply with the requirements of the construction codes, including the Building Code. Additional manual control switches shall be provided as may be required by the commissioner.

2. Workstations: A ventilation system shall be provided to capture and exhaust fumes and vapors at workstations.

3. Liquid storage rooms: Exhaust ventilation for liquid storage rooms shall comply with the requirements of [Section 2704.3] FC2704.3.1 and the construction codes, including the Building Code and Mechanical Code.

4. HPM rooms: Exhaust ventilation for HPM rooms shall comply with the requirements of [Section 2704.3] FC2704.3.1 and the construction codes, including the Building Code and the Mechanical Code.

5. Gas cabinets: Exhaust ventilation for gas cabinets shall comply with the requirements of [Section 2703.8.6.2] FC2703.8.6.2. The gas cabinet ventilation system is allowed to connect to a workstation ventilation system. Exhaust ventilation for gas cabinets containing highly toxic or toxic gases shall additionally comply with the requirements of FC Chapter 37.

6. Exhausted enclosures: Exhaust ventilation for exhausted enclosures shall comply with the requirements of [Section 2703.8.5.2] FC2703.8.5.2. Exhaust ventilation for exhausted enclosures containing highly toxic or toxic gases shall additionally comply with the requirements of FC Chapter 37.

7. Gas rooms: Exhaust ventilation for gas rooms shall comply with the requirements of [Section 2703.8.4.2] FC2703.8.4.2. Exhaust ventilation for gas [cabinets] rooms containing highly toxic or toxic gases shall additionally comply with the requirements of FC Chapter 37.

8. Cabinets containing pyrophoric liquids or Class 3 water-reactive liquids: Exhaust ventilation for cabinets in fabrication areas containing pyrophoric liquids or Class 3 water-reactive liquids shall be as required in FC1805.2.3.4.

**1803.14.2 Penetrations.** Exhaust ducts penetrating fire barrier assemblies shall be contained in a shaft of equivalent fire-resistance-rated construction. Exhaust ducts shall not penetrate fire walls. Fire dampers shall not be installed in exhaust ducts.

**1803.14.3 Treatment systems.** Treatment systems for highly toxic and toxic gases shall comply with the requirements of FC Chapter 37.

**1803.15 Emergency power system.** An emergency power system shall be provided in Group H-5 occupancies where required by the construction codes, including the Building Code. The emergency power system shall be designed to supply power automatically to required electrical systems when the normal supply system is interrupted.

**1803.15.1 Required electrical systems.** Emergency power shall be provided for electrically operated equipment and connected control circuits as required by [Section 415.9.10.1] Chapter 4 of the Building Code or this code.

## SECTION FC 1804
## STORAGE

**1804.1 General.** Hazardous materials shall be stored in semiconductor fabrication facilities in accordance with this section[, Section 1803] and the provisions of other applicable [provisions] chapters of this code.

**1804.2 Fabrication areas.** Hazardous materials shall be stored in accordance with FC 1804.2.1 through 1804.2.2.1.

**1804.2.1 Location of HPM storage in fabrication areas.** Storage of HPM in fabrication areas shall be within approved or listed storage cabinets, gas cabinets or within a workstation[.] as follows:

1. Flammable and combustible liquid storage cabinets shall comply with the requirements of FC Chapter 34.

2. Hazardous materials storage cabinets shall comply with the requirements of [Section 2703.8.7] FC2703.8.7.

3. Gas cabinets shall comply with the requirements of [Section 2703.8.6] FC2703.8.6. Gas cabinets for highly toxic or toxic gases shall additionally comply with the requirements of [Chapter 37] FC3704.1.2.

4. Exhausted enclosures shall comply with FC2703.8.5. Exhausted enclosures for highly toxic or toxic gases shall also comply with FC3704.1.3.

5. Workstations shall comply with the requirements of [Section 1805.2.2] FC1805.2.3.

**[1804.2.1] 1804.2.2 Maximum aggregate quantities in fabrication areas.** The aggregate quantities of hazardous materials stored, handled and used in a single fabrication area shall [not exceed the quantities set forth in Table 1804.2.1] be limited as specified in this section.

**Exception:** Fabrication areas containing quantities of hazardous materials not exceeding the maximum allowable quantities per control area established by [Chapters 27 and 34] FC 2703.1.1, 3404.3.4 and 3404.3.5.

**FC TABLE [1804.2.1] 1804.2.2.1**
**QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5[a]**

| HAZARD CATEGORY | SOLIDS (pounds/square foot) | LIQUIDS (gallons/square foot) | GAS (SCF/square foot) |
|---|---|---|---|
| **PHYSICAL-HAZARD MATERIALS** | | | |
| Combustible dust | Note b | Not Applicable | Not Applicable |
| Combustible fiber<br>Loose<br>Baled | Note b<br>[Note b] Notes b, c | Not Applicable | Not Applicable |
| Combustible liquid<br>Class II<br>Class IIIA<br>Class IIIB<br>Combination Class I, II and IIIA | Not Applicable | 0.01<br>0.02<br>Not Limited<br>0.04 | Not Applicable |
| Cryogenic gas<br>Flammable<br>Oxidizing | Not Applicable | Not Applicable | Note [c] d<br>1.25 |
| Explosives | Note b | Note b | Note b |
| Flammable gas<br>Gaseous<br>Liquefied | Not Applicable | Not Applicable | Note [c] d<br>Note [c] d |
| Flammable liquid<br>Class IA<br>Class IB<br>Class IC<br>Combination Class IA, IB and IC<br>Combination Class I, II and IIIA | Not Applicable | 0.0025<br>0.025<br>0.025<br>0.025<br>0.04 | Not Applicable |
| Flammable solid | 0.001 | Not Applicable | Not Applicable |
| Organic peroxide<br>Unclassified detonable<br>Class I<br>Class II<br>Class III<br>Class IV<br>Class V | Note b<br>Note b<br>0.025<br>0.1<br>Not Limited<br>Not Limited | Not Applicable | Not Applicable |
| Oxidizing gas<br>Gaseous<br>Liquefied<br>Combination of Gaseous and Liquefied | Not Applicable | Not Applicable | 1.25<br>1.25<br>1.25 |
| Oxidizer<br>Class 4<br>Class 3<br>Class 2<br>Class 1<br>Combination oxidizer Class 1, 2, 3 | Note b<br>0.003<br>0.003<br>0.003<br>0.003 | Note b<br>0.03<br>0.03<br>0.03<br>0.03 | Not Applicable |
| Pyrophoric | Note b | 0.00125 | Notes[c] d and [d] e |
| Unstable reactive<br>Class 4<br>Class 3<br>Class 2 | Note b<br>0.025<br>0.1 | Note b<br>0.0025<br>0.01 | Note b<br>Note b<br>Note b |

| | | | |
|---|---|---|---|
| Class 1 | Not Limited | Not Limited | Not Limited |
| Water reactive<br>Class 3<br>Class 2<br>Class 1 | <br>Note b<br>0.25<br>Not Limited | <br>0.00125<br>0.025<br>Not Limited | Not Applicable |
| **HEALTH-HAZARD MATERIALS** | | | |
| Corrosives | Not Limited | Not Limited | Not Limited |
| Highly toxics | Not Limited | Not Limited | Note[c] d |
| Toxics | Not Limited | Not Limited | Note[c] d |

For SI: 1 pound per square foot = 4.882 kg/m$^2$, 1 gallon per square foot = 0.025 L/m$^2$, 1 cubic foot = 0.02832 m$^3$.
a. Hazardous materials within piping shall not be included in the calculated quantities.
b. Quantity of hazardous materials in a single fabrication area shall not exceed the maximum allowable quantities per control area in FC Tables 2703.1.1(1) and 2703.1.1(2).
c. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
[c] d. The aggregate quantity of flammable, pyrophoric, toxic and highly toxic gases shall not exceed 9,000 SCF.
[d] e. The aggregate quantity of pyrophoric gases in the building shall not exceed the amounts set forth in FC Table 2703.8.2.

**[1804.2.2 Maximum quantities of HPM] 1804.2.2.1 Storage and use in fabrication areas.** The maximum quantities of [HPM] hazardous materials stored in a single fabrication area shall not exceed the [maximum allowable] quantities [per control area established by Chapters 27 and 34] set forth in FC Table 1804.2.2.1.

**1804.3 [Storage rooms] Indoor storage outside of fabrication areas.** The indoor storage of hazardous materials outside of fabrication areas shall be in accordance with FC 1804.3.1 through 1804.3.3.

**1804.3.1 HPM storage.** The indoor storage of HPM in quantities greater than those listed in [Chapters 27 and 34] FC 2703.1.1 and 3404.3.4 shall be in a room complying with the requirements of the construction codes, including the Building Code, and this code for a liquid storage room, HPM room or gas room as appropriate for the materials stored.

**1804.3.2 Other hazardous materials storage.** The indoor storage of other hazardous materials shall comply with the requirements of [Chapter 27] FC 2701, 2703 and 2704 and other applicable provisions of this code.

**[1804.3.1] 1804.3.3 Separation of incompatible hazardous materials.** Incompatible hazardous materials in storage shall be separated from each other in accordance with [Section 2703.9.8] FC2703.9.8.

**1804.4 Exit access corridors and exit enclosures.** Hazardous materials shall not be stored in exit access corridors or exit access enclosures.

## SECTION FC 1805
## HANDLING AND USE

**1805.1 General.** Hazardous materials shall be handled and used in accordance with this section, [Section 1803] FC1803 and other applicable provisions of this code.

**1805.2 Fabrication areas.** The use of hazardous materials in fabrication areas shall be in accordance with FC 1805.2.1 through 1805.2.3.4.

**1805.2.1 Location of HPM in use in fabrication areas.** Hazardous production materials [located] in use in fabrication areas shall be within approved or listed [storage cabinets,] gas cabinets, exhausted enclosures or within a workstation, in accordance with FC Chapter 27.

**[1805.2.1] 1805.2.2 Maximum aggregate quantities in fabrication areas.** The aggregate quantities of hazardous materials in a single fabrication area shall comply with the requirements of [Sections 1804.2.1 and 1804.2.2] FC1804.2.2, and FC Table [1804.2.1] 1804.2.2.1. The quantity of HPM in use at a workstation shall not exceed the quantities listed in FC Table [1805.2.1] 1805.2.2.

**FC TABLE [1805.2.1] 1805.2.2**
**MAXIMUM QUANTITIES OF HPM AT A WORKSTATION[e] d**

| HPM CLASSIFICATION | STATE | MAXIMUM QUANTITY |
|---|---|---|
| Flammable, highly toxic, pyrophoric and toxic combined | Gas | [3 containers] Combined aggregate volume of all containers at a workstation shall not exceed an internal container volume of 39.6 gallons or 5.29 cubic feet |
| Flammable | Liquid<br>Solid | 15 gallons[a, b[, c]]<br>5 pounds[a, b[, c]] |
| Corrosive | Gas<br><br>Liquid<br><br>Solid | [3 containers] Combined aggregate volume of all containers at a workstation shall not exceed an internal container volume of 39.6 gallons or 5.29 cubic feet<br>Use-Open System: 25 gallons[a, c] b<br>Use-Closed System: 150 gallons[a,c,f] b, e<br>20 pounds[a, b[, c]] |
| Highly toxic | Liquid<br>Solid | 15 gallons[a[, b]]<br>5 pounds[b] a |
| Oxidizer | Gas<br><br>Liquid<br><br>Solid | [3 containers] Combined aggregate volume of all containers at a workstation shall not exceed an internal container volume of 39.6 gallons or 5.29 cubic feet<br>Use-open system: 12 gallons[a.] b[, c]<br>Use-closed system: 60 gallons[b]<br>20 pounds[a, b[, c]] |
| Pyrophoric | Liquid<br>Solid | [0.5] ½ gallon[d] c, f<br>See FC Table [1804.2.1] 1804.2.2.1 |
| Toxic | Liquid<br><br>Solid | Use-open system: 15 gallons[a,] b[, c]<br>Use-closed system: 60 gallons[b]<br>5 pounds[a, b[, c]] |
| Unstable reactive Class 3 | Liquid<br>Solid | [0.5] ½ gallon[a, b[, c]]<br>5 pounds[a, b[, c]] |
| Water-reactive Class 3 | Liquid<br>Solid | [0.5] ½ gallon[d] c, f<br>See FC Table [1804.2.1] 1804.2.2.1 |

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L.

[a. DOT shipping containers with capacities of greater than 5.3 gallons shall not be located within a workstation.]

[b] a. Maximum allowable quantities may be increased 100 percent for closed systems operations. When Note [c] b applies, the quantities increased may be as set forth in both notes.

[c] b. Quantities may be increased 100 percent when workstations are internally protected throughout by a fire extinguishing system complying with the requirements of FC Chapter 9. When Note [b] a applies, the quantities increased may be as set forth in both notes. When Note [f] e applies, the maximum increase authorized by both Notes [c] b and [f] e shall not exceed 100 percent.

[d] c. Allowed only in workstations that are internally protected throughout by a fire extinguishing system compatible with the reactivity of materials in use at the workstation.

[e] d. The quantity limits apply only to materials classified as HPM.

[f] e. Quantities may be increased 100 percent for nonflammable, noncombustible corrosive liquids when the materials of construction for workstations are listed or approved for use without internal fire extinguishing system protection. When Note [c] b applies, the maximum increase authorized by both Notes [c] b and [f] e shall not exceed 100 percent.

f. A maximum quantity of 5.3 gallons shall be allowed at a workstation when in accordance with FC1805.2.3.4.

**[1805.2.2] 1805.2.3 Workstations.** Workstations in fabrication areas shall be in accordance with FC 1805.2.3.1 through 1805.2.3.4.

**1805.2.3.1 Construction.** Workstations in fabrication areas shall be constructed of materials compatible with the materials stored and used at the workstation. The portion of the workstation that serves as a cabinet for HPM gases and flammable liquids shall be noncombustible and, if of metal, shall not be less than 0.0478-inch ([1.2mm] 1.2-mm) (18 gauge) steel.

**[1805.2.2.1] 1805.2.3.2 Protection of vessels.** Vessels containing [HPM] hazardous materials located in or connected to a workstation shall be protected as follows:

1. HPM: Vessels containing HPM shall be protected from physical damage and shall not project from the workstation.

2. Hazardous cryogenic fluids, gases and liquids: Hazardous cryogenic fluids, gases and liquid vessels located within a workstation shall be protected from seismic forces in an approved manner in accordance with the construction codes, including the Building Code.

3. Compressed gases: Protection for [HPM] compressed gases shall additionally comply with the requirements of [Chapter 30] FC3003.3.

4. Cryogenic fluids: Protection for cryogenic fluid vessels shall additionally comply with FC3203.5.

**[1805.2.2.2] 1805.2.3.3 Drainage and containment for HPM liquids.** Each workstation utilizing HPM liquids shall be provided with all of the following:

1. Drainage piping systems connected to a compatible system for disposition of such liquids.

2. The work surface provided with a slope or other means for directing spilled materials to the containment or drainage system.

3. An approved means of containing or directing spilled or leaked liquids to the drainage system.

**[1805.2.2.3 Clearances.** Workstations where HPM is used shall be provided with horizontal servicing clearances of not less than 3 feet (914 mm) for electrical equipment, gas container connections and similar hazardous conditions. These clearances shall apply only to normal operational procedures and not to repair or maintenance-related work.]

**1805.2.3.4 Pyrophoric liquids and Class 3 water-reactive liquids.** Pyrophoric liquids and Class 3 water-reactive liquids in containers of greater than ½-gallon (2-L) but not more than 5.3-gallon (20-L) capacity shall be allowed at workstations when located inside cabinets and the following conditions are met:

1. Maximum amount per cabinet: The maximum amount per cabinet shall be limited to 5.3 gallons (20 L).

2. Cabinet construction: Cabinets shall be constructed in accordance with the following:

   2.1. Cabinets shall be constructed of not less than 0.097-inch (2.5-mm) (12 gauge) steel.

2.2. Cabinets shall be allowed to have self-closing limited access ports or noncombustible windows that provide access to equipment controls.

2.3. Cabinets shall be provided with self- or manual-closing doors. Manual-closing doors shall be equipped with a door switch that will initiate local audible and visual alarms when the door is in the open position.

3. Cabinet exhaust ventilation system: An exhaust ventilation system shall be provided for cabinets and shall comply with the following:

3.1. The system shall be designed to operate at a negative pressure in relation to the surrounding area.

3.2. The system shall be equipped with a pressure monitor and a flow switch alarm monitored at the on-site emergency control station.

4. Cabinet spill containment: Spill containment shall be provided in each cabinet, with the spill containment capable of holding the contents of the aggregate amount of liquids in containers in each cabinet.

5. Valves: Valves in supply piping between the product containers in the cabinet and the workstation served by the containers shall fail in the closed position upon power failure, loss of exhaust ventilation and upon actuation of the fire control system.

6. Fire detection system: Each cabinet shall be equipped with an automatic fire detection system complying with the following conditions:

6.1. Automatic detection system: UV/IR, high-sensitivity smoke detection (HSSD) or other approved detection systems shall be provided inside each cabinet.

6.2. Automatic shutoff: Activation of the detection system shall automatically close the shutoff valves at the source on the liquid supply.

6.3. Alarms and signals: Activation of the detection system shall initiate a local alarm within the fabrication area and transmit a signal to the emergency control station. The alarms and signals shall be both visual and audible.

**1805.2.4 Exit access corridors and exit enclosures.** Hazardous materials shall not be used in exit access corridors or exit access enclosures.

**1805.2.5 Service corridors.** Hazardous materials shall not be used in service corridors.

**1805.3 Handling.** The handling of hazardous materials shall comply with the requirements of this section and other applicable provisions of this code.

**1805.3.1 Exit corridors access and exit enclosures.** Exit access corridors and exit enclosures shall not contain HPM except as [permitted] allowed for exit access corridors by the construction codes, including the Building Code.

**1805.3.2** Reserved.

**1805.3.3 Service corridors.** A service corridor shall be provided where it is necessary to move HPM during handling from a liquid storage room, HPM room, gas room or from the outdoors to the perimeter wall of a fabrication area. Service corridors shall be designed and constructed in accordance with the construction codes, including the Building Code.

**1805.3.4 Carts and hand trucks.** Carts and hand trucks used to move HPM during handling in exit access corridors and exit enclosures shall comply with the requirements of [Section 2703.10.3] FC2703.10.3.

**1805.3.4.1 Identification.** Carts and hand trucks shall be marked to indicate the contents.

## CHAPTER 19
## LUMBER YARDS AND WOOD WASTE MATERIALS

### SECTION FC 1901
### GENERAL

**1901.1 Scope.** This chapter shall govern the manufacture, storage and handling of lumber, wood products and wood waste material.

**1901.2 Permit.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**1901.3 General.** Lumber and wood waste materials shall be stored and handled in accordance with this chapter. Facilities used for such purposes shall be designed, installed, operated and maintained in accordance with this chapter.

**1901.4 Manufacturing prohibited.** The manufacture of lumber, including plywood and other manufactured wood sheets, from trees and other natural wood materials, is prohibited, except as approved by the commissioner.

### SECTION FC 1902
### DEFINITIONS

**1902.1 Terms defined in FC Chapter 2.** Terms used in this chapter, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown in FC Chapter 2 or elsewhere in this code.

### SECTION FC 1903
### GENERAL REQUIREMENTS

**1903.1 Open yards.** Open yards required by the construction codes, including the Building Code, shall be maintained around structures.

**1903.2** Reserved.

**1903.3** Reserved.

**1903.4** Reserved.

**1903.5 Control of ignition sources.** Sources of ignition shall be controlled or protected in accordance with FC Chapter 3 and [Sections] FC 1903.5.1 and 1903.5.3.

**1903.5.1 Hot work.** Hot work shall comply with the requirements of FC Chapter 26.

**1903.5.2** Reserved.

**1903.5.3 Smoking.** It shall be unlawful to smoke in a lumber yard or wood waste material facility.

## SECTION FC 1904
## THROUGH AND INCLUDING
## SECTION1907
## RESERVED

## SECTION FC 1908
## OUTDOOR STORAGE OF WOOD CHIPS AND OTHER WOOD WASTE MATERIALS

**1908.1 General.** Wood chips and other wood waste materials shall be stored and handled in accordance with this section.

**1908.2 Storage areas.** Storage areas shall be level and on solid ground or other all-weather surface. Storage areas shall be thoroughly cleaned before transferring wood products to the area.

**1908.3 Size of piles.** Piles shall not exceed 25 feet (7620 mm) in height, 150 feet (45 720 mm) in width and 250 feet (76 200 mm) in length.

**Exception:** The commissioner may authorize increased pile sizes provided that adequate fire safety is ensured by installing additional fire protection in accordance with FC Chapter 9 and the construction codes, including the Building Code. The increase shall be based upon the capabilities of the system installed.

**1908.4 Pile separation.** Piles shall be separated from adjacent piles by approved fire apparatus access roads.

**1908.5 Combustible waste.** The storage of wood chips or other wood waste materials, the accumulation and handling of combustible materials, the control of vegetation and the disposal of combustible waste shall comply with the requirements of FC Chapter 3.

**1908.6 Pile protection.** Piles of wood chips or other wood waste materials shall be monitored by an approved means to measure internal temperatures within the piles. Internal pile temperatures shall be measured and recorded weekly.[ Records shall be kept on file at the facility and made available for inspection by any representative of the department.]

**1908.7** Reserved.

**1908.8 Fire protection.** The commissioner may require that a yard hydrant system and/or monitor nozzles connected to a fixed water supply be installed upon the premises where the facility arrangement, pile arrangement, pile heights, number of piles or total volume of piles would hamper the effectiveness of hose streams to control or extinguish a fire. Portable fire extinguishers in compliance with the requirements of [Section 906] FC906 and with a minimum rating of 4-A:60-B:C shall be readily available throughout the premises.

**1908.9 Material-handling equipment.** Approved material-handling equipment shall be available for moving wood chips and other wood waste materials during firefighting operations.

## SECTION FC 1909
## OUTDOOR STORAGE OF FINISHED LUMBER PRODUCTS

**1909.1 General.** Finished lumber products shall be stored in accordance with this section.

**1909.2 Size of piles.** Outdoor lumber storage shall be arranged to form stable piles with a maximum height of 20 feet (6096 mm). Piles shall not exceed 150,000 cubic feet (4248 $m^3$) in volume.

**1909.3 Fire apparatus access roads.** Fire apparatus access roads in accordance with [Section 503] FC503 and the construction codes, including the Building Code, shall be located so that a maximum grid system unit of 50 feet by 150 feet (15 240 mm by 45 720 mm) is established.

**1909.4 Security.** Permanent outdoor lumber storage areas shall be surrounded with an approved fence. Fences shall be a minimum of 6 feet (1829 mm) in height.

**1909.5 Fire protection.** The commissioner may require that the yard hydrant system specified in [Section 508.2.3] FC508.2.3 to include monitor nozzles connected to the fixed water supply where the facility arrangement, pile arrangement, pile heights, number of piles or total volume of piles would hamper the effectiveness of hose streams to control or extinguish a fire. Portable fire extinguishers shall be provided in accordance with [Section 906] FC906 for extra-high hazards and located so that the travel distance to the nearest portable fire extinguisher does not exceed 75 feet (22 860 mm).

# CHAPTER 20
# MANUFACTURE OF ORGANIC COATINGS

## SECTION FC 2001
## GENERAL

**2001.1 Scope.** This chapter shall govern facilities and processes where flammable and combustible liquids are used for the manufacture of organic coatings, other than facilities and processes using nonflammable coatings and operations applying coating materials.

**2001.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**2001.3 Maintenance.** Service equipment within a building, structure or premises shall be maintained in accordance with this code and NFPA 35.

**2001.4 General.** Organic coating manufacturing facilities and processes shall be designed, installed, operated and maintained in accordance with this chapter.

**2001.5 Prohibited organic coatings.** It shall be unlawful to use nitrocellulose in the manufacture of an organic coating.

## SECTION FC 2002
## DEFINITIONS

**2002.1 Definition.** The following term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

**ORGANIC COATING.** A liquid mixture of binders such as alkyd, acrylic or oil, and flammable and combustible liquids, such as hydrocarbon, ester, ketone or alcohol, which, when spread in a thin film, convert to a durable protective and decorative finish.

## SECTION FC 2003
## GENERAL PRECAUTIONS

**2003.1 Building design.** Manufacturing of organic coatings shall be conducted only in buildings or structures that do not have pits, basements or other areas below grade.

**2003.2 Location.** Organic coating manufacturing operations and operations incidental to or connected with organic coating manufacturing shall not be located in buildings having other occupancies.

> **2003.2.1 Location restrictions.** It shall be unlawful to manufacture organic coatings in any building that is located within 50 feet (15 240 mm) of a building occupied as a multiple dwelling, school, hospital, theater, or other place of assembly.

**2003.3 Firefighting access.** Organic coating manufacturing operations shall be accessible from at least one side for the purpose of fire control. Approved aisles shall be maintained for the unobstructed movement of personnel and fire suppression equipment.

**2003.4 Fire protection systems.** It shall be unlawful to manufacture an organic coating in any building unless the building is protected throughout by a fire extinguishing system. Fire protection systems shall be designed, installed, operated and maintained, including performing all required tests and inspections, in accordance with FC Chapter 9 and the Building Code.

**2003.5 Portable fire extinguishers.** A minimum of one portable fire extinguisher complying with the requirements of [Section 906] FC906 for extra hazard shall be provided in organic coating areas.

**2003.6 Open flames.** Open flames and open-flame devices are prohibited in areas where flammable vapor-air mixtures exist.

**2003.7 Smoking.** It shall be unlawful to smoke in any organic coating manufacturing facility.

**2003.8 Power equipment.** Power-operated equipment and industrial trucks shall be of a type approved for the location.

**2003.9 Tank maintenance.** The cleaning of tanks that have contained flammable or combustible liquids shall be performed under the supervision of a person trained in and knowledgeable about the fire and explosion potential.

**2003.9.1 Repairs.** Where necessary to make repairs involving hot work, the work shall be conducted in accordance with FC Chapter 26.

**2003.9.2** Reserved.

**2003.10 Drainage.** Drainage shall be provided to direct flammable and combustible liquid leakage and fire protection water to an approved location away from the building, any other structure, storage area or adjoining premises.

**2003.11 Alarm system.** An approved fire alarm system shall be provided in accordance with the construction codes, including the Building Code.

## SECTION FC 2004
## ELECTRICAL EQUIPMENT AND PROTECTION

**2004.1 Wiring and equipment.** Electrical wiring and equipment shall be designed, installed, operated and maintained in accordance with this chapter and the Electrical Code.

**2004.2 Hazardous locations.** Where Class I liquids are exposed to the air, the facility, including all equipment and the ventilation system, shall be designed in a manner that limits Class I, Division 1, locations to the following:

1. Piping trenches.

2. Within the equipment.

3. The immediate vicinity of pumps or equipment locations, such as dispensing stations, open centrifuges, plate and frame filters, opened vacuum filters, change cans and the surfaces of open equipment. The immediate vicinity shall include a zone extending from the vapor liberation point 5 feet (1524 mm) horizontally in all directions and vertically from the floor to a level 3 feet (914 mm) above the highest point of vapor liberation.

**2004.2.1 Other locations.** Locations within the confines of the manufacturing room where Class I liquids are handled shall be Class I, Division 2, except locations indicated in [Section 2004.2] FC2004.2.

**2004.2.2 Ordinary equipment.** Ordinary electrical equipment, including switchgear, is prohibited except where installed in a room maintained under positive pressure with respect to the hazardous area. The air or other media utilized for pressurization shall be obtained from a source that will not cause any amount or type of flammable vapor to be introduced into the room.

**2004.3 Bonding.** In any area of the facility in which an ignitable mixture may be present in the atmosphere, equipment, including, but not limited to, tanks, machinery and piping, shall be bonded and connected to a ground.

**2004.3.1 Piping.** Electrically isolated sections of metallic piping or equipment shall be grounded or bonded to the other grounded portions of the system.

**2004.3.2 Vehicles.** Cargo tanks loaded or unloaded through open connections shall be grounded and bonded to the receiving system.

**2004.3.3 Containers.** Where a flammable mixture is transferred from one portable container to another, a bond shall be provided between the two containers, and one shall be grounded.

**2004.4 Ground.** Metal framing of buildings shall be grounded with resistance of not more than 5 ohms.

## SECTION FC 2005
## PROCESS STRUCTURES

**2005.1 Design.** Process structures shall be designed and constructed in accordance with the construction codes, including the Building Code.

**2005.2 Fire apparatus access.** Fire apparatus access complying with the requirements of [Section 503] FC503 shall be provided for the purpose of fire control to at least one side of organic coating manufacturing operations.

**2005.3 Drainage.** Drainage facilities shall be provided in accordance with [Section 2003.10] FC2003.10 where topographical conditions are such that flammable and combustible liquids are capable of flowing from the organic coating manufacturing operation so as to constitute a fire hazard to other premises.

**2005.4 Explosion control.** Explosion control shall be provided in areas subject to potential deflagration hazards as set forth in NFPA 35. Explosion control shall be provided in accordance with [Section 911] FC911.

**2005.5 Ventilation.** Buildings in which Class I liquids are processed or handled shall be ventilated at a rate of not less than [[]1 cubic foot per minute per square foot (0.00508 [$m^3/s\ m^2$] $m^3/s/m^2$)[]] of solid floor area. Ventilation shall be accomplished by exhaust fans that take

suction at floor levels and discharge to a safe location outdoors. Noncontaminated intake air shall be introduced in such a manner that all portions of solid floor areas are provided with continuous uniformly distributed air movement.

**2005.6 Heating.** Heating provided in hazardous areas shall be by indirect means. Ignition sources such as open flames or electrical heating elements, except as provided for in [Section 2004] FC2004, are prohibited within the building.

## SECTION FC 2006
## PROCESS MILLS AND KETTLES

**2006.1 Mills.** Mills, operating with close clearances, which process flammable and heat-sensitive materials shall be located in a detached building or in a noncombustible structure without other occupancies. The amount of flammable material brought into the area shall not be more than the amount required for a batch.

**2006.2 Mixers.** Mixers shall be of the enclosed type or, where of the open type, shall be provided with properly fitted covers. Where flow is by gravity, a shutoff valve shall be installed as close as practical to the mixer, and a control valve shall be provided near the end of the fill pipe.

**2006.3 Open kettles.** Open kettles shall be located in outdoor areas provided with a protective roof; in a separate structure of noncombustible construction; or separated from other areas by a noncombustible wall having a fire-resistance rating of at least 2 hours.

**2006.4 Closed kettles.** Contact-heated kettles containing solvents shall be equipped with safety devices that, in case of a fire, will turn off the process heat, turn on the cooling medium and inject inert gas into the kettle.

> **2006.4.1 Vaporizer location.** The vaporizer section of heat-transfer systems that heat closed kettles containing solvents shall be remotely located.

**2006.5 Kettle controls.** The kettle and thin-down tank shall be instrumented, controlled and interlocked so that any failure of the controls will not result in an unsafe condition. The kettle shall be provided with a pressure-rupture disc in addition to the primary vent. The vent piping from the rupture disc shall be of minimum length and shall discharge to an approved location. The thin-down tank shall be adequately vented. Thinning operations shall be provided with a vapor removal system capable of ensuring a safe atmosphere.

## SECTION FC 2007
## PROCESS PIPING

**2007.1 Design.** All piping, valves and fittings shall be designed for the working pressures and structural stresses to which the piping, valves and fittings will be subjected, and shall be of steel or other material approved for the service intended.

**2007.2 Valves and fittings.** Valves shall be of an indicating type. Terminal valves on remote pumping systems shall be of the dead-man type, shutting off both the pump and the flow of solvent. Valves and fittings shall not be constructed of cast iron.

**2007.3 Support.** Piping systems shall be supported and protected against physical damage. Piping shall be pitched to avoid unintentional trapping of liquids, or approved drains shall be provided.

**2007.4 Connectors.** Approved flexible connectors shall be installed where vibration exists or frequent movement is necessary. Hoses at dispensing stations shall be of an approved type.

**2007.5 Tests.** Before being placed in service, all piping shall be free of leaks when tested for a minimum of 30 minutes at not less than [1.5] one and one-half times the working pressure or a minimum of 5 pounds per square inch gauge (psig) (35 kPa) at the highest point in the system.

## SECTION FC 2008
## RAW MATERIALS IN PROCESS AREAS

**2008.1** Reserved.

**2008.2 Organic peroxides.** Organic peroxides brought into the process area shall be in the original shipping container. When in the process area, the organic peroxide shall not be placed in locations exposed to ignition sources, heat, mechanical shocks or flammable liquids, except that organic peroxide may be exposed to flammable liquid during raw material processing.

## SECTION FC 2009
## RAW MATERIALS AND FINISHED PRODUCTS

**2009.1 General.** The storage, handling and use of flammable and combustible liquids in process areas shall be in accordance with FC Chapter 34. The storage, handling and use of organic peroxides shall be in accordance with FC Chapter 39 and the storage, handling and use of oxidizers shall be in accordance with FC Chapter 40.

**2009.2 Tank storage.** Tanks for the storage of flammable and combustible liquids shall be installed in accordance with FC Chapter 34. Process equipment storing or using flammable or combustible liquids and storage in quantities necessary for maintaining the operation is allowed in the process area.

**2009.3 Loading and unloading.** Tank car and cargo tank loading and unloading stations for Class I liquids shall be separated from the process area, other facility structures, the nearest lot line, public street or private road by a minimum distance in accordance with FC Chapter 34.

**2009.3.1 Loading.** Loading and unloading structures and platforms for flammable and combustible liquids shall be designed and installed in accordance with FC Chapter 34.

**2009.3.2 Safety.** Tank cars and cargo tanks for flammable and combustible liquids shall be loaded and unloaded in accordance with FC Chapter 34.

**2009.4** Reserved.

**2009.5 Organic peroxide storage.** The storage of organic peroxides shall be in accordance with FC Chapter 39.

**2009.5.1 Size.** The size of the package containing organic peroxide shall be selected so that, as nearly as practical, full packages are utilized at one time. Spilled peroxide shall be promptly removed and disposed of lawfully.

**2009.6 Finished products.** Finished products that are flammable or combustible liquids shall be stored outdoors, in a separate building, or in a room separate from the process area, in accordance with the construction codes, including the Building Code. The storage of finished products shall be in tanks or closed containers in accordance with FC Chapter 34.

# CHAPTER 21
# INDUSTRIAL FURNACES

## SECTION FC 2101
## GENERAL

**2101.1 Scope.** This chapter shall govern the design, installation, operation and maintenance of industrial furnaces used for commercial and industrial processing of materials.

**2101.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**2101.3 General.** Industrial furnaces shall be designed, installed, operated and maintained in accordance with this chapter, NFPA 86, and the construction codes, including the Fuel Gas Code and the Mechanical Code.

## SECTION FC 2102
## DEFINITIONS

**2102.1 Definitions.** The following words shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**FURNACE.** A compartment, receptacle, enclosed chamber or structure that is capable of being heated to a high temperature in order to heat the contents thereof. Furnaces may be heated by internal or external sources, including gas burners, oil burners, electrical elements, infrared lamps, induction heaters and steam radiation systems, regardless of whether denominated as an oven or furnace. Furnaces shall be classified as follows:

[Industrial furnaces shall be classified as follows:]

**CLASS A.** A furnace that has heat utilization equipment operating at or near atmospheric pressure and that presents a potential explosion or fire hazard if flammable volatiles or combustible materials are processed or heated in the furnace. Such flammable volatiles or combustible materials include those originating from paints, powders, inks, and adhesives

from finishing processes, such as dipped, coated, sprayed and impregnated materials; the substrate material; wood, paper and plastic pallets, spacers or packaging materials; or polymerization or other molecular rearrangements.

**CLASS B.** A furnace that has heat utilization equipment operating at approximately atmospheric pressure wherein there are no flammable volatiles or combustible materials being heated.

**CLASS C.** A furnace with any type of heating system and a special atmosphere supply system that is potentially hazardous due to a flammable or other special atmosphere being used for treatment of material in process, including integral quench furnaces and molten salt bath furnaces.

**CLASS D.** A furnace with any type of heating system that operates at temperatures from above ambient to over 5,000°F (2760°C) and at pressures normally below atmospheric, including special processing atmosphere furnaces.

## SECTION FC 2103
## LOCATION

**2103.1 Ventilation.** Enclosed rooms, basements or other areas below grade containing industrial furnaces shall be provided with combustion air in accordance with the construction codes, including the Mechanical Code and the Fuel Gas Code, and with ventilation in accordance with the Mechanical Code.

**2103.2 Location.** Industrial furnaces and heaters shall be located such that in the event of fire or explosion resulting from overheating or from the escape of fuel gas or fuel oil, damage to the building and injury to persons is minimized.

**2103.3 Ignition source.** Industrial furnaces shall be located so as not to pose an ignition hazard to flammable vapors or mists or combustible dusts that may be present as a result of a manufacturing operation or other lawful use and occupancy of the building.

**2103.4 Temperatures.** Roofs and floors of furnaces shall be insulated and ventilated to prevent temperatures at combustible ceilings and floors from exceeding 160°F (71°C).

## SECTION FC 2104
## FUEL PIPING

**2104.1 Fuel-gas piping.** Fuel-gas piping serving industrial furnaces shall be designed and installed in accordance with the Fuel Gas Code. Piping for other fuel sources shall comply with the requirements of this section.

**2104.2 Shutoff valves.** Each industrial furnace shall be provided with an approved manual fuel shutoff valve in accordance with the construction codes, including the Mechanical Code and the Fuel Gas Code.

**2104.2.1 Fuel supply lines.** Valves for fuel supply lines shall be located within 6 feet (1829 mm) of the appliance served.

**Exception:** When approved and the valve is located in the same general area as the appliance served.

**2104.3 Valve position.** The design of manual fuel shutoff valves shall incorporate a permanent feature that visually indicates the open or closed position of the valve. Manual fuel shutoff valves shall not be equipped with removable handles or wrenches unless the handle or wrench can only be installed parallel with the fuel line when the valve is in the open position.

## SECTION FC 2105
## INTERLOCKS

**2105.1 Shut down.** Interlocks shall be provided for Class A furnaces so that conveyors or sources of flammable or combustible materials shall shut down if either the exhaust or recirculation air supply fails.

## SECTION FC 2106
## FIRE PROTECTION

**2106.1 Required protection.** Class A and B furnaces that contain, or are utilized for the processing of, combustible materials shall be protected throughout by a fire extinguishing system complying with the requirements of FC Chapter 9.

**2106.2 Fixed fire extinguishing systems.** A fixed fire extinguishing system shall be provided for Class C or D furnaces to protect against such hazards as overheating, spillage of molten salts or metals, quench tanks, ignition of hydraulic oil and escape of fuel.

**2106.3 Portable fire extinguishers.** Portable fire extinguishers complying with the requirements of [Section 906] FC906 shall be provided not closer than 15 feet (4572 mm) or a maximum of 50 feet (15 240 mm) from each furnace or in accordance with NFPA 10.

## SECTION FC 2107
## OPERATION AND MAINTENANCE

**2107.1 Furnace operation and maintenance instructions.** The furnace manufacturer's complete installation, inspection, testing, operation and maintenance instructions shall be available on the premises to those individuals responsible for the operation, maintenance and supervision of the furnace.

**2107.2 Furnace nameplate.** The following data for Class A furnaces shall be furnished on the manufacturer's nameplate:

1. The solvent used.

2. The number of gallons (liters) used per batch or per hour of solvent entering the furnace.

3. The required purge time.

4. The oven operating temperature.

5. The exhaust blower rating for the number of gallons (liters) of solvent per hour or batch at the maximum operating temperature, or with regard to low-oxygen furnaces, the maximum allowable oxygen concentration.

**2107.3 Training.** The operation and maintenance of furnaces shall be performed by a person knowledgeable and trained in the operation and maintenance of such furnaces.

**2107.4 Equipment maintenance.** Equipment shall be maintained in accordance with the manufacturer's instructions.

## CHAPTER 22
## MOTOR FUEL-DISPENSING FACILITIES AND REPAIR GARAGES

### SECTION FC 2201
### GENERAL

**2201.1 Scope.** This chapter shall govern the design, installation, operation and maintenance of [automotive liquid] fleet motor fuel-dispensing facilities, [marine liquid] full-service motor fuel-dispensing facilities, [CNG] self-service motor fuel-dispensing facilities, and repair garages.

**2201.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**2201.3 Design and installation documents.** Design and installation documents shall be submitted to the department for review and approval prior to the installation, alteration, repair or construction of [automotive liquid] fleet motor fuel-dispensing facilities, [marine liquid] full-service motor fuel-dispensing facilities and [CNG] self-service motor fuel-dispensing facilities in accordance with [Section 105.4] FC105.4.

**2201.3.1 Compliance with other codes.** The installation or alteration of a liquid motor fuel storage and dispensing system regulated by this chapter shall not be approved by the department unless the design and installation documents demonstrate that the proposed work complies with the regulations of the United States Environmental Protection Agency, as set forth in 40 CFR Part 280, and the regulations of the New York State Department of Environmental Conservation, as set forth in 6 NYCRR Parts 612, 613 and 614, as applicable.

**2201.4 General.** All fleet motor fuel-dispensing facilities, [CNG] full-service motor fuel-dispensing facilities, self-service motor fuel-dispensing facilities and repair garages shall be designed, installed, operated and maintained in accordance with this chapter, FC Chapter 34[,] and the construction codes, including the Building Code, the Fuel Gas Code and the Mechanical Code, and, as applicable, NFPA 30A.

**2201.5 Electrical.** Electrical wiring and equipment shall be suitable for the locations in which they are installed and shall comply with the requirements of [Section 605] FC605, NFPA 30A

and the Electrical Code, as applicable. Upon request, proof of compliance with the Electrical Code shall be filed with the department.

**2201.6 Heat-producing appliances.** Heat-producing appliances shall be suitable for the locations in which they are installed and shall comply with the requirements of the construction codes, including the Building Code, the Mechanical Code and the Fuel Gas Code, and NFPA 30A, as applicable.

**2201.7 Supervision <u>of dispensing operations</u>.** The dispensing of [liquid] motor fuel [and CNG motor fuel] at [motor fuel dispensing facilities] <u>fleet motor fuel-dispensing facilities, full-service motor fuel-dispensing facilities and self-service motor fuel-dispensing facilities</u> shall be conducted by or under the <u>personal</u> supervision of a certified attendant, who shall be responsible [to ensure] <u>for ensuring</u> that dispensing operations are conducted and the facility is maintained in accordance with this chapter[, as follows:] <u>and the rules.</u>

[1. Dispensing operations shall be conducted by or under the personal supervision of a certified attendant at self service automotive liquid motor fuel-dispensing facilities.

2. Dispensing operations shall be conducted by or under the personal supervision of a certified attendant at fleet automotive liquid motor fuel-dispensing facilities.

3. Dispensing operations shall be conducted by or under the personal supervision of a certified attendant at full service automotive liquid motor fuel-dispensing facilities.

4. Dispensing operations shall be conducted by or under the personal supervision of a certified attendant at self service CNG motor fuel-dispensing facilities.

5. Dispensing operations shall be conducted by or under the personal supervision of a certified attendant at fleet CNG motor fuel-dispensing facilities.

6. Dispensing operations shall be conducted by or under the personal supervision of a certified attendant at full service CNG motor fuel-dispensing facilities.

7. Dispensing operations shall be conducted by or under the personal supervision of a certified attendant at fleet marine liquid motor fuel-dispensing facilities.

8. Dispensing operations shall be conducted by or under the personal supervision of a certified attendant at full service marine liquid motor fuel-dispensing facilities.]

**<u>2201.8 Supervision of defueling operations.</u>** <u>The defueling of liquid motor fuel from the fuel tank of a motor vehicle shall be conducted by or under the personal supervision of a person holding a certificate of fitness.</u>

**[2201.8] <u>2201.9</u> Certificate of license.** Persons who install, alter, test or repair any automotive or marine liquid motor fuel storage and dispensing systems shall hold a certificate of license or shall be employed by and perform such duties under the general supervision of a person holding such certificate.

**[2201.9] 2201.10 Records of inspections and testing.** Records of all inspections and testing required by this chapter shall be kept in a bound log book or other approved recordkeeping, maintained on the premises for a minimum of 4 years[, and made available for inspection by any representative of the department], except that records of the required 5 year tests as set forth in FC 2206.9.4, 2206.9.6 and 2208.7.4.1 shall be maintained on the premises for a minimum of 6 years.

**2201.11 Prohibition.** It shall be unlawful to operate as a self-service motor fuel-dispensing facility any motor fuel-dispensing facility or a motor fuel dispenser installed and approved as a fleet or full-service motor fuel-dispensing facility or dispenser.

## SECTION FC 2202
## DEFINITIONS

**2202.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**ALCOHOL-BLENDED MOTOR FUEL.** Gasoline blended with ethanol or other alcohol with an alcohol concentration greater than 15 percent by volume.

[**AUTOMOTIVE LIQUID MOTOR FUEL-DISPENSING FACILITY.** Any building, structure or premises upon which or wherein, liquid motor fuel is stored and dispensed from a liquid motor fuel storage and dispensing system into the fuel tanks of motor vehicles or motorcycles.]

**CERTIFIED ATTENDANT.** A person holding a certificate of fitness for the supervision of [an automotive liquid motor fuel-dispensing facility, marine liquid] a full-service motor fuel-dispensing facility or [automotive CNG] self-service motor fuel-dispensing facility.

**CNG.** Compressed natural gas.

**[CNG MOTOR FUEL.** CNG used as fuel in the operation of motor vehicles.]

**[CNG MOTOR FUEL SYSTEM.** A system comprised of compressors, storage containers, dispensers, piping, valves and ancillary equipment, that compresses natural gas into CNG, and stores and/or dispenses CNG motor fuel.]

[**CNG MOTOR FUEL-DISPENSING FACILITY.** Any building, structure or premises upon which, or wherein, CNG motor fuel is stored and/or dispensed from a CNG motor fuel system into the fuel tank of motor vehicles or watercraft.]

**DISPENSING DEVICE, OVERHEAD TYPE.** A dispensing device mounted above a dispensing area, typically within a canopy structure, and characterized by the use of an overhead hose reel.

**FLAMMABLE LIQUID MOTOR FUEL.** Gasoline or other flammable liquids used as fuel in the operation of motor vehicles, motorcycles, watercraft and aircraft.

[**FLEET MARINE LIQUID MOTOR FUEL-DISPENSING FACILITY.** A marine liquid motor fuel-dispensing facility wherein liquid motor fuel is stored and/or dispensed into the fuel tank of watercraft owned or operated by or on behalf of the owner of the facility, and where such dispensing operations are conducted by persons employed by or otherwise working for the owner of the facility.

**FLEET CNG MOTOR FUEL-DISPENSING FACILITY.** Any CNG motor fuel-dispensing facility wherein CNG motor fuel is stored and/or dispensed into the fuel tank of motor vehicles or watercraft owned or operated by or on behalf of the owner of the facility itself, and where dispensing operations are conducted by persons employed by or otherwise working for the owner of the facility.

**FLEET AUTOMOTIVE LIQUID MOTOR FUEL-DISPENSING FACILITY.** An automotive liquid motor fuel-dispensing facility wherein liquid motor fuel is stored and/or dispensed into the fuel tank of motor vehicles or motorcycles owned or operated by or on behalf of the owner of the facility, and where dispensing operations are conducted by persons employed by or otherwise working for the owner of the facility.]

**FLEET MOTOR FUEL-DISPENSING FACILITY.** A motor fuel-dispensing facility wherein motor fuel is stored and/or dispensed into the fuel tank of a motor vehicle, motorcycle, marine vessel or watercraft owned or operated by or on behalf of the owner of the facility, and where such dispensing operations are conducted by persons employed by or on behalf of the owner of the facility. There are four approved types of fleet motor fuel-dispensing facilities:

Fleet automotive hydrogen motor fuel-dispensing facility (motor vehicles)
Fleet automotive liquid motor fuel-dispensing facility (motor vehicles and motorcycles)
Fleet CNG motor fuel-dispensing facility (motor vehicles, marine vessels and watercraft)
Fleet marine liquid motor fuel-dispensing facility (marine vessel and watercraft)

[**FULL SERVICE AUTOMOTIVE LIQUID MOTOR FUEL-DISPENSING FACILITY.** An automotive liquid motor fuel-dispensing facility wherein liquid motor fuel is dispensed into the fuel tank of motor vehicles or motorcycles by a certified attendant or, when under the personal supervision of a certified attendant, by persons employed by or otherwise working for the owner of the facility.

**FULL SERVICE CNG MOTOR FUEL-DISPENSING FACILITY.** A CNG motor fuel-dispensing facility wherein CNG is dispensed into the fuel tank of motor vehicles or watercraft by a certified attendant or, when under the personal supervision of a certified attendant, by persons employed by or otherwise working for the owner of the facility.

**FULL SERVICE MARINE LIQUID MOTOR FUEL-DISPENSING FACILITY.** A marine liquid motor fuel-dispensing facility wherein liquid motor fuel is dispensed into the fuel tank of watercraft by a certified attendant or, when under the personal supervision of a certified attendant, by persons employed by or otherwise working for the owner of the facility.]

**FULL-SERVICE MOTOR FUEL-DISPENSING FACILITY.** A motor fuel-dispensing facility wherein motor fuel is dispensed into the fuel tank of motor vehicles, motorcycles, marine vessels or watercraft by a certified attendant or, when under the personal supervision of a

certified attendant, by persons employed by or on behalf of the owner of the facility. There are four approved types of full-service motor fuel-dispensing facilities:

Full-service automotive hydrogen motor fuel-dispensing facility (motor vehicles)
Full-service automotive liquid motor fuel-dispensing facility (motor vehicles and motorcycles)
Full-service CNG motor fuel-dispensing facility (motor vehicles, marine vessels and watercraft)
Full-service marine liquid motor fuel-dispensing facility (marine vessel and watercraft)

**LIQUEFIED NATURAL GAS (LNG).** A fluid in the liquid state composed predominantly of methane and which may contain minor quantities of ethane, propane, nitrogen or other components normally found in natural gas.

**LIQUID MOTOR FUEL.** Gasoline, diesel fuel or other flammable or combustible liquids used as fuel in the operation of motor vehicles, motorcycles, marine vessels and watercraft[ and aircraft].

**LIQUID MOTOR FUEL STORAGE AND DISPENSING SYSTEM.** A liquid motor fuel storage tank and all motor fuel storage and dispensing equipment associated with such tank, including the tank, piping, valves, fill connection catchment basins, vent lines, pumps, dispensing devices and any other ancillary equipment.

**[MARINE LIQUID MOTOR FUEL-DISPENSING FACILITY.** Any building, structure or premises, whether on shore, piers, docks or wharves, upon which or wherein, liquid motor fuel is stored and/or dispensed from a liquid motor fuel storage and dispensing system into the fuel tanks of watercraft.]

**MOTOR VEHICLE.** A vehicle or other conveyance having more than [2] two running wheels and using liquid motor fuel or flammable gas as fuel for generating motive power, except such vehicles as have a storage tank with a maximum capacity for less than 2 gallons (7.6 L) of liquid motor fuel or flammable gas that generates energy that is equivalent to the energy generated by 2 gallons (7.6 L) of gasoline.

**REPAIR GARAGE.** A building, structure or portion thereof used for servicing or repairing motor vehicles or motorcycles.

**[SELF-SERVICE AUTOMOTIVE LIQUID MOTOR FUEL-DISPENSING FACILITY.** An automotive liquid motor fuel-dispensing facility where liquid motor fuel is dispensed from a liquid motor fuel storage and dispensing system into the fuel tank of motor vehicles or motorcycles by customers of the facility.

**SELF-SERVICE CNG MOTOR FUEL-DISPENSING FACILITY.** A CNG motor fuel-dispensing facility wherein CNG motor fuel is stored and/or dispensed from a CNG motor fuel system into the fuel tank of motor vehicles by customers of the facility.]

**SELF-SERVICE MOTOR FUEL-DISPENSING FACILITY.** A motor fuel-dispensing facility wherein motor fuel is dispensed by customers of the facility from a motor fuel storage

and dispensing system into the fuel tank of motor vehicles or motorcycles. There are two approved types of self-service motor fuel-dispensing facilities:

Self-service automotive liquid motor fuel-dispensing facility (motor vehicles and motorcycles)
Self-service CNG motor fuel-dispensing facility (motor vehicles)

**[TANK, PROTECTED ABOVEGROUND.** An atmospheric aboveground tank listed in accordance with UL 2085 or equivalent standard that is provided with integral secondary containment, protection from physical damage, and an insulation system intended to reduce the heat transferred to the primary tank when the tank is exposed to a high intensity liquid pool fire.]

## SECTION FC 2203
## [AUTOMOTIVE LIQUID MOTOR FUEL-DISPENSING FACILITY]
## LOCATION OF LIQUID MOTOR FUEL DISPENSING DEVICES

**2203.1 Location of dispensing devices.** Dispensing devices [at automotive liquid motor fuel-dispensing facilities] for liquid motor fuel storage and dispensing systems shall be located as set forth in [Sections] FC 2203.1.1 and 2203.1.2.

**2203.1.1 Outdoor dispensing devices.** When installed outdoors, dispensing devices shall be located as follows:

1. Ten feet (3048 mm) or more from lot lines and building or structure openings.

2. Ten feet (3048 mm) or more from buildings or structures having combustible exterior wall surfaces or buildings or structures having noncombustible exterior wall surfaces that are not part of a 1-hour fire-resistance-rated assembly or buildings or structures having combustible overhangs.

   **Exception:** Canopies constructed in accordance with the construction codes, including the Building Code, providing weather protection for the motor fuel dispensers.

3. Such that all portions of the vehicle being fueled will be on the premises of the [automotive liquid] motor fuel-dispensing facility.

4. Such that the nozzle, when the hose is fully extended, will not reach within 5 feet (1524 mm) of building or structure openings.

5. Twenty feet (6096 mm) or more from fixed sources of ignition.

6. [Twenty five] Twenty-five feet (7620 mm) or more from the nearest subway grating, entrance or exit.

**2203.1.2 Indoor dispensing devices.** When installed [inside a building or structure] indoors, the dispensing area shall be located at street level, with no dispenser located more than 50 feet (15 240 mm) from an exit or entrance to the building or structure used by motor vehicles.

**[2203.2 Emergency disconnect switches.** An approved, clearly identified and readily accessible emergency disconnect switch shall be provided at an approved location, to immediately shut down the transfer of fuel to the fuel dispensers in the event of a fuel spill or other emergency. An emergency disconnect switch for exterior fuel dispensers shall be located within 100 feet (30 480 mm) of, but not less than 20 feet (6096 mm) from, the fuel dispensers. For interior fuel-dispensing operations, the emergency disconnect switch shall be installed at an approved location. An approved sign shall be posted on or immediately adjacent to such devices and shall read: EMERGENCY FUEL SHUTOFF. Such emergency disconnect switches shall be of a type that is reset manually.]

## SECTION FC 2204
## [AUTOMOTIVE LIQUID MOTOR FUEL-DISPENSING FACILITY DISPENSING OPERATIONS]
## DISPENSING OF LIQUID MOTOR FUEL

**[2204.1 Supervision of dispensing.** The dispensing of liquid motor fuel at automotive liquid motor fuel-dispensing facilities shall be conducted under the supervision of a certified attendant as set forth in Section 2201.7.]

**2204.1 General**. The dispensing of liquid motor fuels at motor fuel-dispensing facilities, and the design, installation, operation and maintenance of liquid motor fuel storage and dispensing systems and facilities shall be in accordance with this section.

**2204.1.1 Prohibition.** It shall be unlawful to dispense motor fuel into a vehicle while:

1. smoking;

2. using or maintaining an open flame;

3. the engine of the vehicle being fueled is not shut down;

4. using any object to override, bypass or otherwise render the fuel dispensing nozzle's manual hold-open design feature inoperable.

**2204.1.2 Emergency fuel shutoff.** An approved, clearly identified and readily accessible emergency fuel shutoff switch shall be provided at an approved location to immediately shut down the transfer of fuel to the fuel dispensers in the event of a fuel spill or other emergency and activate an alarm audible in the dispensing area and any control booth. Such audible device may be the same device used to indicate activation of the fire extinguishing system installed to protect the fuel dispensers. An emergency fuel shutoff switch for outdoor fuel dispensers shall be located within 100 feet (30 480 mm) of, but not less than 20 feet (6096 mm) from, the fuel dispensers. For indoor fuel dispensers, the emergency fuel shutoff switch shall be installed at an approved location. An approved sign shall be posted on or immediately adjacent to the emergency fuel shutoff switch, which reads: EMERGENCY FUEL SHUTOFF. Such emergency fuel shutoff switches shall be of a type that must be reset manually.

**2204.1.3 Lighting.** Dispensing areas shall be well lighted whenever dispensing is being conducted.

**2204.1.4 Dispensing area signage.** Durable signs shall be conspicuously posted in dispensing areas in motor fuel-dispensing facilities in compliance with the requirements of FC 2204.1.4.1 through 2204.1.4.4.

**2204.1.4.1 Operating instructions.** A sign setting forth dispenser operating instructions shall be posted on every dispenser. Such sign shall also indicate the location of the emergency fuel shutoff switches required by FC2204.1.2.

**2204.1.4.2 Fuel dispensing warning sign.** A warning sign that reads as follows shall be posted on or immediately adjacent to each dispenser:

1. No smoking.

2. Shut off engine.

3. Before fueling, discharge any static electricity by touching a metal surface. Repeat before removing nozzle.

4. If a fire starts, do not remove nozzle—leave the area immediately.

5. It is unlawful and dangerous to dispense fuel into unapproved containers or to fill portable containers in or on a motor vehicle.

6. It is unlawful for anyone other than the certified attendant to fill portable containers.

**2204.1.4.3 Alcohol-blended motor fuel notice.** A sign or marking indicating the type and concentration of alcohol in the motor fuel being dispensed shall be posted on or affixed to each dispenser dispensing alcohol-blended motor fuel.

**2204.1.4.4 Emergency procedures.** A sign setting forth emergency procedures that reads as follows shall be posted in the dispensing area, or other location designated in this section:

IN CASE OF FIRE OR SPILL:

USE THE EMERGENCY FUEL SHUTOFF SWITCH
TO STOP THE FLOW OF FUEL

(*for flammable fuel dispensers*)
ACTIVATE THE FIRE EXTINGUISHING SYSTEM
PROTECTING THE DISPENSING AREA.
(SWITCH LOCATION:
(*indicate location*)

DIRECT VEHICLE OCCUPANTS TO EXIT VEHICLES
AND LEAVE AREA IMMEDIATELY

NOTIFY THE FIRE DEPARTMENT (CALL 911)
(FACILITY ADDRESS)
(*indicate address, with cross-street reference*).

KEEP ALL PERSONS AWAY FROM THE AREA.

**2204.1.5 Emergency telephone.** A telephone not requiring a coin to operate or another approved, clearly identified means to notify the department, shall be provided at the facility in an approved location.

**2204.1.6 Dispensing on piers, docks or wharves.** Flammable liquid motor fuel shall not be dispensed into the fuel tanks of motor vehicles imported by ship to this country while on any pier, dock or wharf.

**2204.1.7 Dispensing into portable containers.** The dispensing of liquid motor fuel into portable containers shall comply with the requirements of FC 2204.1.7.1 through 2204.1.7.5.

**2204.1.7.1 Approved containers required.** Liquid motor fuel shall not be dispensed into a portable container unless such container is of approved material and construction, and has a tight closure with screwed or spring-loaded cover so designed that the contents can be dispensed without spilling. Liquids shall not be dispensed into portable tanks or cargo tanks.

**2204.1.7.2 Container capacity.** Liquid motor fuel shall be dispensed into approved containers with an individual capacity not greater than 2½ gallons (9.5 L).

**2204.1.7.3 Nozzle operation.** When liquid motor fuel is being dispensed into a portable container the fuel dispensing nozzle shall be manually held open during the dispensing operation, whether or not the nozzle is provided with a latch-open device.

**2204.1.7.4 Location of containers being filled.** Portable containers shall not be filled while located inside the trunk, passenger compartment or truck bed of a motor vehicle or upon a marine vessel or watercraft.

**2204.1.7.5 Certified attendant.** Only a certified attendant shall dispense liquid motor fuel into portable containers.

**2204.1.8 Dispensing from portable containers.** No motor vehicle, motorcycle, marine vessel or watercraft shall be fueled from a portable container while indoors.

**2204.1.9 Vegetation.** Weeds, grass, vines, brush or other vegetation shall not be maintained within 10 feet (3048 mm) of any aboveground tank, tank fill connection or dispensing area.

**2204.1.10 Combustible waste.** Rubbish and other combustible waste shall not be stored within 10 feet (3048 mm) of any aboveground tank, tank fill connection or dispensing area,

except in the dispensing area when in an approved waste container with a capacity not exceeding 40 gallons (0.15 $m^3$).

**2204.2 Self-service [liquid automotive] motor fuel-dispensing facilities.** Self-service [automotive liquid] motor fuel-dispensing facilities shall [comply] be designed, installed, operated and maintained in compliance with the requirements of [Sections] FC 2204.2.1 through [2204.2.7] 2204.2.5. [The certified attendant's primary function shall be to supervise, observe and monitor the dispensing of fuel. The certified attendant shall prevent the dispensing of fuel into containers that do not comply with the requirements of Section 2204.4.1, control sources of ignition, take immediate action upon an accidental spill or release, be ready to use a portable fire extinguisher, and activate the fixed fire extinguishing system. Nothing in this section shall be construed to prohibit a certified attendant from engaging in other activities so long as such activities do not interfere with the certified attendant's ability to supervise, observe and monitor the dispensing of fuel and other requirements of this chapter.]

**2204.2.1 Duties of certified attendant.** The certified attendant's primary function shall be to supervise, observe and monitor the dispensing of fuel. The certified attendant shall prevent the dispensing of fuel into portable containers unless the dispensing is in compliance with the requirements of FC2204.1.7. The certified attendant shall control sources of ignition, take immediate action upon an accidental spill or release, be ready to use a portable fire extinguisher, and activate the fixed fire extinguishing system. Nothing in this section shall be construed to prohibit a certified attendant from engaging in other activities so long as such activities do not interfere with the certified attendant's ability to supervise, observe and monitor the dispensing of fuel and other requirements of this chapter.

**[2204.2.1] 2204.2.2 Self-service dispensers.** Approved self-service devices, equipment and systems such as, but not limited to, card-operated and remote-preset types, are allowed at [automotive] liquid motor fuel-dispensing facilities. The certified attendant shall set the dispensing devices in the "off" position when not in use if such dispensing device can be activated without the certified attendant's knowledge.

**[2204.2.2 Emergency controls.** Approved emergency controls shall be provided in accordance with Section 2203.2.

**2204.2.3 Operating instructions.** Dispenser operating instructions shall be conspicuously posted in approved locations on every dispenser and shall indicate the location of the emergency controls required by Section 2204.2.2.]

**[2204.2.4] 2204.2.3 Monitoring of dispensing.** A control [area] booth shall be located on the premises of every self-service automotive liquid motor fuel-dispensing facility. The control [area] booth shall be an interior or exterior enclosure to which the public has no access. The certified attendant shall be present within the control [area] booth while dispensing operations are conducted. The control [area] booth shall be designed and located so that the certified attendant stationed therein shall have a full, unobstructed clear view of dispensing operations, except that mirrors and/or an approved closed-circuit television installation may be provided to afford the certified attendant a clear view of dispensing operations when the view from the control [area] booth is partially or temporarily obstructed. For purposes of this section, the "clear" view provided by a closed-circuit television installation shall mean that

the image on the monitor shall be of such brightness and resolution as to allow ready identification of individuals and easy observation of activities at all times of day. [Properly] Two properly labeled manual switches, one that [activate] activates the fire extinguishing system, and one that electrically [disconnect] disconnects the liquid motor [fuel dispensing] fuel-dispensing pumps, shall be located adjacent to each other within the control [area] booth. A console that controls the self-service liquid motor fuel dispensers shall be provided within the control [area] booth and within 5 feet (1524 mm) of the manual switches.

**[2204.2.5] 2204.2.4 Communications.** A two-way voice communication system shall be installed to provide contact between the control [area] booth and each dispensing island. [A telephone not requiring a coin to operate, or other approved clearly identified means to notify the department, shall be provided at the facility in an approved location.]

**[2204.2.6 Control area sign.** A durable metal sign that reads as follows shall be posted in plain view within the control area**:**

| |
|---|
| Emergency Procedures:<br>Shut off product pumps.<br>Direct vehicle occupants to exit vehicles and leave area immediately.<br>Keep all persons away from the area.<br>Manually activate fire extinguishing system.<br>Notify the Fire Department (Call 911). |

Such sign shall also indicate the department telephone number, the nearest fire alarm box location, and the motor fuel-dispensing facility's address, with cross-street reference.]

**2204.2.5 Signage.** The signage required by FC2204.1.4 shall be posted in the dispensing area of a self-service motor fuel-dispensing facility, except that the emergency procedures sign required by FC2204.1.4.4 shall be posted in the control booth.

**[2204.2.7 Lighting.** Dispensing areas shall be well lighted whenever the facility is open for business.]

**2204.3 Fleet [automotive liquid] motor fuel-dispensing facilities.** Fleet [automotive liquid] motor fuel-dispensing facilities shall [comply] be designed, installed, operated and maintained in compliance with the requirements of [Sections] FC 2204.3.1 through [2204.3.7] 2204.3.3.

**[2204.3.1 General.** The owner of fleet automotive liquid motor fuel-dispensing facilities shall provide, and be accountable for, daily site visits, regular equipment inspection, and maintenance.

**2204.3.1.1 Supervision.** The supervision of dispensing shall be in accordance with Section 2201.7.]

**2204.3.1 Inspection of dispensing area.** The certified attendant responsible for supervision of the dispensing of liquid motor fuel at fleet motor fuel-dispensing facility shall inspect the dispensing area on a periodic basis in accordance with the rules to ensure that the facility is being maintained in accordance with this chapter and the rules. The certified attendant shall

notify the owner and make any other notifications required by this code if there is any evidence that the facility is not in good working order. A record of such inspections and notifications shall be maintained at the premises in accordance with FC107.7.

**2204.3.2 [**Reserved.] **Duties of fleet personnel.** Employees or other persons working for the owner of a fleet motor fuel-dispensing facility whose duties involve the dispensing of motor fuel shall be trained and knowledgeable in such dispensing in compliance with the requirements of this code and the rules.

**[2204.3.3 Emergency controls.** Approved emergency controls shall be provided in accordance with Section 2203.2.

**2204.3.4 Operating instructions.** Dispenser operating instructions shall be conspicuously posted in approved locations on every dispenser and shall indicate the location of the emergency controls required by Section 2204.3.3.

**2204.3.5 Emergency procedures.** An approved emergency procedures sign, in addition to the sign required by Section 2206.12, shall be posted in a conspicuous location and shall read:

IN CASE OF FIRE, SPILL OR RELEASE

1. USE EMERGENCY PUMP SHUTOFF

2. ACTIVATE THE FIRE EXTINGUISHING SYSTEM PROTECTING THE FLAMMABLE LIQUID MOTOR FUEL DISPENSING AREA.
(*where applicable*) FIRE SUPPRESSION EMERGENCY CONTROL LOCATED
(*indicate location*)

3. NOTIFY THE FIRE DEPARTMENT (CALL 911)

FACILITY ADDRESS (*indicate address, with cross street reference*).

**2204.3.6 Communications.** A telephone not requiring a coin to operate or other approved, clearly identified means to notify the department shall be provided at the facility in an approved location.]

**[2204.3.7]** **2204.3.3** **Quantity limits.** Dispensing equipment used at fleet automotive liquid motor fuel-dispensing facilities shall comply with one of the following:

1. Dispensing devices shall be programmed or set to limit uninterrupted liquid motor fuel delivery to not more than 25 gallons (95 L) and require a manual action to resume delivery.

2. For other than flammable liquid motor fuel, the amount of liquid motor fuel being dispensed shall be limited in quantity by a preprogrammed card as approved.

**2204.4 Full-service motor fuel-dispensing facilities.** Full-service motor fuel-dispensing facilities shall be operated in compliance with the requirements of FC2204.4.1.

**2204.4.1 Duties of certified attendant.** The certified attendant at a full-service motor fuel-dispensing facility shall personally supervise the dispensing of motor fuel into vehicles by facility personnel. The certified attendant shall conduct a visual inspection of the dispensing area on a daily basis to monitor the condition of such installation. The certificate of fitness holder shall notify the owner and make any other notifications required by this code if there is any evidence that the installation is not in good working order. A record of such inspections and notifications shall be maintained at the premises in accordance with FC107.7.

**[2204.4 Dispensing into portable containers.** The dispensing of liquid motor fuel into portable containers shall comply with the requirements of Sections 2204.4.1 through 2204.4.4.

**2204.4.1 Approved containers required.** Liquid motor fuel shall not be dispensed into a portable container unless such container is of approved material and construction, and has a tight closure with screwed or spring-loaded cover so designed that the contents can be dispensed without spilling. Liquids shall not be dispensed into portable tanks or cargo tanks.

**2204.4.1.1 Container capacity.** Liquid motor fuel shall be dispensed into approved containers with an individual capacity not greater than 2½ gallons (9.5 L).

**2204.4.2 Nozzle operation.** A hose nozzle valve used for dispensing liquid motor fuel into a portable container shall be in compliance with the requirements of Section 2206.7.6 and be manually held open during the dispensing operation.

**2204.4.3 Location of containers being filled.** Portable containers shall not be filled while located inside the trunk, passenger compartment or truck bed of a vehicle or upon a watercraft.

**2204.4.4 Certified attendant.** Only a certified attendant shall dispense liquid motor fuel into portable containers.

**2204.5 Dispensing from portable containers.** No motor vehicle, motorcycle or watercraft shall be fueled from a portable container while inside a building or structure.

**2204.6 Full service automotive liquid motor fuel-dispensing facilities.** Full service automotive liquid motor fuel-dispensing facilities shall comply with the requirements of Sections 2204.6.1 through 2204.6.5.

**2204.6.1 Supervision of dispensing.** Dispensing of liquid motor fuel shall be in accordance with Section 2201.7.

**2204.6.2 Emergency controls.** Approved emergency controls shall be provided in accordance with Section 2204.3.3.

**2204.6.3 Operating instructions.** Dispenser operating instructions shall be conspicuously posted in approved locations on every dispenser and shall indicate the location of the emergency controls required by Section 2204.6.2.

**2204.6.4 Emergency procedures.** An approved emergency procedures sign, in addition to the sign required by Section 2206.12, shall be provided and posted in accordance with Section 2204.3.5.

**2204.6.5 Communications.** A telephone not requiring a coin to operate or other approved, clearly identified means to notify the department shall be provided at the facility in an approved location.

**2204.7 Sources of ignition.** It shall be unlawful to smoke or use or maintain an open flame in areas where fuel is dispensed. The engines of vehicles being fueled shall be shut off during fueling. Electrical equipment shall be installed, operated and maintained in accordance with the Electrical Code.

**2204.8 Liquid motor fuel dispensing on piers, docks or wharves.** Flammable liquid motor fuel shall not be dispensed into the fuel tanks of motor vehicles imported by ship to this country while on any pier, dock or wharf.]

## SECTION FC 2205
## [AUTOMOTIVE LIQUID MOTOR FUEL-DISPENSING FACILITY OPERATIONAL AND MAINTENANCE REQUIREMENTS]

## OPERATION AND MAINTENANCE OF LIQUID MOTOR FUEL-DISPENSING FACILITIES

**2205.1 Tank filling operations for liquid motor fuel.** Delivery operations to tanks for liquid motor fuel shall comply with the requirements of [Sections] FC 2205.1.1 through 2205.1.3 and the applicable requirements of FC Chapter 34.

**2205.1.1 Delivery vehicle location.** Where liquid delivery to [aboveground] a motor fuel storage [tanks] tank is accomplished by positive-pressure operation, cargo tanks making delivery shall be positioned a minimum of 25 feet (7620 mm) from tanks receiving flammable liquids and 15 feet (4572 mm) from tanks receiving [liquid motor fuel] combustible liquids. During delivery, a cargo tank shall not obstruct a public street, private road, block motorists' view of roadways or impede the movement of vehicles or pedestrians.

**2205.1.2 Tank capacity calculation.** The driver, operator or attendant of a cargo tank shall, before making delivery to a tank, determine the unfilled, available capacity of such tank by an approved tank [level gauging] level-indicating device or method. A measuring stick shall not be used to measure the contents of the tank through the fill connection line, except where there is a direct fill connection.

**2205.1.3 Tank connections.** Delivery of liquid motor fuel shall be made by means of approved liquid- and vapor-tight connections between the delivery hose and tank fill pipe. Where tanks are equipped with any type of vapor recovery system, all connections required

for the safe and proper functioning of the particular vapor recovery process shall be made. Such connections shall be made [liquid and vapor tight] liquid- and vapor-tight and remain connected throughout the [unloading] delivery process. Vapors shall not be discharged at grade level during delivery.

**2205.2 Equipment maintenance.** [Automotive liquid] Liquid motor [fuel-dispensing facility equipment] storage and dispensing systems shall be maintained in good working order at all times in accordance with [Sections] FC 2205.2.1 through 2205.2.3.

**2205.2.1 Dispensing devices.** Where maintenance to dispensing devices becomes necessary and such maintenance could allow the accidental release or ignition of liquid, the following precautions shall be taken:

1. Only persons with a certificate of license and knowledgeable in performing the required maintenance shall perform the work.

2. Electrical power to the dispensing device and pump serving the dispenser shall be shut off at the main electrical disconnect panel before maintenance begins.

3. The emergency dispenser shutoff valve [at the dispenser, where installed,] shall be closed before maintenance begins.

4. [Vehicle] Vehicular traffic and unauthorized persons shall be prevented from coming within 12 feet (3658 mm) of the dispensing device before and during maintenance.

**2205.2.2 [Emergency] Dispenser emergency shutoff valves.** [Automatic-closing] Dispenser emergency shutoff valves required by [Section 2206.7.4] FC2206.7.4 shall be checked not less than once per year by manually tripping the hold-open linkage.

**2205.2.3 Leak detection system.** The leak detection system required by [Section 2206.7.7] FC2206.7.7 shall be inspected monthly for proper operation and tested at least annually in accordance with the manufacturer's specifications to ensure [proper installation and operation] that it is in good working order.

**2205.3** [Reserved.] **Use of alcohol-blended motor fuel in existing liquid motor fuel storage and dispensing systems.** Department approval shall be obtained prior to using a liquid motor fuel storage and dispensing system for alcohol-blended motor fuel when such system has previously been used to store and dispense another type of motor fuel. If approved, such system may be used alternatively for the various approved fuel types.

**2205.4** [Reserved.] **Signage.** Durable signs shall be conspicuously posted at motor fuel-dispensing facilities in accordance with this section.

**2205.4.1 Tank overfill warning sign.** A warning sign shall be posted on or immediately adjacent to tank overfill alarm panel that reads: "CAUTION: WHEN ALARM ACTIVATES, TANK IS FILLED TO CAPACITY. DO NOT OVERFILL."

**2205.5 [Fire] Portable fire extinguishers.** Approved portable fire extinguishers complying with the requirements of [Section 906] FC906 with a minimum rating of 40-B:C shall be provided and located such that an extinguisher is not less than 20 feet (6096 mm) but not more than 75 feet (22 860 mm) from pumps, dispensers or storage tank [fill-pipe openings] fill connections.

**[2205.6** Reserved.

**2205.7 Control of brush and debris.** Brush, grass, vines or other vegetation and combustible waste shall be kept not less than 10 feet (3048 mm) from the tank and dispensing location.]

## SECTION FC 2206
## [AUTOMOTIVE LIQUID MOTOR FUEL-DISPENSING FACILITIES DESIGN AND INSTALLATION REQUIREMENTS]
## DESIGN AND INSTALLATION REQUIREMENTS FOR LIQUID MOTOR FUEL-DISPENSING FACILITIES

**2206.1 General.** [Storage of liquid] Liquid motor fuel storage and dispensing systems shall be designed and installed in accordance with FC Chapter 34 except as otherwise specified in this chapter, including the requirements of this section.

**2206.2 Method of storage.** Approved methods of storage for liquid motor fuel at [automotive liquid] motor fuel-dispensing facilities shall be in accordance with [Sections] FC 2206.2.1 through 2206.2.4.

**2206.2.1 Underground tanks.** The installation of underground tanks for the storage of liquid motor fuel shall comply with the requirements of FC Chapter 34 except as otherwise specified in this chapter.

**2206.2.1.1 Inventory control for underground tanks.** Accurate daily inventory records shall be maintained and reconciled for underground liquid motor fuel storage tanks for indication of possible leakage from tanks and piping. Inventory reconciliation shall be in accordance with the regulations of the New York State Department of Environmental Conservation as set forth in 6 NYCRR Part 613. The records shall be [kept at the premises and be made available for inspection by any representative of the department] maintained in accordance with FC107.7. Records shall include daily reconciliation between sales, use, receipts and inventory on hand. Where there is more than one system consisting of tanks serving separate pumps or dispensers for a product, the reconciliation shall be maintained separately for each tank system. A consistent or accidental loss of product shall be immediately reported to the commissioner.

**2206.2.1.2 Listing and approval.** Underground liquid motor fuel storage tanks shall be listed and approved.

**2206.2.1.3 Tank design and construction.** Underground liquid motor fuel storage tanks shall be designed and constructed in accordance with the following:

1. Tanks shall be completely double-walled and constructed of steel, fiberglass-reinforced plastic or a combination of both materials. The secondary tank shall be capable of containing any leakage from the primary tank.

2. Tanks shall be designed and constructed to withstand [1.5] one and one-half times the maximum operating loads and stresses, regardless of the amount of liquid motor fuel contained in the tank. Such capabilities shall be established by buoyancy calculations and load and stress analyses.

3. Tanks shall be designed and constructed to withstand a pressure of 15 pounds per square inch gauge (psig)(103.4 kPa) or [1½] one and one-half times the maximum anticipated static head pressure, whichever is greater, for the primary tank and 5 pounds per square inch gauge (psig)(34.5 kPa) for the secondary tank.

4. The capacity of each individual tank shall not exceed 12,000 gallons (45 420 L) of liquid motor fuel.

**2206.2.1.4 Tank connections.** Tank connections shall be designed and located so as to:

1. Minimize the maneuvering necessary to position a cargo tank to make the delivery.

2. Minimize any obstructions of a public right of way or motorists' view of roadways, or any impediment to the movement of motor vehicles or pedestrians, during delivery.

3. Provide connections by means of approved liquid- and vapor-tight connections.

4. Comply with the requirements of FC2205.1.3.

**2206.2.1.5 Liquid level-indicating devices.** Tanks shall be provided with an approved liquid level-indicating device. The quantity of fuel in the tank as indicated on the liquid level-indicating device shall be accessible to the delivery operator. Liquid level-indicating devices shall be designed, constructed and installed to be vapor- and liquid-tight.

**2206.2.1.6 Tank overfill alarm.** Tanks shall be provided with an approved overfill alarm designed to activate a local audible and visual alarm in an area supervised by the cargo tank delivery operator. Such alarms shall activate when the quantity of fuel in the tank exceeds a designated level, which shall not be more than 95 percent of capacity.

**2206.2.2 Prohibited aboveground storage.** The storage of motor fuel in aboveground tanks shall be prohibited as set forth in [Sections] FC 2206.2.2.1, 2206.2.2.2 and 2206.2.2.3.

**2206.2.2.1 Storage of flammable liquid motor fuel.** It shall be unlawful to store flammable liquid motor fuel in aboveground tanks.

**2206.2.2.2 Storage of combustible liquid motor fuel.** It shall be unlawful to store combustible liquid motor fuel in aboveground tanks, except outdoors at a fleet [liquid] motor fuel-dispensing facility complying with the requirements of this chapter.

**2206.2.2.3 [Storage inside buildings] Indoor storage.** It shall be unlawful to store liquid motor fuel in aboveground tanks [within any building or structure] indoors.

**2206.2.3 Aboveground tanks located outdoors, at grade.** Outdoor storage of combustible liquid motor fuel in aboveground tanks at a fleet [liquid] motor fuel-dispensing facility shall comply with the requirements set forth in [Sections] FC 2206.2.3.1 through [2206.2.3.5] 2206.2.3.6.

**2206.2.3.1 Tank design and construction.** Only protected aboveground tanks shall be used.

**2206.2.3.2 Tank capacity.** The capacity of each tank shall not exceed 4,000 gallons (15 140 L). Not more than a total of 4,000 gallons (15 140 L) of liquid motor fuel shall be stored aboveground at any facility. The total storage capacity at a facility in both aboveground and underground tanks shall not exceed 40,000 gallons (15 140 L) of liquid motor fuel. Each tank shall have a separate fill line and a separate vent line that are separate from the fill and vent lines of other tanks.

**Exception:** When approved, individual tanks may exceed 4,000 gallons (151 400 L) but shall not exceed 12,000 gallons (45 420 L).

**2206.2.3.3 Tank base support.** Tanks shall be placed on an approved base slab. The surface of such base slab shall be a minimum of 6 inches (152 mm) above the level of the surrounding area to permit visual inspection. Tanks shall be adequately supported and anchored to the base slab to withstand uplifting by surface water and flooding.

**2206.2.3.4 Tank connections.** Tank connections shall be designed and located [so as to:

1. Minimize the maneuvering necessary to position a cargo tank to make the delivery.

2. Minimize obstructing a public right of way or motorists' view of roadways, or impeding the movement of motor vehicles or pedestrians, during deliveries.

3. Provide connections by means of approved liquid- and vapor-tight connections] in accordance with FC2206.2.1.4.

**2206.2.3.5 Liquid level-indicating devices.** Tanks shall be provided with an approved liquid level-indicating device in accordance with FC2206.2.1.5. [The liquid level indicating device shall be accessible to the delivery operator. Liquid level indicating devices shall be designed and constructed to be vapor-and-liquid tight.]

**2206.2.3.6 Tank overfill alarm.** Tanks shall be provided with an approved overfill alarm in accordance with FC2206.2.1.6.

**2206.2.4 Location requirements for aboveground tanks at fleet [automotive liquid] motor fuel-dispensing facilities**. Tanks shall be located in accordance with FC Table [2206.2.3] 2206.2.4 and as follows:

1. A minimum of 25 feet (7620 mm) from a subway grating, entrance or exit.

2. At a location that will not obstruct or interfere with any means of egress or department access.

3. Tanks shall not be installed under electrical transmission lines, bridges, or public highways.

**FC TABLE [2206.2.3] 2206.2.4**
**MINIMUM SEPARATION REQUIREMENTS FOR ABOVEGROUND TANKS AT FLEET MOTOR FUEL-DISPENSING FACILITIES**

| CLASS OF LIQUID AND TANK TYPE | INDIVIDUAL TANK CAPACITY (gallons) | MINIMUM DISTANCE FROM NEAREST BUILDING (feet) | MINIMUM DISTANCE FROM LOT LINE (feet) | MINIMUM DISTANCE FROM PUBLIC STREET OR PRIVATE ROAD (feet) | MINIMUM DISTANCE BETWEEN TANKS (feet) |
|---|---|---|---|---|---|
| Liquid motor fuel tanks | 4000 | 15 | 15 | [5] 15 | 3 |
| | Greater than 4000 | 25 | 25 | 15 | 3 |

For SI: 1 foot = 304.8 mm, 1 gallon = 3.785 L.

**2206.3 Security.** Aboveground tanks for the storage of liquid motor fuel shall be safeguarded in an approved manner from public access or unauthorized entry.

**2206.4 Physical protection.** Posts complying with the requirements of [Section 312] FC312 or other approved means shall be provided to protect aboveground tanks against impact by a motor vehicle unless the tank is listed as a protected aboveground tank with vehicle impact protection.

**2206.5 Secondary containment.** Aboveground tanks shall be provided with diking in accordance with FC Chapter 34. Diking is not required for listed secondary containment tanks. The secondary containment systems shall be monitored either visually or automatically. Enclosed secondary containment systems shall be provided with emergency venting in accordance with [Section 2206.6.2.5] FC2206.6.2.5.

**2206.6 Piping, valves, fittings and ancillary equipment for use with liquid motor fuel.** The design, fabrication, assembly, testing and inspection of piping, valves, fittings and ancillary equipment for use with liquid motor fuel shall be in accordance with FC Chapter 34 except as otherwise specified in [Sections] FC 2206.6.1 through 2206.6.3, and FC 2206.9 and 2206.10.

**2206.6.1 Protection from damage.** Piping shall be located such that it is protected from physical damage and designed to accommodate settlement, vibration, expansion or contraction.

**2206.6.2 Piping, valves, fittings and ancillary equipment for aboveground tanks.** Piping, valves, fittings and ancillary equipment for aboveground tanks shall comply with the requirements of [Sections] FC 2206.6.2.1 through 2206.6.2.11.

**2206.6.2.1 Tank openings.** Tank openings for aboveground tanks shall be through the top only. There shall be no openings except those necessary to inspect, fill, empty and vent the tank.

**2206.6.2.2 Fill-pipe connections.** The fill-pipe for aboveground tanks shall be provided with a means for making a direct connection to the cargo tank's fuel-delivery hose so that liquid motor fuel is not exposed to the open air during the filling operation. Operator safety equipment for the filling operation shall be provided in accordance with OSHA regulations. Where any portion of the fill-pipe exterior to the tank extends below the level of the top of the tank, a check valve, a dry break coupling and a quick closing valve shall be installed at the fill connection. Tank fill connections from a remote location are prohibited.

**2206.6.2.3 Overfill protection.** Overfill protection shall be provided for aboveground storage tanks. Overfill prevention devices shall be designed to withstand the pressure generated by the cargo tank discharge pump and shall automatically shut off the flow into the tank when the tank is not more than 95 percent full.

**2206.6.2.4 Siphon prevention.** An approved antisiphon method shall be provided in the piping system to prevent flow of liquid motor fuel by siphon action.

**2206.6.2.5 Emergency relief venting.** Aboveground storage tanks, tank compartments and enclosed secondary containment spaces shall be provided with emergency relief venting in accordance with FC Chapter 34.

**2206.6.2.6 Spill containers.** Aboveground tank spill containers having a capacity of not less than 5 gallons (19 L) shall be provided for each fill connection. Spill containers shall be noncombustible and shall be fixed to the tank and equipped with a manual drain valve that drains into the primary tank.

**2206.6.2.7 Piping material construction.** Piping shall be of a minimum Schedule 40 [galvanized] steel construction.

**2206.6.2.8 Compatibility.** Piping, fittings, components and joint compounds shall be mutually compatible, and compatible with diesel fuel and other commonly-used combustible liquid motor fuels, including the additives commonly used in such combustible motor fuels. Joint compounds shall be listed and approved.

**2206.6.2.9 Pressure relief devices.** Where liquid motor fuel may become trapped between shutoff valves and/or check valves, affected piping sections shall be provided with pressure-relief devices that will discharge the pressure generated by thermal expansion back into the tank.

**2206.6.2.10 Vent piping.** Each tank shall be provided with a separate unobstructed vent line, without any trap or device that causes excessive back pressure, and shall be maintained unobstructed at all times.

**2206.6.2.11 Vent termination.** Vent outlets shall discharge outdoors and upward. The discharge point shall be no less than 15 feet (4572 mm) above the adjacent ground level and no less than [15] 10 feet ([4572] 3048 mm) from the nearest building opening.

**2206.6.3 Piping, valves, fittings and ancillary equipment for underground tanks.** Piping, valves, fittings and ancillary equipment for underground tanks shall comply with the requirements of FC Chapter 34 and NFPA 30A, except as otherwise provided in [Sections] FC 2206.6.3.1, 2206.6.3.2 and 2206.10.

**2206.6.3.1 Piping design and construction.** Piping, including vent piping, shall be of a minimum Schedule 40 steel construction. Approved nonmetallic piping, such as fiberglass-reinforced plastic or other equivalent corrosion-resistant material, may be installed underground.

**2206.6.3.2 Underground tank piping.** Piping shall be installed underground, except for the vertical riser of the vent.

**2206.6.3.3 Compatibility.** Piping, fittings, components and joint compounds shall be mutually compatible, and compatible with gasoline, diesel fuel, methanol and other commonly-used liquid motor fuels, including the additives commonly used in such liquid motor fuels. Joint compounds shall be listed and approved.

**2206.7 Fuel-dispensing systems for liquid motor fuel.** The design[,] and installation of liquid motor fuel-dispensing systems shall be in accordance with [this section] FC 2206.7.1 through 2206.7.9.2.4. Alcohol-blended motor fuel-dispensing systems shall additionally comply with FC2206.7.10.

**2206.7.1 Listed equipment.** Electrical equipment, dispensers, hose, nozzles and submersible or subsurface pumps used in [fuel-dispensing] liquid motor fuel storage and dispensing systems shall be listed and approved.

**2206.7.2 Fixed pumps required.** Liquid motor fuel shall be transferred only from the top of the tank by means of fixed pumps designed and equipped to allow control of the flow and prevent leakage or accidental discharge.

**2206.7.2.1 Aboveground tank dispenser.** Only one vehicle may be fueled at a time. Fuel dispensing from a location remote from the tank may be [permitted] allowed when approved by the commissioner.

**2206.7.2.2 Pump sumps.** Pump sumps shall be compatible with the liquid motor fuel, liquid-tight, and accessible for inspection. Prefabricated pump sumps shall be approved.

**2206.7.3 Mounting of dispensers.** Dispensing devices, except those installed on top of a protected aboveground tank that qualifies as vehicle-impact resistant, shall be protected against physical damage by mounting on a concrete island 6 inches (152 mm) or more in height, or shall otherwise be suitably protected in accordance with [Section 312] FC312. Dispensing devices shall be installed and securely fastened to their mounting surface in

accordance with the dispenser manufacturer's instructions. Dispensing devices installed indoors shall be located in an approved position not in a direct line with vehicular traffic.

**2206.7.3.1 Protection of floor openings in indoor facilities.** Openings in floors beneath [automotive] liquid motor fuel-dispensing facilities located [inside buildings or structures] indoors shall be sealed.

**2206.7.3.2 Dispenser pans.** [If a] An approved dispenser pan [is] that is compatible with the liquid motor fuel shall be installed beneath a dispenser[, it shall be approved, compatible with the liquid motor fuel,]. The dispenser pan shall be liquid-tight, accessible for inspection, no larger than necessary, and installed solely for the purpose of collecting any liquid motor fuel leaking from the dispenser. The dispenser pan shall not be used to collect liquid motor fuel discharged from defective piping. The dispenser pan shall be backfilled up to not less than 6 inches (152 mm) above any nonmetallic piping and shall not interfere with the operation of any safety device.

**2206.7.4 Dispenser emergency valve.** An approved automatic emergency shutoff valve designed to close [automatically] in the event of a fire or impact shall be properly installed in the liquid supply line at the base of each dispenser supplied by a remote pump. The valve shall be installed so that the shear groove is flush with or within [0.5] ½ inch (12.7 mm) of the top of the concrete dispenser island and there is clearance provided for maintenance purposes around the valve body and operating parts. The valve shall be installed at the liquid supply line inlet of each overhead-type dispenser. Where installed, a vapor return line located inside the dispenser housing shall have a shear section or approved flexible connector for the liquid supply line emergency shutoff valve to function. Emergency shutoff valves shall be installed and maintained in accordance with the manufacturer's instructions, tested at the time of initial installation and tested at least yearly thereafter in accordance with [Section 2205.2.2] FC2205.2.2.

**2206.7.5 Dispenser hose.** Dispenser hoses shall be a maximum of 18 feet (5486 mm) in length unless otherwise approved. Dispenser hoses shall be listed and approved. When not in use, hoses shall be reeled, racked or otherwise protected from damage. The length of the dispensing hose shall be such that at least 1 inch ([25.4] 25 mm) clearance between the hose and the ground is maintained when the nozzle is rested on its bracket. Dispensing hoses installed at aviation facilities, marine liquid motor fuel-dispensing facilities, and fleet [vehicle] liquid motor fuel-dispensing facilities shall be of an approved length.

**2206.7.5.1 Breakaway devices.** Dispenser hoses shall be equipped with a listed emergency breakaway device designed to retain liquid on both sides of a breakaway point. Such devices shall be installed and maintained in accordance with the manufacturer's instructions. Where hoses are attached to hose-retrieving mechanisms, the emergency breakaway device shall be located between the hose nozzle and the point of attachment of the hose-retrieval mechanism to the hose.

**2206.7.6 Fuel delivery nozzles.** A listed automatic-closing-type hose nozzle valve without a latch-open device shall be provided for dispensers used for dispensing liquid motor fuel, except that a nozzle valve with a latch-open device may be installed and used at the following automotive liquid motor fuel-dispensing facilities:

1. [Full service] Full-service automotive liquid motor fuel-dispensing facilities.

2. Fleet automotive liquid motor fuel-dispensing facilities.

3. Dispensing of diesel fuel at self-service automotive liquid motor fuel-dispensing facilities.

**2206.7.6.1 Special requirements for nozzles.** Where dispensing of liquid motor fuel is performed, a listed automatic-closing-type hose nozzle valve shall be used that incorporates all of the following features:

[1. The hose nozzle valve shall be equipped with an integral latch-open device, when the use of such a device is authorized by this section.]

[2] 1. When the flow of product is normally controlled by devices or equipment other than the hose nozzle valve, the hose nozzle valve shall not be capable of being opened unless the delivery hose is pressurized. If pressure to the hose is lost, the nozzle shall close automatically.

**Exception:** Vapor recovery nozzles incorporating insertion interlock devices designed to achieve shutoff on disconnect from the vehicle fill pipe.

[3] 2. The hose nozzle shall be designed such that the nozzle is retained in the fill pipe during the filling operation.

[4] 3. The system shall include listed equipment with a feature that causes or requires the closing of the hose nozzle valve before the product flow can be resumed or before the hose nozzle valve can be replaced in its normal position in the dispenser.

**2206.7.6.2 Control device.** A control device shall be provided that will allow a liquid motor fuel pump to operate only when the dispensing nozzle is removed from its bracket on the dispenser and the switch on the dispenser is manually activated. The flow of liquid motor fuel shall automatically stop when the switch is deactivated or the nozzle returned to its bracket.

**2206.7.7 Leak detection.** Underground liquid motor fuel storage and dispensing systems shall be provided with a leak detection system in accordance with the following:

1. The leak detection system shall provide continuous monitoring of the tank's interstitial space.

2. The leak detection system shall provide continuous monitoring of liquid motor fuel pump sumps. Activation of the leak detection system shall cause shutdown of the liquid motor fuel pumps.

3. The leak detection system shall provide continuous monitoring of dispenser pans [whenever such pans are provided]. Activation of the leak detection system shall cause shutdown of the affected dispenser or liquid motor fuel pump supplying such dispenser.

4. Primary discharge piping shall be provided with an automatic line leak detector. Activation of such leak detector shall cause shutdown of the liquid motor fuel pump or significantly restrict the product flow.

5. The leak detection system shall have an alarm panel in a supervised location on the premises; trigger both an audible and visible local alarm; be capable of producing hardcopy printouts of all tests and/or leak notification reports; operate on low voltage; and be intrinsically safe for a liquid motor fuel environment.

6. Leak detection systems shall be listed and approved.

**2206.7.8 Gravity and pressure dispensing.** Liquid motor fuel shall not be dispensed by gravity from tanks, drums, barrels or similar containers. Liquid motor fuel shall not be dispensed by a device operating through pressure within a storage tank, drum or container.

**2206.7.9 Vapor-recovery and vapor-processing systems.** Vapor-recovery and vapor-processing systems, when required by the New York State Department of Environmental Conservation, shall be installed in accordance with [Section 2206.7.9,] FC2206.7.9 and the [requirements] regulations of the New York State Department of Environmental Conservation, and shall be approved.

**2206.7.9.1 Vapor-balance systems.** Vapor-balance systems shall comply with the requirements of [Sections] FC 2206.7.9.1.1 through 2206.7.9.1.5.

**2206.7.9.1.1 Dispensing devices.** Dispensing devices incorporating provisions for vapor recovery shall be listed and labeled. When existing listed or labeled dispensing devices are modified for vapor recovery, such modifications shall be listed by report by a nationally recognized testing laboratory. The listing by report shall contain a description of the component parts used in the modification and the recommended method of installation on specific dispensers. Such report shall be made available for inspection by any department representative. Means shall be provided to shut down fuel dispensing in the event the vapor return line becomes blocked.

**2206.7.9.1.2 Vapor-return line closeoff.** An approved method shall be provided to close off the vapor return line from dispensers when the product is not being dispensed.

**2206.7.9.1.3 Piping.** Piping in vapor-balance systems shall be in accordance with [Sections] FC 3403.6 and 3404.2. Nonmetallic piping shall be installed in accordance with the manufacturer's installation instructions. Vapor return piping shall be installed in a manner that drains back to the tank, without sags or traps in which liquid can become trapped. If necessary, because of grade, condensate tanks are allowed in vapor return piping. Condensate tanks shall be designed and installed so that they can be drained without opening.

**2206.7.9.1.4 Flexible joints and shear joints.** Flexible joints shall be installed in accordance with [Section 3403.6.9] FC3403.6.9. An approved shear joint shall be rigidly mounted and connected by a union in the vapor return piping at the base of each dispensing device. The shear joint shall be mounted flush with the top of the surface on which the dispenser is mounted.

**2206.7.9.1.5 Testing.** Vapor return lines and vent piping shall be tested in accordance with [Section 2206.9] FC2206.9.

**2206.7.9.2 Vapor-processing systems.** Vapor-processing systems shall comply with the requirements of [Sections] FC 2206.7.9.2.1 through 2206.7.9.2.4.

**2206.7.9.2.1 Equipment.** Equipment in vapor-processing systems, including hose nozzle valves, vapor pumps, flame arresters, fire checks or systems for prevention of flame propagation, controls and vapor-processing equipment, shall be individually listed for the intended use in a specified manner. Vapor-processing systems that introduce air into the underground piping or storage tanks shall be provided with equipment for prevention of flame propagation that has been tested and listed as suitable for the intended use.

**2206.7.9.2.2 Location.** Vapor-processing equipment shall be located at or above grade. Sources of ignition shall be located not less than 50 feet (15 240 mm) from fuel-transfer areas and not less than 18 inches (457 mm) above tank fill openings and tops of dispenser islands. Vapor-processing units shall be located not less than 10 feet (3048 mm) from the nearest building or structure or lot line.

**Exception:** Where the required distances to buildings or structures, lot lines or fuel-transfer areas cannot be obtained, means shall be provided to protect equipment against fire exposure. Acceptable means shall include:

1. Approved protective enclosures, which extend at least 18 inches (457 mm) above the equipment, constructed of fire-resistant or noncombustible materials; and

2. Fire protection using an approved water-spray system.

**2206.7.9.2.2.1 Location and safeguards.** Vapor-processing equipment shall be located a minimum of 20 feet (6096 mm) from dispensing devices. Processing equipment shall be protected against physical damage by guardrails, curbs, protective enclosures or fencing. Where approved protective enclosures are used, approved means shall be provided to ventilate the volume within the enclosure to prevent pocketing of flammable vapors. Where a downslope exists toward the location of the vapor-processing unit from a fuel-transfer area, the commissioner may require additional separation by distance and height.

**2206.7.9.2.3 Installation.** Vapor-processing units shall be securely mounted on concrete, masonry or structural steel supports on concrete or other noncombustible

foundations. Vapor-recovery and vapor-processing equipment is allowed to be installed on roofs when approved.

**2206.7.9.2.4 Piping.** Piping in a mechanical-assist system shall be in accordance with [Section 3403.6] FC3403.6.

**2206.7.10 Alcohol-blended motor fuel-dispensing equipment.** Dispensers, hoses, nozzles, breakaway fittings, swivels, flexible connectors, dispenser emergency shutoff valves, vapor recovery systems and pumps used in alcohol-blended motor fuel storage and dispensing systems shall be compatible with such fuels and shall be listed or approved for such purpose.

**2206.8 Fire extinguishing system for dispensing area.** Where flammable liquid motor fuel is dispensed at an automotive liquid motor fuel-dispensing facility, the dispensing area shall be provided with a dry chemical fire extinguishing system designed and installed in accordance with [Section 904.6] FC904.6, and the following requirements:

1. The fire extinguishing system shall be designed to provide overhead protection of the dispenser area encompassed by a circle formed by the fully extended hose and nozzle on each fuel dispenser and both ends of the dispenser island.

2. The extinguishing agent containers shall be equipped with indicators to show whether the system is fully charged. Indicators shall be positioned to be easily read from grade.

3. The installation, alteration, testing and repair of the fire extinguishing system, including any maintenance or modification of the system, shall be performed by a person possessing a master fire suppression piping contractor license issued by the [New York City] Department of Buildings and trained and knowledgeable in the installation, operation and maintenance of the specific fire extinguishing system.

4. Dispensers shall not be operated when the fire extinguishing system has discharged or is inoperative, except as authorized in writing by the department. The motor fuel-dispensing facility certified attendant shall immediately notify the department of system discharge or inoperability.

5. Fire extinguishing systems shall be inspected and tested in accordance with [Section 2206.9] FC2206.9.

6. Fire extinguishing systems at fleet [vehicle] automotive liquid motor fuel-dispensing facilities shall be monitored by an approved central station company.

**2206.9 Inspection and testing.** Inspection and testing required by [Sections] FC 2206.9.1 through 2206.9.7 shall be conducted at the owner's risk by his or her representative before a representative of the department.

**2206.9.1 Initial tank test.** Underground and aboveground tanks shall be tested hydrostatically at 15 pounds per square inch (psig)(103.4 kPa), or [1½] one and one-half times the maximum anticipated static head pressure, whichever is greater, for the inner tank, and

pneumatically or hydrostatically at 5 pounds per square inch (psig)(34.5 kPa) for the annular space (secondary containment tank). When a pneumatic test is allowed, an inert gas shall be used; however, air may be used if the tank or piping system does not contain any liquid motor fuel or combustible vapor. Test pressure shall be maintained for a sufficient time to complete visual inspection, but not less than 1 hour. A tank shall be deemed to have passed the test if it shows no evidence of leakage or permanent deformation.

**2206.9.2 Initial piping test**. Prior to backfill, primary piping shall be tested hydrostatically to [1½] one and one-half times the maximum anticipated operating pressure, but not less than 15 pounds per square inch (psig)(103.4 kPa). After backfill and installation of the top slab, discharge piping shall be tested hydrostatically at [1½] one and one-half times the maximum anticipated pressure, but not less than 50 pounds per square inch (psig)(345 kPa). Secondary containment piping (annular space) shall be tested pneumatically [or hydrostatically] at 5 pounds per square inch (psig)(34.5 kPa)[. When a pneumatic test is allowed,] utilizing an inert gas[ shall be used]; however, air may be used if the tank system or piping system does not contain any liquid motor fuel or combustible vapor. Hydrostatic test pressure shall be maintained for sufficient time to complete visual inspection but not less than 1 hour. The test shall show that there is no evidence of leakage. Test pressure for aboveground tank piping shall be at [1½] one and one-half times the maximum anticipated operating pressure but not less than 100 pounds per square inch (psig)(690 kPa).

**2206.9.3 Leak detection functionality test**. Leak detection systems shall be inspected and tested at the time of installation in accordance with the rules. Leak detection systems monitoring [underground] liquid motor fuel storage systems shall be tested at least once every 2 years by a person holding a certificate of license. Such test shall confirm that all leak detection equipment and associated alarms are in good working order.

**2206.9.4 Fire extinguishing system test.** A performance test of the fire extinguishing system shall be performed at the time of installation in accordance with the approved design and installation documents, and such procedures as may be prescribed by the commissioner. Fire extinguishing systems shall be tested at least once every 5 years [from the date of approval of the initial installation]. The test shall be in accordance with procedures prescribed by the commissioner.

**2206.9.5 Emergency tank and piping system test**. The commissioner may require that a tank and piping system be precision tested or pressure tested in accordance with this section to determine the condition of the tank or piping. Storage systems that may contain liquid motor fuel or combustible vapor shall not be tested pneumatically.

**2206.9.6 Periodic tank and piping test**. Any existing underground single-walled liquid motor fuel storage tanks previously approved by the department or any existing underground tanks that is not provided with a leak detection system meeting the requirements of [Section 2206.7.7] FC2206.7.7 shall be precision tested at least once every 5 years.

**2206.9.7 Pouring concrete and backfilling.** The pouring of concrete for the base and top slab, the backfilling of tank and piping, and the construction of the top slab support shall be witnessed by a representative of the department at time of installation.

**2206.10**[.] **Installation of underground tank and piping systems.** The installation of tank and piping systems shall be in accordance with FC Chapter 34, except as otherwise specified in this section.

1. Tanks shall be located so that the forces from building foundations and support loads are not transmitted to the tanks. The distance from any part of a tank to the nearest wall of any basement, pit, cellar or any property line shall not be less than 3 feet (914 mm). Tanks shall not be placed less than 20 feet (6096 mm) from a subway wall.

2. Tanks shall be installed so that the highest point of the tank is not less than 2 feet (609.6 mm) below the level of the lowest cellar floor of any building within a radius of 10 feet (3048 mm) from the tank. No tank shall be located under a sidewalk or beyond the property line of the [automotive] liquid motor fuel-dispensing facility.

3. Tanks shall be placed on a 12-inch ([304.8] 305-mm) thick base slab approved by the Department of Buildings, or installed in such other manner as may be approved by the Commissioner of Buildings, and secured against flotation. The system used for anchoring the tank shall not damage the tank or its coating.

4. Tanks shall be placed on a bed of approved backfill material in accordance with manufacturer's specifications. The backfill material shall evenly and completely support the bottom quadrant of the tank. The backfill material shall be carefully placed along the bottom, under the sides and under the end caps or heads of the tank, by shoveling and tamping. Backfilling shall then be completed in 12-inch ([304.8] 305-mm) lifts placed uniformly around the tank. Provision shall be made, consistent with site conditions, to prevent the migration of backfill.

5. Tanks shall be covered with a reinforced concrete slab not less than 8 inches ([203.2] 203 mm) thick, which shall extend not less than 12 inches ([304.8] 305 mm) beyond the horizontal outlines of the tank. The support of the top slab [and its support] shall be of a design approved by the [New York City] Department of Buildings.

6. Fill, suction and discharge piping shall be encased in 4 inches ([101.6] 102 mm) of concrete or covered by a minimum of 18 inches (457 mm) of manufacturer-approved backfill, or covered by 4 inches ([101.6] 102 mm) of manufacturer-approved backfill and an 8-inch ([203.2] 203-mm) reinforced concrete slab.

7. Not more than 40,000 gallons (151 400 L) of liquid motor fuel shall be stored at any facility, including liquid motor fuel stored in aboveground tanks.

8. Tanks containing identical products may [discharge liquid motor fuel into a common line,] be wet-manifolded provided that the total aggregate capacity [of any group] of such tanks [discharging into a common line] does not exceed 12,000 gallons (45 420 L) of liquid motor fuel, and each tank is provided with its own submersible pump.

9. Tank connections shall be designed and located so as to:

   9.1. Minimize the maneuvering necessary to position a cargo tank to make the delivery.

9.2. Minimize obstructing a public right of way or motorists' view of roadways, or impeding the movement of motor vehicles or pedestrians, during deliveries.

9.3. Provide connections by means of approved [liquid] liquid- and vapor-tight connections.

10. Tanks installed underground [inside a building or structure] indoors shall be provided with an approved liquid level-indicating device. [Liquid-level indicating] Liquid level-indicating devices shall be designed and constructed to prevent the escape of liquid or vapor and shall be approved.

11. Test wells shall be prohibited in tanks located underground [inside a building or structure] indoors. Unused tank openings shall be permanently sealed at the tank to prevent removal of plugs or covers.

12. Secondary containment piping shall be required on all nonmetallic product-carrying pipes except direct fill lines, suction lines or siphon lines containing only one check valve located at the highest point of the line.

13. Underground piping shall have a slope of not less than ⅛ inch per foot (10.4 mm per meter) pitched toward the tank and shall be installed so as to facilitate initial and periodic testing.

14. Flexible joints shall be installed in accordance with [Section 3403.6.9] FC3403.6.9.

15. Each underground motor fuel storage tank shall be provided with a separate unobstructed vent line without any trap or device that causes excessive back pressure.

16. Vent piping shall be installed not less than 12 inches ([304.8] 305 mm) below the finished surface measured from the point where the piping rises vertically and shall slope toward the tank.

17. Vent outlets shall discharge outdoors and upward. The discharge point shall be no less than 15 feet (4572 mm) above the adjacent ground level and no less than 10 feet (3048 mm) from the nearest building opening.

18. An approved overfill prevention device shall be provided to prevent overfilling. When installed in diesel fuel tanks, such overfill prevention device shall be designed to withstand the pressure generated by the cargo tank discharge pump and shall automatically shut off the flow into the tank when the tank is not more than 95 percent full.

19. Each tank shall be provided with one fill connection only, unless approved. Each tank fill connection shall be provided with a catchment basin with a capacity of at least 15 gallons (56.8 L). The contents of the catchment basin shall be automatically drained into the tank without overfilling the tank after the transfer from the cargo tank is completed provided, however, that if the Stage II vapor recovery system approved for the tank does not allow for the installation of an automatic drain, a manual drain may be installed.

20. Where the discharging piping leak detector required by [Section 2206.7.7(4)] FC2206.7.7(4) does not cause shutdown of the liquid motor fuel pump, secondary containment piping shall be provided.

**2206.11 Spill control.** Provision shall be made to prevent liquids spilled during dispensing operations from flowing into buildings, by grading driveways, raising doorsills[,] or other approved means.

**[2206.12 Warning signs.** Durable warning signs shall be conspicuously posted on or immediately adjacent to each dispenser in the fuel-dispensing area and shall state the following:

1. It is illegal and dangerous to fill unapproved containers with fuel.

2. Smoking is prohibited.

3. The engine shall be shut off during the refueling process.

4. Portable containers shall not be filled while located inside the trunk, passenger compartment, or truck bed of a vehicle.

5. It is unlawful for customers to fill portable containers. See attendant for assistance.]

## SECTION FC 2207
## RESERVED

## SECTION FC 2208
## COMPRESSED NATURAL GAS MOTOR FUEL-DISPENSING FACILITIES

**2208.1 General.** CNG motor fuel-dispensing facilities shall be designed, installed, operated and maintained in accordance with NFPA 52 except as otherwise specified in this section and [Section 2201] FC2201.

**2208.1.1 Prohibitions.** It shall be unlawful to:

1. Operate a self-service marine CNG motor fuel-dispensing facility.

2. Fill a portable container, other than permanently mounted fuel containers on CNG-powered vehicles, except outdoors at a utility-operated facility.

**2208.1.2 Supervision of dispensing operations.** The dispensing of CNG at CNG motor fuel-dispensing facilities shall be supervised by a certified attendant as set forth in [Section 2201.7] FC2201.7.

**2208.1.3 Maintenance.** Maintenance of CNG motor fuel-dispensing systems shall be conducted under the personal supervision of a person holding a CNG fueling facility maintenance certificate of fitness.

**[2208.1.4 Operating instructions.** Dispenser operating instructions shall be conspicuously posted in approved locations on every dispenser and shall indicate the location of the emergency shutdown device controls required by Section 2208.7.]

**2208.1.4 Lighting.** Dispensing areas shall be well lighted whenever dispensing is being conducted.

**2208.1.5 Dispensing area signage.** Durable signs shall be conspicuously posted in dispensing areas in CNG motor fuel-dispensing facilities in compliance with the requirements of FC 2208.1.5.1 through 2208.1.5.3.

**2208.1.5.1 Operating instructions.** A sign setting forth dispenser operating instructions shall be posted on every dispenser. Such sign shall also indicate the location of the emergency shutdown switches required by FC2208.7.

**2208.1.5.2 CNG dispensing warning sign.** A warning sign that reads as follows shall be posted on or immediately adjacent to each dispenser:

1. No smoking.

2. Shut off engine.

**2208.1.5.3 Emergency procedures.** A sign setting forth emergency procedures that reads as follows shall be posted in the dispensing area, or other location designated in this section:

IN CASE OF FIRE, LEAK OR EMERGENCY:

ACTIVATE EMERGENCY CNG SHUTDOWN

DIRECT VEHICLE OCCUPANTS TO EXIT VEHICLES
AND LEAVE AREA IMMEDIATELY

KEEP ALL PERSONS AWAY FROM THE AREA.

NOTIFY THE FIRE DEPARTMENT (CALL 911)

(FACILITY ADDRESS)
(*indicate address, with cross-street reference*).

**[2208.1.5] 2208.1.6 [Communications] Emergency telephone.** A telephone not requiring a coin to operate or [otherwise] another approved, clearly identified means to notify the department, shall be provided [on the site] at the facility in an approved location.

**[2208.1.6] 2208.1.7 Electrical equipment.** Electrical wiring and equipment shall be suitable for the location in which they are installed and shall be in accordance with [Section 605] FC605, NFPA 52 and the Electrical Code.

**[2208.1.7] 2208.1.8 Audible and visible alarms.** All audible and visible alarms required by this section shall actuate at a supervised location on the premises that assures immediate response.

**[2208.1.8 Warning signs.** Durable warning signs shall be conspicuously posted on or immediately adjacent to each dispenser in the fuel-dispensing area and shall state the following:

1. Smoking is prohibited.

2. The engine shall be shut off during the refueling process.]

**2208.1.9 Smoking and open flames.** It shall be unlawful to smoke or use or maintain an open flame in any area where CNG motor fuel is compressed, stored or dispensed.

**Exception**: Welding, cutting or similar hot work may be conducted for emergency repair, alteration or installation work, providing that all necessary safety precautions are taken, and all required department permits and authorization from the holder of a certificate of fitness for CNG station maintenance have been obtained.

**2208.1.10 Records of incidents.** Records shall be kept of all incidents including fire, leak, device, equipment or system failure, out-of-service fire protection, alarm, or safety system, and of all equipment maintenance. Such records shall be kept in a bound log book or other recordkeeping approved by the department, maintained on the premises for a minimum of 4 years.

**[2208.1.9] 2208.1.11 Self-service CNG motor fuel-dispensing facilities.** Self-service CNG motor fuel-dispensing facilities shall [comply] be designed, installed, operated and maintained in compliance with the requirements of [Sections 2208.1.9.1 through 2208.1.9.5] FC 2208.1.11.1 through 2208.1.11.5.

**2208.1.11.1 Duties of certified attendant.** The certified attendant's primary function shall be to supervise, observe and monitor the dispensing of CNG. The certified attendant shall prevent the dispensing of [fuel] CNG into portable containers, control sources of ignition, take immediate action upon a fire, leak or other emergency and be ready to use a portable fire extinguisher. Nothing in this section shall be construed to prohibit a certified attendant from engaging in activities directly related to the sale of CNG motor fuel, such as the collection of money or processing of credit cards.

**[2208.1.9.1] 2208.1.11.2 Self-service dispensers.** Approved self-service devices, equipment and systems such as, but not limited to, card-operated and remote-preset types, are allowed at CNG motor fuel-dispensing facilities. The certified attendant shall set the dispensing devices in the "off" position when not in use if such dispensing device can be activated without the certified attendant's knowledge.

**[2208.1.9.2] 2208.1.11.3 Monitoring of dispensing.** A control [area] booth shall be located on the premises of every self-service CNG motor fuel-dispensing facility. The control [area] booth shall be an interior or exterior enclosure to which the public has no

access. The certified attendant shall be present within the control [area] booth while dispensing operations are conducted. The control [area] booth shall be designed and located so that the certified attendant stationed therein shall have a full, unobstructed clear view of dispensing operations, except that mirrors and/or an approved closed-circuit television installation may be provided to afford the certified attendant a clear view of dispensing operations when the view from the control [area] booth is partially or temporarily obstructed. For purposes of this section, the "clear" view provided by a closed-circuit television installation shall mean that the image on the monitor shall be of such brightness and resolution as to allow ready identification of individuals and easy observation of activities at all times of day. Audible and visible alarms required by this section shall actuate within the control [area] booth. A properly labeled manual switch that activates the emergency shut down device shall be located within the control [area] booth. A console that controls the self-service CNG motor fuel dispensers shall be provided within the control [area] booth and within 5 feet (1524 mm) of the emergency [shut down] shutdown device manual switch.

**[2208.1.9.3] 2208.1.11.4 Two-way voice communication.** A two-way voice communication system shall be installed to provide contact between the control [area] booth and each dispensing island.

**[2208.1.9.4 Control area sign.** A durable metal sign that reads as follows shall be posted in plain view within the control area.

| |
|---|
| Emergency Procedures:<br>Activate emergency CNG shut down<br>Direct vehicle occupants to exit vehicles and leave area immediately.<br>Keep all persons away from the area.<br>Notify the Fire Department (Call 911). |

Such sign shall also indicate the department telephone number, the nearest fire alarm box location, and the CNG motor fuel-dispensing facility's address, with cross street reference.

**2208.1.9.5 Lighting.** Dispensing areas shall be well lighted whenever the facility is open for business.]

**2208.1.11.5 Signage.** The signage required by FC2208.1.5 shall be posted in the dispensing area of a self-service motor fuel-dispensing facility, except that the emergency procedures sign required by FC2208.1.5.3 shall be posted in the control booth.

**[2208.1.10] 2208.1.12 Fleet CNG motor fuel-dispensing facilities.** Fleet CNG motor fuel-dispensing facilities shall [comply] be designed, installed, operated and maintained in compliance with the requirements of [Sections 2208.1.10.1 through 2208.1.10.3] FC 2208.1.12.1 through 2208.1.12.3.

**[2208.1.10.1 General.** The owner of fleet CNG motor fuel-dispensing facilities shall provide, and be accountable for, daily site visits, regular equipment inspection, and maintenance.

**2208.1.10.2 Emergency procedures.** An approved emergency procedures sign, in addition to the sign required by Section 2208.1.9, shall be posted in a conspicuous location and shall read:

IN CASE OF FIRE, LEAK OR OTHER EMERGENCY

1. ACTIVATE EMERGENCY CNG SHUTDOWN LOCATED (*indicate location*)

2. NOTIFY THE FIRE DEPARTMENT (CALL 911)

FACILITY ADDRESS (*indicate address, with cross street reference*)]

**2208.1.12.1 Inspection of dispensing areas.** The certified attendant responsible for supervision of the dispensing of CNG at a fleet motor fuel-dispensing facility shall inspect the dispensing area on a periodic basis in accordance with the rules to ensure that the facility is being maintained in accordance with this chapter and the rules. The certified attendant shall notify the owner and make any other notifications required by this code if there is any evidence that the facility is not in good working order. A record of such inspections and notifications shall be maintained at the premises in accordance with FC107.7.

**2208.1.12.2 Duties of fleet personnel.** Employees or other persons working for the owner of a fleet CNG fuel-dispensing facility whose duties involve the dispensing of CNG shall be trained and knowledgeable in such dispensing in compliance with the requirements of this code and the rules.

**[2208.1.10.3] 2208.1.12.3 Quantity limits.** Dispensing equipment used at fleet CNG motor fuel-dispensing facilities shall be programmed or set to limit uninterrupted CNG delivery to an approved amount and require a manual action to resume delivery.

**[2208.1.11] 2208.1.13 [Full service] Full-service CNG motor fuel-dispensing facilities.** [Full service] Full-service CNG motor fuel-dispensing facilities shall [comply] be operated and maintained in compliance with the requirements of [Section 2208.1.11.1] FC2208.1.13.1.

**[2208.1.11.1 Emergency procedures.** An approved emergency procedures sign, in addition to the sign required by Section 2208.1.9, shall be provided and posted as set forth in Section 2208.1.11.2.]

**2208.1.13.1 Duties of certified attendant.** The certified attendant at a full-service CNG motor fuel-dispensing facility shall personally supervise the dispensing of motor fuel into vehicles by facility personnel. The certified attendant shall conduct a visual inspection of the dispensing area on a daily basis to monitor the condition of such installation. The certificate of fitness holder shall notify the owner and make any other notifications required by this code if there is any evidence that the installation is not in good working order. A record of such inspections and notifications shall be maintained at the premises in accordance with FC107.7.

**2208.2 Design, installation and testing requirements.** Devices, equipment and systems used for the compression, storage and dispensing of CNG shall be designed, approved, listed and/or tested in accordance with [Sections] FC 2208.2.1 through 2208.2.7.

**2208.2.1 Approved equipment.** Containers, vessels, compressors, pressure regulators, pressure relief valves and other pressure relief devices and piping used for CNG shall be approved.

**2208.2.2 Listed equipment.** Hoses, hose connections, dispensers, gas detection systems and electrical equipment used for CNG shall be listed. Vehicle-fueling connections shall be listed and labeled.

**2208.2.3 Vehicle fueling hose.** Vehicle fueling hose shall be compatible with CNG and shall withstand a pressure of at least [4] four times the service pressure. Hoses shall be of retractable design and shall be protected against physical damage. Hoses shall be tested for leaks with a [non-corrosive] noncorrosive solution or equivalent leak detection method at least annually by a certified attendant and shall be replaced if damaged. Records of required inspections and testing shall be kept in a bound log book or other approved recordkeeping, maintained on the premises for a minimum of 4 years[ and made available for inspection by any representative of the department].

**2208.2.4 [Container] Initial container testing**. Prior to placing containers and pressure vessels in CNG service, evidence of container and pressure vessel pressure tests shall be submitted to the department demonstrating compliance with the requirements of NFPA 52.

**2208.2.5 Gas piping.** All CNG system gas piping shall be tested by a qualified person in accordance with NFPA 52 at the owner's risk and before a representative of the department prior to placing the system in service. Required tests shall begin at the downstream side of the remote manual shutdown valve.

**2208.2.6 Filters and dryers.** Filters and dryers used at CNG motor fuel-dispensing facilities shall be rated for the service and pressure intended and shall be tested in accordance with the gas piping test requirements set forth in [Section 2208.2.5] FC2208.2.5.

**2208.2.7 Safety devices.** Upon installation, all automatic safety devices intended to cause equipment shutdown shall be tested at the owner's risk by his or her representative before a representative of the department.

**2208.3 Location of dispensing operations and equipment.** CNG motor fuel-dispensing facilities shall be located at a site operated by a natural gas utility, or other approved location.

**2208.3.1 Location on property.** In addition to the requirements of [Section 2203.1] FC2203.1 and NFPA 52, compression, storage and dispensing devices, equipment and systems shall be installed as follows:

1. Aboveground, and not beneath power lines.

2. At least 10 feet (3048 mm) from the nearest building, lot line, public street, private road, sidewalk, or source of ignition.

   **Exception:** Dispensing equipment need not be separated from canopies that are constructed in accordance with the construction codes, including the Building Code, and which provide weather protection for the dispensing equipment.

3. At least 25 feet (7620 mm) from the nearest rail of any railroad track and 50 feet (15 240 mm) or more from the nearest rail of any railroad main track or any railroad or transit line where power for train propulsion is provided by an outside electrical source such as third rail or overhead catenary.

4. At least 50 feet (15 240 mm) from the vertical plane below the nearest overhead wire of a trolley bus line.

**2208.3.2 Rooftop operations.** Rooftop dispensing shall be in accordance with [Sections] FC 2208.3.2.1 through 2208.3.2.3.

**2208.3.2.1 Roof construction.** The roof of the building or structure shall be of noncombustible construction.

**2208.3.2.2 Compressor and discharge piping.** The compressor shall be located on the roof and the discharge piping shall not enter the building or structure.

**2208.3.2.3 Height.** The building or structure shall be 75 feet (22 860 mm) or less in height.

**2208.4** Reserved.

**2208.5 Pressure regulators.** Pressure regulators shall be designed and installed or protected so that their operation will not be affected by the elements (freezing rain, sleet, snow or ice), mud or debris. The protection is allowed to be an integral part of the regulator.

**2208.6 Manual valves.** Gas supply piping to equipment shall be provided with a remote, readily accessible manual shutoff valve of the fast-closing, quarter-turn type. Manual valves shall be located so as to minimize the risk of physical damage and minimize being rendered inoperable as a result of freezing.

**2208.6.1 Location.** Manual valves shall be located within the boundary of the facility and as follows:

1. Not less than 25 feet (7620 mm) from the compressor for compressors rated for 300 standard cubic feet per minute (8.5 $m^3$/min) or less.

2. Not less than 75 feet (22 860 mm) from the compressor for compressors rated for greater than 300 standard cubic feet per minute (8.5 $m^3$/min).

**2208.7 Emergency shutdown switches.** An approved, clearly identified and readily accessible emergency shutdown switch shall be provided at an approved location. The switch, upon activation, shall automatically and immediately shut off the power supply to the compressor and close valves between the gas supply and the compressor and between the storage tanks and the dispensers. Such emergency shutdown switches for outdoor CNG dispensers shall be located within 75 feet (22 860 mm) of, but not less than 25 feet (7620 mm) from, the fuel dispensers. For interior fuel-dispensing operations, such emergency shutdown switches shall be installed at an approved location. An additional automatic emergency shutdown switch shall be provided in the compressor area for both indoor and outdoor compressors. An approved sign shall be posted on or immediately adjacent to such switches and shall read: EMERGENCY CNG SHUTOFF. Such emergency shutdown switch shall be of a type that is manually resettable.

**2208.7.1 Compressor shutdown devices.** Each compressor shall be equipped with an automatic shutdown device that will shut down the compressor in the event of low suction pressure, high suction pressure, high motor temperature, high discharge pressure or high discharge temperature.

**2208.7.2 Gas detection system.** Indoor compressing, storage and dispensing areas shall be provided with a combustible gas detection alarm system meeting the standards of the construction codes, including the Building Code. Such system shall activate a local audible and visible alarm at 20 percent of the LEL and automatically shut off gas supply at 50 percent of the LEL, with simultaneous transmission of an alarm to the department by an approved central station company. The automatic [shut-off] shutoff valve shall be located upstream from the confined [high pressure] high-pressure piping and shall be installed underground or otherwise protected from exposure to fire in an approved manner.

**2208.7.3 Heat detection system.** Indoor compressing, storage and dispensing areas shall be provided with a [closed circuit] closed-circuit heat detection system utilizing approved heat detection devices and equipment designed to automatically activate a local audible and visible alarm with simultaneous transmission to an approved central station, activate a fire extinguishing system over the area or enclosure, and [shutoff] shut off the gas supply to the compressor and dispenser. The automatic [shut-off] shutoff valve shall be installed underground or be otherwise protected from exposure to fire in an approved manner.

**2208.7.3.1 Outdoor heat detection system.** Outdoor compressing, storage and dispensing shall be provided with a [closed circuit] closed-circuit heat detection system designed utilizing approved heat detection devices and equipment designed to automatically activate a local audible and visible alarm and shut off the gas supply to the compressor and dispenser. The automatic [shut-off] shutoff valve shall be installed underground or otherwise protected from exposure to fire in an approved manner.

**2208.7.3.2 Outdoor storage exceeding 35,000 SCF (991.2 $m^3$).** For outdoor CNG storage exceeding 35,000 SCF (991.2 $m^3$) located within 25 feet (7620 mm) of a building or structure, activation of the heat detection system shall simultaneously transmit an alarm to an approved central station.

**2208.7.4 Fire extinguishing systems and appliances.** Indoor compressing, storage and dispensing areas shall be protected throughout by a fire extinguishing system.

**2208.7.4.1 Fire extinguishing system periodic testing.** A performance test of the non-water fire extinguishing system and the dispensing facility emergency shutdown system shall be conducted at least once every 5 years. The test shall be conducted at the owner's risk by his or her representative before a representative of the department.

**[2208.7.4.1] 2208.7.4.2 Portable fire extinguishers**. Portable fire extinguishers shall be provided adjacent to the CNG motor fuel-dispensing facility in the number and size specified by NFPA 52 and [Section 906] FC906.

**[2208.7.5 Smoking and open flames.** It shall be unlawful to smoke or use or maintain an open flame in any area where CNG motor fuel is compressed, stored or dispensed.

**Exception**: Welding, cutting or similar hot work may be conducted at times and places for emergency repair, alteration or installation work, providing that all necessary safety precautions are taken, and all required department permits and authorization from the holder of a certificate of fitness for CNG station maintenance has been obtained.

**2208.7.6 Records of incidents.** Records shall be kept of all incidents including fire, leak, device, equipment or system failure, out of service fire protection, alarm, or safety system, and of all equipment maintenance. Such records shall be kept in a bound log book or other recordkeeping approved by the department, maintained on the premises for a minimum of 4 years and made available for inspection by any representative of the department.]

**2208.8 Discharge of CNG from motor vehicle fuel storage containers.** The discharge of CNG from motor vehicle fuel containers for the purposes of maintenance, container certification, calibration of dispensers or other activities shall be in accordance with [Sections] FC 2208.8.1 through 2208.8.1.2.

**2208.8.1 Methods of discharge.** The discharge of CNG from motor vehicle fuel containers shall be accomplished through a closed transfer system in accordance with [Section 2208.8.1.1] FC2208.8.1.1 or an approved method of atmospheric venting in accordance with [Section 2208.8.1.2] FC2208.8.1.2.

**2208.8.1.1 Closed transfer system.** Documentation of the procedure for discharging the container shall be provided to the commissioner for approval. The procedure shall include the actions the operator will take in the event of a low-pressure or high-pressure natural gas release during the discharging activity. A schematic design document illustrating the arrangement of piping, regulators and equipment settings, and their relation to the location of the compressor, storage vessels and emergency shutdown devices, shall be provided to the commissioner for approval.

**2208.8.1.2 Atmospheric venting.** Atmospheric venting of CNG shall comply with the requirements of [Sections] FC 2208.8.1.2.1 through 2208.8.1.2.6.

**2208.8.1.2.1 Plans and specifications.** A schematic design document illustrating the location of the vessel support, piping, the method of grounding and bonding, and

other requirements specified herein or requested by the department shall be provided to the commissioner for approval.

**2208.8.1.2.2 Container stability.** A method of rigidly supporting the container during the venting of CNG shall be provided. The selected method shall provide not less than two points of support and shall prevent the horizontal and lateral movement of the container. The system shall be designed to prevent the movement of the container based on the highest gas-release velocity through valve orifices at the container's rated pressure and volume. The structure or appurtenance shall be constructed of noncombustible materials.

**2208.8.1.2.3 Separation.** The structure or appurtenance used for stabilizing the container shall be separated from other equipment or features as set forth in FC Table 2208.8.1.2.3.

**FC TABLE 2208.8.1.2.3**
**SEPARATION DISTANCE FOR ATMOSPHERIC VENTING OF CNG**

| EQUIPMENT OR FEATURE | MINIMUM SEPARATION (feet) |
|---|---|
| Buildings | 25 |
| Building openings | 25 |
| Lot lines | 15 |
| Public street or private roads | 15 |
| Vehicles | 25 |
| CNG compressor and storage containers | 25 |
| CNG dispensers | 25 |

For SI: 1 foot = 304.8 mm.

**2208.8.1.2.4 Grounding and bonding.** The structure or appurtenance used for supporting the container shall be grounded in accordance with the Electrical Code. The container valve shall be bonded prior to the commencement of venting operations.

**2208.8.1.2.5 Vent tube.** A vent tube that will divert the gas flow to the atmosphere shall be installed on the container prior to commencement of the venting and purging operation. The vent tube shall be constructed of pipe or tubing materials approved for use with CNG in accordance with FC Chapter 30. The vent tube shall be capable of dispersing the gas a minimum of 10 feet (3048 mm) above grade level. The vent tube shall not be provided with a rain cap or other feature that would limit or obstruct the gas flow. At the connection fitting of the vent tube and the CNG container, a listed bi-directional detonation flame arrester shall be provided.

**2208.8.1.2.6 Signage.** Approved "No Smoking" signs complying with the requirements of [Section 310] FC310 shall be conspicuously posted within 10 feet (3048 mm) of the container support structure or appurtenance. Approved CONTAINER SHALL BE BONDED signs shall be posted on the container support structure or appurtenance.

**2208.9 Residential and other vehicle fueling appliance facilities.** The compressing and dispensing of CNG by a vehicle fueling appliance shall be in accordance with [Sections] FC 2208.9.1 through 2208.9.4.

**2208.9.1 Residential fueling appliance facilities.** The compressing and dispensing of CNG at a residential fueling appliance facility shall be in accordance with [Chapter 7 of] NFPA 52 and this chapter, except that such facilities shall be exempt from the requirements of [Section 2208.3.1(2)] FC2208.3.1(2) with regard to the distance to the nearest building, and [Sections] FC 2208.7 through 2208.7.4.

**2208.9.2 [Non-residential] Nonresidential fueling appliance facilities.** The compressing and dispensing of CNG at a [non-residential] nonresidential fueling appliance facility shall be in accordance with [Section 6.17 of] NFPA 52 and this chapter, except that such facilities shall be exempt from [Section 2208.3.1(2)] FC2208.3.1(2) with regard to the distance to the nearest building, and [Sections] FC 2208.7 through 2208.7.4.

**2208.9.3 Prohibitions.** It shall be unlawful to:

1. Fill or store any containers, other than permanently mounted fuel containers on CNG-powered vehicles.

2. Compress and dispense CNG indoors.

**2208.9.4 Supervision.** The operation of a vehicle fueling appliance facility shall be under the personal supervision of a certified attendant.

**2208.10 Mobile CNG [fuel] motor fuel compression, storage and dispensing.** A mobile CNG motor fuel compression, storage and/or dispensing system may be used to fuel [vehicle mounted] vehicle-mounted containers as approved by the commissioner and subject to such conditions as the commissioner may prescribe consistent with public safety.

## SECTION FC 2209
## [RESERVED] HYDROGEN MOTOR FUEL-DISPENSING AND GENERATION FACILITIES

**2209.1 General**. Hydrogen motor fuel-dispensing and generation facilities shall be designed, installed, operated and maintained in accordance with this section and FC Chapters 30, 32 and 35, as applicable.

**2209.1.1 Prohibition.** It shall be unlawful to:

1. Maintain or operate a self-service hydrogen motor fuel-dispensing facility.

2. Maintain or operate a marine hydrogen motor fuel-dispensing facility.

3. Fill a container with hydrogen, other than containers permanently mounted on a powered industrial truck or a hydrogen-powered motor vehicle and used for motive power as set forth in FC3501.5(1).

4. Generate, compress, store or dispense hydrogen indoors.

**2209.1.2 Supervision.** The dispensing of hydrogen at hydrogen motor fuel-dispensing facilities shall be conducted by or under the personal supervision of a certified attendant in accordance with FC2201.7.

**2209.1.2.1 Inspection of dispensing area.** The certified attendant at a hydrogen motor fuel-dispensing facility responsible for supervision of the dispensing of hydrogen shall inspect the dispensing area on a daily basis to ensure that the facility is being maintained in accordance with this chapter and the rules. The certified attendant shall notify the owner and make any other notifications required by this code if there is any evidence that the facility is not in good working order. A record of such inspections and notifications shall be maintained at the premises in accordance with FC107.7.

**2209.1.2.2 Duties of fleet personnel.** Employees or other persons working for the owner of a fleet hydrogen motor fuel-dispensing facility whose duties involve the dispensing of hydrogen shall be trained and knowledgeable in such dispensing in compliance with the requirements of this code and the rules.

**2209.1.3 Maintenance.** Maintenance of hydrogen motor fuel-dispensing facilities shall be conducted under the personal supervision of a person holding a hydrogen fueling-facility maintenance certificate of fitness.

**2209.1.4 Lighting.** Dispensing areas shall be well lighted whenever dispensing is conducted.

**2209.1.5 Dispensing area signage.** Durable signs shall be conspicuously posted in dispensing areas in hydrogen motor fuel-dispensing facilities in compliance with the requirements of FC 2209.1.5.1 through 2209.1.5.4.

**2209.1.5.1 Operating instructions.** A sign setting forth dispenser operating instructions shall be posted on every dispenser. Such sign shall also indicate the location of the emergency shutdown valves and emergency shutdown controls required by FC 2209.7.3 and 2209.7.4.

**2209.1.5.2 Hydrogen dispensing warning sign.** A warning sign that reads as follows shall be posted on or immediately adjacent to each dispenser:

1. No smoking.

2. Shut off engine.

**2209.1.5.3 Emergency procedures.** A sign setting forth emergency procedures that reads as follows shall be posted in the dispensing area, or other location designated in this section:

IN CASE OF FIRE, LEAK OR EMERGENCY:

ACTIVATE EMERGENCY SHUTDOWN

DIRECT VEHICLE OCCUPANTS TO EXIT VEHICLES

AND LEAVE AREA IMMEDIATELY

KEEP ALL PERSONS AWAY FROM THE AREA

NOTIFY THE FIRE DEPARTMENT (CALL 911)

(FACILITY ADDRESS)
(*indicate address, with cross-street reference*).

**2209.1.5.4 Canopy top hydrogen storage.** An approved sign having 2-inch (51-mm) block letters shall be conspicuously posted at approved locations on the exterior of any canopy structure when gaseous hydrogen compression and storage equipment is located on top of such canopy reading "CANOPY TOP HYDROGEN STORAGE."

**2209.1.6 Emergency telephone.** A telephone not requiring a coin to operate or another approved, clearly identified means to notify the department, shall be provided on the site in an approved location.

**2209.2 Equipment.** Equipment used for the generation, compression, storage or dispensing of hydrogen shall be designed for hydrogen motor fuel in accordance with this section.

**2209.2.1 Approved equipment.** Containers and tanks; pressure relief devices, including pressure valves, hydrogen vaporizers, pressure regulators, and piping used for gaseous hydrogen systems shall be designed and constructed in accordance with FC Chapters 30, 32 and 35.

**2209.2.2 Listed or approved equipment.** Hoses, hose connections, compressors, hydrogen generators, dispensers, detection systems and electrical equipment used for hydrogen shall be listed or approved for use with hydrogen. Hydrogen motor fueling connections shall be listed and labeled or approved for use with hydrogen.

**2209.2.3 Electrical equipment.** Electrical wiring and equipment shall be suitable for the location in which they are installed and shall be in accordance with the Electrical Code.

**2209.3 Location.** In addition to the requirements of FC2203.1, generation, compression, storage and dispensing equipment shall be located in accordance with this section.

**2209.3.1 Outdoors.** Generation, compression, storage or dispensing equipment shall be allowed outdoors only in accordance with FC Chapter 35.

**2209.3.2 Gaseous hydrogen storage.** Storage of gaseous hydrogen shall be in accordance with FC Chapters 30 and 35.

**2209.3.3 Liquefied hydrogen storage.** Storage of liquefied hydrogen shall be in accordance with FC Chapters 32 and 35.

**2209.3.4 Canopy tops.** Gaseous hydrogen compression and storage equipment located on top of motor fuel-dispensing facility canopies shall be in accordance with FC Chapters 30 and 35, the Fuel Gas Code and this section.

**2209.3.4.1 Construction.** Canopies shall be constructed in accordance with the motor fuel-dispensing facility canopy requirements of Chapter 4 of the Building Code and the following:

1. The canopy shall meet or exceed Type I construction requirements.

2. Operations located under canopies shall be limited to fueling only.

3. The canopy shall be constructed in a manner that prevents the accumulation of hydrogen gas.

**2209.3.4.2 Fire extinguishing systems.** Fuel-dispensing areas under canopies shall be protected throughout by a sprinkler system. The design of the sprinkler system shall not be less than that required for Extra Hazard Group 2 occupancies. Operation of the sprinkler system shall activate the emergency functions of this section.

**2209.3.4.3 Emergency discharge.** Operation of the sprinkler system shall activate an automatic emergency discharge system, which will discharge the hydrogen gas from the equipment on the canopy top through the vent pipe system.

**2209.3.4.4 Emergency shutdown control.** Operation of the sprinkler system shall activate the emergency shutdown control required by FC2209.7.4.

**2209.4 Canopies.** Dispensing equipment need not be separated from canopies of Type I or II construction that are constructed in a manner that prevents the accumulation of hydrogen gas and in accordance with Chapter 4 of the Building Code.

**2209.5 Weather protection.** Generation, compression, storage or dispensing equipment shall be allowed under weather protection in accordance with the requirements of Chapter 4 of the Building Code and FC2704.13. The weather protection shall be constructed in a manner that prevents the accumulation of hydrogen gas.

**2209.6 Overpressure protection.** Dispensing systems shall be equipped with an overpressure protection device set at 140 percent of the service pressure of the fueling nozzle it supplies.

**2209.7 Safety precautions.** Safety precautions at hydrogen motor fuel-dispensing and generation facilities shall be in accordance with this section.

**2209.7.1 Protection from vehicles.** Guard posts or other approved means shall be provided to protect hydrogen storage systems and use areas subject to vehicular damage in accordance with FC312.

**2209.7.2 Vehicle fueling pad.** The motor vehicle shall be fueled on noncoated concrete or other approved paving material having a resistance not exceeding 1 megohm as determined by the methodology specified in EN 1081.

**2209.7.3 Emergency shutoff valves.** A manual emergency shutoff valve shall be provided at a clearly visible, accessible and approved location, to shut down the flow of gas from the hydrogen supply to the piping system.

**2209.7.4 Emergency shutdown controls.** In addition to the manual emergency shutoff valve required by FC2209.7.3, a remotely located, manually activated emergency shutdown control shall be provided. An emergency shutdown control shall be located within 75 feet (22 860 mm) of, but not less than 25 feet (7620 mm) from, dispensers and hydrogen generators.

**2209.7.5 System requirements.** Activation of the emergency shutdown control shall automatically shut down the power supply to all hydrogen storage, compression and dispensing equipment; shut off natural gas or other fuel supply to the hydrogen generator; and close valves between the main supply and the compressor and between the storage containers and dispensing equipment.

## SECTION FC 2210
## MARINE LIQUID MOTOR FUEL-DISPENSING FACILITIES

**2210.1 General.** The construction of marine liquid motor fuel-dispensing facilities shall be in accordance with the construction codes, including the Building Code, and NFPA 30A. The installation, inspection, testing, maintenance and operation of a liquid motor fuel storage and dispensing system at marine liquid motor fuel-dispensing facilities shall be in accordance with this chapter governing automotive liquid motor fuel-dispensing facilities, except that [full service] full-service marine liquid motor fuel-dispensing facilities do not require a fire extinguishing system for the dispensing area.

**2210.1.1 Prohibited facility.** It shall be unlawful to operate a self-service marine liquid motor fuel-dispensing facility.

**2210.2 Storage and handling.** The storage and handling of liquid motor fuel at marine liquid motor fuel-dispensing facilities shall be in accordance with [Sections] FC 2210.2.1 through 2210.2.3.

**2210.2.1 Class I, II or IIIA liquid storage.** Class I, II or IIIA liquids stored [inside of buildings or structures] indoors used for marine liquid motor fuel-dispensing facilities shall be stored in approved containers. Storage of Class I liquids shall not exceed 10 gallons (38 L).

**2210.2.2 Dispensing from portable containers.** No marine vessel or watercraft shall be fueled from a portable container while [inside a building or structure] indoors.

**2210.2.3 Heating equipment.** Heating equipment installed in liquid motor fuel storage or dispensing areas shall comply with the requirements of [Section 2201.6] FC2201.6.

**2210.3 Dispensing.** The dispensing of liquid motor fuel at marine liquid motor fuel-dispensing facilities shall comply with the requirements of [Sections] FC 2210.3.1 through 2210.3.4.

**2210.3.1 General.** Unless another use has been approved, piers, docks or wharves at marine liquid motor fuel-dispensing facilities shall be used exclusively for the dispensing or transfer of liquid motor fuel to or from marine vessel, watercraft, except that transfer of essential ship stores is allowed.

**2210.3.1.1 Flexible metallic piping.** Where there is a need to provide flexibility in piping to allow for motion of a pier or dock, flexible metallic piping of an approved length and design may be installed and used in compliance with NFPA 30A. All flexible metallic piping or other flexible hose connections authorized by this section shall be inspected for proper operation at least once a year by a certificate of license holder. A record of such inspection shall be kept in a bound log book or other approved form of recordkeeping, and maintained on the premises for a minimum of 4 years[, and made available for inspection by any representative of the department].

**2210.3.2 Supervision.** The dispensing of liquid motor fuel at marine liquid motor fuel-dispensing facilities shall be [supervised] conducted by or under the personal supervision of a certified attendant as set forth in [Section 2201.7] FC2201.7.

**2210.3.3 Hoses and nozzles.** Dispensing of liquid motor fuel into the fuel tanks of marine vessels and watercraft shall be by means of an approved-type hose equipped with a listed automatic-closing nozzle without a latch-open device. Hoses used for dispensing or transferring liquid motor fuel, when not in use, shall be reeled, racked or otherwise protected from mechanical damage.

**2210.3.4 Portable containers.** Liquid motor fuel dispensing into portable containers shall be performed in accordance with [Section 2204.4] FC2204.1.7, except that portable containers that are approved and used as the fuel tank for marine vessels or watercraft may be of a capacity not greater than 5½ gallons (20.8 L).

**[2210.3.5** Reserved.]

**2210.4 Fueling of marine vehicles at other than approved marine liquid motor fuel-dispensing facilities.** It shall be unlawful to fuel floating marine vessels and watercraft with liquid motor fuel at other than a marine liquid motor fuel-dispensing facility, except fueling of marine vessels and watercraft performed by off-shore fueling vessels approved by the United States Coast Guard.

**2210.5 Fire prevention.** Marine liquid motor fuel-dispensing facilities shall comply with the requirements of [Sections] FC 2210.5.1 through 2210.5.7.

**2210.5.1 Housekeeping.** Marine motor fuel-dispensing facilities shall be maintained in a neat and orderly manner. Accumulations of rubbish or waste oils in excessive amounts are prohibited. Rubbish and other combustible waste shall be regularly removed from the premises and disposed of lawfully.

**2210.5.2 Spills.** Spills of liquid motor fuel near or in the water shall be reported immediately to the department and other governmental agencies requiring such reporting.

**2210.5.3 Rubbish containers.** Metal containers with tight-fitting or self-closing metal lids shall be provided for the temporary storage of rubbish or other combustible waste.

**2210.5.4 [Watercraft] Marine vessel and watercraft mooring.** When marine vessels and watercraft [is] are being fueled at a fuel dock, no other marine vessel or watercraft shall be made fast to the marine vessel or watercraft being fueled or to the fuel dock. The dispensing hose shall not cross one marine vessel or watercraft to reach another.

**2210.5.5 Sources of ignition.** Any activity or operation involving the use of open flames, arc- or spark-producing devices shall not be performed at marine motor fuel-dispensing facilities or within 50 feet (15 240 mm) of the dispensing facilities, including piers, docks or wharves, except where approved by the commissioner. Dispensing shall not be conducted at such pier, dock or wharf during the course of such emergency repairs.

**2210.5.5.1 Smoking.** It shall be unlawful to smoke, use or maintain an open flame within 50 feet (15 240 mm) of fueling operations. "No Smoking" signs complying with the requirements of [Section 310] FC310 shall be conspicuously posted throughout the premises. Such signs shall have letters of not less than 4 inches (102 mm) in height with a background of contrasting color.

**2210.5.6 Preparation of tanks for fueling.** [Watercraft] Marine vessel and watercraft owners and operators shall not offer their marine vessel or watercraft for fueling unless the tanks being filled are properly vented to dissipate fumes to the [outside atmosphere] outdoors.

**2210.5.7 Warning signs.** Warning signs shall be prominently displayed at the face of each pier, dock or wharf at such elevation as to be clearly visible from the decks of marine vessels and watercraft being fueled. Such signs shall have letters not less than 3 inches (76 mm) in height on a background of contrasting color bearing the following or approved equivalent wording:

WARNING
NO SMOKING—STOP ENGINE WHILE
FUELING, SHUT OFF ELECTRICITY.
DO NOT START ENGINE UNTIL AFTER
BELOW DECK SPACES ARE VENTILATED.

**2210.6 Fire protection.** Marine liquid motor fuel-dispensing facilities shall comply with the requirements of [Sections] FC 2210.6.1 through 2210.6.4, and the construction codes, including the Building Code.

**2210.6.1 Standpipe hose stations.** Fire hose, when required, shall be provided and enclosed within a cabinet, and hose stations shall be labeled: FIRE HOSE—EMERGENCY USE ONLY.

**2210.6.2 Obstruction of fire protection equipment.** Materials shall not be placed or stored on a pier, dock or wharf in such a manner as to obstruct access to firefighting equipment or piping system control valves.

**2210.6.3 Access.** Where the pier, dock or wharf is accessible to vehicular traffic, an unobstructed roadway to the shore end of the pier, dock or wharf shall be maintained for access by fire apparatus.

**2210.6.4 Portable fire extinguishers.** One portable fire extinguisher in accordance with [Section 906] FC906 having a minimum rating of 40-B:C shall be provided on the pier, dock or wharf within 25 feet (7620 mm) of the head of the gangway to the pier, dock or wharf. If the certified attendant's office is within 25 feet (7620 mm) of the gangway or is on the pier, dock or wharf, the fire extinguisher may be provided therein.

## SECTION FC 2211
## REPAIR GARAGES

**2211.1 General.** Repair garages shall comply with the requirements of this section and the construction codes, including the Building Code. Repair garages for vehicles that use more than one type of fuel shall comply with the applicable requirements of this section for each type of fuel used. Where a repair garage also includes a motor fuel-dispensing facility, the fuel-dispensing operation shall comply with the requirements of this chapter for motor fuel-dispensing facilities.

**2211.1.1 Supervision of defueling operations.** The defueling of liquid motor fuel from the fuel tank of a motor vehicle shall be conducted by or under the personal supervision of a person holding a certificate of fitness.

**2211.2 Storage and use of flammable and combustible liquids.** The storage and use of flammable and combustible liquids in repair garages shall comply with the requirements of FC Chapter 34 and [Sections] FC 2211.2.1 through 2211.2.4.

**2211.2.1 Cleaning of parts.** Cleaning of parts shall be conducted in listed and approved parts-cleaning machines in accordance with FC Chapter 34.

**2211.2.2 Waste oil, motor oil and other Class IIIB liquids.** Waste oil, motor oil and other Class IIIB liquids, including crankcase drainings shall be stored in approved tanks or containers, which are allowed to be stored and dispensed from inside repair garages.

**2211.2.2.1 Tanks storing waste oil.** For tanks of a capacity of 500 gallons (1893 L) or less, the fill connection may be located [inside a building or structure] indoors provided that discharge of vapor from the fill port is prevented from entering the building or structure during and after filling. An automatic spring-loaded vertical check valve in the fill line or other device designed to prevent vapors from escaping shall be provided. The fill line shall be capped immediately after filling.

**2211.2.3 Drainage and disposal of liquids and oil-soaked waste.** Garage floor drains, where provided, shall drain to approved oil separators or traps discharging to a sewer in accordance with the construction codes, including the Plumbing Code. Contents of oil separators, traps and floor drainage systems shall be collected at sufficiently frequent intervals and removed from the premises to prevent oil from being carried into the sewers. Crankcase drainings and liquids shall not be dumped into sewers, streams or on the ground, but shall be stored in approved tanks or containers in accordance with FC Chapter 34 until removed from the premises. Self-closing metal cans shall be used for oily waste.

**2211.2.4 Spray finishing.** Spray finishing with flammable or combustible liquids shall comply with the requirements of FC Chapter 15.

**2211.3 Sources of ignition.** Sources of ignition shall not be located within 18 inches (457 mm) of the floor and shall comply with the requirements of FC Chapters 3 and 26.

**2211.3.1 Equipment.** Appliances and equipment installed in a repair garage shall comply with the requirements of the construction codes, including the Building Code, the Mechanical Code[,] and the Electrical Code.

**2211.3.2 Smoking.** Smoking is prohibited in repair garages.

**2211.4 [Below-grade] Below grade areas.** Pits and other [below-grade] work areas below grade in repair garages shall comply with the requirements of [Sections] FC 2211.4.1 through 2211.4.3.

**2211.4.1 Construction.** Pits and other [below-grade] work areas below grade shall be constructed in accordance with the construction codes, including the Building Code.

**2211.4.2 Means of egress.** Pits and other [below-grade] work areas below grade shall be provided with means of egress in accordance with the Building Code.

**2211.4.3 Ventilation.** Where Class I liquids are stored or used within a building having a basement or pit wherein flammable vapors could accumulate, the basement or pit shall be provided with mechanical ventilation in accordance with the construction codes, including the Mechanical Code, at a minimum rate of 1.5 cubic feet per minute per square foot [(cfm/ft$^2$) [0.008 m$^3$/(s·m$^2$)]] 0.008 m$^3$/s/m$^2$ to prevent the accumulation of flammable vapors.

**2211.5 Preparation of vehicles for repair.** For vehicles powered by gaseous fuels, the fuel shutoff valves shall be closed prior to repairing any portion of the vehicle fuel system. Vehicles powered by gaseous fuels in which the fuel system has been damaged shall be inspected and evaluated for fuel system integrity prior to being brought into the repair garage. The inspection shall include testing of the entire fuel delivery system for leakage.

**2211.5.1 Drainage of liquid motor fuel tanks.** Portable equipment used for defueling and refueling shall be listed and labeled and shall have fuel storage tanks not exceeding 65 gallons (246 L). Systems for defueling and refueling, other than by use of portable equipment, shall be approved.

**2211.6 Portable fire extinguishers.** Portable fire extinguishers shall be provided in accordance with [Section 906] FC906.

**2211.7 Repair garages for vehicles fueled by lighter-than-air fuels.** Repair garages for the conversion and/or repair of vehicles which use CNG, liquefied natural gas (LNG), hydrogen or other lighter-than-air motor fuels shall be designed, installed, operated and maintained in accordance with [Sections 2211.7] FC 2211.7.1 and 2211.7.2, and, as applicable, [Section 2211] FC2211.

**Exception:** Repair garages where work is not performed on the fuel system and is limited to exchange of parts and maintenance requiring no open flame or welding.

**2211.7.1 Ventilation.** Repair garages used for the repair of CNG, LNG or hydrogen-fueled vehicles shall be provided with an approved mechanical ventilation system. The mechanical ventilation system shall be in accordance with the construction codes, including the Mechanical Code.

**2211.7.2 Gas detection system.** Repair garages used for repair of vehicles fueled by CNG, LNG or hydrogen shall be provided with an approved flammable gas detection system meeting the requirements of the construction codes, including the Building Code.

**2211.8 Defueling of hydrogen from motor vehicle fuel storage containers.** Discharge or defueling of hydrogen from motor vehicle fuel storage containers for the purpose of maintenance, container certification or other purposes shall be performed in accordance with [Section 2211.8.1] FC2211.8.1.

**2211.8.1 Methods of discharge.** The discharge of hydrogen from motor vehicle fuel storage containers shall be accomplished through a closed transfer system in accordance with [Section 2211.8.1.1] FC2211.8.1.1 or an approved method of atmospheric venting in accordance with [Section 2211.8.1.2] FC2211.8.1.2.

**2211.8.1.1 Closed transfer system.** A documented procedure that explains the logic sequence for discharging the storage container shall be provided to the commissioner for review and approval. The procedure shall include the actions the operator is required to take in the event of a low-pressure or high-pressure hydrogen release during discharging activity. Schematic design documents shall be provided illustrating the arrangement of piping, regulators and equipment settings. The design and installation documents shall illustrate the piping and regulator arrangement and shall be shown in spatial relation to the location of the compressor, storage vessels and emergency shutdown devices.

**2211.8.1.2 Atmospheric venting of hydrogen from motor vehicle fuel storage containers.** When atmospheric venting is used for the discharge of hydrogen from motor vehicle fuel storage containers, such venting shall be performed in accordance with [Sections] FC 2211.8.1.2.1 through 2211.8.1.2.4.

**2211.8.1.2.1 Defueling equipment required at vehicle maintenance and repair facilities.** All facilities for repairing hydrogen systems on hydrogen-fueled vehicles

shall have equipment to defuel vehicle storage containers. Equipment used for defueling shall be listed and labeled for the intended use.

**2211.8.1.2.1.1 Manufacturer's equipment required.** Equipment supplied by the vehicle manufacturer shall be used to connect the vehicle storage containers to be defueled to the vent pipe system.

**2211.8.1.2.1.2 Vent pipe maximum diameter.** Defueling vent pipes shall have a maximum inside diameter of 1 inch (25 mm) and be installed in an approved manner.

**2211.8.1.2.1.3 Maximum flow rate.** The maximum rate of hydrogen flow through the vent pipe system shall not exceed 1,000 [cfm] SCF/min (28.3 $m^3$/min) [at NTP] and shall be controlled by means of the manufacturer's equipment, at low pressure and without adjustment.

**2211.8.1.2.1.4 Isolated use.** The vent pipe used for defueling shall not be connected to a venting system used for another purpose.

**2211.8.1.2.2 Design and installation documents.** Design and installation documents shall be provided illustrating the defueling system to be utilized. Plan details shall be of sufficient detail and clarity to allow for evaluation of the piping and control systems to be utilized and include the method of support for containers to be used as part of a closed transfer system, the method of grounding and bonding, and other requirements set forth in this section.

**2211.8.1.2.3 Stability of containers**. A method of rigidly supporting containers used during defueling of hydrogen shall be provided. The method shall provide not less than two points of support and shall be designed to resist lateral movement of the receiving container. The system shall be designed to resist movement of the receiver based on the highest gas-release velocity through valve orifices at the receiver's rated service pressure and volume. Supporting structures or appurtenances used to support containers shall be constructed of noncombustible materials in accordance with the construction codes, including the Building Code.

**2211.8.1.2.4 Grounding and bonding.** Containers and piping systems used for defueling shall be bonded and grounded. Structures or appurtenances used for supporting the containers shall be grounded in accordance with the Electrical Code. The valve of the vehicle storage container shall be bonded with the defueling system prior to the commencement of discharge or defueling operations.

**2211.8.2 Repair of hydrogen piping.** Piping systems containing hydrogen shall not be opened to the atmosphere for repair without first purging the piping with an inert gas to achieve 1 percent hydrogen or less by volume. Defueling operations and exiting purge flow shall be vented in accordance with [Section 2211.8.1.2] FC2211.8.1.2.

**2211.8.3 Purging.** Each individual component of a hydrogen defueling system shall have a label affixed as well as a description in the installation and owner's manuals describing the

procedure for purging air from the system during startup, regular maintenance and for purging hydrogen from the system prior to disassembly (to admit air). For the interconnecting piping between the individual manufactured components, the pressure rating must be at least [20] twenty times the absolute pressure present in the piping when any hydrogen meets any air.

**2211.8.3.1 System purge required.** After installation, repair or maintenance, the hydrogen piping system shall be purged of air in accordance with the manufacturer's specifications.

# CHAPTER 23
# HIGH-PILED COMBUSTIBLE STORAGE

## SECTION FC 2301
## GENERAL

**2301.1 Scope.** This chapter shall govern high-piled combustible storage, and the design, installation, operation and maintenance of any building, structure or premises used for such purpose.

**2301.2 Permits. [**A permit] Permits shall be required as set forth in [Section 105.6] FC105.6.

**2301.3 Permit application.** Applications for permits for high-piled combustible storage shall include design and installation documents that contain the following information, and such other information and documentation as the commissioner may prescribe:

1. Floor plan of the building showing locations and dimensions of high-piled storage areas.

2. Usable storage height for each storage area.

3. Number of tiers within each rack, if applicable.

4. Commodity clearance between top of storage and the sprinkler deflector for each storage arrangement.

5. Aisle dimensions between each storage array.

6. Maximum pile volume for each storage array.

7. Location and classification of commodities in accordance with [Section 2303] FC2303.

8. Location of commodities that are banded or encapsulated.

9. Location of required fire department access doors.

10. Type of fire extinguishing and fire detection systems.

11. Location of valves controlling the water supply of ceiling and in-rack sprinklers.

12. Type, location and specifications of smoke removal and curtain board systems.

13. Dimension and location of transverse and longitudinal flue spaces.

14. Such other information, regarding design features, commodities, storage arrangement and fire protection features within the high-piled storage area, as may be required by the commissioner to ensure compliance with the requirements of this chapter.

**2301.3.1 Records.** A copy of the permit application documents shall be maintained on the premises and made available for inspection by any department representative.

**2301.4 Egress plan.** Where the area of the high-piled combustible storage requires a permit, the owner shall prepare and familiarize employees with an egress plan that indicates the location and width of aisles, exits, exit access doors, exit signs, height of storage and location of hazardous materials. Such plan shall be maintained in an approved location and shall be made available for inspection by any representative of the department.

**Exception.** Any high-piled combustible storage facility or area required to have an emergency preparedness plan pursuant to FC Chapter 4.

**2301.5 General.** All buildings, structures and premises that contain high-piled combustible storage shall be designed, installed, operated and maintained in accordance with this chapter. In addition to the requirements of this chapter, the following material-specific requirements shall apply:

1. Aerosols shall be in accordance with FC Chapter 28.

2. Flammable and combustible liquids shall be in accordance with FC Chapter 34.

3. Hazardous materials shall be in accordance with FC Chapter 27.

4. Storage of combustible paper records shall be in accordance with NFPA 13, as modified by FC Appendix B.

5. Storage of combustible fibers shall be in accordance with FC Chapter 29.

6. Storage of miscellaneous combustible material shall be in accordance with FC Chapter 3.

## SECTION FC 2302
## DEFINITIONS

**2302.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**ARRAY.** Each separate storage configuration, taking into consideration the type of packaging, flue spaces, height of storage and compactness of storage.

**ARRAY, CLOSED.** A storage configuration having a 6-inch ([152 mm] 152-mm) or smaller width vertical flue space that restricts air movement through the stored commodity.

**AUTOMATED RACK STORAGE.** A method of stocking racks and retrieving stored products or pallets of products from racks, whereby the movement of products and pallets of products is controlled by computer or other automated means.

**BIN BOX.** A five-sided container with the open side facing an aisle. Bin boxes are self-supporting or supported by a structure designed so that little or no horizontal or vertical space exists around the boxes.

**COMMODITY.** Items in high-piled combustible storage, including products and product packaging.

**DRAFT CURTAIN.** A structure arranged to limit the spread of smoke and heat along the underside of the ceiling or roof.

**EARLY SUPPRESSION FAST-RESPONSE (ESFR) SPRINKLER.** A sprinkler listed for early suppression fast-response performance.

**EXPANDED PLASTIC.** A foam or cellular plastic material having a reduced density based on the presence of numerous small cavities or cells dispersed throughout the material.

**EXTRA-HIGH-RACK COMBUSTIBLE STORAGE.** Storage on racks of Class I, II, III or IV commodities that exceed 40 feet (12 192 mm) in height and storage on racks of high-hazard commodities that exceed 30 feet (9144 mm) in height.

**HIGH-PILED COMBUSTIBLE STORAGE.** Storage of combustible materials in closely packed piles or combustible materials on pallets, in racks or on shelves where the top of storage is greater than 12 feet (3658 mm) in height. High-piled combustible storage also includes certain high-hazard commodities, such as rubber tires, Group A plastics, flammable liquids, idle pallets and similar commodities, where the top of storage is greater than 6 feet (1829 mm) in height.

**HIGH-PILED STORAGE AREA.** An area within a building, structure or premises that is designed or used for high-piled combustible storage.

**LONGITUDINAL FLUE SPACE.** The flue space between rows of storage perpendicular to the direction of loading.

**MANUAL STOCKING METHODS.** Stocking methods utilizing ladders or other nonmechanical equipment to move stock.

**MECHANICAL STOCKING METHODS.** Stocking methods utilizing motorized vehicles or hydraulic jacks to move stock.

**RACK STORAGE.** Any storage system, except shelf storage.

**SHELF STORAGE.** Storage on shelves less than 30 inches (762 mm) deep with the distance between shelves not exceeding 3 feet (914 mm) vertically.

**SOLID SHELVING.** Shelving that is solid, slatted or of other construction located in racks and that obstructs sprinkler discharge down into the racks.

**TRANSVERSE FLUE SPACE.** The space between rows of storage parallel to the direction of loading.

## SECTION FC 2303
## COMMODITY CLASSIFICATION

**2303.1 Classification of commodities.** Commodities shall be classified as Class I, II, III, IV or high hazard in accordance with this section. Materials listed within each commodity classification are assumed to be unmodified for improved combustibility characteristics. Use of flame-retarding modifiers or the physical form of the material could change the classification. See [Section 2303.7] FC2303.7 for classification of Group A, B and C plastics.

**2303.2 Class I commodities.** Class I commodities are essentially noncombustible products on wooden or nonexpanded polyethylene solid deck pallets, in ordinary corrugated cartons with or without single-thickness dividers, or in ordinary paper wrappings with or without pallets. Class I commodities are allowed to contain a limited amount of Group A plastics in accordance with [Section 2303.7.4] FC2303.7.4. Examples of Class I commodities include the following:

Alcoholic beverages not [exceeding] more than 20-percent alcohol
Cement in bags
Ceramics
Dairy products in nonwax-coated containers (excluding bottles)
Dry insecticides
Electrical appliances, noncombustible
Foods in noncombustible containers
Fresh fruits and vegetables in nonplastic trays or containers
Frozen foods
Glass
Glycol in metal cans
Gypsum board
Inert materials, bagged
Insulation, noncombustible
Liquids, noncombustible, in plastic containers having less than a 5-gallon (19 L) capacity
Metal products, noncombustible

**2303.3 Class II commodities.** Class II commodities are Class I products in slatted wooden crates, solid wooden boxes, multiple-thickness paperboard cartons or equivalent combustible packaging material with or without pallets. Class II commodities are allowed to contain a limited amount of Group A plastics in accordance with [Section 2303.7.4] FC2303.7.4. Examples of Class II commodities include the following:

Alcoholic beverages not [exceeding] more than 20-percent alcohol, in combustible containers

Foods in combustible containers
Incandescent or fluorescent light bulbs in cartons
Thinly coated fine wire on reels or in cartons

**2303.4 Class III commodities.** Class III commodities are commodities of wood, paper, natural fiber cloth, or Group C plastics or products thereof, with or without pallets. Products are allowed to contain limited amounts of Group A or B plastics, such as metal bicycles with plastic handles, pedals, seats and tires. Group A plastics shall be limited in accordance with [Section 2303.7.4] FC2303.7.4. Examples of Class III commodities include the following:

Aerosol, Level 1 (see FC Chapter 28)
Combustible fiberboard
Cork, baled
Feed, bagged
Fertilizers, bagged
Food in plastic containers
Furniture: wood, natural fiber, upholstered, nonplastic, wood or metal with plastic-padded and covered arm rests
Glycol in combustible containers not [exceeding] more than 25 percent
Liquids, noncombustible, in plastic containers having a capacity of more than 5 gallons (19 L)
Lubricating or hydraulic fluid in metal cans
Lumber
Mattresses, excluding foam rubber and foam plastics
Paints, oil base, in metal cans
Paper, waste, baled
Paper and pulp, horizontal storage, or vertical storage that is banded or protected with approved wrap
Paper in cardboard boxes
Pillows, excluding foam rubber and foam plastics
Plastic-coated paper food containers
Plywood
Rags, baled
Rugs, without foam backing
Sugar, bagged
Wood, baled
Wood doors, frames and cabinets
Yarns of natural fiber and viscose

**2303.5 Class IV commodities.** Class IV commodities are Class I, II or III products containing Group A plastics in ordinary corrugated cartons and Class I, II and III products, with Group A plastic packaging, with or without pallets. Group B plastics and free-flowing Group A plastics are also included in this class. The total amount of nonfree-flowing Group A plastics shall be in accordance with [Section 2303.7.4] FC2303.7.4. Examples of Class IV commodities include the following:

Aerosol, Level 2 (see FC Chapter 28)

Alcoholic beverages, [exceeding] more than 20-percent but less than 80-percent alcohol, in cans or bottles in cartons.
Clothing, synthetic or nonviscose
Combustible metal products (solid)
Furniture, plastic upholstered
Furniture, wood or metal with plastic covering and padding
Glycol in combustible containers ([greater] more than 25 percent and less than 50 percent)
Linoleum products
Paints, oil base in combustible containers
Pharmaceutical, alcoholic elixirs, tonics, etc.
Rugs, foam back
Shingles, asphalt
Thread or yarn, synthetic or nonviscose

**2303.6 High-hazard commodities.** High-hazard commodities are high-hazard products presenting special fire hazards beyond those of Class I, II, III or IV. Group A plastics not otherwise classified are included in this class. Examples of high-hazard commodities include the following:

Aerosol, Level 3 (see FC Chapter 28)
Alcoholic beverages, [exceeding] more than 80-percent alcohol, in bottles or cartons
Commodities of any class in plastic containers in carousel storage
Flammable solids (except solid combustible metals)
Glycol in combustible containers (50 percent or [greater] more)
Lacquers, which dry by solvent evaporation, in metal cans or cartons
Lubricating or hydraulic fluid in plastic containers
Mattresses, foam rubber or foam plastics
Pallets and flats which are idle combustible
Paper, asphalt, rolled, horizontal storage
Paper, asphalt, rolled, vertical storage
Paper and pulp, rolled, in vertical storage which is unbanded or not protected with an approved wrap
Pillows, foam rubber and foam plastics
Pyroxylin
Rubber tires
Vegetable oil and butter in plastic containers

**2303.7 Classification of plastics.** Plastics shall be designated as Group A, B or C in accordance with this section.

**2303.7.1 Group A plastics.** Group A plastics are plastic materials having a heat of combustion that is much higher than that of ordinary combustibles, and a burning rate higher than that of Group B plastics. Examples of Group A plastics include the following:

ABS (acrylonitrile-butadiene-styrene copolymer)
Acetal (polyformaldehyde)
Acrylic (polymethyl methacrylate)
Butyl rubber

EPDM (ethylene propylene rubber)
FRP (fiberglass-reinforced polyester)
Natural rubber (expanded)
Nitrile rubber (acrylonitrile butadiene rubber)
PET or PETE (polyethylene terephthalate)
Polybutadiene
Polycarbonate
Polyester elastomer
Polyethylene
Polypropylene
Polystyrene (expanded and unexpanded)
Polyurethane (expanded and unexpanded)
PVC (polyvinyl chloride [greater] more than 15 percent plasticized, e.g., coated fabric unsupported film)
SAN (styrene acrylonitrile)
SBR (styrene butadiene rubber)

**2303.7.2 Group B plastics.** Group B plastics are plastic materials having a heat of combustion and a burning rate higher than that of ordinary combustibles, but not as high as those of Group A plastics. Examples of Group B plastics include the following:

Cellulosics (cellulose acetate, cellulose acetate butyrate, ethyl cellulose)
Chloroprene rubber
Fluoroplastics (ECTFE, ethylene-chlorotrifluoroethylene copolymer; ETFE, ethylene-tetrafluoroethylene copolymer; FEP, fluorinated ethylene-propylene copolymer)
Natural rubber (nonexpanded)
Nylon (Nylon 6, Nylon 6/6)
PVC (polyvinyl chloride [greater] more than 5-percent, but not [exceeding] more than 15-percent plasticized)
Silicone rubber

**2303.7.3 Group C plastics.** Group C plastics are plastic materials having a heat of combustion and a burning rate similar to those of ordinary combustibles. Examples of Group C plastics include the following:

Fluoroplastics (PCTFE, polychlorotrifluoroethylene;
PTFE, polytetrafluoroethylene)
Melamine (melamine formaldehyde)
Phenol
PVC (polyvinyl chloride, rigid or plasticized less than 5 percent, e.g., pipe, pipe fittings)
PVDC (polyvinylidene chloride)
PVDF (polyvinylidene fluoride)
PVF (polyvinyl fluoride)
Urea (urea formaldehyde)

**2303.7.4 Limited quantities of Group A plastics in mixed commodities.** FC Figure 2303.7.4 shall be used to determine the quantity of Group A plastics allowed to be stored in a package or carton or on a pallet without increasing the commodity classification.

## SECTION FC 2304
## DESIGNATION OF HIGH-PILED STORAGE AREAS

**2304.1 General.** High-piled storage areas, and portions of high-piled storage areas for storage of a commodity class different from adjacent areas, shall be designed and specifically designated to contain Class I, Class II, Class III, Class IV or high-hazard commodities. The designation of a high-piled combustible storage area, or portion thereof intended for storage of a different commodity class, shall be based on the highest hazard commodity class stored except as provided in [Section 2304.2] FC2304.2.

**2304.2 Designation based on engineering analysis.** The designation of a high-piled combustible storage area, or portion thereof, is allowed to be based on a lower hazard class than that of the highest class of commodity stored when a limited quantity of the higher hazard commodity has been demonstrated by engineering analysis to be adequately protected by the sprinkler system provided. The engineering analysis shall consider the ability of the sprinkler system to deliver the higher density required by the higher hazard commodity. The higher density shall be based on the actual storage height of the pile or rack and the minimum allowable design area for sprinkler operation as set forth in the density/area figures provided in NFPA 13, as modified by FC Appendix B. The contiguous area occupied by the higher hazard commodity shall not exceed 120 square feet (11 $m^2$), and additional areas of higher hazard commodity shall be separated from other such areas by 25 feet (7620 mm) or more. The sprinkler system shall be capable of delivering the higher density over a minimum area of 900 square feet (84 $m^2$) for wet pipe systems and 1,200 square feet ([11] 111 $m^2$) for dry pipe systems. The shape of the design area shall be in accordance with the construction codes, including the Building Code.

## SECTION FC 2305
## HOUSEKEEPING AND MAINTENANCE

**2305.1 Rack structures.** The structural integrity of racks shall be maintained.

**2305.2 Ignition sources.** Clearance from ignition sources shall be provided in accordance with [Section 305] FC305.

**2305.3 Smoking.** Smoking [shall be] is prohibited in high-piled storage areas. [Approved] "No Smoking" signs complying with the requirements of FC310 shall be conspicuously posted in [accordance with Section 310] such areas.

**2305.4 Aisle maintenance.** When restocking is not being conducted, aisles shall be kept clear of stored or waste material. Fire department access doors, aisles and exit doors shall not be obstructed. During restocking operations using manual stocking methods, a minimum unobstructed aisle width of 24 inches (610 mm) shall be maintained in 48-inch ([1219 mm] 1219-mm) or smaller aisles, and a minimum unobstructed aisle width of one-half of the required aisle width shall be maintained in aisles greater than 48 inches (1219 mm). During mechanical stocking operations, a minimum unobstructed aisle width of 44 inches (1118 mm) shall be maintained in accordance with [Section 2306.9] FC2306.9.

**2305.5 Pile dimension and height limitations.** Pile dimensions and height limitations shall comply with the requirements of [Section 2307.3] FC2307.3.

**2305.6 Arrays.** Arrays shall comply with the requirements of [Section 2307.4] FC2307.4.

**2305.7 Flue spaces.** Flue spaces shall comply with the requirements of [Section 2308.3] FC2308.3.

## SECTION FC 2306
## GENERAL FIRE PROTECTION AND LIFE SAFETY FEATURES

**2306.1 General.** Fire protection and life safety features for high-piled storage areas shall be in accordance with this section.

**2306.2 Extent and type of protection.** Where required by FC Table 2306.2, fire detection systems, smoke and heat removal, draft curtains and sprinkler design densities shall extend the lesser of 15 feet (4572 mm) beyond the high-piled storage area or to a permanent partition. Where portions of high-piled storage areas have different fire protection requirements because of commodity, method of storage or storage height, the fire protection features required by FC Table 2306.2 within this area shall be based on the most restrictive design requirements.

**2306.3 Separation of high-piled storage areas.** High-piled storage areas shall be separated from other portions of the building where required by [Sections] FC 2306.3.1 through 2306.3.2.2.

**2306.3.1 Separation from other uses.** Mixed occupancies shall be separated in accordance with the construction codes, including the Building Code.

**2306.3.2 Multiple high-piled storage areas.** Multiple high-piled storage areas shall be designed and installed in accordance with [Section] FC 2306.3.2.1 or 2306.3.2.2.

**2306.3.2.1 Aggregate area.** The aggregate of all high-piled storage areas within a building shall be used for application of FC Table 2306.2 unless such areas are separated from each other by 1-hour fire-resistance-rated fire barrier walls constructed in accordance with the construction codes, including the Building Code. Openings in such walls shall be protected by opening protective assemblies having a 1-hour fire protection rating.

**2306.3.2.2 Multiclass high-piled storage areas.** High-piled storage areas classified as Class I through Class IV not separated from high-piled storage areas classified as high hazard shall utilize the aggregate of all high-piled storage areas as high hazard for purposes of application of FC Table 2306.2. To be considered as separated, 1-hour fire-resistance-rated fire barrier walls shall be constructed in accordance with the construction codes, including the Building Code. Openings in such walls shall be protected by opening protective assemblies having a 1-hour fire protection rating.

**Exception:** As provided for in [Section 2304.2] FC2304.2.

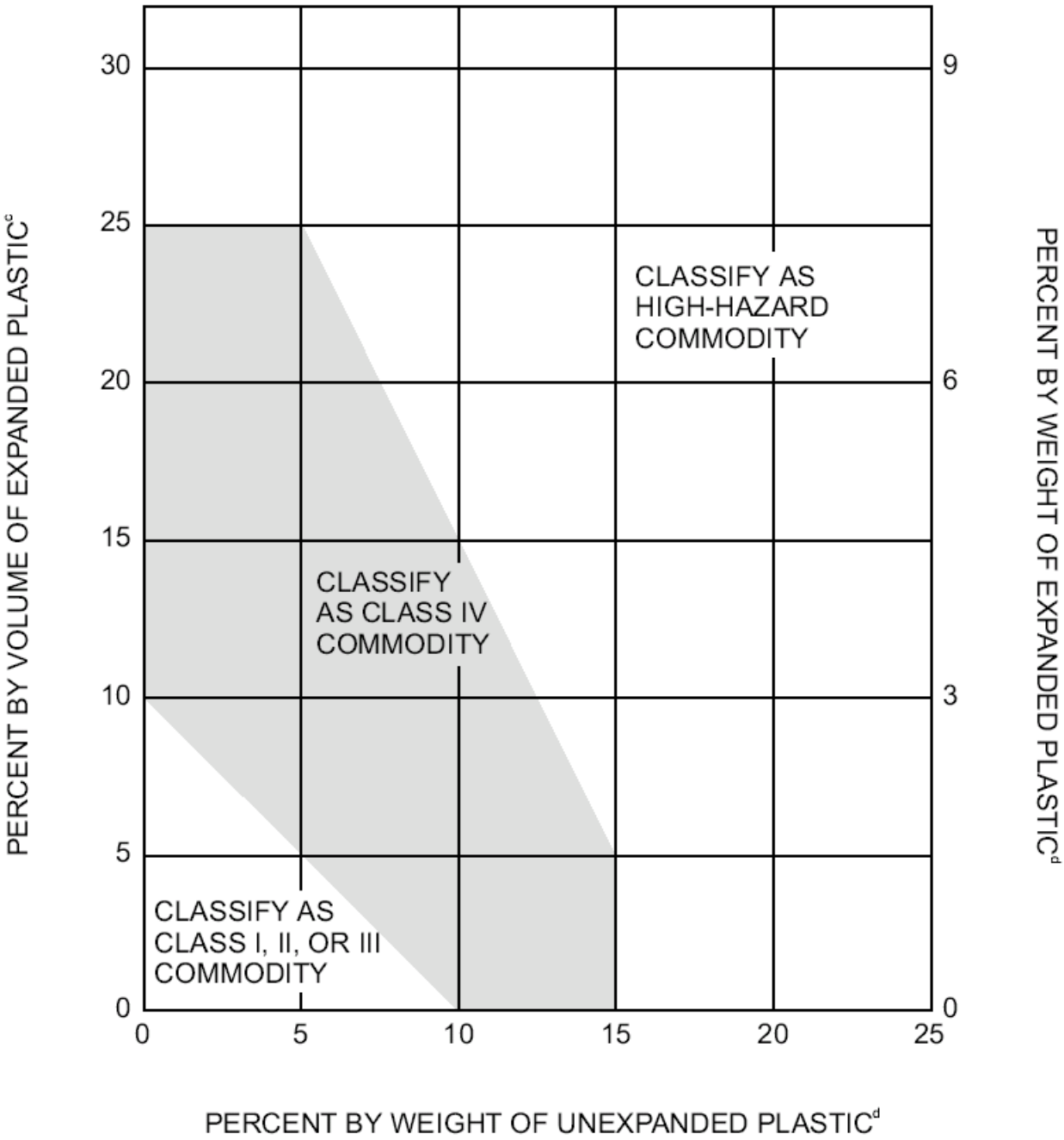



**FIGURE 2303.7.4**
**MIXED COMMODITIES[a, b]**

a. This figure is intended to determine the commodity classification of a mixed commodity in a package, carton or on a pallet where plastics are involved.

b. The following is an example of how to apply the figure: A package containing a Class III commodity has 12-percent Group A expanded plastic by volume. The weight of the unexpanded Group A plastic is 10 percent. This commodity is classified as a Class IV commodity. If the weight of the unexpanded plastic is increased to 14 percent, the classification changes to a high-hazard commodity.

c. $\text{Percent by volume} = \dfrac{\text{Volume of plastic in pallet load}}{\text{Total volume of pallet load, including pallet}}$

d. $\text{Percent by weight} = \dfrac{\text{Weight of plastic in pallet load}}{\text{Total weight of pallet load, including pallet}}$

**FC TABLE 2306.2**
**GENERAL FIRE PROTECTION AND LIFE SAFETY REQUIREMENTS**

| COMMODITY CLASS | SIZE OF HIGH-PILED STORAGE AREA[a] (square feet) (see [Sections] FC 2306.2 and 2306.4) | ALL STORAGE AREAS (See [Sections] FC 2306, 2307 and 2308)[b] | | | | | SOLID-PILED STORAGE, SHELF STORAGE AND PALLETIZED STORAGE (see [Section 2307.3] FC2307.3) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Automatic fire-extinguishing system (see [Section 2306.4] FC2306.4) | Fire detection system (see [Section 2306.5] FC2306.5) | Building Access (see [Section 2306.6] FC2306.6) | Smoke and heat removal (see [Section 2306.7] FC2306.7) | Draft curtains (see [Section 2306.7] FC2306.7) | Maximum pile dimension[c] (feet) | Maximum permissible storage height[d] (feet) | Maximum pile volume (cubic feet) |
| I-IV | 0-500 | Not Required[a] | Not Required | Not Required[e] | Not Required | Not Required | Not Required | Not Required | Not Required |
| | 501-2,500 | Not Required[a] | Yes[i] | Not Required[e] | Not Required | Not Required | 100 | 40 | 100,000 |
| | 2,501-12,000 Public accessible | Yes | Not Required | Not Required[e] | Not Required | Not Required | 100 | 40 | 400,000 |
| | 2,501-12,000 Nonpublic accessible (Option 1) | Yes | Not Required | Not Required[e] | Not Required | Not Required | 100 | 40 | 400,000 |
| | 2,501-12,000 Nonpublic accessible (Option 2) | Not Required[a] | Yes | Yes | Yes[j] | Yes[j] | 100 | 30[f] | 200,000 |
| | 12,001-20,000 | Yes | Not Required | Yes | Yes[j] | Not Required | 100 | 40 | 400,000 |
| | 20,001-500,000 | Yes | Not Required | Yes | Yes[j] | Not Required | 100 | 40 | 400,000 |
| | Greater than 500,000[g] | Yes | Not Required | Yes | Yes[j] | Not Required | 100 | 40 | 400,000 |
| High hazard | 0-500 | Not Required[a] | Not Required | Not Required[e] | Not Required | Not Required | 50 | Not Required | Not Required |
| | 501-2,500 Public accessible | Yes | Not Required | Not Required[e] | Not Required | Not Required | 50 | 30 | 75,000 |
| | 501-2,500 Nonpublic accessible (Option 1) | Yes | Not Required | Not Required[e] | Not Required | Not Required | 50 | 30 | 75,000 |
| | 501-2,500 Nonpublic accessible (Option 2) | Not Required[a] | Yes | Yes | Yes[j] | Yes[j] | 50 | 20 | 50,000 |
| | 2,501-300,000 | Yes | Not Required | Yes | Yes[j] | Not Required | 50 | 30 | 75,000 |
| | 300,001-500,000[g, h] | Yes | Not Required | Yes | Yes[j] | Not Required | 50 | 30 | 75,000 |

For SI: 1 foot = 304.8 mm, 1 cubic foot = 0.02832 $m^3$ , 1 square foot = 0.0929 $m^2$.

a. When sprinkler systems are required for reasons other than those in FC Chapter 23, the portion of the sprinkler system protecting the high-piled storage area shall be designed and installed in accordance with [Sections] FC 2307 and 2308.

b. For aisles, see [Section 2306.9] FC2306.9.

c. Piles shall be separated by aisles complying with the requirements of [Section 2306.9] FC2306.9.

d. For storage in excess of the height indicated, special fire protection shall be provided in accordance with Note g when required by the commissioner. See also FC Chapters 28 and 34 for special limitations for aerosols and flammable and combustible liquids.

e. [Section 503] FC503 shall apply for fire apparatus access.

f. For storage exceeding 30 feet in height, Option 1 shall be used.

g. Special fire protection provisions including fire protection of exposed steel columns; increased sprinkler density; additional in-rack sprinklers, without associated reductions in ceiling sprinkler density; or additional fire department hose connections shall be provided when required by the commissioner.

h. High-piled storage areas shall not exceed 500,000 square feet. A 2-hour fire wall constructed in accordance with the construction codes, including the Building Code shall be used to divide high-piled storage exceeding 500,000 square feet in area.

i. Not required when a fire extinguishing system is designed and installed to protect the high-piled storage area in accordance with [Sections] FC 2307 and 2308.

j. Not required when storage areas are protected throughout by early suppression fast response (ESFR) sprinkler systems installed in accordance with NFPA 13, as modified by FC Appendix B.

**2306.4 Sprinkler systems.** Sprinkler systems shall be provided in accordance with [Sections] FC 2307, 2308 and 2309.

**2306.5 Fire detection.** Where fire detection is required by FC Table 2306.2, an approved automatic fire detection system shall be installed throughout the high-piled storage area. The system shall be monitored and be in accordance with [Section 907] FC907.

**2306.6 Building access.** Where building access is required by FC Table 2306.2, fire apparatus access roads in accordance with [Section 503] FC503 shall be provided within 150 feet (45 720 mm) of all portions of the exterior walls of buildings used for high-piled storage.

**Exception:** Where fire apparatus access roads cannot be installed because of topography, railways, waterways, non-negotiable grades or other similar conditions, the commissioner may require additional fire protection.

**2306.6.1 Access doors.** Where building access is required by FC Table 2306.2, fire department access doors shall be provided in accordance with this section. Access doors shall be accessible without the use of a ladder.

**2306.6.1.1 Number of doors required.** A minimum of one access door shall be provided in each 100 lineal feet (30 480 mm), or fraction thereof, of the exterior walls which face required fire apparatus access roads. The required access doors shall be distributed such that the lineal distance between adjacent access doors does not exceed 100 feet (30 480 mm).

**2306.6.1.2 Door size and type.** Access doors shall not be less than 3 feet (914 mm) in width and 6 feet 8 inches (2032 mm) in height. Roll-up doors shall not be used unless approved.

**2306.6.1.3 Locking devices.** Only approved locking devices shall be used.

**2306.7 Smoke and heat removal.** Where smoke and heat removal are required by FC Table 2306.2, smoke and heat vents shall be provided in accordance with the construction codes, including the Building Code. Where draft curtains are required by FC Table 2306.2, they shall be provided in accordance with the construction codes, including the Building Code.

**2306.8 Fire department hose connections.** Where exit passageways are required by the construction codes, including the Building Code for egress, a Class I standpipe system shall be provided in accordance with the construction codes, including the Building Code.

**2306.9 Aisles.** Aisles providing access to exits and fire department access doors shall be provided in high-piled storage areas exceeding 500 square feet (46 $m^2$), in accordance with [Sections] FC 2306.9.1 through 2306.9.3. Aisles separating storage piles or racks shall comply with the requirements of NFPA 13, as modified by FC Appendix B. Aisles shall also comply with the requirements of the construction codes, including the Building Code.

**Exception:** Where aisles are precluded by rack storage systems, alternate methods of access and protection are allowed when approved.

**2306.9.1 Width.** Aisle width shall be in accordance with [Sections] FC 2306.9.1.1 and 2306.9.1.2.

**Exceptions:**

1. [Cross aisles] Aisles crossing rack structures or storage piles, which are used only for employee access between aisles shall be a minimum of 24 inches (610 mm) wide.

2. Aisles separating shelves classified as shelf storage shall be a minimum of 30 inches (762 mm) wide.

**2306.9.1.1 Sprinklered buildings.** Aisles in buildings protected throughout by a sprinkler system shall be a minimum of 44 inches (1118 mm) wide. Aisles shall be a minimum of 96 inches (2438 mm) wide in high-piled storage areas that exceed 2,500 square feet (232 $m^2$) in area, and that are accessible to the public and designated to contain high-hazard commodities.

**Exception:** Aisles in high-piled storage areas exceeding 2,500 square feet (232 $m^2$) in area, that are accessible to the public and designated to contain high-hazard commodities, and that are protected throughout by a sprinkler system designed for multiple-row racks of high-hazard commodities, shall be a minimum of 44 inches (1118 mm) wide.

Aisles shall be a minimum of 96 inches (2438 mm) wide in areas accessible to the public where mechanical stocking methods are used.

**2306.9.1.2 Nonsprinklered buildings.** Aisles in buildings not protected throughout by a sprinkler system shall be a minimum of 96 inches (2438 mm) wide.

**2306.9.2 Clear height.** The required aisle width shall extend from floor to ceiling. Rack structural supports and catwalks are allowed to cross aisles at a minimum height of 6 feet 8 inches (2032 mm) above the finished floor level, provided that such supports do not interfere with fire department hose stream trajectory.

**2306.9.3 Dead ends.** Dead-end aisles shall be in accordance with the construction codes, including the Building Code.

**2306.10 Portable fire extinguishers.** Portable fire extinguishers shall be provided in accordance with [Section 906] FC906.

## SECTION FC 2307
## SOLID-PILED AND SHELF STORAGE

**2307.1 General.** Shelf storage and storage in solid piles, solid piles on pallets and bin box storage in bin boxes not exceeding 5 feet (1524 mm) in any dimension, shall be designed and maintained in accordance with [Section 2306] FC2306 and this section.

**2307.2 Fire protection.** Where sprinkler systems are required for solid-piled and shelf storage pursuant to FC Table 2306.2, a sprinkler system shall be provided in any area containing such storage that is enclosed in 1-hour fire-rated walls in accordance with the Building Code, or, if such storage is not enclosed within such fire-rated walls, throughout the building. Openings in such walls shall be protected by opening protective assemblies having 1-hour fire protection ratings. The design and installation of the sprinkler system and other applicable fire protection shall be in accordance with this code, the construction codes, including the Building Code, and NFPA 13, as modified by FC Appendix B.

**2307.2.1 Shelf storage.** Shelf storage greater than 12 feet (3658 mm) but less than 15 feet (4572 mm) in height shall be in accordance with the fire protection requirements set forth in NFPA 13, as modified by FC Appendix B. Shelf storage 15 feet (4572 mm) or more in height shall be protected in an approved manner with special fire protection, such as in-rack sprinklers.

**2307.3 Pile dimension and height limitations.** Pile dimensions, the maximum permissible storage height and pile volume shall be in accordance with FC Table 2306.2.

**2307.4 Array.** Where a sprinkler system design utilizes protection based on a closed array, array clearances shall be provided and maintained as specified by the standard used.

## SECTION FC 2308
## RACK STORAGE

**2308.1 General.** Rack storage shall be designed and maintained in accordance with [Section 2306] FC2306 and this section. Bin boxes exceeding 5 feet (1524 mm) in any dimension shall be regulated as rack storage.

**2308.2 Fire protection.** Where a sprinkler system is required for rack storage pursuant to FC Table 2306.2, a sprinkler system shall be provided in any area containing such storage that is enclosed in 1-hour fire-rated walls in accordance with the Building Code, or, if such storage is not enclosed within such fire-rated walls, throughout the building. Openings in such walls shall be protected by opening protective assemblies having 1-hour fire protection ratings. The design and installation of the sprinkler system and other applicable fire protection shall be in accordance with this code, the construction codes, including the Building Code, and NFPA 13, as modified by FC Appendix B.

**2308.2.1 Plastic pallets and shelves.** Storage on plastic pallets or plastic shelves shall be protected by approved specially-engineered fire protection systems, except that plastic pallets listed and labeled in accordance with UL 2335 shall be treated as wood pallets for determining required sprinkler protection.

**2308.2.2 Racks with solid shelving.** Racks with solid shelving having an area greater than 32 square feet (3 $m^2$), measured between approved flue spaces at all four edges of the shelf, shall be in accordance with this section.

**Exceptions:**

1. Racks with mesh, grated, slatted or similar shelves having uniform openings not more than 6 inches (152 mm) apart, comprising at least 50 percent of overall shelf area, and with approved flue spaces, are allowed to be treated as racks without solid shelves.

2. Racks used for the storage of combustible paper records, with solid shelving, shall be in accordance with NFPA 13, as modified by FC Appendix B.

**2308.2.2.1 Fire protection.** Fire protection for racks with solid shelving shall be in accordance with NFPA 13, as modified by FC Appendix B.

**FC TABLE 2308.3**
**REQUIRED FLUE SPACES FOR RACK STORAGE**

| RACK CONFIGURATION | SPRINKLER PROTECTION | | SPRINKLER AT THE CEILING WITH OR WITHOUT MINIMUM IN-RACK SPRINKLERS | | | IN-RACK SPRINKLERS AT EVERY TIER | NONSPRINKLERED |
|---|---|---|---|---|---|---|---|
| | | | ≤ 25 feet | | > 25 feet | | |
| | Storage height | | Option 1 | Option 2 | | Any height | Any height |
| Single-row rack | Transverse flue space | Size[b] | 3 inches | Not Applicable | 3 inches | Not Required | Not Required |
| | | Vertically aligned | Not Required | Not Applicable | Yes | Not Applicable | Not Required |
| | Longitudinal flue space | | Not Required | Not Applicable | Not Required | Not Required | Not Required |
| Double-row rack | Transverse flue space | Size[b] | 6 inches[a] | 3 inches | 3 inches | Not Required | Not Required |
| | | Vertically aligned | Not Required | Not Required | Yes | Not Applicable | Not Required |
| | Longitudinal flue space | | Not Required | 6 inches | 6 inches | Not Required | Not Required |
| Multi-row rack | Transverse flue space | Size[b] | 6 inches | Not Applicable | 6 inches | Not Required | Not Required |
| | | Vertically aligned | Not Required | Not Applicable | Yes | Not Applicable | Not Required |
| | Longitudinal flue space | | Not Required | Not Applicable | Not Required | Not Required | Not Required |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.
a. Three-inch transverse flue spaces shall be provided at least every 10 feet where ESFR sprinkler protection is provided.
b. Random variations are allowed, provided that the configuration does not obstruct water penetration.

**2308.3 Flue spaces.** Flue spaces shall be provided in accordance with FC Table 2308.3. Required flue spaces shall be maintained.

**2308.4 Column protection.** Steel building columns shall be protected in accordance with NFPA 13, as modified by FC Appendix B.

**2308.5 Extra-high-rack storage systems.** Approval of the commissioner shall be obtained prior to installing extra-high-rack combustible storage.

**2308.5.1 Fire protection.** Buildings with extra-high-rack combustible storage shall be protected with a specially engineered sprinkler system. Extra-high-rack combustible storage shall be provided with additional special fire protection, such as separation from other buildings and additional built-in fire protection features and fire department access, when required by the commissioner.

## SECTION FC 2309
## AUTOMATED STORAGE

**2309.1 General.** Automated storage shall be designed and maintained in accordance with this section.

**2309.2 Sprinkler systems.** Where a sprinkler system is required by FC Table 2306.2, a sprinkler system shall be installed throughout the building. The design and installation of such system shall be in accordance with this code and the construction codes, including the Building Code.

**2309.3 Carousel storage.** High-piled storage areas having greater than 500 square feet (46 $m^2$) of carousel storage shall be provided with automatic shutdown in accordance with one of the following:

1. An automatic smoke detection system installed in accordance with the construction codes, including the Building Code, with coverage extending 15 feet (4575 mm) in all directions beyond unenclosed carousel storage systems and which sounds a local alarm at the operator's station and stops the carousel storage system upon the activation of a single detector.

2. An automatic smoke detection system installed in accordance with the construction codes, including the Building Code and within enclosed carousel storage systems, that sounds a local alarm at the operator's station and stops the carousel storage system upon the activation of a single detector.

3. A single dead-man-type control switch that allows the operation of the carousel storage system only when the operator is present. The switch shall be in the same room as the carousel storage system and located to allow for observation of the carousel system.

**2309.4 Automated rack storage.** High-piled storage areas with automated rack storage shall be provided with a manually activated emergency shutdown switch for use by firefighters and other emergency response personnel. The switch shall be clearly marked and shall be located at the fire command center. In buildings without a fire command center, such switch shall be located in a conspicuous, readily accessible location near the entrance to the building, occupancy or area containing the automated rack storage, or other approved location.

## SECTION FC 2310
## RECORD STORAGE

**2310.1 General.** Records storage facilities used for the rack or shelf storage of combustible paper records greater than 12 feet (3658 mm) in height shall be designed, installed, operated and maintained in accordance with [Sections] FC 2306 and 2308 and NFPA 13, as modified by FC Appendix B. Palletized storage of records shall be designed, installed, operated and maintained in accordance with [Section 2307] FC2307.

## TENTS AND OTHER MEMBRANE STRUCTURES

### SECTION FC 2401
### GENERAL

**2401.1 Scope.** This chapter shall govern membrane structures.

**2401.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

### SECTION FC 2402
### DEFINITIONS

**2402.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**AIR-INFLATED STRUCTURE.** A structure whose structural elements are inflated and maintained by elevated air pressure and are not occupiable spaces.

**AIR-SUPPORTED STRUCTURE.** A structure, the shape of which is attained and maintained by elevated air pressure, and the occupancy of which is within the area of elevated pressure.

**MEMBRANE STRUCTURE.** An air-inflated, air-supported, cable or frame-covered structure or tent, as defined in Chapter 31 of the Building Code.

**TENT.** A [non-pressurized] nonpressurized membrane structure of a fabric weather barrier supported by poles and guys in which the fabric weather barrier does not impart stability to the structure. Tents need not be fully enclosed on the sides.

### SECTION FC 2403
### RESERVED

### SECTION FC 2404
### TENTS AND OTHER MEMBRANE STRUCTURES

**2404.1 General**. All membrane structures shall be designed, installed, operated and maintained in accordance with this section and the construction codes, including the Building Code.

**2404.2 Flame-resistant treatment.** The owner or agent shall file with the commissioner a certificate issued by an approved testing laboratory, certifying that the tent materials and their appurtenances, sidewalls, drops and tarpaulins, floor coverings, bunting, combustible decorative materials and effects, including sawdust when used on floors or passageways, [shall be] are composed of flame-resistant material meeting the flame propagation performance criteria of NFPA 701 or shall be treated with a flame retardant in an approved manner and meet the [requirements for flame resistance as determined in accordance with NFPA 701 and Chapter 8] flame propagation performance criteria of NFPA 701, and that such flame resistance is effective for the period specified by the permit.

**[2402.2.1] 2404.2.1 Certification.** An affidavit or affirmation shall be submitted to the commissioner and a copy retained on the premises on which the tent is located. The affidavit shall attest to the information required in FC Chapter 8 and the rules.

**2404.2.2 Label.** Membrane structures shall have a label permanently affixed to them identifying the type and quality of the fabric or other material.

**2404.3 Location and access.** Membrane structures shall be placed and afforded access for firefighting apparatus in accordance with this section.

**2404.3.1 Access.** Fire apparatus access roads shall be provided in accordance with [Section 503] FC503 and the Building Code.

**2404.3.2 Location.** Membrane structures shall not be located within 20 feet (6096 mm) of parked vehicles or internal combustion engines. For the purpose of determining required distances, support ropes and guy wires shall be considered as part of the membrane structure.

**2404.3.3 Fire break.** An unobstructed fire break not less than 12 feet (3658 mm) wide and free from guy ropes or other obstructions shall be maintained on all sides of all membrane structures unless otherwise approved by the commissioner.

**2404.4 Means of egress.** Means of egress for membrane structures shall be in accordance with this section and the construction codes, including the Building Code.

**2404.4.1 Seating arrangements.** Seating in membrane structures shall be in accordance with the construction codes, including the Building Code.

**2404.4.2 Exit openings from tents.** Exit openings from tents shall remain open unless covered by a flame-resistant curtain. The curtain shall comply with the following requirements:

1. Curtains shall be free sliding on a metal support. The support shall be a minimum of 80 inches (2032 mm) above the floor level at the exit. The curtains shall be so arranged that, when open, no part of the curtain obstructs the exit.

2. Curtains shall be of a color, or colors, that contrasts with the color of the tent.

3. Curtains shall be flame resistant in accordance with FC Chapter 8.

**2404.4.2.1 Door operation in air-supported structures.** During high winds exceeding 50 miles per hour (80 kph) or in snow conditions, the use of doors in air-supported structures shall be controlled to avoid excessive air loss. Doors shall not be left open.

**2404.4.3 Aisle arrangement and maintenance.** The arrangement of aisles shall be subject to the approval of the commissioner and shall be maintained clear at all times.

**2404.4.4 Maintenance of means of egress.** The required width of exits, aisles and passageways to a public street shall be maintained at all times. Guy wires, guy ropes and

other support members shall not cross a means of egress at a height of less than 8 feet (2438 mm). The surface of means of egress shall be maintained in an approved manner.

**2404.5 Combustible materials.** Hay, straw, shavings or similar combustible materials shall not be located within any membrane structure containing an assembly occupancy, except the materials necessary for the daily feeding and care of animals. Sawdust and shavings utilized for a public performance or exhibit shall not be prohibited provided the sawdust and shavings are kept damp. Combustible materials shall not be [permitted] allowed under stands or seats at any time. [The areas within and adjacent to the membrane structure shall be maintained clear of all combustible materials or vegetation that could create a fire hazard within 20 feet (6096 mm) from the structure. Combustible trash shall be removed at least once a day from the structure during the period the structure is occupied by the public.]

**2404.6 Smoking.** Smoking shall not be [permitted] allowed in membrane structures. [Approved] "No Smoking" signs complying with the requirements of FC310 shall be conspicuously posted [in accordance with Section 310].

**2404.7 Open or exposed flame.** Open flame or other devices emitting flame, fire or heat or any flammable or combustible liquids, gas, charcoal or other cooking device or any other unapproved devices shall not be [permitted] allowed inside or located within 20 feet (6096 mm) of a membrane structure while open to the public unless an open-flame permit has been issued.

**2404.8 Fireworks and special effects.** Any fireworks or special effects displays in or near any membrane structure shall be conducted in accordance with FC Chapter 33.

**2404.9 Spot lighting.** Spot or effect lighting shall only be by electricity, and all combustible construction located within 6 feet (1829 mm) of such equipment shall be protected with approved noncombustible insulation not less than 9.25 inches (235 mm) thick.

**2404.10 Safety film.** Motion pictures shall not be displayed in membrane structures unless the motion picture film is safety film.

**2404.11 Clearance.** There shall be a minimum clearance of at least 3 feet (914 mm) between the surface of a membrane structure and all contents therein.

**2404.12 Portable fire extinguishers.** Portable fire extinguishers shall be provided as required by [Section 906] FC906.

**2404.13 Fire protection equipment.** Fire hose lines, water supplies and other auxiliary fire equipment shall be maintained at the site in such numbers and sizes as required by the commissioner.

**2404.14 Occupant load.** The occupant load allowed in a membrane structure, shall be determined in accordance with the construction codes, including the Building Code.

**2404.15 Heating and cooking equipment.** Heating and cooking equipment shall be in accordance with this section.

**2404.15.1 Installation.** Heating or cooking equipment, tanks, piping, hoses, fittings, valves, tubing and other related components shall be installed as set forth in the construction codes, including the Mechanical Code and the Fuel Gas Code.

**2404.15.2 Venting.** Gas, liquid and solid fuel-burning equipment designed to be vented shall be vented to the outdoors in accordance with the construction codes, including the Mechanical Code and the Fuel Gas Code. Such vents shall be equipped with approved spark arresters when required. Where vents or flues are used, all portions of the membrane structure shall be not less than 12 inches (305 mm) from the flue or vent.

**2404.15.3 Location.** Cooking and heating equipment shall not be located within 10 feet (3048 mm) of exits or combustible materials.

**2404.15.4 Operations.** Operations such as warming of foods, cooking demonstrations and similar operations that use solid flammables shall be approved by the commissioner.

**2404.15.5 Cooking.** Membrane structures in which cooking is performed shall be separated from other membrane structures by a minimum of 20 feet (6096 mm).

**2404.15.6 Outdoor cooking.** Outdoor cooking that produces sparks or grease-laden vapors shall not be performed within 20 feet (6096 mm) from a membrane structure.

**2404.15.7 Electrical heating and cooking equipment.** Electrical cooking and heating equipment shall comply with the requirements of the Electrical Code.

**2404.16 LPG.** The storage, handling and use of LPG and LPG equipment shall be in accordance with this section and FC Chapter 38.

**2404.16.1 General.** Stationary LPG installations, including tanks, piping, hoses, fittings, valves, tubing and other related components shall be approved and in accordance with FC Chapter 38.

**2404.16.2 Location of containers.** LPG containers shall be located outside the membrane structure. Pressure relief valves shall be pointed away from the membrane structure.

**2404.16.2.1 Containers.** Portable LPG containers shall have a minimum separation between the container and structure of not less than 10 feet (3048 mm).

**2404.16.3 Protection [and security] from movement.** Portable LPG containers, piping, valves and fittings which are being used to fuel LPG-fueled devices, equipment or systems inside a membrane structure shall be located outside the membrane structure and shall be secured from movement or other hazard.

**2404.17 Flammable and combustible liquids.** The storage of flammable and combustible liquids and the use of flammable-liquid-fueled equipment shall be in accordance with this section.

**2404.17.1 Use.** Flammable-liquid-fueled equipment shall not be used in membrane structures.

**2404.17.2 Flammable and combustible liquid storage.** Flammable and combustible liquids shall be stored outside the membrane structure in an approved manner not less than 50 feet (15 240 mm) from the membrane structure. Storage shall be in accordance with FC Chapter 34.

**2404.17.3 Refueling.** Refueling shall be performed at an approved location not less than 20 feet (6096 mm) from membrane structures.

**2404.18 Display of liquid- and gas-fueled motor vehicles.** Liquid- and gas-fueled vehicles and equipment may be displayed within a membrane structure in accordance with this section and FC Chapter 3.

**2404.18.1 Batteries.** Batteries shall be disconnected in an appropriate manner.

**2404.18.2 Fuel systems.** Vehicles or equipment shall not be fueled or defueled within the membrane structure.

**2404.18.2.1 Quantity limit.** Fuel in the fuel tank shall not exceed 1 gallon (3.8 L).

**2404.18.2.2 Inspection.** Fuel systems shall be inspected for leaks.

**2404.18.2.3 Closure.** Fuel tank openings shall be locked and sealed to prevent the escape of vapors.

**2404.18.3 Location.** The location of vehicles or equipment shall not obstruct means of egress.

**2404.18.4 Display of CNG/LPG vehicles.** When a compressed natural gas (CNG) or liquefied petroleum gas (LPG) powered vehicle is parked inside a membrane structure, all of the following conditions shall be met:

1. The quarter-turn shutoff valve or other shutoff valve on the outlet of the CNG or LPG container shall be closed and the engine shall be operated until it stops. Valves shall remain closed while the vehicle is indoors.

2. The hot lead of the battery shall be disconnected.

3. Dual-fuel vehicles equipped to operate on gasoline and CNG or LPG shall comply with the requirements of this section and [Sections] FC 2404.18 through 2404.18.3 for gasoline-powered vehicles.

**2404.18.5 Competitions and demonstrations.** Liquid and gas-fueled vehicles and equipment used for competition or demonstration within a membrane structure shall comply with the requirements of [Section 2404.18.5.1] FC2404.18.5.1.

**2404.18.5.1 Fuel storage and dispensing.** Fuel for vehicles or equipment shall be stored and dispensed in an approved location outside of the membrane structure in accordance with [Section 2404.17.2, Section 2404.17.3] FC 2404.17.2 and 2404.17.3, and FC Chapter 22.

**2404.19 Separation of generators.** Generators and other internal combustion power sources shall be separated from membrane structures by a minimum of 20 feet (6096 mm) and shall be isolated from contact with the public by fencing, enclosure or other approved means.

**2404.20 Fire guards.** When the interest of public safety so requires, the commissioner may order the owner of any membrane structure in which a performance, exhibition, display, contest or other activity is to be conducted to provide one or more fire guards or other qualified persons to remain on duty during the times such places are open to the public, or when such activity is being conducted. [Such fire guards shall keep diligent watch for fires during the time such place is open to the public or such activity is being conducted and take prompt measures for extinguishment of fires that occur] Persons conducting such fire watch shall have duties and responsibilities set forth in FC901.7.2.1 with respect to the areas being monitored in connection with such membrane structure, and shall assist in the evacuation of the [public] occupants from the structure in the event of a fire or other emergency.

**2404.21 Vegetation removal.** Vegetation shall be removed from the area occupied by a membrane structure, and from areas within 30 feet (9144 mm) of such structures.

**2404.22 [Waste material] Combustible waste and storage of combustible material.** The floor surface inside membrane structures and the grounds [outside and] within [a] 30[-foot] feet (9144 mm) [perimeter shall be kept clear of combustible waste. Such combustible waste shall not be permitted to accumulate and shall be stored in approved containers until removed from the premises and disposed of lawfully] of the membrane structure shall be kept free of combustible waste and storage of combustible materials.

## CHAPTER 25
## TIRE REBUILDING AND TIRE STORAGE

### SECTION FC 2501
### GENERAL

**2501.1 Scope.** This chapter shall govern the design, operation and maintenance of tire rebuilding plants, tire storage and tire byproduct facilities.

**2501.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**2501.3 General.** Tire rebuilding plants, tire storage and tire byproduct facilities shall be designed, operated and maintained in accordance with this chapter, NFPA 13, as modified by FC Appendix B, [NFPA 231D,] and if applicable, FC Chapter 23.

### SECTION FC 2502
### DEFINITIONS

**2502.1 Terms defined in FC Chapter 2.** Terms used in this chapter and defined in FC Chapter 2 shall have the meanings defined therein.

## SECTION FC 2503
## TIRE REBUILDING

**2503.1 Construction.** Tire rebuilding plants shall comply with the requirements of the construction codes, including the Building Code.

**2503.2 Location.** Buffing operations shall be conducted in a room separated from the remainder of the building housing the tire rebuilding or tire recapping operations by a 1-hour fire barrier.

**Exception:** Buffing operations are not required to be separated where the following requirements are complied with:

1. Buffing operations are protected throughout by a continuous water-spray fire protection system directed at the point of cutting action.

2. Buffing machines are connected to particle-collecting systems providing a minimum air movement of 1,500 cubic feet per minute (cfm) ($0.71 m^3/s$) in volume and 4,500 feet per minute (fpm) (23 m/s) in-line velocity.

3. The collecting system shall discharge the rubber particles to an approved outdoor noncombustible or noncombustible container, which is emptied at frequent intervals to prevent overflow.

**2503.3 Cleaning.** The buffing area shall be cleaned and combustible waste regularly removed and disposed of to prevent the accumulation of rubber particles.

**2503.4 Spray rooms and booths.** Spray rooms or spray booths wherein flammable or combustible solvents are applied shall comply with the requirements of FC Chapter 15.

## SECTION FC 2504
## PRECAUTIONS AGAINST FIRE

**2504.1 Open fires and flames prohibited.** It shall be unlawful in a tire storage yard to ignite or maintain an open fire or open flame.

**2504.2 Hot work prohibited.** It shall be unlawful in a tire storage yard to conduct hot work operations.

**2504.3 Smoking prohibited.** It shall be unlawful in a tire storage yard to smoke.

**2504.4 Power lines.** Tire storage piles shall not be located beneath electrical power lines having a voltage in excess of 750 volts or near lines supplying power to fire emergency systems where a fire in such storage piles would damage such lines.

**2504.5** Reserved.

**2504.6 [Communications] Emergency telephone.** A telephone not requiring a coin to operate, or [other] another approved, clearly identified means to notify the department, shall be provided at the facility in an approved location. A sign shall be conspicuously posted at or near the telephone indicating that all fires shall be immediately reported to the department, and setting forth the facility's address with cross-street reference and the fire department telephone number.

## SECTION FC 2505
## OUTDOOR STORAGE

**2505.1 Individual piles.** Tire storage shall be restricted to individual piles not exceeding 5,000 square feet (464.5 $m^2$) of continuous area. Piles shall not exceed 50,000 cubic feet (1416 $m^3$) in volume or 10 feet (3048 mm) in height.

**2505.2 Separation of piles.** Individual tire storage piles shall be separated from other piles [of salvage] by a clear space of at least 40 feet (12 192 mm).

**2505.3 Distance between piles of other stored products.** Tire storage piles shall be separated by a clear space of at least 40 feet (12 192 mm) from piles of other stored product.

**2505.4 Distance from lot lines and buildings.** Tire storage piles shall be located at least 50 feet (15 240 mm) from lot lines and buildings unless the commissioner approves a lesser separation distance of tire storage piles in accordance with the criteria set forth in NFPA [231D] 13.

**2505.5 Fire breaks.** Storage yards shall be maintained free from combustible [ground vegetation] grass and weeds for a distance of 40 feet (12 192 mm) from the stored [material to grass and weeds] tires; and for a distance of 100 feet (30 480 mm) from the stored [product] tires to brush and forested areas.

**2505.6 Volume more than 150,000 cubic feet.** Where the bulk volume of stored material is more than 150,000 cubic feet (4248 $m^3$), fire breaks shall be provided around the perimeter of each group of storage piles in accordance with the following:

1. Individual storage piles shall be arranged so that there are not more than 16 individual storage piles per group.

2. Fire breaks shall at least be 75 feet (22 860 mm) wide.

**2505.7 Location [of storage].** Outdoor [waste] tire storage shall not be located under bridges, elevated trestles, elevated roadways or elevated railroads.

## SECTION FC 2506
## FIRE DEPARTMENT ACCESS

**2506.1 Required access.** New and existing tire storage yards shall be provided with fire apparatus access roads in accordance with [Section 503] FC503 and this section.

**2506.2 Location.** Fire apparatus access roads shall be located within all pile clearances identified in [Section 2505.4] FC2505.4 and within all fire breaks required in [Sections] FC 2505.5 and 2505.6. Access roadways shall be within 150 feet (45 720 mm) of any point in the storage yard where storage piles are located, at least 20 feet (6096 mm) from any storage pile.

## SECTION FC 2507
## FENCING

**2507.1 Where required.** Where the bulk volume of stored material is more than 20,000 cubic feet (566 $m^3$), a firmly anchored fence or other approved method of security that controls unauthorized access to the storage yard shall surround the storage yard.

**2507.2 Construction.** The fence shall be constructed of approved materials and shall be at least 6 feet (1829 mm) high and provided with gates at least 20 feet (6096 mm) wide. Where gates are constructed, they shall comply with the vertical clearance requirements of [Section 503.6] FC503.6.

**2507.3 Security.** All gates to the storage yard shall be locked when the storage yard is not staffed.

## SECTION FC 2508
## FIRE PROTECTION

**2508.1 Water supply.** A public or private fire protection water supply shall be provided in accordance with [Section 508] FC508. The water supply shall be arranged such that any part of the storage yard can be reached by using not more than 300 feet (91 m) of hose.

**2508.2 Portable fire extinguishers.** Buildings or structures shall be provided with portable fire extinguishers in accordance with [Section 906] FC906. Fuel-fired vehicles operating in the storage yard shall be equipped with a minimum 2-A:20-B:C rated portable fire extinguisher.

## SECTION FC 2509
## INDOOR STORAGE ARRANGEMENT

**2509.1 Pile dimensions.** Where tires are stored on-tread, the dimension of the pile in the direction of the wheel hole shall not be more than 50 feet (15 240 mm). Tires stored adjacent to or along one wall shall not extend more than 25 feet (7620 mm) from that wall. Other piles shall not be more than 50 feet (15 240 mm) in width.

# CHAPTER 26
# WELDING AND OTHER HOT WORK

## SECTION FC 2601
## GENERAL

**2601.1 Scope.** This chapter shall govern welding, cutting and other torch and hot work operations and equipment.

**2601.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**2601.3 Approved locations.** Hot work shall be conducted only in the areas set forth in this section or approved by the commissioner.

**2601.3.1 Authorized areas.** Hot work may be conducted in the following areas:

1. Areas designed for hot work operations.

2. Areas authorized for that purpose by the responsible person at the premises when precautions have been taken in compliance with the requirements of this chapter.

**2601.3.2 Restricted areas.** Hot work shall not be conducted in the following areas unless approval has been obtained from the commissioner:

1. Areas where the sprinkler system is impaired.

2. Areas where there exists the potential of an explosive atmosphere, such as locations where flammable gases, liquids or vapors are present.

3. Areas with readily ignitable materials, such as storage of large quantities of bulk sulfur, baled paper, cotton, lint, dust or loose combustible materials.

4. On board marine vessels or watercraft at dock under construction or repair.

**2601.4 Containers.** Compressed gas containers shall be designed, installed, operated and maintained in accordance with this chapter and FC Chapter 30.

**2601.5 Design and installation of oxygen-fuel gas systems.** An oxygen-fuel gas system shall be designed and installed in accordance with NFPA 51 [and ANSI Z49.1, as applicable].

**2601.5.1 Oxygen at construction sites.** The storage and use of oxygen at a construction site shall additionally comply with the requirements of FC Chapter 14.

**2601.6 Torches.** Torches and tips that utilize a flammable gas for hot work operations shall be listed.

**2601.7 Certificate of approval.** Devices used to increase the pressure of piped natural gas in accordance with FC2609.8 shall be of a type for which a certificate of approval has been issued.

## SECTION FC 2602
## DEFINITIONS

**2602.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**[FIRE GUARD.** A person holding a certificate of fitness for such purpose, who is trained in and responsible for maintaining a fire watch and performing such fire safety duties as may be prescribed by the commissioner.]

**HOT WORK.** Cutting, welding, thermit welding, brazing, soldering, grinding, thermal spraying, thawing pipe, cadwelding, installation of torch-applied roof systems or any other similar operation or activity.

**HOT WORK AREA.** The area exposed to sparks, hot slag, radiant heat, or convective heat as a result of hot work.

**HOT WORK EQUIPMENT.** Electric or gas welding or cutting equipment used for hot work.

**[HOT WORK PROGRAM AUTHORIZATIONS.** Authorizations issued by the responsible person under a hot work program allowing welding or other hot work to be performed at the premises.]

**HOT WORK PROGRAM.** A program, implemented by a responsible person designated by the owner of a building or structure in or on which hot work is being performed, to oversee and issue authorizations for such hot work for the purpose of preventing fire and fire spread.

**HOT WORK PROGRAM AUTHORIZATIONS.** Authorizations issued by the responsible person under a hot work program allowing welding or other hot work to be performed at the premises.

**RESPONSIBLE PERSON.** A person trained in the fire safety hazards associated with hot work and in the necessary and appropriate measures to minimize those hazards, who is designated by the owner of a premises to authorize the performance of hot work at the premises.

**TORCH-APPLIED ROOF SYSTEM.** Bituminous roofing systems using membranes that are adhered by heating with a torch and melting asphalt back coating instead of mopping hot asphalt for adhesion.

## SECTION FC 2603
## GENERAL REQUIREMENTS

**2603.1 General.** Hot work operations, including temporary and fixed hot work areas, shall be conducted in accordance with this chapter.

**2603.1.1 Torch operations using LPG.** The use of LPG for torch operations shall additionally comply with the requirements of FC Chapter 38.

**2603.1.2 Torch operations using CNG.** The use of CNG for torch operations shall additionally comply with the requirements of FC Chapter 35.

**2603.2 Hot work program.** Whenever hot work is performed in any building or structure, on a building roof or on a building setback, the owner shall ensure that such work is performed in accordance with this chapter and shall designate a responsible person to ensure compliance.

**2603.2.1 Hot work program responsible person.** The responsible person shall ensure that a permit has been obtained from the department when one is required, and ensure that the hot work is performed in compliance with the terms and conditions of the permit. The responsible person shall inspect the hot work site prior to issuing a hot work program authorization and periodically monitor the work as it is being performed to ensure there are no fire safety hazards.

**2603.2.2 Responsible person supervision.** Hot work operations shall be conducted under the general supervision of the responsible person.

**2603.3 Hot work program authorization.** A hot work program authorization bearing the signature of the responsible person shall be obtained for any project conducted on a premises involving hot work operations by the person in charge of such hot work operations. Hot work authorizations, issued by the responsible person, shall be available for inspection by any representative of the department during the performance of the work and for 48 hours after the work is complete.

**2603.4 Qualifications of operators.** An authorization for hot work operations shall not be issued unless the individuals [in charge of performing] conducting such operations are capable of performing such operations safely. Demonstration of a working knowledge of the provisions of this chapter shall constitute acceptable evidence of compliance with this requirement.

**2603.4.1 Torch operations using oxygen and flammable gases.** Torch operations using oxygen and a flammable gas, and any torch operation for torch-applied [roof] roofing systems, shall be performed by a certificate of fitness holder.

**Exception:** Torch operations using oxygen and piped natural gas for manufacturing jewelry or in a dental laboratory may be performed under the personal supervision of a certificate of fitness holder, who shall be responsible to regulate the pressure and flow of oxygen and natural gas to each torch.

**2603.4.2 Use of portable fire extinguishers.** All persons conducting hot work operations shall be trained in the use of portable fire extinguishers, and shall be capable of extinguishing fires when they are limited in size and spread such that they can readily be extinguished using a portable fire extinguisher.

**2603.5 Records.** The responsible person for the hot work area shall maintain "prework check" reports in accordance with [Section 2604.3.1] FC2604.3.1. [These reports shall be maintained on the premises for a minimum of 48 hours after work is complete.]

**2603.6 Signage.** Visible hazard identification signs shall be provided where required by FC Chapter 27. Where the hot work area is accessible to persons other than the operator of the hot work equipment, signs shall be posted in a conspicuous location to warn others before they enter the hot work area. Such signs shall read as follows:

CAUTION
HOT WORK IN PROGRESS

STAY CLEAR.

## SECTION FC 2604
## FIRE SAFETY REQUIREMENTS

**2604.1 Protection of combustibles.** Combustible material and combustible waste shall be protected during hot work operations in accordance with [Sections] FC 2604.1.1 through 2604.1.9.

**2604.1.1 Separation from combustibles.** Hot work [areas shall not be less than] operations involving cutting or welding shall be conducted at least 35 feet (10 668 mm) from combustible materials and combustible waste or shall be provided with appropriate shielding to prevent sparks, slag or heat from igniting exposed combustibles. All other hot work operations shall be conducted at least 25 feet (7620 mm) from combustible materials and combustible waste or shall be provided with appropriate shielding to prevent sparks, slag or heat from igniting exposed combustibles.

**2604.1.2 Openings.** Openings or cracks in walls, floors, ducts or shafts within 35 feet (10 668 mm) of the hot work area shall be tightly covered to prevent the passage of sparks to adjacent combustible areas, or shielded by metal fire-resistant guards, or provided with curtains to prevent passage of sparks or slag.

**2604.1.3 Housekeeping.** Combustible waste shall not be allowed to accumulate on floors and other surfaces within the hot work area. Hot work areas shall be regularly cleaned and combustible waste removed and disposed of lawfully.

**2604.1.4 Conveyor systems.** Conveyor systems that are capable of carrying sparks to distant combustibles shall be shielded or shut down.

**2604.1.5 Partitions.** Partitions segregating hot work areas from other areas of the building shall be of noncombustible construction. In fixed hot work areas, the partitions shall be securely connected to the floor such that no gap exists between the floor and the partition. Partitions shall prevent the passage of sparks, slag, and heat from the hot work area.

**2604.1.5.1 Motor-fuel dispensing facilities.** The use of a torch within a repair garage located on a property upon which a motor-fuel dispensing facility is situated shall be conducted within a fire-rated enclosure. All doors of such enclosure shall be fireproof and self-closing.

**2604.1.5.2 Repair garages.** In a repair garage with a capacity for more than one vehicle, hot work shall be conducted within a fire-rated enclosure in compliance with [Section 2604.1.5.1] FC2604.1.5.1 or behind a noncombustible screen that is positioned and of sufficient size to prevent the passage of sparks, slag[,] and heat from the hot work area.

**2604.1.6 Floors.** [Fixed hot work areas] Areas designed for hot work operations shall have floors with noncombustible surfaces.

**2604.1.7 Precautions in hot work.** Hot work shall not be performed on a container or equipment that contains or has contained a flammable [liquids, gases or solids] solid, flammable liquid or flammable gas until the container or equipment has been thoroughly cleaned, inerted or purged; except that "hot tapping" shall be allowed at bulk plants and terminals on tanks and piping when such work is conducted by competent personnel. Hot work involving cutting, welding or heating of any flammable solid in any form shall be conducted only with the approval of the commissioner.

**2604.1.8 Sprinkler protection.** Sprinkler system protection shall not be shut off or impaired while hot work is performed unless approved by the commissioner. Where hot work is performed close to sprinklers, noncombustible barriers or damp cloth guards shall shield the individual sprinkler heads and shall be removed when the work is completed. If the work extends over several days, the shields shall be removed at the end of each workday.

**2604.1.9 Fire detection systems.** Approved [special precautions] precautionary measures shall be taken to avoid accidental operation of automatic fire detection systems.

**2604.2 Fire watch.** A fire watch shall be maintained and fire guards provided in accordance with [Sections] FC 2604.2.1 through [2604.2.7] 2604.2.7.1.

**2604.2.1 When required.** A fire watch shall be maintained during hot work operations. The fire watch shall continue for a minimum of 30 minutes after the conclusion of the work. The commissioner, or the responsible person implementing a hot work program, may extend the duration of the fire watch based on the hazards or work being performed.

**2604.2.2 Location.** The fire watch shall observe the entire hot work area. Hot work conducted in areas with vertical or horizontal fire exposures that are not observable by a single individual shall have additional personnel assigned to ensure that exposed areas are monitored, including compliance with FC2604.2.7.1.

**2604.2.3 Duties.** [Individuals assigned to fire watch duty shall have fire extinguishing equipment readily available and shall be trained in the use of such equipment. Individuals assigned to fire watch duty shall be responsible for identifying and extinguishing spot fires and reporting such fires to the department.] Persons conducting a fire watch shall have the duties and responsibilities set forth in FC901.7.2.1 with respect to the areas being monitored in connection with hot work operations.

**2604.2.4 [Fire training.** The individuals responsible for performing the hot work, and for the fire watch, shall be trained in the use of portable fire extinguishers.] Reserved.

**2604.2.5 Fire hoses.** Where hose lines are required, they shall be connected, charged and ready for operation.

**2604.2.6 Portable fire extinguishers.** A minimum of one portable fire extinguisher complying with the requirements of [Section 906] FC906 and with a minimum 2-A:20-B:C rating shall be provided and readily accessible within a 30 feet (9144 mm) travel distance of the location where hot work is performed and where the fire guards are positioned.

**2604.2.7 Fire guards for torch operations.** The fire watch for torch operations conducted at the following locations shall be conducted by fire guards:

1. Construction sites.

2. On any rooftop, or in connection with any torch-applied [roof] roofing system operation.

3. In any building or structure, when the torch operation is conducted by a person holding a citywide permit for torch operations.

**2604.2.7.1 Construction sites and torch-applied [roof] roofing systems.** [A fire guard shall be provided for each torch operation at a construction site and in connection with torch-applied roofing system operations. A fire guard shall be provided for each torch in operation. An additional fire guard shall be provided on the floor or level below the torch operation.] A fire watch shall be maintained for each torch operation at a construction site and torch-applied roofing system operations in compliance with the requirements of FC 2604.2.7.1.1 and 2604.2.7.1.2.

**2604.2.7.1.1 Fire watch coverage.** A fire guard shall be provided for each torch in operation, except that a single fire guard may be designated to conduct a fire watch for more than one torch operation on the same floor or level if each torch operation is not more than 50 feet (15 240 mm) from the fire guard, as measured by the actual path of travel, and the field of view of such fire guard encompasses all of the horizontal fire exposures of such torch operations.

**2604.2.7.1.2 Fire watch on floors below.** In addition to the fire guard required by FC2604.2.7.1.1, if the torch operation is being conducted at or near the edge of an unenclosed floor of a building, or near a floor opening, or other location where sparks and slag may travel to one or more lower floors or levels, a fire guard shall conduct a fire watch on each lower floor or level containing combustible surfaces or materials within 35 feet (10 668 mm) of the area of such floor or level that potentially would be exposed to such sparks or slag. Prior to commencement of the torch operation, the fire safety manager or responsible person shall inspect the lower floors or levels and take all necessary and appropriate precautions to protect any combustible surfaces and materials that potentially would be exposed to sparks and slag from the torch operation. A certification to that effect shall be made on the hot work authorization.

**Exception:**

1. A fire watch is not required on the floors or levels below a torch operation on a construction site when:

   1.1. the torch operation is not being conducted at or near the edge of an unenclosed floor of a building;

   1.2. the floor upon which the torch operation is being conducted is of noncombustible construction;

1.3. there are no floor or exterior building openings within 35 feet (10 668 mm) of the torch operation; and

1.4. prior to commencement of the torch operation, the fire safety manager or responsible person conducts an inspection and takes the precautions required pursuant to FC2604.2.7.1.2.

2. Notwithstanding the foregoing exception, if sparks or slag generated by the torch operation are observed to extend beyond 35 feet (10 668mm), thereby potentially exposing lower floors or levels, the torch operation shall be immediately discontinued, and the floors or levels below shall be inspected for any fire condition. If there is any potential exposure to combustible surfaces or materials on the floors below from such sparks and slag, noncombustible barriers shall be provided and any other necessary or appropriate precautions shall be taken. If such barriers and precautions fail to block the passage of sparks and slag, a fire watch shall be established on the floors or levels below.

**2604.3 Area reviews.** Before hot work is authorized and at least once per day while the authorization is in effect, the hot work area shall be inspected by the responsible person to ensure that it is a fire safe area.

**2604.3.1 Pre-hot work check.** A pre-hot work check shall be conducted by the responsible person prior to work to ensure that all equipment is safe and hazards are recognized and protected. A report of the check shall be kept at the work site during the work and for a minimum of 48 hours after work is completed, and made available for inspection by any representative of the department. The pre-hot work check shall be conducted at least once per day and shall verify the following:

1. The hot work equipment is in good working order.

2. The hot work area is clear of combustibles and flammable solids or that such materials present in the area are protected in accordance with [Section 2604.1.1] FC2604.1.1.

3. Exposed construction is of noncombustible materials or, if combustible, is protected.

4. Openings are protected.

5. Hot work area floors are clear of combustible waste accumulation.

6. Reserved.

7. Fire watch personnel, where required, are assigned.

8. Approved actions have been taken to prevent accidental activation of fire extinguishing systems and detection equipment in accordance with [Sections] FC 2604.1.8 and 2604.1.9.

9. Portable fire extinguishers and fire hoses (where provided) are operable and available.

10. All persons performing hot work possess certificates of fitness, where such certificates are required.

11. All persons performing hot work requiring a permit possess a site-specific permit or citywide permit, authorizing such work.

## SECTION FC 2605
## GAS WELDING AND CUTTING

**2605.1 General.** Devices or attachments mixing air or oxygen with flammable gases prior to consumption, except at the burner or in a standard torch or blow pipe, shall not be allowed unless approved.

**2605.2 Container storage, handling and use.** Storage, handling and use of compressed gas containers shall be in accordance with this section and FC Chapter 30.

**2605.2.1 Containers connected for use.** A single container of oxygen and a single container of flammable gas may be installed on a cart without the separation of containers required by FC3504.1.3 provided that the containers are connected to regulators, equipped with apparatus designed for cutting, welding or other hot work operation, and are otherwise ready for use, and are stored, handled and used in compliance with the following requirements:

1. Carts shall be designed and used in accordance with FC2703.10.3.

2. Container valves shall have a fixed hand wheel, or other approved means by which the flow of gas may be immediately shut down during hot work operations.

3. Container valves shall be closed at the end of each workday and whenever work is discontinued or the cart moved.

4. Container valve outlet connections shall conform to the requirements of CGA V-1.

5. Separation of the cart from the hot work operation shall be maintained in accordance with FC2605.5, or fire-resistant shields shall be provided.

6. A separation distance of 20 feet (6096 mm) shall be maintained between such carts.

**2605.3 Precautions.** [Containers,] Oxygen containers and oxygen container valves, regulators, hose and other apparatus and fittings [for oxygen] shall be kept free of oil or grease. Oxygen containers, apparatus and fittings shall not be handled with oily hands, oily gloves, or greasy tools or equipment.

**2605.4 Acetylene gas.** Acetylene gas shall not be piped except in approved container manifolds and container manifold connections, or piped or utilized at a pressure exceeding 15 pounds per

square inch gauge (psig) (103 kPa). Acetylene gas stored in containers shall be dissolved in a suitable solvent. Acetylene gas shall not be brought in contact with unalloyed copper, except in a torch.

**2605.5 Remote locations.** Oxygen and fuel gas containers shall be located at a distance from the hot work area sufficient to protect such containers from heat, sparks, slag, or misdirection of the torch flame.

**2605.6 Container shutoff.** The torch valve shall be closed and the gas supply to the torch completely shut off when hot work operations are discontinued for a period of 1 hour or more.

**2605.6.1 Emergency [shut-off] shutoff.** Oxygen and fuel gas container valves shall be accessible to the torch operator or fire guard for immediate [shut off] shutoff of the gas supply in the event of an emergency.

**2605.7 Prohibited operations**. [The] It shall be unlawful to conduct the following hot work operations[ shall be prohibited.]:

1. Welding or cutting operations supported by or resting on compressed gas containers.

2. Torch-applied roof system operations on roofs constructed of combustible materials.

3. Use of an acetylene [generators] generator for hot work operations.

**2605.8 Tests.** It shall be unlawful to test piping equipment or systems for leaks using a flame. Tests for suspected leaks in piping equipment and systems shall be made using soapy water.

## SECTION FC 2606
## ELECTRIC ARC HOT WORK

**2606.1 General.** The frame or case of electric hot work machines, except internal-combustion-engine-driven machines, shall be grounded. Ground connections shall be mechanically strong and electrically adequate for the required current.

**2606.2 Return circuits.** Welding current return circuits from the work to the machine shall have proper electrical contact at joints. The electrical contact shall be periodically inspected.

**2606.3 Disconnecting.** Electrodes shall be removed from the holders when electric arc welding or cutting is discontinued for any period of 1 hour or more. The holders shall be located to prevent accidental contact and the machines shall be disconnected from the power source.

**2606.4 Emergency disconnect.** A switch or circuit breaker shall be provided so that fixed electric welders and control equipment can be disconnected from the supply circuit. The disconnect shall be installed in accordance with the Electrical Code.

**2606.5 Damaged cable.** Damaged cable shall be removed from service until properly repaired or replaced.

## SECTION FC 2607
## RESERVED

## SECTION FC 2608
## RESERVED

## SECTION FC 2609
## PIPING MANIFOLDS AND HOSE SYSTEMS FOR FUEL GASES AND OXYGEN

**2609.1 General.** The use of piping manifolds, protective equipment and hose systems in oxygen-fuel gas systems, including natural gas supplied from a utility for use in an oxygen-fuel gas system, shall be designed, installed, operated and maintained in accordance with [Section FC 2609] FC2609, FC Chapter 30 and NFPA 51.

**2609.2 Protection.** Piping shall be protected against physical damage.

**2609.3 Signage.** Signage shall be provided for piping and hose systems as follows:

1. Aboveground piping systems shall be marked in accordance with [ANSI] ASME A13.1.

2. Station outlets shall be marked to indicate their intended usage.

3. Signs shall be posted, indicating clearly the location and identity of section shutoff valves.

**2609.4 Manifolding of containers.** Oxygen manifolds shall be located at least 20 feet (6096 mm) away from combustible waste and combustible material, including oil and grease, and gas containers containing flammable gases, unless the gas containers are separated from each other by a fire partition.

**2609.5 Identification of manifolds.** Signs shall be posted for oxygen manifolds with service pressures not exceeding 250 psig (1379 kPa). Such signs shall read as follows:

LOW-PRESSURE MANIFOLD
DO NOT CONNECT HIGH-PRESSURE CONTAINERS
MAXIMUM PRESSURE 250 PSIG

**2609.6 Clamps.** Hose connections shall be clamped or otherwise securely fastened.

**2609.7 Inspection.** Hoses shall be inspected frequently for leaks, burns, wear, loose connections or other defects.

**2609.8 Piped natural gas precautions.** When piped natural gas is used with oxygen in any hot work operation, a listed protective device that serves as a combination flashback arrester and backflow check valve shall be provided at an approved location on both the natural gas and oxygen supply lines so as to ensure the safe operation of all devices, equipment and systems, including the utility gas meter. Where pressure of the piped natural gas supply is insufficient to ensure such safe operation, approved equipment shall be provided between the gas meter and the [fuel consuming] fuel-consuming appliance that increases such pressure to the level required for

such safe operation. Notwithstanding any section of this code to the contrary, such flashback arresters and check valves, [pressure-increasing] pressure-increasing equipment, shall be installed as components of both new and existing installations. Installations involving the use of piped natural gas with oxygen in any hot work operation shall additionally comply with the rules.

# CHAPTER 27
# HAZARDOUS MATERIALS—GENERAL PROVISIONS

## SECTION FC 2701
## GENERAL

**2701.1 Scope.** This chapter shall govern the storage, handling, use and transportation of hazardous materials. Hazardous material storage, handling and use shall additionally comply with the requirements of the New York State Department of Environmental Conservation regulations, as set forth in 6 NYCRR Parts 595 through 614.

**Exceptions:**

1. The storage, handling and use in retail or wholesale sales occupancies of alcoholic beverages, medicines, foodstuffs, cosmetics, and consumer products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, when packaged in individual containers not exceeding 1.3 gallons (5 L) in volume.

2. Storage, handling and use of hazardous materials for agricultural purposes as a pesticide, fertilizer or similar application, when approved for such use by the regulatory agency having jurisdiction and when such storage, handling and use is in accordance with the manufacturer's instructions.

3. Reserved.

4. Reserved.

5. Refrigerating systems when designed, installed, operated and maintained in accordance with the Mechanical Code and [Section 606] FC606.

6. Stationary [lead-acid batteries] storage battery systems when in accordance with [Section 608] FC608.

7. The storage, handling and use, including storage for sale, of fireworks, in accordance with FC Chapter 33.

8. The storage, handling and use of corrosives in Group M occupancies, including storage for sale, of personal and household products, when in the manufacturer's original consumer packaging.

9. The storage of distilled spirits and wines in wooden barrels and casks.

10. The use of wall-mounted dispensers containing alcohol-based hand rubs classified as Class I or Class II liquids when in accordance with [Section 3405.5] FC3405.5.

**2701.1.1 Relationship with other chapters.** This chapter shall apply to all hazardous materials, including those materials regulated elsewhere in this code, except that when specific requirements inconsistent with the provisions of this chapter are set forth elsewhere in this code, those specific requirements shall apply to the extent that they are inconsistent. Where a material is in multiple hazard categories, compliance with each hazard category shall be required. Where a material is both a physical hazard and a health hazard, compliance with the requirements for each hazard category shall be required.

**2701.2 Material classification.** Hazardous materials shall be classified by physical hazard, health hazard and/or other hazards associated with the properties of the material, or if the hazardous material is a mixture, with the hazards associated with the mixture as a whole. The commissioner may determine the appropriate hazard classification of a hazardous material, or may accept the classification set forth in nationally recognized standards, material safety data sheets, or other approved standard or method.

**2701.2.1** Reserved.

**2701.2.2** Reserved.

**2701.2.2.1 Physical hazards.** The material categories listed in this section are classified primarily as physical hazards.

1. Explosives and blasting agents.

2. [Flammable and combustible] Combustible liquids.

3. Flammable solids, liquid and gases.

4. Organic peroxide [materials] solids or liquids.

5. [Oxidizer materials] Oxidizing solids or liquids.

6. Oxidizing gases.

[6] 7. Pyrophoric [materials] solids or liquids.

[7] 8. Unstable (reactive) [materials] solids, liquids or gases.

[8] 9. Water-reactive solids and liquids.

[9] 10. Cryogenic fluids.

**2701.2.2.2 Health hazards.** The material categories listed in this section are classified primarily as health hazards.

1. Highly toxic and toxic materials.

2. Corrosive materials.

**2701.3** Reserved.

**2701.4 Retail and wholesale storage and display.** For retail and wholesale storage and display of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in Group M occupancies and storage in Group S occupancies, see [Section 2703.11] FC2703.11.

**2701.5 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**2701.5.1 Hazardous Materials Management Plan.** The commissioner may require [each] an application for a permit to include a Hazardous Materials Management Plan (HMMP). Such plan shall be drawn approximately to scale. The HMMP shall contain the following:

1. [Storage, handling and use areas] Access to each area where hazardous materials are stored, handled or used.

[2. Maximum amount of each material stored, handled or used in each area.

3. Type and size of containers to be used for storage.]

[4] 2. Location of [valves and devices used to control and mitigate the accidental or unauthorized release of hazardous materials, and where such valves are of the self-indicating type, an illustration of their on and off position] emergency equipment.

[5. Piping through which hazardous material liquids or gases are transferred, other than utility-owned natural gas lines and low-pressure natural gas lines subject to compliance with the requirements of the Plumbing Code.

6. Reserved.

7. Storage plan showing the storage arrangement, including the location and dimensions of aisles.

8. The location and type of emergency equipment.]

3. Location where liaison required by FC2703.9.1.1 will meet emergency responders.

4. Facility evacuation meeting point locations.

5. The predominant use and/or occupancy of areas within the building where hazardous materials are not stored or used.

6. Location of all aboveground and underground hazardous material storage tanks and their appurtenances including, but not limited to, sumps, vaults, below-grade treatment systems and piping.

7. The hazard classes of hazardous materials stored or used in each area.

8. Locations of all control areas and Group H occupancies.

9. Locations of exits.

[9] 10. Such other information and documentation as the commissioner may prescribe.

**2701.5.2 Hazardous materials reporting.** The storage of hazardous materials shall be reported as required by the New York State General Municipal Law Section 209-u. The commissioner may require an application for a permit pursuant to this code to include a copy of the current filing pursuant to such New York State General Municipal Law for the facility or premises for which a permit is sought. The commissioner may also require an application for a permit to include a Hazardous Materials Inventory Statement (HMIS), such as a statement prepared for purposes of the Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III, Tier II Report, or other approved statement. The HMIS shall include the following information:

1. Product name.

2. Chemical composition.

3. Chemical Abstract Service (CAS) number.

4. Location where stored or used.

5. Container size.

6. Hazard classification.

7. Quantity in storage.

8. Quantity in use-closed systems.

9. Quantity in use-open systems.

**2701.6 Facility closure.** Facilities shall be placed permanently out of service in accordance with [Sections] FC 2701.6.2 and 2701.6.3 and, as applicable, with the New York State Department of Environmental Conservation regulations as set forth in 6 NYCRR Sections 598.10 and 613.9.

**2701.6.1** Reserved.

**2701.6.2 Permanently [out of service] out-of-service facilities.** Facilities that are not operated for a period of more than [one] 1 year or for which a permit has lapsed for more

than [one] 1 year shall be deemed to be permanently out of service and shall be closed in an approved manner.

**2701.6.3 Facility closure plan.** The commissioner may require permittees to apply for approval to permanently close a facility that manufactures, stores, handles or uses hazardous materials. Such application shall be submitted at least 30 calendar days prior to the planned closure of the facility. Such plan and/or such other requirements as the commissioner may prescribe shall demonstrate that hazardous materials that are manufactured, stored, handled or used in the facility will be lawfully disposed of in a manner that eliminates the need for further maintenance and any threat to public health and safety.

## SECTION FC 2702
## DEFINITIONS

**2702.1 Definitions.** The following terms shall, for the purposes of this chapter, FC Chapters 28 through 44, and as used elsewhere in this code, have the meanings shown herein.

**BOILING POINT.** The temperature at which the vapor pressure of a liquid equals the atmospheric pressure of 14.7 pounds per square inch (psia) (101 kPa) or 760 mm of mercury. Where a boiling point is unavailable for the material in question, or for mixtures which do not have a constant boiling point, for the purposes of this classification, the 20-percent evaporated point of a distillation performed in accordance with ASTM D 86 shall be used as the boiling point of the liquid.

**CARGO TANK.** A vehicle other than a railroad tank car, [or] marine vessel, or watercraft with a tank mounted thereon or built as an integral part thereof, used for the transportation of flammable or combustible liquids, LPG or other hazardous materials, including self-propelled vehicles and full trailers and semi-trailers, with or without motive power, and carrying part or all of the load.

**CEILING LIMIT.** The maximum concentration of an airborne contaminant to which one may be exposed shall be as established by the regulations of the United States Department of Labor, as set forth in 29 CFR Part 1910.1000, or if not listed therein, the ceiling Recommended Exposure Limit (REL-C) concentrations published by the U.S. National Institute for Occupational Safety and Health (NIOSH), the Threshold Limit Value — Ceiling (TLV-C) concentrations published by the American Conference of Governmental Industrial [Hygenists] Hygienists (ACGIH), the ceiling Workplace Environmental Exposure Level (WEEL-Ceiling) Guides published by the American Industrial Hygiene Association (AIHA), or other approved standard.

**CHEMICAL.** An element, chemical compound or mixture of elements or compounds or both.

**CHEMICAL NAME.** The scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry, the Chemical Abstracts Service rules of nomenclature, or a name that will clearly identify a chemical for the purpose of conducting an evaluation.

**CLOSED CONTAINER.** A container sealed by means of a lid or other device capable of preventing the escape of liquid, vapor or dusts in the ordinary course of storage, handling or use.

**CONTAINER.** For solid and liquid hazardous materials, a vessel of 60 gallons (227 L) or less in capacity used for storage or transportation. For compressed gases, a cylinder, pressure vessel or tank designed for pressures greater than one atmosphere at 68°F (20ºC). Pipes, piping systems, engines and engine fuel tanks associated with solid or liquid hazardous materials or compressed gases, shall not be deemed to be containers if in active use.

**CONTROL AREA.** Spaces within a building [that are enclosed and bounded by exterior walls, fire walls, fire barriers and roofs, or a combination thereof, where] wherein quantities of hazardous materials not exceeding the maximum allowable quantities per control area are stored, handled or used, including any dispensing.

**DEFLAGRATION.** An exothermic reaction, such as the extremely rapid oxidation of a flammable dust or vapor in air, in which the reaction progresses through the unburned material at a rate less than the velocity of sound. A deflagration can have an explosive effect.

**DESIGN PRESSURE.** The maximum gauge pressure that a pressure vessel, device, component or system is designed to withstand safely under the temperature and conditions of use.

**DETACHED BUILDING.** A separate single-story building, without a basement or crawl space, used for the storage, handling or use of hazardous materials and located an approved distance from other buildings or structures.

**DISPENSING.** The pouring or transferring by other means of any material from a container, tank or similar vessel, which would release dusts, fumes, mists, vapors or gases to the atmosphere, unless such release is prevented by a device, equipment or system designed for that purpose.

**EXCESS FLOW CONTROL.** A fail-safe system or other approved device, equipment or system designed to shut off flow caused by a rupture in a pressurized piping system.

**EXHAUSTED ENCLOSURE.** A device, typically consisting of a hood equipped with a fan that serves to capture and exhaust fumes, mist, vapors and gases generated at a workstation or other local environment. An exhausted enclosure does not include a room provided with general ventilation.

**EXPLOSION.** An effect produced by the sudden violent expansion of gases, whether or not accompanied by a shock wave or disruption, of enclosing materials, including the effects of the following sources of explosion:

1. Chemical changes such as rapid oxidation, deflagration or detonation, decomposition of molecules and runaway polymerization (usually detonations).

2. Physical changes such as pressure tank ruptures.

3. Atomic changes (nuclear fission or fusion).

**FLAMMABLE VAPORS OR FUMES.** The concentration of flammable constituents in air that exceeds 25 percent of their lower flammable limit (LFL).

**GAS CABINET.** A fully enclosed, noncombustible enclosure used to provide an isolated environment for compressed gas containers in storage or use, including any doors and access ports for exchanging containers and accessing pressure-regulating controls.

**GAS ROOM.** A separately ventilated, fully enclosed room in which only compressed gases and associated equipment and supplies are stored or used.

**HANDLING.** The movement of a material in its container, the removal of the material from its container, or any other action or process that may affect the material, other than its storage or use.

**HAZARDOUS MATERIALS.** Those chemicals or substances that are physical hazards or health hazards as defined and classified in this chapter, whether the materials are in usable or waste condition.

**HEALTH HAZARD.** A classification of a chemical for which there is statistically significant evidence that acute or chronic health effects are capable of occurring in exposed persons. The term "health hazard" includes chemicals that are toxic, highly toxic and corrosive.

**IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).** The concentration of air-borne contaminants that poses a threat of death, immediate or delayed permanent adverse health effects, or effects that could prevent escape from such an environment, as established by the National Institute of Occupational Safety and Health (NIOSH) based on both toxicity and flammability. It generally is expressed in parts per million by volume (ppm v/v) or milligrams per cubic meter ($mg/m^3$). If adequate data do not exist for precise establishment of IDLH concentrations, an independent certified industrial hygienist, industrial toxicologist, appropriate regulatory agency or other source approved by the commissioner shall make such determination.

**INCOMPATIBLE MATERIALS.** Materials that, if mixed or combined, could explode, generate heat, gases or other byproducts, or react in a way hazardous to life or property.

**LABORATORY CHEMICAL.** A material with a health, flammability and/or instability hazard ranking of 2, 3 or 4 as defined in NFPA 704.

**LABORATORY UNIT.** An enclosed space of a minimum one-hour [fire rated] <u>fire-rated</u> 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.

**LIQUID.** A material having a melting point that is equal to or less than 68°F (20°C) and a boiling point that is greater than 68°F (20°C) at 14.7 psia (101 kPa). When not otherwise identified, the term "liquid" includes both flammable and combustible liquids.

**LOWER EXPLOSIVE LIMIT (LEL).** See "Lower flammable limit."

**LOWER FLAMMABLE LIMIT (LFL).** The minimum concentration of vapor in air at which propagation of flame will occur in the presence of an ignition source. The LFL is sometimes referred to as LEL or lower explosive limit.

**MATERIAL SAFETY DATA SHEET (MSDS).** A document prepared in accordance with the regulations of the United States Department of Labor, as set forth in 29 CFR Part 1910.1200 or a federally approved state OSHA plan which sets forth information concerning a hazardous material.

**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA.** The maximum amount of a hazardous material allowed to be stored or used within [a] an indoor or an outdoor control area [inside a building or structure or an outdoor control area].

**NON-PRODUCTION LABORATORY.** A building or portion thereof wherein chemicals or gases are stored, handled or used on a non-production basis for testing, research, experimental, instructional or educational purposes.

**NORMAL TEMPERATURE AND PRESSURE (NTP).** A temperature of 70°F (21°C) and a pressure of 1 atmosphere (14.7 psia (101 kPa)).

**OUTDOOR CONTROL AREA.** An outdoor area that contains hazardous materials in amounts not exceeding the maximum allowable quantities of FC Table 2703.1.1(3) or 2703.1.1(4).

**PERMISSIBLE EXPOSURE LIMIT (PEL).** The maximum [permitted] allowed 8-hour time-weighted-average concentration of an air-borne contaminant as established by the regulations of the United States Department of Labor, as set forth in 29 CFR Part 1910.1000, the Recommended Exposure Limit (REL) concentrations published by the U.S. National Institute for Occupational Safety and Health (NIOSH), the Threshold Limit Value-Time Weighted Average (TLV-TWA) concentrations published by the American Conference of Governmental Industrial Hygienists (ACGIH), the Workplace Environmental Exposure Level (WEEL) Guides published by the American Industrial Hygiene Association (AIHA), or other approved standard.

**PESTICIDE.** A substance or mixture of substances, including fungicides, but excluding any product defined as a drug in the Federal Food, Drug and Cosmetic Act, intended for the purpose of preventing, repelling or killing pests or pest infestations, or for use as a plant regulator, defoliant or desiccant.

**PRESSURE VESSEL.** A closed vessel designed to operate at pressures above 15 psig (103 kPa).

**SAFETY CAN.** An approved container with a capacity of not more than 5-gallons (19 L) and equipped with a spring-closing lid and spout cover designed to relieve internal pressure when exposed to fire.

**SECONDARY CONTAINMENT.** A device, equipment or system designed to contain liquid or solid, that is external to and separate from the primary containment device, equipment or system.

**SOLID.** A material that has a melting point and decomposes or sublimates at a temperature greater than 68°F (20°C).

**STANDARD CUBIC FEET (SCF).** Cubic feet of gas at normal temperature and pressure (NTP).

**SYSTEM.** An assembly of devices, equipment, containers, appurtenances, pumps, compressors and connecting piping that is designed to perform a complex and/or complete function.

**TANK, ATMOSPHERIC.** A storage tank designed to operate at pressures from atmospheric through 1.0 pound per square inch gauge (760 mm Hg through 812 mm Hg) measured at the top of the tank.

**TANK, PORTABLE.** A container of more than 60-gallon (227 L) capacity, and designed to be loaded into or on or temporarily attached to a transport vehicle, [or] marine vessel, or watercraft and equipped with skids, mountings or accessories to facilitate handling of the tank by mechanical means. It does not include any cargo tank or tank car.

**TANK, STATIONARY.** A container having not less than 1,000-pound (454 kg) water capacity, designed primarily for stationary installations, and not intended to be moved in the course of normal use.

**VAPOR PRESSURE.** The pressure exerted by a volatile fluid, as determined in accordance with ASTM D 323.

## SECTION FC 2703
## GENERAL REQUIREMENTS

**2703.1 General.** Hazardous materials shall be manufactured, stored, handled, used and transported in accordance with this chapter.

**2703.1.1 Maximum allowable quantity per control area.** The maximum allowable quantity per control area shall be as specified in FC Tables 2703.1.1(1) through 2703.1.1(4), and for retail and wholesale storage and display in Group M occupancies, and Group S storage, as specified in [Section 2703.11] FC2703.11.

**Exceptions:** The maximum allowable quantity per control area requirements set forth in FC Tables 2703.1.1(1) through 2703.1.1(4) shall not apply to:

1. A construction site in an unoccupied building prior to issuance of a certificate of occupancy or temporary certificate of occupancy for such building. Maximum allowable quantity per control area requirements shall apply to a construction site in an occupied or partially occupied building, except as may be otherwise authorized by the department in writing.

2. Liquid or gaseous fuel in fuel tanks on motor vehicles.

3. Gaseous fuels in piping systems and fixed appliances regulated by the Fuel Gas Code.

4. Liquid fuels in piping systems and fixed appliances regulated by the Mechanical Code.

**2703.1.2 Conversion.** A conversion factor of 10 pounds per gallon (1.2 kg/L) shall be used to ascertain the weight per gallon of liquid when such weight is not provided or otherwise available to the commissioner.

**2703.1.3 Quantities not exceeding the maximum allowable quantity per control area.** The storage, handling and use of hazardous materials in quantities not exceeding the maximum allowable quantity per control area indicated in FC Tables 2703.1.1(1) through 2703.1.1(4) shall be in accordance with [Sections] FC 2701 and 2703.

**2703.1.4 Quantities exceeding the maximum allowable quantity per control area.** The storage, handling and use of hazardous materials in quantities exceeding the maximum allowable quantity per control area indicated in FC Tables 2703.1.1(1) through 2703.1.1(4) shall be in accordance with this chapter.

**2703.1.5 Additional specific requirements.** The storage, handling and use of hazardous materials shall additionally comply with the specific requirements of FC Chapters 28 through 44, as applicable.

**FC TABLE 2703.1.1(1)**
**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, q]**

| MATERIAL | CLASS | GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED[q] | STORAGE[b] | | | USE-CLOSED SYSTEMS[b] | | | USE-OPEN SYSTEMS[b] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Solid Pounds (cubic feet) | Liquid Gallons (pounds) | Gas SCF | Solid Pounds (cubic feet) | Liquid gallons (pounds) | Gas [[cubic feet at NTP]] SCF | Solid Pounds (cubic feet) | Liquid gallons (pounds) |
| Combustible Liquid[c, i, r] | II<br>IIIA<br>IIIB | H-2 or H-3<br>H-2 or H-3<br>Not Applicable | Not Applicable | 120[d, e]<br>330[d, e]<br>13,200[e, f] | Not Applicable | Not Applicable | 120[d]<br>330[d]<br>13,200[f] | Not Applicable | Not Applicable | 30[d]<br>80[d]<br>3,300[f] |
| Combustible fiber | Loose<br>Baled[s] | H-3 | (100)<br>(1,000) | Not Applicable | Not Applicable | (100)<br>(1,000) | Not Applicable | Not Applicable | (20)<br>(200) | Not Applicable |
| Cryogenics Flammable | Not Applicable | H-2 | Not Applicable | 45[d] | Not Applicable | Not Applicable | 45[d] | Not Applicable | Not Applicable | 10[d] |
| Cryogenics Oxidizing | Not Applicable | H-3 | Not Applicable | 45[d] | Not Applicable | Not Applicable | 45[d] | Not Applicable | Not Applicable | 10[d] |
| Explosives | Division 1.1<br>Division 1.2<br>Division 1.3<br>Division 1.4<br>Division 1.4G<br>Division 1.5<br>Division 1.6 | H-1<br>H-1<br>H-1 or H-2<br>H-3<br>H-3<br>H-1<br>H-1 | 1[e, g]<br>1[e, g]<br>5[e, g]<br>50[e, g]<br>125[d, e, l]<br>1[e, g]<br>1[d, e, g] | (1)[e, g]<br>(1)[e, g]<br>(5)[e, g]<br>(50)[e, g]<br>Not Applicable<br>(1)[e, g]<br>Not Applicable | Not Applicable | 0.25[g]<br>0.25[g]<br>1[g]<br>50[g]<br>Not Applicable<br>0.25[g]<br>Not Applicable | (0.25)[g]<br>(0.25)[g]<br>(1)[g]<br>(50)[g]<br>Not Applicable<br>(0.25)[g]<br>Not Applicable | Not Applicable | 0.25[g]<br>0.25[g]<br>1[g]<br>Not Applicable<br>Not Applicable<br>0.25[g]<br>Not Applicable | (0.25)[g]<br>(0.25)[g]<br>(1)[g]<br>Not Applicable<br>Not Applicable<br>(0.25)[g]<br>Not Applicable |
| Flammable gas | Gaseous<br>Liquefied | H-2 | Not Applicable | Not Applicable<br>[30] (150)[d, e] | 1,000[d, e]<br>Not Applicable | Not Applicable | Not Applicable<br>[30] (150)[d, e] | 1,000[d, e]<br>Not Applicable | Not Applicable | Not Applicable |
| Flammable liquids[c, k] | IA[o]<br><br>IB and IC | H-2<br>or<br>H-3 | Not Applicable | 30[d, e]<br><br>120[d, e] | Not Applicable | Not Applicable | 30[d]<br><br>120[d] | Not Applicable | Not Applicable | 10[d]<br><br>30[d] |
| Combination Flammable liquid (IA[o], IB, IC) | Not Applicable | H-2<br>or<br>H-3 | Not Applicable | 120[d, e, h] | Not Applicable | Not Applicable | 120[d, h] | Not Applicable | Not Applicable | 30[d, h] |
| Flammable solid<br>Pigs, ingots, billets, heavy castings<br>Light castings, light metallic products<br>Scraps, shavings, powders, dusts<br>All others | Not Applicable | H-3 | 1,000[d, e]<br>125[d, e]<br>1[d, e]<br>125[d, e] | Not Applicable | Not Applicable | 1,000[d]<br>125[d]<br>1[d]<br>125[d] | Not Applicable | Not Applicable | 1,000[d]<br>[125] 25[d]<br>1[d]<br>25[d] | Not Applicable |
| Inert Gas<br><br>Cryogenic Inert | Gaseous<br>Liquefied<br>Not Applicable | Not Applicable<br>Not Applicable<br>Not Applicable | Not Applicable<br>Not Applicable<br>Not Applicable | Not Applicable<br>Not Applicable<br>Not Applicable | Not Limited<br>Not Limited<br>Not Limited | Not Applicable<br>Not Applicable<br>Not Applicable | Not Applicable<br>Not Applicable<br>Not Applicable | Not Limited<br>Not Limited<br>Not Limited | Not Applicable<br>Not Applicable<br>Not Applicable | Not Applicable<br>Not Applicable<br>Not Applicable |
| Organic peroxide[p] | Unclassified Detonable<br>I<br>II<br>III<br>IV<br>V | H-1<br>H-2<br>H-3<br>H-3<br>Not Applicable<br>Not Applicable | 1[e, g]<br>5[d, e]<br>50[d, e]<br>125[d, e]<br>Not Limited<br>Not Limited | (1)[e, g]<br>(5)[d, e]<br>(50)[d, e]<br>(125)[d, e]<br>Not Limited<br>Not Limited | Not Applicable | 0.25[g]<br>1[d]<br>50[d]<br>125[d]<br>Not Limited<br>Not Limited | (0.25)[g]<br>(1)[d]<br>(50)[d]<br>(125)[d]<br>Not Limited<br>Not Limited | Not Applicable | 0.25[g]<br>1[d]<br>10[d]<br>25[d]<br>Not Limited<br>Not Limited | (0.25)[g]<br>(1)[d]<br>(10)[d]<br>(25)[d]<br>Not Limited<br>Not Limited |
| Oxidizer | 4<br>3[k]<br>2<br>1 | H-1<br>H-2<br>H-3<br>H-3 | 1[g]<br>10[d, e]<br>250[d, e]<br>4,000[e,f] | (1)[e, g]<br>(10)[d, e]<br>(250)[d, e]<br>(4,000)[e,f] | Not Applicable | 0.25[g]<br>2[d]<br>250[d]<br>4,000[f] | (0.25)[g]<br>(2)[d]<br>(250)[d]<br>(4,000)[f] | Not Applicable | 0.25[g]<br>2[d]<br>50[d]<br>1,000[f] | (0.25)[g]<br>(2)[d]<br>(50)[d]<br>(1,000)[f] |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Oxidizing gas | Gaseous<br>Liquefied | H-3 | Not Applicable | Not Applicable<br>[15] (150)[d, e] | 1,500[d, e]<br>Not Applicable | Not Applicable | Not Applicable<br>[15] (150)[d, e] | 1,500[d, e]<br>Not Applicable | Not Applicable | Not Applicable |
| Pyrophoric material[p] detonable | Not Applicable | H-1 | 1[e, g] | (1)[e, g] | 10[e, g] | 0.25[g] | (0.25)[g] | 2[e, g] | 0 | 0 |
| Pyrophoric material nondetonable | Not Applicable | H-2 | 4[e, g] | (4)[e, g] | 50[e, g] | 1[g] | (1)[g] | 10[e, g] | 0 | 0 |
| Unstable (reactive)[p] detonable | 4<br>3 | H-1<br>H-1 | 1[e, g]<br>1[e, g] | (1)[e, g]<br>(1)[e, g] | 10[e, g]<br>10[e, g] | 0.25[g]<br>0.25[g] | (0.25)[g]<br>(0.25)[g] | 2[e, g]<br>2[e, g] | 0.25[g]<br>0.25[g] | (0.25)[g]<br>(0.25)[g] |
| Unstable (reactive) nondetonable | 4<br>3<br>2<br>1 | H-1<br>H-1 or H-2<br>H-3<br>Not Applicable | 1[e, g]<br>5[d, e]<br>50[d, e]<br>Not Limited | (1)[e, g]<br>(5)[d, e]<br>(50)[d, e]<br>Not Limited | 10[e, g]<br>50[d, e]<br>250[d, e]<br>750[d, e] | 0.25[g]<br>1[d]<br>50[d]<br>Not Limited | (0.25)[g]<br>(1)[d]<br>(50)[d]<br>Not Limited | 2[e, g]<br>10[d, e]<br>250[d, e]<br>Not Limited | 0.25[g]<br>1[d]<br>10[d]<br>Not Limited | (0.25)[g]<br>(1)[d]<br>(10)[d]<br>Not Limited |
| Water-reactive detonable[p] | 3<br>2 | H-1<br>H-1 | 1[e, g]<br>1[e, g] | (1)[e, g]<br>(1)[e, g] | Not Applicable | 0.25[g]<br>0.25[g] | (0.25)[g]<br>(0.25)[g] | Not Applicable | 0.25[g]<br>0.25[g] | (0.25)[g]<br>(0.25)[g] |
| Water-reactive nondetonable | 3<br>2<br>1 | H-2<br>H-3<br>Not Applicable | 5[d, e]<br>50[d, e]<br>Not Limited | (5)[d, e]<br>(50)[d, e]<br>Not Limited | Not Applicable | 5[d]<br>50[d]<br>Not Limited | (5)[d]<br>(50)[d]<br>Not Limited | Not Applicable | 1[d]<br>10[d]<br>Not Limited | (1)[d]<br>(10)[d]<br>Not Limited |

For SI: 1 cubic foot = 0.023 $m^3$, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

a. For use of control areas, see [Section 2703.8.3] FC2703.8.3.

b. The aggregate quantity in storage, handling and use shall not exceed the quantity listed for storage.

c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs, consumer or industrial products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities, except for liquefied petroleum gas and flammable liquid motor fuel, may be increased 100 percent in buildings protected throughout by a sprinkler system. Where Note e applies, the quantities may be increased as set forth in both notes.

e. Maximum allowable quantities, except for liquefied petroleum gas and flammable liquid motor fuel, may be increased 100 percent when stored in approved storage cabinets, gas cabinets, exhausted enclosures or listed safety cans. Listed safety cans shall be in accordance with FC2703.9.10. Where Note d applies, the quantities may be increased as set forth in both notes.

f. Quantities shall not be limited in a building protected throughout by a sprinkler system.

g. Allowed only in buildings protected throughout by a sprinkler system.

h. Containing not more than the maximum allowable quantity per control area of Class IA, Class IB or Class IC flammable liquids.

i. Stationary fuel oil storage tanks shall comply with the requirements of the construction codes, including the Mechanical Code.

j. Quantities shown in the table in parentheses have the units shown in parentheses at the head of the column.

k. A maximum quantity of 200 pounds of solid or 20 gallons of liquid Class 3 oxidizers is allowed when such materials are necessary for maintenance and operation of equipment when the storage containers and the manner of storage are approved.

l. Reserved.

m. For gallons of liquids, divide the amount in pounds by 10 in accordance with [Section 2703.1.2] FC2703.1.2.

n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with the requirements of [Section 2703.11] FC2703.11, see FC Table 2703.11.1.

o. For purposes of this table, gasoline and other flammable liquid motor fuels are classified as a Class IA flammable liquid.

p. Unclassified detonable organic peroxides (see FC Chapter 39), detonable pyrophoric materials (see FC Chapter 41), detonable unstable (reactive) materials (see FC Chapter 43) and detonable water-reactive materials (see FC Chapter 44) shall be treated as explosives for purposes of storage, handling and use (see FC Chapter 33).

q. The maximum allowable quantities shall be limited by [Section 2706] FC2706 for non-production laboratories classified as Occupancy Group B.

r. For storage of flammable and combustible liquids in Group M occupancy, see FC Chapter 34.

s. Densely-packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.

**FC TABLE 2703.1.1(2)**
**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIAL POSING A HEALTH HAZARD[a,b,c,i,j[,k]]**

| MATERIAL | STORAGE[d] | | | USE-CLOSED SYSTEMS[d] | | | USE-OPEN SYSTEMS[d] | |
|---|---|---|---|---|---|---|---|---|
| | Solid Pounds[e, f] | Liquid Gallons (pounds)[e, f] | Gas SCF (pounds)[e] | Solid pounds[e] | Liquid gallons (pounds)[e] | Gas SCF (pounds)[e] | Solid pounds[e] | Liquid gallons (pounds)[e] |
| Corrosive | 5,000 | 500 | Gaseous 810[f, g]<br>Liquefied (150)[f, h] | 5,000 | 500 | Gaseous 810[f, g]<br>Liquefied (150)[f, h] | 1,000 | 100 |
| Highly toxic | 10 | (10)[[i] h] | Gaseous 20[[h] g] | 10 | (10)[[i] h] | Gaseous 20[[h] g] | 3 | (3)[[i] h] |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Liquefied (4)[g, h] | | | Liquefied (4)[g, h] | | |
| Toxic | 500 | (500)[I] h | Gaseous 810[f]<br>Liquefied (150)[f, h] | 500 | (500)[i] h | Gaseous 810[f]<br>Liquefied (150)[f, h] | 125 | (125)[i] h |

For SI: 1 cubic foot = 0.028 $m^3$, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

a. For use of control areas, see [Section 2703.8.3] FC2703.8.3.

b. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs consumer or industrial products, and cosmetics, containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

c. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with the requirements of [Section 2703.11] FC2703.11, see FC Table 2703.11.1.

d. The aggregate quantity in storage, handling and use shall not exceed the quantity listed for storage.

e. Maximum allowable quantities may be increased 100 percent in buildings protected throughout by a sprinkler system. Where Note f applies, the quantities increased shall be as set forth in both notes.

f. Maximum allowable quantities may be increased 100 percent when stored in approved storage cabinets, gas cabinets, or exhausted enclosures. Where Note e applies, the quantities increased shall be as set forth in both notes.

[g. A single container of anhydrous ammonia containing not more than 150 pounds in a single control area in a building not protected throughout by a sprinkler system shall be considered a maximum allowable quantity. Two containers of anhydrous ammonia, each containing not more than 150 pounds in a single control area shall be considered a maximum allowable quantity provided the building is protected throughout by a sprinkler system.]

[h] g. Allowed only when stored in approved exhausted gas cabinets or exhausted enclosures.

[i] h. Quantities shown in the table in parentheses have the units shown in parentheses at the head of the column.

[j] i. For gallons of liquids, divide the amount in pounds by 10 in accordance with [Section 2703.1.2] FC2703.1.2.

[k] j. The maximum allowable quantities shall be limited by [Section 2706] FC2706 for non-production laboratories classified as [occupancy group] Occupancy Group B.

**FC TABLE 2703.1.1(3)**
**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD IN AN OUTDOOR CONTROL AREA[a, b, f]**

| MATERIAL | CLASS | STORAGE[b] | | | USE-CLOSED SYSTEMS[b] | | | USE-OPEN SYSTEMS[b] | |
|---|---|---|---|---|---|---|---|---|---|
| | | Solid Pounds | Liquid gallons (pounds) | Gas SCF | Solid Pounds | Liquid gallons (pounds) | Gas SCF | Solid Pounds | Liquid gallons (pounds) |
| Flammable gas | Gaseous<br>Liquefied | Not Applicable | Not Applicable<br>[15] (150) | 1000<br>Not Applicable | Not Applicable | Not Applicable<br>[15] (150) | 1000<br>Not Applicable | Not Applicable | Not Applicable |
| Flammable solid | Not Applicable | 125 | Not Applicable | Not Applicable | 25 | Not Applicable | Not Applicable | 25 | Not Applicable |
| Inert Gas<br>Cryogenic Inert | Gaseous<br>Liquefied<br>Not Applicable | Not Applicable<br>Not Applicable<br>Not Applicable | Not Applicable<br>Not Applicable<br>Not Applicable | Not Limited<br>Not Limited<br>Not Limited | Not Applicable<br>Not Applicable<br>Not Applicable | Not Applicable<br>Not Applicable<br>Not Applicable | Not Limited<br>Not Limited<br>Not Limited | Not Applicable<br>Not Applicable<br>Not Applicable | Not Applicable<br>Not Applicable<br>Not Applicable |
| Organic peroxide[e] | Unclassified Detonable | 1 | (1) | Not Applicable | 0.25 | (0.25)[d] | Not Applicable | 0.25 | (0.25)[d] |
| Organic peroxide[e] | I<br>II<br>III<br>IV<br>V | 5<br>50<br>125<br>500<br>Not Limited | (5)[d]<br>(50)[d]<br>(125)[d]<br>(500)[d]<br>Not Limited | Not Applicable | 1<br>50<br>125<br>500<br>Not Limited | (1)[d]<br>(50)[d]<br>(125)[d]<br>(500)[d]<br>Not Limited | Not Applicable | 1<br>10<br>25<br>100<br>Not Limited | (1)[d]<br>(10)[d]<br>(25)[d]<br>(100)[d]<br>Not Limited |
| Oxidizer[c] | 4<br>3<br>2<br>1 | 1<br>10<br>250<br>4,000 | (1)[d]<br>(10)[d]<br>(250)[d]<br>(4,000) | Not Applicable | 1/4<br>2<br>250<br>4,000 | (1/4)[d]<br>(2)[d]<br>(250)[d]<br>(4,000) | Not Applicable | 0.25<br>2<br>50<br>1,000 | (0.25)[d]<br>(2)[d]<br>(50)[d]<br>(1,000) |
| Oxidizing gas | Gaseous<br>Liquefied | Not Applicable | Not Applicable<br>15 | 1,500<br>Not Applicable | Not Applicable | Not Applicable<br>15 | 1,500<br>Not Applicable | Not Applicable | Not Applicable |
| Pyrophoric material[e] detonable | Not Applicable | 1 | (1)[d] | 10 | 0.25 | (0.25)[d] | 2 | 0.25 | (0.25) |
| Pyrophoric | Not | 4 | (4)[d] | 50 | 1 | (1)[d] | 10 | 0 | 0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| material[e]<br>nondetonable | Applicable | | | | | | | | |
| Unstable (reactive)[e]<br>detonable | 4<br>3 | 1<br>1 | (1)[d]<br>(1)[d] | 10<br>10 | 0.25<br>0.25 | (0.25)[d]<br>(0.25)[d] | 2<br>2 | 0.25<br>0.25 | (0.25)[d]<br>(0.25)[d] |
| Unstable (reactive)[c]<br>nondetonable | 4<br>3<br>2<br>1 | 1<br>5<br>50<br>Not Limited | (1)[d]<br>(5)[d]<br>(50)[d]<br>Not Limited | 10<br>50<br>250<br>750 | 0.25<br>1<br>50<br>Not Limited | (0.25)[d]<br>(1)[d]<br>(50)[d]<br>Not Limited | 2<br>10<br>250<br>Not Limited | 0.25<br>1<br>10<br>Not Limited | (0.25)[d]<br>(1)[d]<br>(10)[d]<br>Not Limited |
| Water-reactive[e]<br>detonable | 3<br>2 | 1<br>1 | (1)[d]<br>(1)[d] | [10<br>10] Not applicable | 0.25<br>0.25 | (0.25)[d]<br>(0.25)[d] | 2<br>2 | 0.25<br>0.25 | (0.25)[d]<br>(0.25)[d] |
| Water-reactive[c]<br>nondetonable | 3<br>2<br>1 | 5<br>50<br>Not Limited | (5)[d]<br>(50)[d]<br>Not Limited | [50<br>250<br>750] Not applicable | 5<br>50<br>Not Limited | (5)[d]<br>(50)[d]<br>Not Limited | 10<br>250<br>Not Limited | 1<br>10<br>Not Limited | (1)[d]<br>(10)[d]<br>Not Limited |

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 $m^3$.

a. For gallons of liquids, divide the amount in pounds by 10 in accordance with [Section 2703.1.2] FC2703.1.2.

b. The aggregate quantities in storage and use shall not exceed the quantity listed for storage.

c. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed in outdoor storage per single property under the same ownership or control used for retail or wholesale sales is allowed to exceed the maximum allowable quantity per control area when such storage is in accordance with [Section 2703.11] FC2703.11.

d. Quantities shown in the table in parentheses have the units shown in parentheses at the head of the column.

e. Unclassified detonable organic peroxides (see FC Chapter 39), detonable pyrophoric materials (see FC Chapter 41), detonable unstable (reactive) materials (see FC Chapter 43) and detonable water-reactive materials (see FC Chapter 44) shall be treated as explosives for purposes of storage (see FC Chapter 33).

f. In addition to these requirements, the outdoor storage and use of hazardous materials shall comply with applicable requirements of the Zoning Resolution.

**FC TABLE 2703.1.1(4)**
**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A HEALTH HAZARD IN AN OUTDOOR CONTROL AREA[a,b,c,[h]f,g]**

| MATERIAL | STORAGE | | | USE-CLOSED SYSTEMS | | | USE-OPEN SYSTEMS | |
|---|---|---|---|---|---|---|---|---|
| | Solid pounds | Liquid Gallons (pounds) | Gas [cubic feet at NTP] SCF (pounds) | Solid Pounds | Liquid Gallons (pounds) | Gas [cubic feet at NTP] SCF (pounds) | Solid pounds | Liquid gallons (pounds) |
| Corrosives | 5,000 | 500 | Gaseous 810[g]<br>Liquefied (150)[f] | 5,000 | 500 | Gaseous 810[g]<br>Liquefied (150)[f] | 1,000 | 100 |
| Highly toxics | 10 | (10)[f] | Gaseous 20[d]<br>Liquefied (4)[f] | 10 | (10)[f] | Gaseous 20[d]<br>Liquefied (4)[f] | 3 | (3)[f] |
| Toxics | 500 | (500)[e, f] | Gaseous 810<br>Liquefied (150)[f] | 500 | 50[e] | Gaseous 810<br>Liquefied (150)[f] | 25 | (25)[e, f] |

For SI: 1 cubic foot = 0.02832 $m^3$, 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 pound per square inch absolute = 6.895 kPa, °C = [[(°F)-32/1.8]] (°F-32)/1.8.

a. For gallons of liquids, divide the amount in pounds by 10 in accordance with [Section 2703.1.2] FC2703.1.2.

b. The aggregate quantities in storage and use shall not exceed the quantity listed for storage.

c. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed in outdoor storage on a single property under the same ownership or control used for retail or wholesale sales is allowed to exceed the maximum allowable quantity per control area when such storage is in accordance with [Section 2703.11] FC2703.11.

d. Allowed only when used in approved exhausted gas cabinets, exhausted enclosures or under fume hoods.

e. The maximum allowable quantity per control area for toxic liquids with vapor pressures in excess of 1 psia at 77°F shall be the maximum allowable quantity per control area listed for highly toxic liquids.

f. Quantities shown in the table in parentheses have the units shown in parentheses at the head of the column.

[g. Two containers of anhydrous ammonia, each container containing not more than 150 pounds, shall be considered a maximum allowable quantity in an outdoor control area.]

[h] g. In addition to these requirements, the outdoor storage and use of hazardous materials shall comply with the applicable requirements of the Zoning Resolution.

**2703.2 Devices, equipment, systems and processes.** Devices, equipment, systems and processes utilized for storage, handling and use of hazardous materials shall be in accordance with [Sections] FC 2703.2.1 through 2703.2.8 and the regulations of the New York State Department of Environmental Conservation as set forth in 6 NYCRR Parts 596, 598, 599, 612, 613 and 614.

**2703.2.1 Design and construction of containers and tanks.** Containers and tanks shall be designed and constructed in accordance with approved standards. Containers, tanks and other means used for containment of hazardous materials shall be of an approved type.

**2703.2.2 Piping, tubing, valves and fittings.** Piping, tubing, valves and fittings conveying hazardous materials, except piping for inlet connections to prevent backflow or piping for pressure relief devices, shall be designed and installed in accordance with approved standards and [Sections] FC 2703.2.2.1 and 2703.2.2.2.

**2703.2.2.1 Design and construction.** Piping, tubing, valves, fittings and ancillary equipment used for hazardous materials shall be in accordance with the following:

1. Piping, tubing, valves, fittings and ancillary equipment shall be designed and fabricated from materials compatible with the material to be contained and shall be of adequate strength and durability to withstand the pressure, structural and seismic stress, and exposure to which they are subjected.

2. Piping and tubing shall be identified in accordance with [ANSI] ASME A13.1 to indicate the material conveyed.

3. Readily accessible manual valves, or automatic remotely-activated fail-safe emergency shutoff valves, shall be installed on supply piping and tubing at the point of use and at the tank, container or other source of supply.

4. Emergency shutoff valves shall be clearly visible and readily accessible. A durable sign shall be conspicuously posted immediately adjacent to such valves that identifies their location.

5. Backflow prevention or check valves shall be provided when the backflow of hazardous materials could create a hazardous condition or cause the unauthorized discharge of hazardous materials.

6. Where gases or liquids having a hazard ranking of health hazard Class 3 or 4, flammability Class 4, or [reactivity] instability Class 3 or 4 in accordance with NFPA 704 are conveyed in pressurized piping above 15 pounds per square inch gauge (psig) (103 kPa), an approved means of leak detection and emergency shutoff or excess flow control shall be provided. Where the piping originates from within a hazardous material storage room or area, the excess flow control shall be located within the storage room or area. Where the piping originates from any other source of supply, the excess flow control shall be located as close to the source of supply as practical.

**Exceptions:**

1. Piping for inlet connections designed to prevent backflow.

2. Piping for pressure relief devices.

**2703.2.2.2 Additional regulations for supply piping for health-hazard materials.** Supply piping and tubing for gases and liquids having a health-hazard ranking of 3 or 4 in accordance with NFPA704 shall be in accordance with [ANSI] ASME B31.3 and the following:

1. Piping and tubing utilized for the transmission of highly toxic, toxic or highly volatile corrosive liquids and gases shall have welded, threaded or flanged connections throughout, except where connections are located within a ventilated enclosure if the material is a gas, or an approved method of drainage or containment is provided for connections if the material is a liquid.

2. Piping and tubing shall not be located within corridors, within any portion of a means of egress required to be enclosed in fire-resistance-rated construction or in concealed spaces in areas not classified as Group H occupancies.

   **Exception:** Piping and tubing within the space defined by the walls of corridors and the floor or roof above or in concealed spaces above other occupancies when installed in accordance with Section 415.9.6.3 of the Building Code for Group H-5 occupancies.

**2703.2.3 Devices, equipment and systems.** Devices, equipment and systems, including required detection and alarm systems, installed or used in conjunction with the storage, handling and use of hazardous materials shall be listed or approved.

**2703.2.4 Installation of tanks.** Installation of tanks shall be in accordance with [Sections] FC 2703.2.4.1 through 2703.2.4.2.1 and with the regulations of the New York State Department of Environmental Conservation as set forth in 6 NYCRR Sections 599.6, 614.7 and 614.13.

**2703.2.4.1 Underground tanks.** Underground tanks used for the storage of liquid hazardous materials shall be provided with secondary containment.

**2703.2.4.2 Aboveground tanks.** Aboveground stationary tanks used for the storage of liquid hazardous materials shall be located and protected in compliance with the requirements for outdoor storage of the particular material involved.

**2703.2.4.2.1 Marking.** Aboveground stationary tanks shall be marked as required by [Section 2703.5] FC2703.5.

**2703.2.5 Empty containers and tanks.** Empty containers and tanks previously used for the storage of hazardous materials shall be free from residual material and vapor in compliance with the requirements of DOTn, the Resource Conservation and Recovery Act (RCRA) or

other governmental agencies having jurisdiction, or shall be stored, handled and used in compliance with the requirements of this code.

**2703.2.6 Maintenance.** In addition to the requirements of [Section 2703.2.3] FC2703.2.3, all devices, equipment and systems used in conjunction with hazardous materials, including tanks, and detection and alarm systems, shall be maintained in good working order. Defective devices, equipment and systems shall be removed from service and repaired or replaced, or disposed of lawfully.

**2703.2.6.1 Tanks out of service for 30 days.** Stationary tanks not used for a period of 30 calendar days or more shall be properly safeguarded or removed in an approved manner. Such tanks shall have the fill line, gauge opening and pump connection secured against tampering. Vent lines shall be properly maintained. Stationary tanks containing flammable and combustible liquid out of service for a period of 30 calendar days or more shall additionally comply with the requirements of [Section 3404.2.13] FC3404.2.13.

**2703.2.6.1.1 Return to service.** Tanks that are returned to service shall be tested in an approved manner prior to use.

**2703.2.7 Liquid-level limit control.** Atmospheric tanks that contain hazardous material liquids shall be equipped with a liquid-level limit control or other approved means to prevent overfilling of the tank.

**Exception:** Tanks with a capacity not exceeding 500 gallons (1893 L) that are filled from a source other than a cargo tank or tank car.

**2703.2.8 Seismic protection.** Machinery and equipment utilizing hazardous materials shall be braced and anchored in accordance with the seismic design requirements of the Building Code for the seismic design category in which the machinery or equipment is classified.

**2703.2.9 Testing.** The following devices, equipment and systems shall be tested at the time of installation and not less than annually thereafter, provided that testing shall be conducted at least as often as is recommended by the manufacturer of such device, equipment or system:

1. Gas detection systems, alarms and automatic emergency shutoff valves required by FC3704.2.2.10 for highly toxic and toxic gases.

2. Limit control systems for liquid level, temperature and pressure required by FC 2703.2.7, 2704.8 and 2705.1.4.

3. Emergency alarm systems required by FC 2704.9 and 2705.4.4.

4. Monitoring and supervisory systems required by FC 2704.10 and 2705.1.6.

5. Manually activated shutdown controls required by FC4103.1.1.1 for compressed gas systems conveying pyrophoric gases.

**2703.3 Release and disposal of hazardous materials.** It shall be unlawful to release or dispose of any amount of hazardous material, including pesticides and fertilizers used for domestic, agricultural or horticultural purposes, into a sewer, storm drain, ditch, drainage canal, creek, stream, river, lake or tidal waterway or on the ground, sidewalk, street, highway or into the atmosphere, except when allowed by federal, state or local regulations or permits, including the regulations of the New York State Department of Environmental Conservation, as set forth in 6 NYCRR Parts 595 and 611.

**2703.3.1 Reporting of discharges.** When hazardous materials are released in quantities reportable under federal, state or local regulations, the commissioner shall be notified and the following procedures required in accordance with [Sections] FC 2703.3.1.1 through 2703.3.1.4.

**2703.3.1.1 Records.** Accurate records shall be kept of the discharge of hazardous materials.

**2703.3.1.2 Preparation.** Provisions shall be made for controlling and mitigating accidental discharges.

**2703.3.1.3 Control.** When a discharge is caused by a container failure, the container shall be repaired or removed from service.

**2703.3.1.4 Responsibility for cleanup.** The owner of a facility or other person responsible for an accidental discharge shall undertake all actions necessary to remediate such discharge. When deemed necessary by the commissioner, cleanup may be initiated by the department or other city agency. Costs associated with such cleanup shall be borne by the owner or other person responsible for the discharge. The department shall give such owner or other person written notice of such costs and an opportunity to be heard. Payment of such costs shall be recoverable in any manner authorized by law, rule or regulation. Failure to pay such costs shall cause a lien to be placed upon the premises pursuant to the provisions of [Section 117.4 of this code] FC117.4, as applicable, or against vehicles or other personal property in accordance with the provisions applicable thereto. Nothing in this section shall be construed to preclude the implementation of response measures, or the recovery of the costs of such measures, by any other city agency, either prior or subsequent to any response measure implemented pursuant to this section.

**2703.4 Material [Safety Data Sheets] safety data sheets.** [Material Safety Data Sheets (MSDS) shall be readily available on the premises for hazardous materials regulated by this chapter.] A material safety data sheet (MSDS) for each hazardous material stored, handled or used on a premises shall be maintained on such premises at a location where the MSDS is readily available for reference by persons handling or using such hazardous materials or supervising such storage, handling or use, and by any department representative.

**2703.5 Hazard identification signs.** Unless otherwise exempted by the commissioner, hazard identification signs as set forth in NFPA 704 for the specific material contained shall be conspicuously affixed on stationary containers and aboveground tanks and at entrances to locations where hazardous materials are stored, handled or used, including dispensing, in

quantities requiring a permit, including locations where such materials are dispensed, and at such other locations as may be designated by the commissioner.

**2703.5.1 Markings.** Individual containers, cartons or packages shall be conspicuously marked or labeled in an approved manner. Signs reading "COMPRESSED GAS" shall be conspicuously posted at the entrance to rooms or on cabinets containing compressed gases.

**2703.6 Signs.** Signs and markings required by [Sections] FC 2703.5 and 2703.5.1 shall not be obscured or removed, shall be in English as a primary language or in symbols allowed by this code, shall be durable, and the size, color and lettering shall be acceptable to the commissioner.

**2703.7 Sources of ignition.** Sources of ignition shall comply with the requirements of [Sections] FC 2703.7.1 through 2703.7.3.

**2703.7.1 Smoking.** It shall be unlawful to smoke in the following locations, and "No Smoking" signs [shall be provided in English as a primary language and in symbols complying] in compliance with the requirements of [Section 310] FC310 shall be conspicuously posted:

1. In rooms or areas where hazardous materials are stored or used in open systems in amounts requiring a permit.

2. Within 25 feet (7620 mm) of outdoor hazardous material storage, handling and use areas, including dispensing areas.

[3. Facilities or areas within facilities in which smoking has been entirely prohibited shall have "No Smoking" signs conspicuously placed at all entrances to the facility or area. Facilities or areas within facilities in which smoking is permitted in designated areas shall have signs indicating that smoking is permitted in designated areas only.]

[4] 3. In rooms or areas where flammable or combustible hazardous materials are stored, handled or used.

**2703.7.2 Open flames.** Open flames and devices that generate or operate at a high temperature shall be kept a safe distance from hazardous material in storage or use.

**2703.7.3 Industrial trucks.** Powered industrial trucks used in areas designated as hazardous (classified) locations in accordance with the Electrical Code shall be listed and labeled in accordance with NFPA 505.

**2703.8 Construction requirements.** Buildings, structures, control areas, enclosures and cabinets for hazardous materials shall be designed and constructed in accordance with [Sections] FC 2703.8.1 through 2703.8.6.2.

**2703.8.1 Buildings.** Buildings, structures, or portions thereof, in which hazardous materials are stored, handled or used shall be constructed in accordance with the construction codes, including the Building Code.

**2703.8.2 Required detached buildings.** Group H occupancies containing quantities of hazardous materials in excess of those set forth in FC Table 2703.8.2 shall be in detached buildings.

**FC TABLE 2703.8.2**
**REQUIRED DETACHED STORAGE**

| DETACHED STORAGE IS REQUIRED WHEN THE QUANTITY OF MATERIAL EXCEEDS THAT LISTED HEREIN | | | |
|---|---|---|---|
| **Material** | **Class** | **Solids and liquids (tons)[a, b]** | **Gases (SCF)[a, b]** |
| Explosives[a] | Division 1.1<br>Division 1.2<br>Division 1.3<br>Division 1.4<br>Division 1.4[c]<br>Division 1.5<br>Division 1.6 | Maximum Allowable Quantity<br>Maximum Allowable Quantity<br>Maximum Allowable Quantity<br>Maximum Allowable Quantity<br>1<br>Maximum Allowable Quantity<br>Maximum Allowable Quantity | Not Applicable |
| Oxidizers | Class 4 | Maximum Allowable Quantity | Maximum Allowable Quantity |
| Unstable (reactives) detonable | Class 3 or 4 | Maximum Allowable Quantity | Maximum Allowable Quantity |
| Water-reactives detonable | Class 2 or 3 | Maximum Allowable Quantity | [Maximum Allowable Quantity] Not Applicable |
| Oxidizer, liquids and solids | Class 3<br>Class 2 | 1,200<br>2,000 | Not Applicable |
| Organic peroxides | Unclassified Detonable<br>Class I<br>Class II<br>Class III | Maximum Allowable Quantity<br>Maximum Allowable Quantity<br>25<br>50 | Not Applicable |
| Unstable (reactives) nondetonable | Class 4<br>Class 3<br>Class 2 | Maximum Allowable Quantity<br>1<br>25 | Maximum Allowable Quantity<br>2,000<br>10,000 |
| [Water reactives] Water-reactives nondetonable | Class 3<br>Class 2 | 1<br>25 | Not Applicable |
| Pyrophoric material detonable | [Detonable] Not Applicable | Maximum Allowable Quantity | Maximum Allowable Quantity |
| Pyrophoric gases nondetonable | [Nondetonable] Not Applicable | Not Applicable | 2,000 |

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.02832 $m^3$, 1 ton = 2,000 pounds = 908 kg.

a. For materials that are detonable, the distance to other buildings or lot lines shall be as specified in the Building Code. For materials classified as explosives, the required separation distances shall be as specified in FC Chapter 33. Unclassified detonable organic peroxides (see FC Chapter 39), detonable pyrophoric materials (see FC Chapter 41), detonable unstable (reactive) materials (see FC Chapter 43) and detonable water-reactive materials (see FC Chapter 44) shall be treated as explosives for purposes of storage, handling and use (see FC Chapter 33).

b. "Maximum Allowable Quantity" means the maximum allowable quantity per control area set forth in FC Table 2703.1.1(1).

c. Limited to Division 1.4 materials and articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco and Firearms regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles, providing the net explosive weight of individual articles does not exceed 1 pound.

**2703.8.3 Control areas.** [Control areas shall be those spaces within a building or structure and outdoor areas where quantities of hazardous materials not exceeding the maximum quantities allowed by this code are stored, handled or used.] Control areas shall be in accordance with FC 2703.8.3.1 through 2703.8.3.5.

**2703.8.3.1 Construction requirements.** Control areas shall be separated from each other by [not less than a 1-hour fire barrier] fire barriers constructed in accordance with [the construction codes, including] Chapter 7 of the Building Code or horizontal assemblies constructed in accordance with Chapter 7 of the Building Code, or both.

**2703.8.3.2 Percentage of maximum allowable quantities.** The percentage of maximum allowable quantities of hazardous materials per control area allowed at each floor level within a building shall be in accordance with FC Table 2703.8.3.3.

**[2703.8.3.2] 2703.8.3.3 Number.** The maximum number of control areas per floor within a building or structure shall be in accordance with FC Table [2703.8.3.2] 2703.8.3.3.

**[2703.8.3.3 Separation] 2703.8.3.4 Fire-resistance rating requirements.** The required fire-resistance rating for fire [barrier assemblies] barriers shall be in accordance with FC Table [2703.8.3.2] 2703.8.3.3. The floor [construction] assembly of the control area and the construction supporting the floor of the control area shall have a minimum 2-hour fire-resistance rating.

**Exception:** The floor assembly of the control area and the construction supporting the floor of the control area may be 1-hour fire-resistance rated in a building of Type IIA, IIIA and VA construction that is three stories or less in height and protected throughout by a sprinkler system.

**FC TABLE [2703.8.3.2] 2703.8.3.3**
**DESIGN AND NUMBER OF CONTROL AREAS**

| FLOOR LEVEL | | PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA[a] | NUMBER OF CONTROL AREAS PER FLOOR[b] | FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[c] b |
|---|---|---|---|---|
| Above grade plane | Higher than 9 | 5 | 1 | 2 |
| | 7-9 | 5 | 2 | 2 |
| | 6 | 12.5 | 2 | 2 |
| | 5 | 12.5 | 2 | 2 |
| | 4 | 12.5 | 2 | 2 |
| | 3 | 50 | 2 | 1 |
| | 2 | 75 | 3 | 1 |
| | 1 | 100 | 4 | 1 |
| Below grade plane | 1 | 75 | 3 | 1 |
| | 2 | 50 | 2 | 1 |
| | Lower than 2 | Not Allowed | Not Allowed | Not Allowed |

a. Percentages shall be of the maximum allowable quantity per control area shown in FC Tables 2703.1.1(1) and 2703.1.1(2), with all increases allowed in the footnotes to those tables.

[b. There shall be a maximum of two control areas per floor in Group M occupancies and in buildings or portions of buildings having Group S occupancies with storage conditions and quantities in accordance with Section 2703.11.]

[c] b. Fire barriers shall include walls and floors as necessary to provide separation from other portions of the building.

**[2703.8.3.4] 2703.8.3.5 Hazardous materials in Group M display and storage areas and in Group S [occupancies] storage areas.** The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed within a single control area of a Group M display and storage area or a Group S [occupancy] storage area is allowed to exceed the maximum allowable quantities specified in FC Tables 2703.1.1(1) and 2703.1.1(2) without classifying the building or use as a Group H occupancy, provided that the materials are displayed and stored in accordance with [Section 2703.11] FC2703.11.

**2703.8.4 Gas rooms.** Where a gas room is provided to comply with the requirements of FC Chapter 37, the gas room shall be in accordance with [Sections] FC 2703.8.4.1 and 2703.8.4.2.

**2703.8.4.1 Construction.** Gas rooms shall be protected [with] throughout by a sprinkler system. Gas rooms shall be separated from the remainder of the building in accordance

with the construction codes, including the Building Code, based on the occupancy group into which the building has been classified.

**2703.8.4.2 Ventilation system.** The ventilation system for gas rooms shall be designed to operate at a negative pressure relative to the surrounding area. Highly toxic and toxic gases shall additionally comply with the requirements of [Section 3704.2.2.6] FC3704.2.2.6. The ventilation system shall be installed in accordance with the construction codes, including the Mechanical Code.

**2703.8.5 Exhausted enclosures.** Where an exhausted enclosure is used to increase maximum allowable quantity per control area or when the location of hazardous materials in exhausted enclosures is provided to comply with the requirements of FC Chapter 37, the exhausted enclosure shall be in accordance with [Sections] FC 2703.8.5.1 through 2703.8.5.3.

**2703.8.5.1 Construction.** Exhausted enclosures shall be of noncombustible construction.

**2703.8.5.2 Ventilation.** The ventilation system for exhausted enclosures shall be designed to operate at a negative pressure relative to the surrounding area. Ventilation systems used for highly toxic and toxic gases shall additionally comply with the requirements of [Sections 3704.1.2(1), 3704.1.2(2) and 3704.1.2(3)] FC3704.1.3. The ventilation system shall be installed in accordance with the construction codes, including the Mechanical Code.

**2703.8.5.3 Fire extinguishing system.** Exhausted enclosures where flammable materials are used shall be protected by a fire extinguishing system in accordance with FC Chapter 9 and the construction codes, including the Building Code.

**2703.8.6 Gas cabinets.** Where a gas cabinet is used to increase the maximum allowable quantity per control area or when the location of compressed gases in gas cabinets is provided to comply with the requirements of FC Chapter 37, the gas cabinet shall be in accordance with [Sections] FC 2703.8.6.1 through 2703.8.6.3.

**2703.8.6.1 Construction.** Gas cabinets shall be constructed of not less than 0.097-inch ([2.5 mm] 2.5-mm) (No. 12 gauge) steel; provided with self-closing limited access ports or noncombustible windows to give access to equipment controls; and have all interior surfaces treated, coated or constructed of materials that are compatible with the hazardous materials stored.

**2703.8.6.2 Ventilation.** The ventilation system for gas cabinets shall be designed to operate at a negative pressure relative to the surrounding area. Ventilation systems used for highly toxic and toxic gases shall additionally comply with the requirements of [Sections 3704.1.2(1), 3704.1.2(2) and 3704.1.2(3)] FC3704.1.2. The ventilation system shall be installed in accordance with the construction codes, including the Mechanical Code.

**2703.8.6.3 Maximum number of containers per gas cabinet.** The number of containers stored in a single gas cabinet shall not exceed three.

**2703.8.7 Hazardous materials storage cabinets.** Where storage cabinets are used to increase maximum allowable quantity per control area or to comply with the requirements of this chapter, such cabinets shall be in accordance with [Sections] FC 2703.8.7.1 and 2703.8.7.2.

**2703.8.7.1 Construction.** All interior surfaces of such cabinets shall be treated, coated or constructed of materials that are nonreactive with the hazardous material stored. Cabinets shall either be listed in accordance with UL 1275 as suitable for the intended storage or constructed in accordance with the following:

1. Cabinets shall be of steel having a thickness of not less than 0.0478 inch (1.2 mm) (No. 18 gage). The cabinet, including the door, shall be double walled with a [1.5-inch (38 mm)] 1½-inch (8-mm) airspace between the walls. Joints shall be riveted or welded and shall be tight fitting. Doors shall be well fitted, self-closing and equipped with a self-latching device.

2. The bottoms of cabinets utilized for the storage of liquids shall be [liquid tight] liquid-tight to a minimum height of 2 inches (51 mm).

**2703.8.7.1.1 Electrical equipment.** Electrical equipment and devices within cabinets used for the storage of hazardous gases or liquids shall be in accordance with the Electrical Code.

**2703.8.7.2 Warning markings.** Cabinets shall be clearly identified in an approved manner with red letters on a contrasting background to read: HAZARDOUS — KEEP FIRE AWAY.

**2703.9 General safety precautions.** General precautions for the safe storage, handling and use of hazardous materials shall be in accordance with [Sections] FC 2703.9.1 through 2703.9.9.

**2703.9.1 Personnel training and written procedures.** Persons responsible for the operation of areas in which hazardous materials are stored, handled or used, including dispensing, shall be familiar with the chemical nature of the materials and the appropriate mitigating actions necessary in the event of fire, leak or spill. A certificate of fitness shall be required when specified by this code or the rules or as a condition of a permit.

**2703.9.1.1 Fire department liaison.** One or more responsible persons shall be designated to serve as a liaison to the department in connection with any emergency response to the premises, for purposes of providing access to the location where hazardous materials are stored on the premises, providing access to [Material Safety Data Sheets] material safety data sheets, and otherwise assisting in the development and implementation of emergency procedures. The names and telephone numbers of such responsible persons shall be included on the annual inventory required by New York State General Municipal Law Section 209-u and on a hazardous materials management plan when such plan is required. Telephone numbers shall include a 24-hour contact number for such responsible persons.

**2703.9.2 Security.** Storage, handling and use areas, including dispensing areas, shall be secured against unauthorized entry and safeguarded in a manner approved by the commissioner.

**2703.9.3 Protection from vehicles.** Posts or other approved means shall be provided to protect storage tanks and connected piping, valves and fittings; use areas; and dispensing areas subject to vehicular damage in accordance with [Section 312] FC312.

**2703.9.4 Electrical wiring and equipment.** Electrical wiring and equipment shall be installed and maintained in accordance with the Electrical Code.

**2703.9.5 Static accumulation.** When conditions exist that could cause a flammable mixture to be ignited by static electricity, equipment shall be grounded and all other necessary and appropriate actions taken to prevent the accumulation of a static charge.

**2703.9.6 Protection from light.** Materials that are sensitive to light shall be stored in containers designed to protect them from such exposure.

**2703.9.7 Shock protection.** Materials that are sensitive to shock shall be padded, suspended or otherwise protected against jarring, seismic activity or other movement.

**2703.9.8 Separation of incompatible materials.** Incompatible materials shall be separated while in storage or use except for stored materials in containers having a capacity of not more than 5 pounds (2 kg) or [0.5] ½ gallon (2 L). Separation shall be accomplished by:

1. Segregating incompatible materials in storage by a distance of not less than 20 feet (6096 mm).

2. Isolating incompatible materials in storage by a noncombustible partition extending not less than 18 inches (457 mm) above and to the sides of the stored material.

3. Storing liquid and solid materials in hazardous material storage cabinets. Materials that are incompatible shall not be stored in the same cabinet.

4. Storing compressed gases in gas cabinets or exhausted enclosures in accordance with [Sections] FC 2703.8.5 and 2703.8.6. Materials that are incompatible shall not be stored within the same cabinet or exhausted enclosure.

**2703.9.9 Shelf storage.** Shelving shall be of substantial construction, and shall be braced and anchored in accordance with the seismic design requirements of the construction codes, including the Building Code, for the seismic zone in which the material is located. Shelving shall be treated, coated or constructed of materials that are compatible with the hazardous materials stored. Shelves shall be provided with a lip or guard when used for the storage of individual containers.

**Exceptions:**

1. Storage in hazardous material storage cabinets or laboratory furniture specifically designed for such use.

2. Storage of hazardous materials in amounts not requiring a permit in accordance with [Section 105.6] FC105.6.

Shelf storage of hazardous materials shall be maintained in an orderly manner.

**2703.9.10 Safety cans.** Safety cans shall be listed in accordance with UL 30 when used to increase the maximum allowable quantities per control area of flammable or combustible liquids in accordance with FC Table 2703.1.1(1). Safety cans listed in accordance with UL 1313 are allowed for flammable and combustible liquids when not used to increase the maximum allowable quantities per control area and for other hazardous material liquids in accordance with the listing.

**2703.10 Handling.** In addition to the requirements of [Section 2703.2] FC2703.2, the handling of hazardous materials in corridors or exit enclosures shall be in accordance with [Sections] FC 2703.10.1 through 2703.10.3.6.

**2703.10.1 Valve protection.** Hazardous material gas containers and tanks moved during handling shall have their protective caps in place. Containers and tanks of highly toxic or toxic compressed gases shall have their valve outlets capped or plugged with an approved closure device in accordance with FC Chapter 30.

**2703.10.2 Carts and hand trucks required.** Containers of hazardous materials having a hazard ranking of 3 or 4 pursuant to NFPA 704, and liquids in containers exceeding 5 gallons (19 L), shall be moved during handling on a cart or hand truck meeting the requirements of [Section 2703.10.3] FC2703.10.3, when moved through any corridor or exit enclosure.

**Exceptions:**

1. Two hazardous material liquid containers, which are hand carried in [acceptable] approved safety carriers.

2. Not more than four drums not exceeding 55 gallons (208 L) each, which are moved by suitable drum trucks.

3. Containers of compressed gases, which are moved by approved carts or hand trucks, and containers not exceeding 25 pounds (11 kg), which are hand carried.

4. Solid hazardous materials not exceeding 100 pounds (45 kg), which are moved by approved hand trucks, and a single container not exceeding 50 pounds (23 kg), which is hand carried.

**2703.10.3 Carts and hand trucks.** Carts and hand trucks required by [Section 2703.10.2] FC2703.10.2 to be used to move hazardous materials shall be designed and constructed in accordance with [Sections] FC 2703.10.3.1 through 2703.10.3.6.

**2703.10.3.1 Design.** Carts and hand trucks used to move hazardous materials shall be designed to provide a stable base for such movement during handling and shall have a means of restraining containers to prevent accidental dislodgement. Compressed gas containers placed on carts and hand trucks shall be individually restrained.

**2703.10.3.2 Speed-control devices.** Carts and hand trucks shall be provided with a device that will enable the operator to safely control movement by providing stops or speed-reduction devices.

**2703.10.3.3 Construction.** The cart or hand truck shall be sturdily constructed of materials compatible with the material being moved.

**2703.10.3.4 Spill control.** Carts and hand trucks used to move liquids shall be capable of containing a spill from the largest single container being moved.

**2703.10.3.5 Attendance.** Carts and hand trucks used to move materials shall not obstruct or be left unattended in any corridor, exit enclosure, or other means of egress.

**2703.10.3.6 Incompatible materials.** Incompatible materials shall not be [moved during handling] kept on the same cart or hand truck.

**[2703.10.4 Emergency alarm.** Where hazardous materials having a hazard ranking of 3 or 4 pursuant to NFPA 704 are handled through corridors or exit enclosures, there shall be an emergency telephone system, a local manual alarm station or an approved alarm-initiating device at not more than 150-foot (45 720 mm) intervals throughout the handling route, and at each exit doorway throughout the handling route. The signal shall be relayed to an approved central station or remote supervising station or a constantly attended on-site location and shall also initiate a local audible alarm.]

**2703.11 Group M storage and display and Group S storage.** The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single control area of a Group M occupancy, or an outdoor control area, or stored in a single control area of a Group S occupancy, may exceed the maximum allowable quantity per control area indicated in [Section 2703.1] FC2703.1 when stored and displayed in accordance with [Sections] FC 2703.11.1 through 2703.11.3.10.

**2703.11.1 Maximum allowable quantity per control area in Group M or S occupancies.** The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single control area of a Group M occupancy or stored in a single control area of a Group S occupancy shall not exceed the amounts set forth in FC Table 2703.11.1.

**FC TABLE 2703.11.1**
**MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES NONFLAMMABLE SOLIDS, NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS[d, e, f]**

| CONDITION | | MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA | |
|---|---|---|---|
| Material[a] | Class | Solids Pounds | Liquids gallons |
| HEALTH-HAZARD MATERIALS—NONFLAMMABLE AND NONCOMBUSTIBLE SOLIDS AND LIQUIDS | | | |
| Corrosives[b, c] | Not Applicable | 9,750 | 975 |
| Highly Toxics | Not Applicable | 20[b, c] | 2[b, c] |

| | | | |
|---|---|---|---|
| Toxics[b, c] | Not Applicable | 1,000 | 100 |
| **PHYSICAL-HAZARD MATERIALS —NONFLAMMABLE AND NONCOMBUSTIBLE SOLIDS AND LIQUIDS** | | | |
| Oxidizers[b, c] | 4 | Not Allowed | Not Allowed |
| | 3 | 1,150[g] | 115 |
| | 2 | 2,250[h] | 225 |
| | 1 | 18,000[i, j] | 1,800[i, j] |
| Nondetonable unstable (reactives)[b, c] | 4 | Not Allowed | Not Allowed |
| | 3 | 550 | 55 |
| | 2 | 1,150 | 115 |
| | 1 | Not Limited | Not Limited |
| Nondetonable [water reactives] water-reactives | 3[b, c] | 550 | 55 |
| | 2[b, c] | 1,150 | 115 |
| | 1 | Not Limited | Not Limited |

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 $m^3$.
a. Hazard categories are as specified in [Section 2701.2.2] FC2701.2.2.
b. Maximum allowable quantities shall be increased 100 percent in buildings protected throughout by a sprinkler system. When Note c applies, amounts increased shall be as set forth in both notes.
c. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets in accordance with [Section 2703.8] FC2703.8. When Note b applies, amounts increased shall be as set forth in both notes.
d. See FC Table [2703.8.3.2] 2703.8.3.3 for design and number of control areas.
e. Allowable quantities for other hazardous material categories shall be in accordance with [Section 2703.1] FC2703.1.
f. Maximum quantities shall be increased 100 percent in outdoor control areas.
g. Maximum amounts may be increased to 2,250 pounds when individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
h. Maximum amounts may be increased to 4,500 pounds when individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
i. Quantities are unlimited where protected by a sprinkler system.
j. Quantities are unlimited in an outdoor control area.

**2703.11.2 Maximum allowable quantity per outdoor control area in Group M or S occupancies.** The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single outdoor control area of a Group M occupancy shall not exceed the amounts set forth in FC Table 2703.11.1.

**2703.11.3 Storage and display.** Storage and display shall be in accordance with [Sections] FC 2703.11.3.1 through 2703.11.3.10.

**2703.11.3.1 Density.** Storage and display of solids shall not exceed 200 pounds per square foot (976 kg/$m^2$) of floor area actually occupied by solid merchandise. Storage and display of liquids shall not exceed 20 gallons per square foot (0.50 L/$m^2$) of floor area actually occupied by liquid merchandise.

**2703.11.3.2 Storage and display height.** Display height shall not exceed 6 feet (1829 mm) above the finished floor in display areas of Group M occupancies. Storage height shall not exceed 8 feet (2438 mm) above the finished floor in storage areas of Group M and Group S occupancies.

**2703.11.3.3 Container location.** Individual containers less than 5 gallons (19 L) or less than 25 pounds (11 kg) shall be stored or displayed on pallets, racks or shelves.

**2703.11.3.4 Racks and shelves.** Racks and shelves used for storage or display shall be in accordance with [Section 2703.9.9] FC2703.9.9.

**2703.11.3.5 Container type.** Containers shall be approved for the intended use and identified as to their content.

**2703.11.3.6 Container size.** Individual containers shall not exceed 100 pounds (45 kg) for solids or 10 gallons (38 L) for liquids in storage and display areas.

**2703.11.3.7 Incompatible materials.** Incompatible materials shall be separated in accordance with [Section 2703.9.8] FC2703.9.8.

**2703.11.3.8 Floors.** Floors shall be in accordance with [Section 2704.12] FC2704.12.

**2703.11.3.9 Aisles.** Aisles 4 feet (1219 mm) in width shall be maintained on three sides of the storage or display area.

**2703.11.3.10 Signs.** Hazard identification signs shall be provided in accordance with [Section 2703.5] FC2703.5.

**2703.12 Outdoor control areas.** Outdoor control areas for hazardous materials in amounts not exceeding the maximum allowable quantity per outdoor control area shall be in compliance with the following requirements:

1. Outdoor control area shall be kept free from vegetation, rubbish and other combustible waste, and combustible materials not necessary to the storage. The area surrounding an outdoor control area shall be kept clear of such materials for a minimum of 15 feet (4572 mm).

2. Outdoor control areas shall be located at least 5 feet (1524 mm) from a building opening and at least 15 feet (4572 mm) from Group A occupancies. Outdoor control areas shall be located at least 20 feet (6096 mm) from a lot line, public street or private road.

   **Exception:** A 2-hour fire-resistance-rated wall without openings extending not less than 30 inches (762 mm) above and to the sides of the storage area is allowed in lieu of such distances required from a building opening, lot line, public street or private road.

3. Where a property exceeds 10,000 square feet (929 $m^2$), there may be two outdoor control areas separated by a minimum distance of 50 feet (15 240 mm), when approved.

4. Where a property exceeds 35,000 square feet (3252 $m^2$), there may be multiple outdoor control areas, separated a minimum distance of 50 feet (15 240 mm), when approved.

## SECTION FC 2704
## STORAGE

**2704.1 General.** Hazardous materials in amounts exceeding the maximum allowable quantity per control area as set forth in [Section 2703.1] FC2703.1 shall be stored in accordance with [Sections] FC 2701, 2703 and 2704. Hazardous materials in amounts not exceeding the maximum allowable quantity per control area as set forth in [Section 2703.1] FC2703.1 shall be stored in accordance with [Sections] FC 2701 and 2703. Nonflammable solid and nonflammable and noncombustible liquid hazardous materials in Group M retail occupancies and Group S

wholesale storage shall be stored and displayed in accordance with [Section 2703.11] FC2703.11.

**2704.2 Spill control and secondary containment for liquid and solid hazardous materials.** Buildings, structures, rooms or areas used for the storage of liquid or solid hazardous materials shall be provided with spill control and secondary containment in accordance with [Sections] FC 2704.2.1 through 2704.2.3.

**Exception:** Outdoor storage of containers on approved containment pallets in accordance with [Section 2704.2.3] FC2704.2.3.

**2704.2.1 Spill control for hazardous material liquids.** Buildings, structures, rooms or areas used for the storage of hazardous material liquids in individual vessels having a capacity of more than 55 gallons (208 L), or in which the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L), shall be provided with spill control to prevent the flow of liquids to adjoining areas. Floors in indoor locations, and similar surfaces in outdoor locations, shall be [constructed] designed to contain a spill from the largest single vessel by one of the following methods:

1. Liquid-tight sloped or recessed floors in indoor locations or similar protection in outdoor locations.

2. Liquid-tight floors and raised or recessed sills or dikes in indoor locations or similar protection in outdoor locations.

3. Sumps and collection systems.

4. Other approved engineered systems.

**2704.2.1.1 Containment system construction.** Except for surfacing, the floors, sills, dikes, sumps and collection systems shall be constructed of noncombustible material, and the liquid-tight seal shall be compatible with the material stored. When liquid-tight sills or dikes are provided, they are not required at perimeter openings having an open-grate trench across the opening that connects to an approved collection system.

**2704.2.2 Secondary containment for hazardous material liquids and solids.** Where required by FC Table 2704.2.2, buildings, structures, rooms or areas used for the storage of hazardous materials liquids or solids shall be provided with secondary containment in accordance with this section when the capacity of an individual vessel or the aggregate capacity of multiple vessels exceeds the following quantities:

1. Liquids: Capacity of an individual vessel exceeds 55 gallons (208 L) or the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L).

2. Solids: Capacity of an individual vessel exceeds 550 pounds (250 kg) or the aggregate capacity of multiple vessels exceeds 10,000 pounds (4540 kg).

**FC TABLE 2704.2.2**
**REQUIRED SECONDARY CONTAINMENT—HAZARDOUS MATERIAL SOLIDS AND LIQUIDS STORAGE**

| MATERIAL | | INDOOR STORAGE | | OUTDOOR STORAGE | |
|---|---|---|---|---|---|
| | | Solids | Liquids | Solids | Liquids |
| Physical-hazard materials | | | | | |
| Combustible liquids | Class II | Not Applicable | See FC Chapter 34 | Not Applicable | See FC Chapter 34 |
| | Class IIIA | | See FC Chapter 34 | | See FC Chapter 34 |
| | Class IIIB | | See FC Chapter 34 | | See FC Chapter 34 |
| Cryogenic fluids | | | See FC Chapter 32 | | See FC Chapter 32 |
| Explosives[a] | | See FC Chapter 33 | | See FC Chapter 33 | |
| Flammable liquids | Class IA | Not Applicable | See FC Chapter 34 | Not Applicable | See FC Chapter 34 |
| | Class IB | | See FC Chapter 34 | | See FC Chapter 34 |
| | Class IC | | See FC Chapter 34 | | See FC Chapter 34 |
| Flammable solids | | Not Required | Not Applicable | Not Required | Not Applicable |
| Organic peroxides, nondetonable | Class I | Required | Required | Not Required | Required |
| | Class II | Required | Required | Not Required | Not Required |
| | Class III | | | | |
| | Class IV | | | | |
| | Class V | Not Required | Not Required | Not Required | Not Required |
| Oxidizers | Class 4 | Required | Required | Not Required | Required |
| | Class 3 | | | | Not Required |
| | Class 2 | | | | Not Required |
| | Class 1 | Not Required | Not Required | Not Required | Not Required |
| Pyrophorics, nondetonable | | Not Required | Required | Not Required | Required |
| Unstable (reactives), nondetonable | Class 4 | Required | Required | Required | Required |
| | Class 3 | | | | |
| | Class 2 | | | | |
| | Class 1 | Not Required | Not Required | Not Required | Not Required |
| [Water reactives] Water-reactives, nondetonable | Class 3 | Required | Required | Required | Required |
| | Class 2 | | | | |
| | Class 1 | Not Required | Not Required | Not Required | Not Required |
| Health-hazard materials | | | | | |
| Corrosives | | Not Required | Required | Not Required | Required |
| Highly toxics | | Required | Required | Required | Required |
| Toxics | | | | | |

a. Unclassified detonable organic peroxides (see FC Chapter 39), detonable pyrophoric materials (see FC Chapter 41), detonable unstable (reactive) materials (see FC Chapter 43) and detonable water-reactive materials (see FC Chapter 44) shall be treated as explosives for purposes of storage, handling and use (see FC Chapter 33).

**2704.2.2.1 Containment and drainage methods.** The building, structure, room or area shall contain or drain the hazardous materials and fire protection water through the use of one of the following methods:

1. Liquid-tight sloped or recessed floors in indoor locations or similar protection in outdoor locations.

2. Liquid-tight floors and raised or recessed sills or dikes in indoor locations or similar protection in outdoor locations.

3. Sumps and collection systems.

4. Drainage systems leading to an approved location.

5. Other approved engineered systems.

**2704.2.2.2 Incompatible materials.** Incompatible materials used in open systems shall be separated from each other in the secondary containment system.

**2704.2.2.3 Indoor design.** Secondary containment for indoor storage areas shall be designed to contain a spill from the largest vessel plus the design flow volume of fire protection water calculated to discharge from the fire extinguishing system over the minimum required system design area or area of the room or area in which the storage is located, whichever is smaller. The containment capacity shall be designed to contain the flow for a minimum period of 20 minutes.

**2704.2.2.4 Outdoor design.** Secondary containment for outdoor storage areas shall be designed to contain a spill from the largest individual vessel. If the area is open to rainfall, secondary containment shall be designed to include the volume of a 24-hour rainfall as determined by a 25-year storm but in no case less than 110[%] percent of the largest individual vessel and provisions shall be made to drain accumulations of ground water and rainwater.

**2704.2.2.5 Monitoring.** Monitoring shall be provided to detect hazardous materials in the secondary containment system. The method of monitoring may be visual inspection of the primary or secondary containment, or other approved means. Where secondary containment is subject to the intrusion of water, a monitoring method for detecting water shall be provided. Where monitoring devices are provided, they shall be connected to approved audible or visible alarms.

**2704.2.2.6 Drainage system design.** Drainage systems shall be in accordance with the Plumbing Code and the following requirements:

1. The slope of floors to drains in indoor locations, or similar protection in outdoor locations, shall not be less than 1 percent.

2. Drains from indoor storage areas shall be sized to carry the volume of the fire protection water as determined by the design density discharged from the fire extinguishing system over the minimum required system design area or area of the room or area in which the storage is located, whichever is smaller.

3. Drains from outdoor storage areas shall be sized to carry the volume of the fire flow and the volume of a 24-hour rainfall as determined by a 25-year storm.

4. Materials of construction for drainage systems shall be compatible with the materials stored.

5. Incompatible materials used in open systems shall be separated from each other in the drainage system.

6. Drains shall terminate in an approved location away from buildings, structures, valves, means of egress, fire access roadways, adjoining property and storm drains.

**2704.2.3 Containment pallets.** When used as an alternative to spill control and secondary containment for outdoor storage in accordance with the exception set forth in [Section 2704.2] FC2704.2, containment pallets shall be in compliance with the following requirements:

1. A liquid-tight sump accessible for visual inspection shall be provided.

2. The sump shall be designed to contain not less than 66 gallons (250 L).

3. Exposed surfaces shall be compatible with material stored.

4. The containment pallet shall be protected to prevent collection of rainwater within the sump.

**2704.3 Ventilation.** Indoor storage areas and storage buildings shall be provided with mechanical exhaust ventilation or natural ventilation where natural ventilation can be shown to be acceptable for the materials as stored.

**Exception:** Storage areas for flammable solids complying with the requirements of FC Chapter 36.

**2704.3.1 System requirements.** Exhaust ventilation systems shall comply with the following requirements:

1. Installation shall be in accordance with the Mechanical Code.

2. Mechanical ventilation shall be at a rate of not less than 1 cubic foot per minute per square foot [[0.00508 $m^3/(s\ m^2)$]] (0.00508 $m^3/s/m^2$) of floor area over the storage area.

3. Systems shall operate continuously unless alternative designs are approved.

4. A manual shutoff control shall be provided outside of the room in a position adjacent to the access door to the room or in an approved location. The switch shall be [of the] a break-glass or other approved type and shall be labeled: VENTILATION SYSTEM EMERGENCY SHUTOFF.

5. Exhaust ventilation shall be designed [to consider] based on the density of the potential fumes or vapors released. For fumes or vapors that are heavier than air, exhaust shall be taken from a point within 12 inches (305 mm) of the floor. For fumes or vapors that are lighter than air, exhaust shall be taken from a point within 12 inches (305 mm) of the highest point of the room.

6. [The location of both the] The design and location of exhaust and inlet air openings shall [be designed] serve to provide air movement across all portions of the floor [or] and room to prevent the accumulation of vapors.

[7. Exhaust ventilation shall not be recirculated within the room or building if the materials stored are capable of emitting hazardous vapors.]

**2704.4 Separation of incompatible hazardous materials.** Incompatible materials shall be separated in accordance with [Section 2703.9.8] FC2703.9.8.

**2704.5 Sprinkler systems.** Indoor storage areas and storage buildings shall be protected throughout by a sprinkler system. The design of the sprinkler system shall not be less than that required for Ordinary Hazard Group 2 with a minimum design area of 3,000 square feet (279 $m^2$). Where the materials or storage arrangement are required by other regulations to be provided with a higher level of sprinkler system protection, the higher level of sprinkler system protection shall be provided.

**2704.6 Explosion control.** Buildings, structures and indoor rooms and other areas shall be provided with explosion control in accordance with [Section 911] FC911.

**2704.7 Emergency power.** Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required, such systems shall be provided with an emergency power system in accordance with the Electrical Code, and the construction codes, including the Building Code, and [Section 604] FC604.

**Exceptions:**

1. Mechanical ventilation for storage of Class IB and Class IC flammable liquids and combustible liquids in closed containers not exceeding 6½ gallons (25 L) capacity.

[1] 2. Storage areas for Class 1 and 2 oxidizers.

[2] 3. Storage areas for Class III, IV and V organic peroxides.

[3] 4. Storage areas for highly toxic or toxic materials, in accordance with [Sections] FC 3704.2.2.8 and 3704.3.2.6.

[4] 5. Storage areas for which an approved fail-safe engineered system has been installed for mechanical ventilation, treatment systems or temperature control systems.

**2704.8 Limit controls.** Limit controls shall be provided in accordance with [Sections] FC 2704.8.1 and 2704.8.2.

**2704.8.1 Temperature control.** Materials that must be kept at temperatures other than normal ambient temperatures shall be provided with an approved means to maintain the temperature within a safe range. Redundant temperature control equipment that will operate on failure of the primary temperature control system, or other approved means to maintain the required temperature range, shall be provided.

**2704.8.2 Pressure control.** Stationary tanks and equipment containing hazardous material liquids that can generate pressures exceeding design limits because of exposure fires or internal reaction, shall have some form of construction or other approved means that will relieve excessive internal pressure. The means of pressure relief shall vent to an approved location outdoors or to an exhaust scrubber or treatment system in accordance with FC Chapter 37.

**2704.9 Emergency alarm.** An approved manual emergency alarm system shall be provided in buildings, rooms or areas used for storage of hazardous materials. Emergency alarm-initiating devices shall be installed outside of each interior exit or exit access door of storage buildings, rooms or areas. Activation of an emergency alarm-initiating device shall sound a local alarm to alert occupants of an emergency situation involving hazardous materials.

**2704.10 Supervision.** Emergency alarm, detection and fire extinguishing systems required by [Section 2704] FC2704 shall be supervised by an approved central, proprietary or remote station service or shall initiate an audible and visual signal at a constantly attended on-site location.

**2704.11 Clearance from combustibles.** The area surrounding an outdoor storage area or tank shall be kept clear of vegetation, rubbish and other combustible waste, and storage of combustible materials, for a minimum distance of 25 feet (7620 mm).

**2704.12 Noncombustible floor.** Except for surfacing, floors of storage areas shall be of noncombustible construction.

**2704.13 Weather protection.** Outdoor hazardous material storage areas sheltered by overhead noncombustible construction shall not be considered indoor storage when the area is constructed in accordance with the requirements for weather protection as required by the construction codes, including the Building Code.

**Exception:** Storage of explosives shall be considered as indoor storage.

## SECTION FC 2705
## HANDLING AND USE

**2705.1 General.** Hazardous materials in amounts exceeding the maximum allowable quantity per control area set forth in [Section 2703.1] FC2703.1 shall be handled and used, including dispensed, in accordance with [Sections] FC 2701, 2703 and 2705. Hazardous materials in amounts not exceeding the maximum allowable quantity per control area set forth in [Section 2703.1] FC2703.1 shall be handled and used, including dispensed, in accordance with [Sections] FC 2701 and 2703.

**2705.1.1 Separation of incompatible materials.** Separation of incompatible materials shall be in accordance with [Section 2703.9.8] FC2703.9.8.

**2705.1.2 Noncombustible floor.** Except for floor finishing operations, floors of areas where liquid or solid hazardous materials are used in open systems shall be of noncombustible, liquid-tight construction.

**2705.1.3 Spill control and secondary containment for hazardous material liquids.** Where required by other provisions of [Section 2705] FC2705, spill control and secondary containment shall be provided for hazardous material liquids in accordance with [Section 2704.2] FC2704.2.

**2705.1.4 Limit controls.** Limit controls shall be provided in accordance with [Sections] FC 2705.1.4.1 through 2705.1.4.4.

**2705.1.4.1 High-liquid-level control.** Open tanks in which liquid hazardous materials are used shall be equipped with a liquid-level limit control or other means to prevent overfilling of the tank.

**2705.1.4.2 Low-liquid-level control.** Approved safeguards shall be provided to prevent a low-liquid level in a tank from creating a hazardous condition, including overheating of a tank or its contents.

**2705.1.4.3 Temperature control.** Temperature control shall be provided in accordance with [Section 2704.8.1] FC2704.8.1.

**2705.1.4.4 Pressure control.** Pressure control shall be provided in accordance with [Section 2704.8.2] FC2704.8.2.

**2705.1.5 Emergency power.** Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required, such systems shall be provided with an emergency power system in accordance with the Electrical Code, the construction codes, including the Building Code, and [Section 604] FC604.

**Exceptions:**

1. Areas in which an approved fail-safe engineered system has been installed for mechanical ventilation, treatment systems and temperature control systems.

2. Systems for highly toxic or toxic gases provided with emergency power in accordance with [Sections] FC 3704.2.2.8 and 3704.3.2.6.

**2705.1.6 Supervision.** Alarm, detection and fire extinguishing systems required by other provisions of [Section 2705] FC2705 shall be supervised by an approved central station or shall initiate an audible and visible signal at a continuously attended on-site location.

**2705.1.7 Lighting.** Adequate lighting by natural or artificial means shall be provided.

**2705.1.8 Fire extinguishing systems.** Indoor rooms or areas in which hazardous materials are handled or used shall be protected by a fire extinguishing system in accordance with FC Chapter 9 and the construction codes, including the Building Code. The design of any sprinkler system shall not be less than that required for Ordinary Hazard, Group 2, with a minimum design area of 3,000 square feet (279 $m^2$). Where the materials or storage arrangement are required by other regulations to be provided with a higher level of sprinkler system protection, the higher level of sprinkler system protection shall be provided.

**2705.1.9 Ventilation.** Indoor use areas, including dispensing areas, shall be provided with exhaust ventilation in accordance with Section 502.8 of the Mechanical Code.

**Exception:** Ventilation is not required for flammable solids, unless they are in the form of finely divided particles or generate finely divided particles during use.

**2705.1.10 Liquid transfer.** Liquids having a hazard ranking of 3 or 4 pursuant to NFPA 704 shall be transferred by one of the following methods:

1. From safety cans complying with the requirements of UL 30.

2. Through an approved closed piping system.

3. From containers or tanks by an approved pump taking suction through an opening in the top of the container or tank.

4. From containers or tanks by gravity through an approved self-closing or automatic-closing valve when the container or tank and dispensing operations are provided with spill control and secondary containment in accordance with [Section 2704.2] FC2704.2. Highly toxic liquids shall not be dispensed by gravity from tanks.

5. Approved engineered liquid transfer systems.

**Exceptions:**

1. Liquids having a hazard ranking of 4 when dispensed from approved containers not exceeding 1.3 gallons (5 L).

2. Liquids having a hazard ranking of 3 when dispensed from approved containers not exceeding 5.3 gallons (20 L).

**2705.2 Indoor use.** Indoor use, including dispensing, of hazardous materials shall be in buildings complying with the requirements of the construction codes, including the Building Code, and in accordance with [Section 2705.1] FC2705.1 and [Sections] FC 2705.2.1 through 2705.2.2.5.

**2705.2.1 Open systems.** Use of hazardous materials in open containers or systems shall be in accordance with [Sections] FC 2705.2.1.1 through 2705.2.1.4.

**2705.2.1.1 Ventilation.** Where gases, liquids or solids having a hazard ranking of 3 or 4, as defined in NFPA 704 are used, mechanical exhaust ventilation shall be provided to capture gases, fumes, mists or vapors at the point of generation.

**Exception:** Gases, liquids or solids that do not generate harmful fumes, mists or vapors.

**2705.2.1.2 Explosion control.** Explosion control shall be provided in accordance with [Section 2704.6] FC2704.6 when an explosive environment can occur because of the characteristics or nature of the hazardous materials or the manner in which they are used.

**2705.2.1.3 Spill control for hazardous material liquids.** Buildings, rooms or areas where hazardous material liquids are dispensed into vessels exceeding a 1.3-gallon (5 L) capacity or used in open systems exceeding a 5.3-gallon (20 L) capacity shall be provided with spill control in accordance with [Section 2704.2.1] 2704.2.1.

**2705.2.1.4 Secondary containment for hazardous material liquids.** Where required by FC Table 2705.2.1.4, buildings, structures, rooms or areas where hazardous material liquids are used in open systems shall be provided with secondary containment in accordance with [Section 2704.2.2] FC2704.2.2 when the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following quantities:

1. Individual vessel or system: greater than 1.3 gallons (5 L).

2. Multiple vessels or systems: greater than 5.3 gallons (20 L).

**FC TABLE 2705.2.1.4**
**REQUIRED SECONDARY CONTAINMENT—HAZARDOUS MATERIAL SOLIDS AND LIQUIDS USE**

| MATERIAL | | INDOOR USE | | OUTDOOR USE | |
|---|---|---|---|---|---|
| | | Solids | Liquids | Solids | Liquids |
| Physical-hazard materials | | | | | |
| Combustible liquids | Class II | Not Applicable | See FC Chapter 34 | Not Applicable | See FC Chapter 34 |
| | Class IIIA | | See FC Chapter 34 | | See FC Chapter 34 |
| | Class IIIB | | See FC Chapter 34 | | See FC Chapter 34 |
| Cryogenic fluids | | Not Applicable | See FC Chapter 32 | Not Applicable | See FC Chapter 32 |
| Explosives[a] | | See FC Chapter 33 | | See FC Chapter 33 | |
| Flammable liquids | Class IA | Not Applicable | See FC Chapter 34 | Not Applicable | See FC Chapter 34 |
| | Class IB | | See FC Chapter 34 | | See FC Chapter 34 |
| | Class IC | | See FC Chapter 34 | | See FC Chapter 34 |
| Flammable solids | | Not Required | Not Applicable | Not Required | Not Applicable |
| Organic peroxides nondetonable | Class I | Not Required | Required | Not Required | Required |
| | Class II | | | | |
| | Class III | | | | |
| | Class IV | | | | |
| | Class V | | Not Required | Not Required | Not Required |
| Oxidizers | Class 4 | | Required | Not Required | Required |
| | Class 3 | | | | |
| | Class 2 | | | | |
| | Class 1 | | | | |
| Pyrophorics nondetonable | | Not Required | Required | Not Required | Required |
| Unstable (reactives) nondetonable | Class 4 | Not Required | Required | Required | Required |
| | Class 3 | | | | |
| | Class 2 | | | | |
| | Class 1 | Not Required | Not Required | Required | Required |
| [Water reactives] Water-reactives, nondetonable | Class 3 | Not Required | Required | Required | Required |
| | Class 2 | | | | |
| | Class 1 | Not Required | Not Required | Required | Required |
| Health-hazard materials | | | | | |
| Corrosives | | Not Required | Required | Not Required | Required |
| Highly toxics | | Required | | | |
| Toxics | | Not Required | | | |

a. Unclassified detonable organic peroxides (see FC Chapter 39), detonable pyrophoric materials (see FC Chapter 41), detonable unstable (reactive) materials (see FC Chapter 43) and detonable water-reactive materials (see FC Chapter 44) shall be treated as explosives for purposes of storage, handling and use (see FC Chapter 33).

**2705.2.2 Closed systems.** Use of hazardous materials in closed containers or systems shall be in accordance with [Sections] FC 2705.2.2.1 through 2705.2.2.5.

**2705.2.2.1 Design.** Systems shall be suitable for the use intended and shall be designed by a qualified person. Controls shall be designed to prevent materials from entering or leaving the process or reaction systems at other than the intended time, rate or path. Where automatic controls are provided, they shall be designed to be fail safe.

**2705.2.2.2 Ventilation.** Where closed systems are designed to be opened as part of normal operations, ventilation shall be provided in accordance with [Section 2705.2.1.1] FC2705.2.1.1.

**2705.2.2.3 Explosion control.** Explosion control shall be provided in accordance with [Section 2704.6] FC2704.6 where an explosive environment exists because of the hazardous materials or the manner in which they are used.

**Exception:** Where process vessels are designed to contain fully the worst-case explosion anticipated within the vessel under process conditions based on the most likely failure.

**2705.2.2.4 Spill control for hazardous material liquids.** Buildings, rooms or areas where hazardous material liquids are used in individual vessels exceeding a 55-gallon (208 L) capacity shall be provided with spill control in accordance with [Section 2704.2.1] FC2704.2.1.

**2705.2.2.5 Secondary containment for hazardous material liquids.** Where required by FC Table 2705.2.1.4, buildings, rooms or areas where hazardous material liquids are used in vessels or systems shall be provided with secondary containment in accordance with [Section 2704.2.2] FC2704.2.2 when the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following quantities:

1. Individual vessel or system: greater than 55 gallons (208 L).

2. Multiple vessels or systems: greater than 1,000 gallons (3785 L).

**2705.3 Outdoor use.** Outdoor use, including dispensing, of hazardous materials shall be in accordance with [Sections] FC 2705.3.1 through 2705.3.9.

**2705.3.1 Quantities exceeding the maximum allowable quantity per control area.** Outdoor use of hazardous materials, in either closed or open containers or systems, in amounts exceeding the maximum allowable quantity per control area indicated in FC Tables 2703.1.1(3) and 2703.1.1(4) shall be in accordance with [Sections] FC 2701, 2703, 2705.1 and 2705.3.

**2705.3.2 Quantities not exceeding the maximum allowable quantity per control area.** Outdoor use of hazardous materials, in either closed or open containers or systems, in amounts not exceeding the maximum allowable quantity per control area indicated in FC Tables 2703.1.1(3) and 2703.1.1(4) shall be in accordance with [Sections] FC 2701 and 2703.

**2705.3.3 Location.** Outdoor use areas for hazardous materials shall be located as required for outdoor storage in accordance with [Section 2704] FC2704.

**2705.3.4 Spill control for hazardous material liquids in open systems.** Outdoor areas where hazardous material liquids are dispensed in vessels exceeding a 1.3-gallon (5 L)

capacity or used in open systems exceeding a 5.3-gallon (20 L) capacity shall be provided with spill control in accordance with [Section 2704.2.1] FC2704.2.1.

**2705.3.5 Secondary containment for hazardous material liquids in open systems.** Where required by FC Table 2705.2.1.4, outdoor areas where hazardous material liquids are used in open systems shall be provided with secondary containment in accordance with [Section 2704.2.2] FC2704.2.2 when the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following quantities:

1. Individual vessel or system: greater than 1.3 gallons (5 L).

2. Multiple vessels or systems: greater than 5.3 gallons (20 L).

**2705.3.6 Spill control for hazardous material liquids in closed systems.** Outdoor areas where hazardous material liquids are used in closed systems exceeding 55 gallons (208 L) shall be provided with spill control in accordance with [Section 2704.2.1] FC2704.2.1.

**2705.3.7 Secondary containment for hazardous material liquids in closed systems.** Where required by FC Table 2705.2.1.4, outdoor areas where hazardous material liquids are used in closed systems shall be provided with secondary containment in accordance with [Section 2704.2.2] FC2704.2.2 when the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following quantities:

1. Individual vessel or system: greater than 55 gallons (208 L).

2. Multiple vessels or systems: greater than 1,000 gallons (3785 L).

**2705.3.8 Clearance from combustibles.** The area surrounding an outdoor use area, including an area used for dispensing, shall be kept clear of vegetation, rubbish and other combustible waste, and combustible materials, for a minimum distance of 30 feet (9144 mm).

**2705.3.9 Weather protection.** Outdoor hazardous material use areas sheltered by overhead noncombustible construction shall not be considered indoor use when the area is constructed in accordance with the requirements for weather protection as required in the construction codes, including the Building Code.

**Exception:** Use of explosives shall be considered as indoor use.

**2705.4 Handling.** Handling of hazardous materials shall be in accordance with [Sections] FC 2705.4.1 through 2705.4.4.

**2705.4.1 Quantities exceeding the maximum allowable quantity per control area.** Handling of hazardous materials in indoor and outdoor locations in amounts exceeding the maximum allowable quantity per control area indicated in FC Tables 2703.1.1(1) through 2703.1.1(4) shall be in accordance with [Sections] FC 2701, 2703, 2705.1 and 2705.4.

**2705.4.2 Quantities not exceeding the maximum allowable quantity per control area.** Handling of hazardous materials in indoor locations in amounts not exceeding the maximum

allowable quantity per control area indicated in FC Tables 2703.1.1(1) and 2703.1.1(2) shall be in accordance with [Sections] FC 2701[,] and 2703 [and 2705.1]. Handling of hazardous materials in outdoor locations in amounts not exceeding the maximum allowable quantity per control area indicated in FC Tables 2703.1.1(3) and 2703.1.1(4) shall be in accordance with [Sections] FC 2701 and 2703.

**2705.4.3 Location.** Outdoor handling areas for hazardous materials shall be located as required for outdoor storage in accordance with [Section 2704] FC2704.

**2705.4.4 Emergency alarm.** Where hazardous materials in quantities exceeding the maximum allowable quantity per control area having a hazard ranking of 3 or 4 pursuant to NFPA 704 are moved through corridors or exit enclosures, there shall be an emergency telephone system, a local manual alarm station or an approved alarm-initiating device at not more than 150-foot (45 720-mm) intervals throughout the handling route, and at each exit doorway throughout the handling route. The signal shall be relayed to an approved central station or remote supervising station or a constantly attended on-site location and shall also initiate a local audible alarm.

## SECTION FC 2706
## NON-PRODUCTION CHEMICAL LABORATORIES

**2706.1 Scope.** This section shall govern the storage, handling and use of laboratory chemicals in a non-production laboratory and accessory storage of laboratory chemicals in a storage room. The design and construction of non-production laboratories and accessory storage rooms for laboratory chemicals shall comply with the requirements of the construction codes, including the Building Code and the Mechanical Code.

**2706.2 General.** Laboratory chemicals within a laboratory unit shall be stored, handled and used in accordance with this section and, except as otherwise provided in this section, NFPA 45 laboratory unit fire hazard class D requirements.

**2706.3 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**2706.4 Supervision.** Non-production laboratory operations requiring a permit shall be under the personal supervision of a certificate of fitness holder. At least one certificate of fitness holder shall be present on each floor of the laboratory unit on which laboratory operations are being conducted while the laboratory is in operation. Additional certificate of fitness holders shall be provided as the commissioner may require as a condition of the permit. Accessory laboratory chemical storage rooms shall be under the general supervision of a certificate of fitness holder.

**2706.5 Prohibitions.** It shall be unlawful in any non-production laboratory or any accessory storage of laboratory chemicals in a storage room to:

1. Store, handle or use any explosive.

2. Store, handle or use any unclassified detonable organic peroxide, detonable pyrophoric material, detonable unstable (reactive) material or detonable water-reactive material.

3. Store, handle or use any Class 4 unstable (reactive) material.

4. Store, handle or use any Class 4 oxidizing material.

5. Store, handle or use below grade any flammable gas.

6. Use an open flame for heating or distilling any flammable solid, flammable liquid or flammable gas.

7. Store flammable liquids in basements, cellars or other areas below grade.

8. Store combustible liquids in basements, cellars or other areas below grade in a manner contrary to FC3404.3.5.1.

**2706.6 Quantity limitations.**

**2706.6.1 Flammable and combustible liquids.** The density and total quantity of flammable and combustible liquids allowed within a laboratory unit, excluding storage rooms, shall be in accordance with Table 10.1.1 of NFPA 45 for laboratory unit fire hazard [class] Class D.

**Exceptions[.]:** For laboratory units other than educational or instructional laboratories pursuant to NFPA 45:

1. The density of flammable and combustible liquids allowed within a laboratory unit may be increased to those set forth in Table 10.1.1 of NFPA 45 for laboratory unit fire hazard [class] Class B provided the total quantity of flammable and combustible liquid, including any in storage cabinets or safety cans, does not exceed 25 gallons (95 L).

2. The density of flammable and combustible liquids allowed within a laboratory unit may be increased to those set forth in Table 10.1.1 of NFPA 45 for laboratory unit fire hazard [class] Class B provided the total quantity of flammable and combustible liquid, including any in storage cabinets or safety cans, does not exceed 30 gallons (114 L) and the walls, floors and ceilings of the laboratory unit are separated from all adjoining areas by 2-hour [fire rated] fire-rated construction.

3. The quantity of flammable and combustible liquids allowed within a laboratory unit, excluding quantities in storage cabinets or safety cans, may be increased to 100 gallons (379 L), and the total quantities of flammable and combustible liquids, including quantities in storage cabinets or safety cans, may be increased to 200 gallons (757 L) provided the walls, floors and ceilings of the laboratory unit are separated from all adjoining areas by 2-hour [fire rated] fire-rated construction.

**2706.6.2 Flammable solids.** The storage, handling and use of flammable solids within a laboratory unit shall be in accordance with FC Chapters 27 and 36. The total quantity of flammable solids stored, handled and used, excluding any quantities in a storage room, shall not exceed 10 pounds (4.54 kg).

**Exception:** The total quantity of flammable solids allowed within a laboratory unit that is provided with walls, floors and ceilings that separate the laboratory unit from all adjoining areas by 2-hour [fire rated] fire-rated construction shall not exceed 15 pounds (6.81 kg).

**2706.6.3 Oxidizers and organic peroxides.** The storage, handling and use of solid and liquid oxidizers and organic peroxides within a laboratory unit shall be in accordance with FC Chapters 27, 39 and 40 and the total quantity of all such material, excluding any quantities in a storage room, shall not exceed 40 pounds (18.16 kg), provided that not more than 2 pounds (0.908 kg) of such oxidizers are Class 3 oxidizers and not more than 1 pound (0.454 kg) of such peroxides are Class I organic peroxides.

**Exception:** The total aggregate quantity of solid and liquid oxidizers and organic peroxides allowed within a laboratory unit that is provided with walls, floors and ceilings that separate the laboratory unit from all adjoining areas by 2-hour [fire rated] fire-rated construction shall not exceed 50 pounds (22.7 kg), provided that not more than 2 pounds (0.908 kg) of such oxidizers are Class 3 oxidizers and not more than 1 pound (0.454 kg) of such peroxides are Class I organic peroxides.

**2706.6.4 Unstable (reactive) material.** The storage, handling and use of unstable (reactive) material within a laboratory unit shall be in accordance with FC Chapters 27 and 43 and the total quantity, excluding any quantities in a storage room, shall not exceed 6 pounds (2.724 kg), provided not more than 1 pound (0.454 kg) of such reactive material is Class 3 unstable (reactive).

**Exception:** The total quantity of unstable (reactive) material allowed within a laboratory unit that is provided with walls, floors and ceilings that separate the laboratory unit from all adjoining areas by 2-hour [fire rated] fire-rated construction shall not exceed 12 pounds (5.44 kg), provided not more than 1 pound (0.454 kg) of such reactive material is Class 3 unstable (reactive).

**2706.6.5 [Water reactive] Water-reactive material.** The storage, handling and use of [water reactive] water-reactive material within a laboratory unit shall be in accordance with FC Chapters 27 and 44 and the total quantity, excluding any quantities in a storage room, shall not exceed [2.5] 2½ pounds (1.135 kg).

**Exception:** The total quantity of [water reactive] water-reactive material allowed within a laboratory unit that is provided with walls, floors and ceilings that separate the laboratory unit from all adjoining areas by 2-hour [fire rated] fire-rated construction shall not exceed 5 pounds (2.27 kg).

**2706.6.6 Pyrophoric material.** The storage, handling and use of solid or liquid pyrophoric material within a laboratory unit shall be in accordance with FC Chapters 27 and 41 and the total quantity, excluding any quantities in a storage room, shall not exceed [0.5 pounds] ½ pound (0.227 kg).

**Exception:** The total quantity of solid or liquid pyrophoric material allowed within a laboratory unit that is provided with walls, floors and ceilings that separate the laboratory

unit from all adjoining areas by 2-hour [fire rated] fire-rated construction shall not exceed 1 pound (0.454 kg).

**2706.6.7 Highly toxic material.** The storage, handling and use of solid or liquid highly toxic material within a laboratory unit shall be in accordance with FC Chapters 27 and 37 and the total quantity, excluding any quantities in a storage room, shall not exceed 5 pounds (2.27 kg).

**2706.6.8 Toxic material.** The storage, handling and use of solid or liquid toxic material within a laboratory unit shall be in accordance with FC Chapters 27 and 37 and the total quantity, excluding any quantities in a storage room, shall not exceed 250 pounds (113.5 kg).

**2706.6.9 Corrosive material.** The storage, handling or use of solid or liquid corrosive material within a laboratory shall be in accordance with FC Chapters 27 and 31 and the total quantity, excluding any quantity in a storage room, shall not exceed 250 gallons (946 L).

**2706.6.10 Highly toxic and toxic gases.** It shall be unlawful to store, handle or use in any educational and instructional laboratory unit any combination of highly toxic and toxic gases in quantities that exceed 20 SCF (0.566 $m^3$).

**2706.7 Storage room classification.** Storage rooms for laboratory chemicals accessory to a laboratory unit shall be classified as set forth in the Building Code.

**2706.8 Storage rooms.** In addition to the quantities that may be stored, handled and used in a laboratory unit pursuant to [Section 2706.6] FC2706.6, chemicals for use in a laboratory unit may be stored in a dedicated storage room complying with Chapter 4 of the Building Code and the following requirements:

1. Storage room capacity shall not exceed a maximum of 300 gallons (1136 L) of chemicals, not to exceed [or] 5 gallons per square foot (204 L/$m^2$) of floor area.

2. Flammable gas storage rooms shall not contain more than 2,500 SCF (70.8 $m^3$) of flammable gas.

3. Chemicals that are incompatible with each other shall not be stored in the same storage room, unless in compliance with the requirements of this chapter.

4. Chemicals shall not be used within the storage room.

**2706.9 Safety showers.** Where more than 5 gallons (19 L) of corrosive liquid or flammable liquid are stored, handled or used, suitable facilities with fixed overhead or flexible hand-held showers shall be provided. Such shower shall be within 25 feet (7620 mm) of the laboratory unit and storage room door and shall be maintained in good working order, and readily accessible at all times.

**2706.10 Neutralizing or absorbing agents.** Where more than 5 gallons (19 L) of corrosive liquids are stored, handled or used, a sufficient quantity of suitable neutralizing or absorbing agents shall be provided.

**2706.11 Curtains and drapes.** Curtains and drapes installed in a laboratory unit shall comply with the flame resistance requirements of FC Chapter 8.

## SECTION FC 2707
## TRANSPORTATION OF HAZARDOUS MATERIALS

**2707.1 Scope.** This section shall govern the transportation of hazardous materials, as defined in the regulations of the United States Department of Transportation, as set forth in 49 CFR Part 173.

**2707.2 General.** Transportation of hazardous materials shall be in accordance with the regulations of the United States Department of Transportation and this section.

**2707.3 Prohibitions.** It shall be unlawful to:

1. Transport hazardous materials in or through the city where such transport is prohibited or restricted by federal or state law, rule or regulation, including restrictions on transportation of hazardous materials over bridges and through tunnels.

2. Transport in or through the city hazardous materials of such type, in such quantities, or in such manner as is prohibited by this code or the rules, except where such transport is in accordance with approved routes and times or other approved procedures or safety measures.

3. Transport hazardous materials in quantities requiring a permit pursuant to this code or the rules without such permit.

4. Deliver hazardous materials in quantities requiring a permit pursuant to this code or the rules to any location unless the owner or other person taking delivery thereof is in possession of a permit for the storage, handling and/or use of such hazardous material at such location.

5. Transport LPG containers that are or have ever been filled with LPG in the trunk of a passenger motor vehicle, or other area of such vehicle not readily visible to emergency responders.

**2707.4 Permits.** Permits to transport hazardous materials shall be required as set forth in [Section 105.6] FC105.6. Such permits shall be issued to a particular motor vehicle, [or] marine vessel, or watercraft for such transportation. Any hazardous material for which a permit is required pursuant to [Section 105.6] FC105.6 for transportation, may be transported without a permit provided that such cargo originates outside New York State and: (1) remains in continuous transit without picking up or delivering such cargo in the city; or (2) remains in continuous transit through the city until delivering such cargo to piers, airports and shipping terminals for transshipment out of the city. Such transport shall be in accordance with approved routes and times or other approved procedures and safety measures.

**2707.5 Transportation of hazardous materials by vehicle.** Transportation of hazardous materials by vehicle shall be in accordance with this section, the rules, and the requirements contained in the regulations of the United States Department of Transportation, as set forth in 49 CFR, Parts 171, 172, 173, 177, 178, 180, 383, 387, 390, 392, 393, 396 and 397 and their appendices, and any amendments thereto, with respect to:

1. The design, construction, maintenance and equipment of cargo tanks and other vehicles.

2. The marking and placarding of vehicles.

3. The preparation, execution and use of shipping documents.

4. The handling, loading and unloading of hazardous materials.

5. The qualifications and commercial driver's license requirements of vehicle operators.

6. Insurance and other financial requirements.

**2707.6 Transportation of explosives by vehicle.** Transportation of explosives by vehicle for storage, handling and use in the city shall additionally comply with the requirements of [Sections] FC 2707.6.1 through 2707.6.6.

**2707.6.1 Approved vehicles.** It shall be unlawful to transport, including delivering, any blasting materials or Division 1.1 or 1.5 explosives for storage, handling or use in the city, except in a vehicle designed and constructed in accordance with the rules, and for which a permit has been issued.

**2707.6.2 Nitroglycerine**. It shall be unlawful to transport any nitroglycerine-containing material, except nitroglycerine in the form of tablets, pills or granules, in quantities not exceeding [10,000] ten thousand, containing not more than 1/50 of a grain each, or to transport frozen nitroglycerine.

**2707.6.3 Packing and marking**. Other than as prescribed or approved by the commissioner, it shall be unlawful to sell or deliver for use any explosive except in original and unopened packages, packed in accordance with [Sections] FC 2707.6.3.1 through 2707.6.3.3.

**2707.6.3.1 Explosives containing liquids**. Dynamite and other explosives containing a liquid which may exude a liquid shall be transported in DOTn approved cases, lined with a [liquid-proof] liquidproof plastic lining sufficient to prevent the exudation of the liquid. Such cases shall contain not more than 50 pounds (22.7 kg) of net explosive weight.

**2707.6.3.2 Other explosives**. Other blasting materials (except black powder, blasting powder and smokeless propellant) that do not contain a substance subject to deterioration or instability by exposure to moisture shall be transported in DOTn approved cases each containing not more than 50 pounds (22.7 kg) of net explosive weight.

**2707.6.3.3 Sticks or cartridges**. All explosives in the form of sticks or cartridges shall be packed so as to lie on their sides; and, when the boxes are loaded in or upon a motor

vehicle, [or] marine vessel[,] or watercraft they shall be so arranged that the sticks or cartridges rest on their sides.

**2707.6.4 Detonators.** Transportation of blasting caps and other detonators shall additionally comply with the requirements of [Sections] FC 2707.6.4.1 and 2707.6.4.2.

**2707.6.4.1 Packaging.** It shall be unlawful to bring into, transport, or deliver within the city any blasting caps and other detonators, unless packaged in original, unopened boxes.

**2707.6.4.2 Delivery vehicles**. It shall be unlawful to transport any detonators in quantities exceeding [5,000] five thousand, or to transport or cause to be transported, detonators together with any other explosives, except in an approved container in accordance with the regulations of the United States Department of Transportation, as set forth in 49 CFR Part 177.

**2707.6.5 Black powder, blasting powder or smokeless propellants.** Black powder, blasting powder or smokeless propellant shall be transported in containers of not more than 25 pounds (11.35 kg).

**2707.6.6 Restrictions.** Vehicles transporting explosives shall comply with the following requirements:

1. [Vehicles shall deliver explosives] Explosives shall be delivered only during daylight hours.

2. No unnecessary stops shall be made in transit.

3. Vehicles shall be escorted in accordance with [Section 2707.12] FC2707.12, as applicable.

4. If explosives are being transported in more than one vehicle, the vehicles shall maintain a safe distance from each other of not less than 250 feet (76 200 mm).

5. It shall be unlawful to transport or deliver any explosives in a subway or other underground tunnel or conveyance, except as approved for blasting operations.

**2707.7 Transportation of explosives by marine vessel.** Transportation of explosives by marine vessel and watercraft shall be in accordance with the regulations of the United States Department of Transportation, as set forth in CFR Part 176, and any amendments thereto, and shall additionally comply with the requirements of [Sections] FC 2707.7.1 through 2707.7.5.

**2707.7.1 Temporary storage on marine vessel.** It shall be unlawful to store for more than 48 hours on board of any marine vessel or watercraft lying to at a wharf, pier, bulkhead or other structure over or contiguous to navigable waters within the city, any explosives in excess of the amount required for the vessel's own use for signaling or [life saving] lifesaving purposes.

**2707.7.2 Supervision.** Any powder-boat or other marine vessel or watercraft used to transport explosives upon the navigable waters within the city for delivery at a wharf, pier, bulkhead or other structure over or contiguous to navigable waters, or to a marine vessel or watercraft lying thereto, shall, while transporting explosives, have on board at all times two persons, each holding a certificate of fitness for explosives handling. Only such certificate holders, the permit holder and the marine [vessel's] vessel or watercraft's crew shall be allowed in or upon such vessel or watercraft. Whenever practicable, all explosives shall be stowed on deck under a waterproof cover or otherwise kept dry.

**2707.7.3 Detonators.** Except for marine vessels and watercraft engaged in export trade, it shall be unlawful to carry in or upon a marine vessel or watercraft transporting explosives within the city, detonators together with any other explosives, except in approved containers in accordance with the regulations of the United States Department of Transportation, as set forth in 49 CFR Part 176.

**2707.7.4 Unloading.** It shall be unlawful to unload explosives onto a wharf, pier, bulkhead or other structure over or contiguous to navigable waters. Explosives intended for storage, handling or use within the city shall be transferred from the marine vessel or watercraft making the delivery directly to a vehicle at a wharf, pier, bulkhead or other structure over or contiguous to navigable waters approved by the commissioner. Explosives intended for shipment to points outside the city may be transferred from a marine vessel or watercraft directly to another marine vessel or watercraft lying at a wharf, pier, bulkhead or other structure within the city over or contiguous to navigable waters approved by the commissioner, provided the amount so transferred does not exceed 2,500 pounds (1135 kg). All such shipments in quantities exceeding 2,500 pounds (1135 kg) but not more than 5,000 pounds (2270 kg), may be transferred from marine vessel or watercraft to a marine vessel or watercraft at a distance of not less than 1,000 feet (304 800 mm) from any pier line.

**2707.7.5 Smoking and intoxicated persons**. It shall be unlawful to smoke or maintain any flame while in or upon any marine vessel or watercraft carrying explosives, or allow in or upon such vessel or watercraft, any intoxicated person.

**2707.8 Transportation of fireworks by vehicle.** Transportation of fireworks by vehicle for firework displays in the city shall additionally comply with the requirements of [Section] FC 2707.8.1 and 2707.8.2.

**2707.8.1 Delivery to display site.** It shall be unlawful to transport fireworks through the city unless such fireworks are being transported to or from a display site for which a permit has been issued and such vehicle is escorted by department firefighting apparatus in accordance with [Section 2207.12] FC2707.12.

**2707.8.2 Restrictions.** Vehicles transporting fireworks shall comply with the requirements of [Section 2707.6.6] FC2707.6.6.

**2707.9 Transportation of flammable and combustible liquids by vehicle.** Transportation of flammable and combustible liquids by vehicle shall additionally comply with the requirements of [Sections] FC 2707.9.1 through 2707.9.5.

**2707.9.1 Operation of cargo tanks.** Cargo tanks shall be maintained and operated in accordance with [Sections] FC 2707.9.1.1 through 2707.9.1.13.

**2707.9.1.1 Vehicle maintenance.** Cargo tanks shall not be used unless they are in good working order and free from accumulation of grease, oil or other flammable or combustible waste.

**2707.9.1.2 Monitoring of loading and unloading.** The operator of a cargo tank shall not remain in the vehicle during loading or unloading of the cargo and shall personally supervise such operation from a location at which the operator may observe the vehicle, the delivery and vapor recovery hoses, the fill connection and any overfilling of the tank.

**2707.9.1.3 Vehicle shutdown.** The cargo tank motor shall be shut down during the making and breaking of hose connections. If loading or unloading is performed without the use of a power pump, the cargo tank motor shall be shut down throughout such operations.

**2707.9.1.4 Secured from movement.** All appropriate actions shall be taken to prevent vehicle movement during the loading and unloading of the cargo, including setting the parking brake and chocking of tires.

**2707.9.1.5 Outage.** A cargo tank or compartment thereof shall not be loaded to absolute capacity. The vacant space in a cargo tank or compartment thereof shall not be less than 1 percent to prevent leakage from or distortion of such tank or compartment by expansion of the contents caused by a rise in temperature.

**2707.9.1.6 Overfill prevention.** The operator of a cargo tank shall, before making delivery to a tank, determine the unfilled capacity of the tank by use of a suitable gauging device, and shall not deliver cargo in excess of that amount.

**2707.9.1.7 Securing hatches.** During the loading of cargo tanks with openable domes, the domes shall be secured on all but the receiving compartment, except that during loading of gasoline, all domes shall be secured.

**2707.9.1.8 Cargo temperature.** Flammable and combustible liquids shall not be loaded into or transported in a cargo tank or delivered at a temperature above the material's ignition temperature.

**2707.9.1.9 Bonding to underground tanks.** An external bond-wire connection or bond-wire integral to the delivery hose shall be provided when transferring flammable liquids into underground tanks.

**2707.9.1.10 Smoking.** It shall be unlawful for the operator of a cargo tank to smoke in and [around] within 25 feet (7620 mm) of the vehicle while transporting, loading or unloading cargo or to allow others to do so.

**2707.9.1.11 Hose connections.** Flammable and combustible liquids shall be transferred to tanks by means of approved [liquid and vapor tight] liquid- and vapor-tight

connections between the delivery hose and fill tank connection. Where underground tanks are equipped with a vapor recovery system, all connections required for the safe and proper functioning of the vapor recovery system shall be made and maintained [liquid and vapor tight] liquid- and vapor-tight throughout the unloading process. Vapors shall not be discharged at grade level during delivery.

**2707.9.1.12 Hose protection.** In making any delivery of flammable or combustible liquid the operator of the cargo tank shall ensure, prior to unloading, that all hoses utilized for liquid delivery and vapor recovery are protected from physical damage, including damage by motor vehicles. Such protection shall be provided by positioning the cargo tank to prevent motor vehicles from passing through the area or areas occupied by hoses, or by other approved equivalent means.

**2707.9.1.13 Method of discharge.** Gasoline that is transferred to underground tanks shall be discharged by gravity only.

**2707.9.2 Parking restrictions.** Parking of cargo tanks shall be in accordance with [Sections] FC 2707.9.2.1 and 2707.9.2.2, except that in the event of an accident, mechanical breakdown or other emergency, a cargo tank may be parked and left unattended at any safe location while the operator is obtaining assistance.

**2707.9.2.1 Restricted areas.** It shall be unlawful to:

1. Leave a cargo tank unattended at any time on a public street, or any [off street] off-street location within 250 feet (76 200 mm) of an occupied building, or any other restricted location designated by the commissioner by rule or as a condition of a permit.

2. Park cargo tanks indoors.

**2707.9.2.2 Approved parking.** Cargo tanks temporarily parked during working hours shall be parked at an approved [off street] off-street location not less than 250 feet (76 200 mm) from an occupied building. Cargo tanks shall be parked during [non-working] nonworking hours on the grounds of a bulk plant or terminal, not less than 25 feet (7620 mm) from the nearest lot line; or at other approved location, not less than 50 feet (15 240 mm) from any building.

**2707.9.3 Portable fire extinguishers.** Cargo tanks shall be equipped with a portable fire extinguisher complying with the requirements of [Section 906] FC906 and having a minimum rating of 2-A:20-B:C. During unloading of the cargo tank, the portable fire extinguisher shall be outside of the motor vehicle and shall be readily available, but at a distance of at least 15 feet (4572 mm) from the unloading valves.

**2707.9.4 [Unloading] Delivery and unloading of cargo.** Except as otherwise provided in FC3406.2.8, cargo tanks shall deliver flammable or combustible liquids only to approved stationary storage systems. Flammable liquids being transported by a motor vehicle other than a cargo tank shall not be dispensed from a container prior to removal of the container from the vehicle.

**2707.9.5 Emergency transfers between vehicles.** Department representatives may authorize a transfer from one cargo tank directly into a permitted or other approved cargo tank in the interest of public safety, such as when a cargo tank has been involved in a vehicular accident or has otherwise been damaged.

**2707.9.6 Compartmental markings.** The maximum capacity of each compartment of a cargo tank shall be marked, in gallons, on the driver and passenger sides of the cargo tank in 3-inch (76-mm) white letters.

**2707.10 Transportation of compressed gases by cargo tank.** Transportation of compressed gases by cargo tank shall additionally comply with the requirements of [Section 2707.10.1] FC2707.10.1.

**2707.10.1 Prohibited compressed gases.** It shall be unlawful to transport the following compressed gases in a cargo tank:

1. Acetylene.
2. Liquefied carbon monoxide.
3. Liquefied chlorine.
4. Cyanogen.
5. Cyclopropane.
6. Diborane.
7. Di-, mono-, and tri-methylamines.
8. Dimethyl ether.
9. Ethylene.
10. Fluorine.
11. Liquefied hydrogen.
12. Hydrogen cyanide.
13. Hydrogen sulfide.
14. Liquefied petroleum gases (LPG).
15. Liquefied natural gas (LNG).
16. Methylacetylene propadiene mixture-stabilized, including propyns, mapp gas or apache gas.
17. Methyl chloride.
18. Methyl mercaptan.
19. Phosgene.
20. Phosphine.
21. Vinyl chloride.
22. Vinyl fluoride.
23. Vinyl methyl ether.
24. Any gas mixtures of the foregoing.
25. Any gas that contains:
    - 25.1. Bromacetone.
    - 25.2. Cyanogen chloride containing less than 0.9 percent water.
    - 25.3. Diphosgene.
    - 25.4. Ethyldichlorarsine.
    - 25.5. Methyldichlorarsine.

25.6. Nitrogen peroxide (tetroxide).
25.7. Nitrogen tetroxide-nitric oxide mixtures containing up to 33.2 percent weight nitric oxide.

**2707.11 Route and time requirements.** Vehicles transporting hazardous materials shall comply with such route and time requirements as the commissioner may promulgate by rule, except that vehicles for which a permit has been issued for the transportation of hazardous materials may transport such hazardous materials, including delivery, without having to comply with such route and time requirements.

**2707.12 Escort requirements for vehicles transporting explosives and fireworks.** Vehicles transporting explosives and fireworks shall additionally comply with the requirements of [Sections] FC 2707.12.1 and 2707.12.2.

**2707.12.1 Vehicles transporting explosives.** Vehicles transporting in or through the city [any amount of] Division 1.1, 1.2, 1.3 or 1.5 explosives[, or more than 50 pounds (22.7 kg) of Division 1.4 or 1.6 explosives] requiring the vehicle to be placarded pursuant to DOTn regulations, including vehicles in continuous transit or transporting such explosives on approved routes at approved times, shall be escorted by department firefighting apparatus unless such explosives are transported in a vehicle [permitted for such explosives] for which a transportation permit has been issued.

**2707.12.2 Vehicles transporting fireworks.** Vehicles transporting [any amount of] fireworks[, 1.3, or more than 50 pounds (22.7 kg) of fireworks, 1.4] in amounts requiring the vehicle to be placarded pursuant to DOTn regulations, whether in continuous transit through the city or to or from a fireworks display in the city or surrounding waters, shall be escorted by department firefighting apparatus, in accordance with approved routes and times.

## CHAPTER 28
## AEROSOLS

## SECTION FC 2801
## GENERAL

**2801.1 Scope.** This chapter shall govern the manufacture, storage, handling and use of combustible Level 1, 2 and 3 aerosol products, including the display of such products in any building, structure or premises.

**2801.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**2801.3** [Reserved.] **Supervision.** The handling and use of aerosols in quantities requiring a permit shall be performed under the personal supervision of a person holding a certificate of fitness. The storage of aerosols in quantities requiring a permit shall be under the general supervision of a person holding a certificate of fitness.

**2801.4 General.** Combustible Level 1, 2 and 3 aerosol products shall be manufactured, stored, handled and used in accordance with this chapter, the construction codes, including the Building Code, and NFPA 30B.

**2801.5 Manufacturing prohibited.** It shall be unlawful to manufacture Level 1, 2 or 3 aerosol products.

**2801.6 Aerosol container size limitations.** It shall be unlawful to store, handle or use Level 1, 2 or 3 aerosol products in metal cans exceeding 33.8 fluid ounces (1000 ml), or in glass or plastic bottles exceeding 4 fluid ounces (118 ml).

**Exceptions:**

1. Level 3 aerosol products shall be stored, handled and used in containers with a maximum capacity of 24 fluid ounces (708 ml).

2. Pressurized ether shall be stored, handled or used only in metal containers with a maximum capacity of 8 fluid ounces (236 ml).

3. Level 1, 2 and 3 [oven cleaning] <u>oven-cleaning</u> aerosol products shall be stored, handled or used in containers with a maximum capacity of 16 fluid ounces (472 ml).

## SECTION FC 2802
## DEFINITIONS

**2802.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**AEROSOL.** A product that is dispensed from a container by a propellant, classified as follows:

**Level 1.** Aerosol products with a total chemical heat of combustion that is greater than 0 and less than or equal to 8,600 British thermal units per pound (Btu/lb) (20 kJ/g).

**Level 2.** Aerosol products with a total chemical heat of combustion that is greater than 8,600 Btu/lb (20 kJ/g), but less than or equal to 13,000 Btu/lb (30 kJ/g).

**Level 3.** Aerosol products with a total chemical heat of combustion that is greater than 13,000 Btu/lb (30 kJ/g).

**AEROSOL CONTAINER.** A metal can, or a glass or plastic bottle designed to dispense an aerosol.

**AEROSOL WAREHOUSE.** A Group H or S occupancy used exclusively for the [non-retail] <u>nonretail</u> storage <u>and transhipment</u> of aerosol products.

**PROPELLANT.** The liquefied or compressed gas in an aerosol container that expels the contents from an aerosol container when the valve is actuated. A propellant is considered

flammable if it forms a flammable mixture with air, or if a flame is self-propagating in a mixture with air.

**RETAIL DISPLAY AREA.** The area of a Group M occupancy open for the purpose of viewing or purchasing merchandise offered for sale. Individuals in such establishments are free to circulate among the items offered for sale which are typically displayed on shelves, racks or the floor.

## SECTION FC 2803
## CLASSIFICATION OF AEROSOL PRODUCTS

**2803.1 Classification levels.** Aerosol products shall be classified as Level 1, 2 or 3 in accordance with [Section 2802.1] FC2802.1. Aerosol products in cartons which are not identified shall be classified as Level 3.

**2803.2 Identification.** Cartons shall be identified on at least one side with the classification level of the aerosol products contained within the carton as follows: LEVEL _____ AEROSOLS.

## SECTION FC 2804
## INDOOR STORAGE OF AEROSOL PRODUCTS

**2804.1 General.** Indoor storage of Level 2 and 3 aerosol products shall comply with the requirements of [Sections] FC 2804.2 through 2804.7 and NFPA 30B. Level I aerosol products shall be considered equivalent to a Class III commodity and shall comply with the requirements for palletized or rack storage set forth in NFPA 13, as modified by FC Appendix B.

**2804.2 Storage in Groups A, B, E, F, I and R.** Except as otherwise provided in [Section 2804.2.1] FC2804.2.1, it shall be unlawful to store Level 2 and 3 aerosol products in Group A, B, E, F, I and R occupancies in excess of the following amounts:

1. A net weight of 1,000 pounds (454 kg) of Level 2 aerosol products.

2. A net weight of 500 pounds (227 kg) of Level 3 aerosol products.

3. A combined net weight of 1,000 pounds (454 kg) of Level 2 and 3 aerosol products.

**2804.2.1 Excess storage.** Level 2 and 3 aerosol products exceeding the maximum quantities set forth in [Section 2804.2] FC2804.2 may be lawfully stored in accordance with [Sections] FC 2804.2.1.1 and 2804.2.1.2.

**2804.2.1.1 Storage cabinets.** Aerosol products in a quantity not to exceed 100 percent of the maximum storage limitation may be stored in storage cabinets in accordance with [Section 3404.3.2] FC3404.3.2.

**2804.2.1.2 Storage rooms.** Level 2 and 3 aerosol products in a quantity exceeding that set forth in [Section 2804.2] FC2804.2 may be lawfully stored indoors in a flammable liquid storage room in accordance with [Section 2804.5] FC2804.5.

**2804.3 Storage in general purpose warehouses.** Storage of aerosol products in general purpose warehouses, as defined in NFPA 30B, utilized only for warehousing-type operations involving mixed commodities shall comply with the requirements of [Section] FC 2804.3.1 or 2804.3.2.

**2804.3.1 Nonsegregated storage.** Storage consisting of solid pile, palletized or rack storage of Level 2 and 3 aerosol products not segregated into areas utilized exclusively for the storage of aerosols shall comply with the requirements of FC Table 2804.3.1.

**FC TABLE 2804.3.1**
**NONSEGREGATED STORAGE OF LEVEL 2 AND 3 AEROSOL PRODUCTS IN GENERAL PURPOSE WAREHOUSES[b]**

| AEROSOL LEVEL | MAXIMUM NET WEIGHT PER FLOOR (pounds)[b] | | | |
|---|---|---|---|---|
| | Palletized or solid-pile storage | | Rack storage | |
| | Unprotected | Protected[a] | Unprotected | Protected[a] |
| 2 | 2,500 | 12,000 | 2,500 | 24,000 |
| 3 | 1,000 | 12,000 | 1,000 | 24,000 |
| Combination 2 and 3 | 2,500 | 12,000 | 2,500 | 24,000 |

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg, 1 square foot = 0.0929 $m^2$.
a. Sprinkler system protection and storage arrangements shall comply with the requirements of NFPA 30B. Sprinkler system protection shall extend 20 feet beyond the storage area containing the aerosol products.
b. Storage quantities indicated are the maximum [permitted] allowed in any 50,000-square-foot area.

**2804.3.2 Segregated storage.** Storage of Level 2 and 3 aerosol products segregated into areas utilized exclusively for the storage of aerosols shall be in accordance with FC Table 2804.3.2 and [Sections] FC 2804.3.2.1 and 2804.3.2.2.

**2804.3.2.1 Chain-link fence enclosures.** Chain-link fence enclosures required by FC Table 2804.3.2 shall comply with the following requirements:

1. The fence shall not be less than No. 9 gage steel wire, woven into a maximum 2-inch ([51 mm] 51-mm) diamond mesh.

2. The fence shall be installed from the floor to the underside of the roof or ceiling above.

3. Class [III,] IV and high-hazard commodities shall be stored outside of the aerosol storage area and a minimum of 8 feet (2438 mm) from the fence.

4. Access openings in the fence shall be provided with either self-closing or automatic-closing devices or a labyrinth opening arrangement preventing aerosol containers from rocketing through the access openings.

5. Not less than two means of egress shall be provided from the fenced enclosure.

**2804.3.2.2 Aisles.** The minimum aisle requirements for segregated storage in general purpose warehouses shall be in accordance with FC Table 2804.3.2.2.

**2804.4 Storage in aerosol warehouses.** The total quantity of Level 2 and 3 aerosol products stored in [a] an aerosol warehouse [exclusively utilized for the storage, shipping and receiving of aerosol products] shall not be restricted [in structures complying] provided such warehouse complies with the requirements of [Sections] FC 2804.4.1 through 2804.4.4.

**FC TABLE 2804.3.2**

**SEGREGATED STORAGE OF LEVEL 2 AND 3 AEROSOL PRODUCTS IN GENERAL PURPOSE WAREHOUSES**

| STORAGESEPARATION | MAXIMUM SEGREGATED STORAGE AREA[a] | | SPRINKLER REQUIREMENTS |
|---|---|---|---|
| | Percentage of building area (percent) | Area limitation (square feet) | |
| Separation area[e, f] | 15 | 20,000 | Notes b, c |
| Chain-link fence enclosure [d] | 20 | 20,000 | Notes b, c |
| 1-hour fire-resistance-rated interior walls | 20 | 30,000 | Note b |
| 2-hour fire-resistance-rated interior walls | 25 | 40,000 | Note b |
| 3-hour fire-resistance-rated interior walls | 30 | 50,000 | Note b |

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 $m^2$.

a. The maximum segregated storage area shall be limited to the smaller of the two areas resulting from the percentage of building area limitation and the area limitation.

b. Sprinkler system protection in aerosol product storage areas shall comply with the requirements of NFPA 30B and be approved. Other building areas not containing aerosol product storage shall be protected throughout by a sprinkler system in accordance with the construction codes, including the Building Code.

c. Sprinkler system protection in aerosol product storage areas shall comply with the requirements of NFPA 30B and be approved. Sprinkler system protection shall extend a minimum 20 feet beyond the aerosol storage area.

d. Chain-link fence enclosures shall comply with the requirements of [Section 2804.3.2.1] FC2804.3.2.1.

e. A separation area shall be defined as an area extending outward from the periphery of the segregated aerosol product storage area as follows.

1. The limits of the aerosol product storage shall be clearly marked on the floor.
2. The separation distance shall be a minimum of 25 feet and maintained clear of all materials with a commodity classification greater than Class Ill in accordance with [Section 903.3.1.1] NFPA 13, as modified by FC Appendix B.

f. Separation areas shall be allowed when approved.

**FC TABLE 2804.3.2.2**
**SEGREGATED STORAGE AISLE WIDTHS AND DISTANCE TO AISLES IN GENERAL PURPOSE WAREHOUSES**

| STORAGE CONDITION | MINIMUM AISLE WIDTH (feet) | MAXIMUM DISTANCE FROM STORAGE TO AISLE (feet) |
|---|---|---|
| Solid pile or palletized[a] | 4 feet between piles | 25 |
| Racks with ESFR sprinklers[a] | 4 feet between racks and adjacent Level 2 and 3 aerosol product storage | 25 |
| Racks without ESFR sprinklers[a] | 8 feet between racks and adjacent Level 2 and 3 aerosol product storage | 25 |

For SI: 1 foot = 304.8 mm.

a. Sprinklers shall comply with the requirements of NFPA 30B.

**2804.4.1 Sprinkler system.** Aerosol warehouses shall be protected throughout by a wet-pipe sprinkler system in accordance with NFPA 30B. Sprinkler protection shall be designed based on the highest classification level of aerosol product present.

**2804.4.2 Pile and palletized storage aisles.** Solid pile and palletized storage shall be arranged so the maximum travel distance to an aisle is 25 feet (7620 mm). Aisles shall have a minimum width of 4 feet (1219 mm).

**2804.4.3 Rack storage aisles.** Rack storage shall be arranged with a minimum aisle width of 8 feet (2438 mm) between rows of racks and 8 feet (2438 mm) between racks and adjacent solid pile or palletized storage. Where early suppression fast-response (ESFR) sprinklers provide sprinkler protection, the minimum aisle width shall be 4 feet (1219 mm).

**2804.4.4 Combustible commodities.** Combustible commodities, other than flammable and combustible liquids, may be stored in an aerosol warehouse.

**Exception:** Flammable and combustible liquids in 1-quart (0.95 L) metal containers and smaller may be stored in an aerosol warehouse.

**2804.5 Storage in indoor flammable liquid storage rooms.** Indoor flammable liquid storage rooms shall comply with the requirements of [Section 3404.3.7] FC3404.3.7. The maximum quantities of aerosol products shall comply with the requirements of [Section] FC 2804.5.1 or 2804.5.2.

**2804.5.1 Storage rooms of 500 square feet or less.** The storage of aerosol products in flammable liquid storage rooms less than or equal to 500 square feet (46 $m^2$) in area shall not exceed the following quantities:

1. A net weight of 1,000 pounds (454 kg) of Level 2 aerosol products.

2. A net weight of 500 pounds (227 kg) of Level 3 aerosol products.

3. A combined net weight of 1,000 pounds (454 kg) of Level 2 and 3 aerosol products.

**2804.5.2 Storage rooms greater than 500 square feet.** The storage of aerosol products in flammable liquid storage rooms greater than 500 square feet (46 $m^2$) in area shall not exceed the following quantities:

1. A net weight of 2,500 pounds (1135 kg) of Level 2 aerosol products.

2. A net weight of 1,000 pounds (454 kg) of Level 3 aerosol products.

3. A combined net weight of 2,500 pounds (1135 kg) of Level 2 and 3 aerosol products. The maximum aggregate storage quantity of Level 2 and 3 aerosol products [permitted] allowed in separate indoor storage rooms protected by a sprinkler system in accordance with NFPA 30B shall be 5,000 pounds (2270 kg).

**2804.6 Storage in liquid warehouses.** The storage of Level 2 and 3 aerosol products in liquid warehouses, as defined in NFPA 30B, shall comply with the requirements of NFPA 30B. The storage shall be located within segregated storage areas in accordance with [Section 2804.3.2] FC2804.3.2 and [Sections] FC 2804.6.1 through 2804.6.3.

**2804.6.1 Containment.** Spill control or drainage shall be provided to prevent the flow of liquid to within 8 feet (2438 mm) of the segregated storage area.

**2804.6.2 Sprinkler design.** Sprinkler protection shall be designed based on the highest level of aerosol product present.

**2804.6.3 Opening protection into segregated storage areas.** Fire doors or gates opening into the segregated storage area shall either be self-closing or provided with automatic-closing devices activated by sprinkler water flow or an approved fire detection system.

**2804.7 Storage in Group M occupancies.** Storage of Level 2 and 3 aerosol products in occupancies in Group M shall comply with the requirements of FC Table 2804.7. Retail display shall comply with the requirements of [Section 2806] FC2806.

**FC TABLE 2804.7**
**MAXIMUM QUANTITIES OF LEVEL 2 AND 3 AEROSOL PRODUCTS IN RETAIL STORAGE AREAS**

| MAXIMUM NET WEIGHT PER FLOOR (pounds) | | | |
|---|---|---|---|
| | | Segregated storage | |
| Floor | Nonsegregated storage[a, b] | Storage cabinets[b] | Separated from retail area[c] |
| Basement, cellar or other area below grade | Not permitted | Not permitted | Not permitted |
| Ground floor | 2,500 | 5,000 | Note d |
| Upper floors | 500 | 1,000 | Note d |

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 $m^2$.
a. The total aggregate quantity on display and in storage shall not exceed the maximum retail display quantity indicated in [Section 2806.3] FC2806.3.
b. Storage quantities indicated are the maximum [permitted] allowed in any 50,000-square-foot area.
c. The storage area shall be separated from the retail area with a 1-hour fire-resistance-rated assembly.
d. See FC Table 2804.3.2.

## SECTION FC 2805
## OUTDOOR STORAGE

**2805.1 General.** The outdoor storage of Level 2 and 3 aerosol products, including storage in temporary storage trailers, shall be separated from exposures in accordance with FC Table 2805.1.

**FC TABLE 2805.1**
**DISTANCE TO EXPOSURES FOR OUTDOOR STORAGE OF LEVEL 2 AND 3 AEROSOL PRODUCTS**

| EXPOSURE | MINIMUM DISTANCE FROM AEROSOL STORAGE (feet) [a] |
|---|---|
| Public streets or private roads | 20 |
| Buildings | 50 |
| Exit discharge to a public street or private road | 50 |
| Lot lines | 20 |
| Other outdoor hazardous material storage | 50 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.
a. The minimum separation distance indicated is not required where exterior walls having a 2-hour fire-resistance rating without penetrations separate the storage from the exposure. The walls shall extend not less than 30 inches above and to the sides of Level 2 and 3 aerosol products.

## SECTION FC 2806
## RETAIL DISPLAY

**2806.1 General.** This section shall apply to the retail display of Level 2 and 3 aerosol products.

**2806.2 Retail aerosol product displays not exceeding 8 feet high.** Aerosol product displays for retail sale not exceeding 8 feet (2438 mm) in height shall comply with the requirements of FC 2806.2.1 through 2806.2.4.

**[2806.2] 2806.2.1 Maximum [quantities in retail display areas] quantity.** [Aerosol products in retail display areas shall not exceed quantities needed for display and normal merchandising and shall not exceed the quantities in] Only aerosol products being used for display purposes shall be stored for sale in retail display areas and the total quantity of such aerosol products shall not exceed the amounts set forth in FC Table [2806.2] 2806.2.1.

**FC TABLE [2806.2] 2806.2.1**

**MAXIMUM QUANTITIES OF LEVEL 2 AND 3 AEROSOL PRODUCTS IN RETAIL DISPLAY AREAS**

| MAXIMUM NET WEIGHT PER FLOOR (pounds)[a,] b | | | |
|---|---|---|---|
| FLOOR | Unprotected[c] a | Protected in accordance with FC2806.2[a, c[,d]] | Protected in accordance with FC2806.3[c] |
| Basement, cellar or other area below grade | Not allowed | 500 | 500 |
| Ground | 2,500 | 10,000 | 10,000 |
| Upper | 500 | 2,000 | Not allowed |

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 $m^2$.
a. The total quantity shall not exceed 1,000 pounds net weight in any one 100-square-foot retail display area.
[b. When packaged, stored and protected in accordance with NFPA 30B, quantity limits shall be limited to those specified in NFPA 30B.]
[c] b. Per 25,000-square-foot retail display area.
[d] c. Minimum Ordinary Hazard Group 2 wet-pipe sprinkler system throughout the retail sales occupancy.

**[2806.3 Maximum quantities in storage areas.** Aerosol products in storage areas adjacent to retail display areas shall not exceed the quantities in Table 2806.3.

**TABLE 2806.3**
**MAXIMUM STORAGE QUANTITIES FOR STORAGE AREAS ADJACENT TO RETAIL DISPLAY OF LEVEL 2 AND LEVEL 3 AEROSOLS**

| MAXIMUM NET WEIGHT PER FLOOR (pounds) | | | |
|---|---|---|---|
| Floor | Unseparated[a, b] | Separated | |
| | | Storage cabinets[b] | 1-hour occupancy separation |
| Basement, cellar or other area below grade | Not allowed | Not allowed | Not allowed |
| Ground | 2,500 | 5,000 | In accordance with NFPA 30B, Sections 4-3.4.2 and 4-3.4.3 |
| Upper | 500 | 1,000 | In accordance with NFPA 30B, Sections 4-3.4.2 and 4-3.4.3 |

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 $m^2$.
a. The aggregate quantity in storage and retail display shall not exceed the quantity limits for retail display.
b. In any 50,000-square-foot area.]

**[2806.4] 2806.2.2 Display of containers.** Aerosol containers shall not be stacked more than 6 feet (1829 mm) high from the base of the aerosol array to the top of the aerosol array unless the containers are placed on fixed shelving or otherwise secured in an approved manner. When storage or retail display is on shelves, the height of such storage or retail display to the top of aerosol containers shall not exceed 8 feet (2438 mm) from the floor.

**Exception:** Storage or display protected in accordance with [Sections 2806.2 and 2806.3] FC2806.3.

**[2806.5] 2806.2.3 Combustible cartons.** Aerosol products located in retail display areas shall be removed from combustible cartons.

**Exceptions:**

1. Display areas that use a portion of combustible cartons, which consist of only the bottom panel and not more than 2 inches (51 mm) of side panel are allowed.

2. When the display area is protected in accordance with [Table 4-3] Tables 6.3.2.7(a) through 6.3.2.7(l) of NFPA 30B, storage of aerosol products in combustible cartons is allowed.

**[2806.6 Aisles.** Aisles not less than 4 feet (1219 mm) in width shall be maintained on three sides of a retail display area containing aerosol products.

**Exception:** An approved aggregate quantity of aerosol product in the occupancy of less than 100 pounds (45.4 kg).]

**[2806.7]** **2806.2.4 Retail display sprinkler system.** When a sprinkler system is required for the protected retail display of aerosol products, the wet-pipe sprinkler system shall be in accordance with this code, and the construction codes, including the Building Code. The minimum system design shall be for an Ordinary Hazard Group 2 occupancy. The system shall be provided throughout the retail display area.

**[2806.8 Storage fire extinguishing system.** When the height of any stored or displayed aerosol products exceeds the height limitations set forth in Section 2806.4, the design of the sprinkler system shall be in accordance with NFPA 30B.]

**2806.3 Retail aerosol displays exceeding 8 feet high.** Aerosol product displays for retail sale exceeding 8 feet (2438 mm) in height shall comply with the requirements of FC 2806.3.1 through 2806.3.3.

**2806.3.1 Maximum quantity.** Only aerosol products being used for display purposes shall be stored for sale in retail display areas and the total quantity of such aerosol products shall not exceed the amounts set forth in FC Table 2806.2.1.

**2806.3.2 Fire protection.** Aerosol displays shall be protected by a sprinkler system in accordance with NFPA 30B and the following requirements:

1. The fire protection required for a retail display of aerosol products shall be determined based on the height of the aerosol products in the display and the type of packaging in which aerosol products displayed more than 6 feet (1829 mm) above the finished floor are stored.

2. Uncartoned Level 2 and 3 aerosols and Level 2 and 3 aerosols in display-cut cartons may be displayed not more than 6 feet (1829 mm) above the finished floor when applying the cartoned aerosol display tables set forth in NFPA 30B.

3. Where sprinkler protection is provided for a Level 2 or 3 aerosol retail display area, such sprinkler system shall be designed to extend coverage to an area not less than 20 feet (6096 mm) in all directions beyond the display area.

4. Where ordinary and high-temperature ceiling sprinkler systems are adjacent to each other, noncombustible draft curtains shall be installed between the areas protected by the respective sprinkler systems.

**2806.3.3 Fire separation.** Retail displays of Level 2 and 3 aerosol products shall comply with the following separation distance requirements:

1. Level 2 and 3 aerosol display areas shall be separated from each other by not less than 25 feet (7620 mm).

2. Level 2 and 3 aerosol displays shall be separated from flammable and combustible liquids storage and display areas by one or more of the following measures:

   2.1. A horizontal distance of not less than 25 feet (7620 mm).

   2.2. A noncombustible partition extending not less than 18 inches (457 mm) above the merchandise. When the aerosol products are located within 25 feet (7620 mm) of flammable or combustible liquids, the noncombustible partition shall be liquid tight at the floor level.

   2.3. Special fire protection for double-row racks in accordance with FC2806.5.

**2806.4 Maximum quantities in storage areas.** Aerosol products in storage areas adjacent to retail display areas shall not exceed the quantities in FC Table 2806.4.

**FC TABLE 2806.4**
**MAXIMUM STORAGE QUANTITIES FOR STORAGE AREAS ADJACENT TO RETAIL DISPLAY OF LEVEL 2 AND LEVEL 3 AEROSOLS**

| MAXIMUM NET WEIGHT PER FLOOR (pounds) | | | |
|---|---|---|---|
| Floor | Unseparated[a, b] | Separated | |
| | | Storage cabinets[b] | 1-hour occupancy separation |
| Basement, cellar or other area below grade | Not allowed | Not allowed | Not allowed |
| Ground | 2,500 | 5,000 | In accordance with NFPA 30B, Sections 6.3.4.3 and 6.3.4.4 |
| Upper | 500 | 1,000 | In accordance with NFPA 30B, Sections 6.3.4.3 and 6.3.4.4 |

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 $m^2$.
a. The aggregate quantity in storage and retail display shall not exceed the quantity limits for retail display.
b. In any 50,000-square-foot area.

**2806.5 Special protection design for Level 2 and 3 aerosols adjacent to flammable and combustible liquids in double-row racks.** The display of Level 2 and 3 aerosols adjacent to flammable and combustible liquids in double-row racks shall be in accordance with FC 2806.5.1 through 2806.5.8 or FC2806.3.3.

**2806.5.1 Fire protection.** Fire protection for the display of Level 2 and 3 aerosols in double-row racks shall be in accordance with Table 7.4.1 and Figure 7.4.1 of NFPA 30B.

**2806.5.2 Cartoned products.** Level 2 and 3 aerosols displayed more than 8 feet (2438 mm) above the finished floor shall be in cartons.

**2806.5.3 Shelving.** Shelving in racks shall be limited to wire mesh shelving having uniform openings not more than 6 inches (152 mm) apart, with the openings comprising at least 50 percent of the overall shelf area.

**2806.5.4 Aisles.** Racks shall be arranged so that aisles not less than 7½ feet (2286 mm) wide are maintained between rows of racks and adjacent solid-piled or palletized merchandise.

**2806.5.5 Flue spaces.** Flue spaces in racks shall comply with the following:

1. Transverse flue spaces–nominal 3-inch (76-mm) transverse flue spaces shall be maintained between merchandise and rack uprights.

2. Longitudinal flue spaces–nominal 6-inch (152-mm) longitudinal flue spaces shall be maintained.

**2806.5.6 Horizontal barriers.** Horizontal barriers constructed of minimum 3/8-inch-thick (10-mm-thick) plywood or minimum 0.034-inch (0.086-mm) (No. 22 gage) sheet metal shall be provided and located in accordance with NFPA 30B when in-rack sprinklers are installed.

**2806.5.7 Class I, II, III, IV and plastic commodities.** Class I, II, III, IV and plastic commodities located adjacent to retail Level 2 and 3 aerosol product displays shall be protected in accordance with NFPA 13, as modified by FC Appendix B.

**2806.5.8 Flammable and combustible liquids.** Class I, II, III A and III B Liquids shall be allowed to be located adjacent to Level 2 and 3 aerosol products when the following conditions are met:

1. Class I, II, IIIA and IIIB liquid containers: Containers for Class I, II, IIIA and IIIB liquids shall be limited to 1.06-gallon (4-L) metal-relieving and nonrelieving style containers and 5.3-gallon (20-L) metal-relieving style containers.

2. Fire protection for Class I, II, IIIA and IIIB Liquids: Automatic sprinkler protection for Class I, II, IIIA and IIIB liquids shall be in accordance with FC Chapter 34.

## CHAPTER 29
## COMBUSTIBLE FIBERS

### SECTION FC 2901
### GENERAL

**2901.1 Scope.** This chapter shall govern the storage and handling of combustible fibers.

**2901.2 General.** Combustible fibers shall be stored and handled in accordance with this chapter.

**2901.3 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**2901.4 Approved facility or location.** Combustible fibers in quantities requiring a permit shall be stored in an approved facility or other approved location.

**2901.5 Prohibition.** It shall be unlawful to store combustible fibers in a quantity that covers more than two-thirds of the floor area of any floor or in a quantity that is to a height greater than two-thirds of the distance from the floor to the ceiling.

## SECTION FC 2902
## DEFINITIONS

**2902.1 Definition.** The following term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

**BALED COTTON.** A natural seed fiber wrapped in and secured with industry-accepted materials, typically consisting of burlap, woven polypropylene, polyethylene or cotton or sheet polyethylene, secured with wire or bands. The term baled cotton includes lint removed from the cottonseed (linters) and residual materials from the ginning process (motes).

**BALED COTTON, DENSELY PACKED.** Baled cotton with a packing density of at least 22 pounds per cubic foot (360 kg/m$^3$). A bale of densely-packed baled cotton typically measures 55 inches (1397 mm) in length, 21 inches (533 mm) in width, and 27.6 to 35.4 inches (701 to 899 mm) in height.

**COMBUSTIBLE FIBERS.** Readily ignitable and free-burning [fibers] materials in a fibrous or shredded form, such as cocoa fiber, cotton, excelsior, hay, hemp, henequen, istle, jute, kapok, oakum, sisal, Spanish moss, straw, tow, wastepaper, or other natural or synthetic fibers that possess similar qualities, but excluding densely packed baled cotton.

**SEED COTTON.** Cotton in its raw, unprocessed (unginned) form, an agricultural commodity consisting of cotton fiber (lint) attached to the seed of the cotton plant.

## SECTION FC 2903
## GENERAL REQUIREMENTS

**2903.1 Combustible waste.** Ashes, rubbish or other combustible waste shall not be placed in wooden or other combustible containers and shall be removed daily from the facility.

**2903.2 Vegetation.** Grass, vines, weeds, brush or other combustible vegetation shall not be allowed to accumulate within 15 feet (4570 mm) of any combustible fiber storage location.

**2903.3 Clearances.** A minimum clearance of 3 feet (914 mm) shall be maintained between sprinkler heads and the top of piles.

**2903.4 Agricultural products.** Hay, straw, seed cotton or similar agricultural products shall not be stored in an area adjoining any combustible fiber storage location unless a clear horizontal distance equal to the height of a pile is maintained between such agricultural products and such storage location. Storage shall be limited to stacks of 100 tons (91 metric tons) each. Stacks shall be separated by a minimum of 20 feet (6096 mm) of clear space.

**2903.5 Dust collection.** Where located within a building, devices, equipment and systems that generate or emit combustible fibers shall be provided with an approved dust-collecting and

exhaust system. Such system shall comply with the requirements of FC Chapter 13 and the construction codes, including the Mechanical Code.

**2903.6 Portable fire extinguishers.** Portable fire extinguishers shall be provided in accordance with [Section 906] FC906 governing extra-hazard occupancy protection, as set forth in FC Table [906.3(1)] 906.3.1.

## SECTION FC 2904
## LOOSE FIBER STORAGE

**2904.1** Reserved.

**2904.2 Storage of 100 cubic feet or less.** Loose combustible fibers in quantities of not more than 100 cubic feet (3 $m^3$) located in a building or structure shall be stored in a metal or metal-lined bin equipped with a self-closing cover.

**2904.3 Storage of more than 100 cubic feet to 500 cubic feet.** Loose combustible fibers in quantities exceeding 100 cubic feet (3 $m^3$) but not exceeding 500 cubic feet (14 $m^3$) shall be stored in rooms enclosed with 1-hour fire-resistance-rated fire barriers, with openings protected by an approved opening protective assembly having a fire protection rating of ¾-hour, constructed in accordance with the construction codes, including the Building Code.

**2904.4 Storage of more than 500 cubic feet to 1,000 cubic feet.** Loose combustible fibers in quantities exceeding 500 cubic feet (14 $m^3$) but not exceeding 1,000 cubic feet (28 $m^3$) shall be stored in rooms enclosed with 2-hour fire-resistance-rated fire barriers, with openings protected by an approved opening protective assembly having a fire protection rating of 1½-hours, and constructed in accordance with the construction codes, including the Building Code.

**2904.5 Storage of more than 1,000 cubic feet to 2,500 cubic feet.** Loose combustible fibers in quantities exceeding 1,000 cubic feet (28 $m^3$) but not exceeding 2,500 cubic feet (70 $m^3$) shall be stored in rooms enclosed with 2-hour fire-resistance-rated fire barriers, with openings protected by an approved opening protective assembly having a fire protection rating of 1½-hours, and constructed in accordance with the construction codes, including the Building Code. The storage room shall be protected throughout by a sprinkler system.

**2904.6 Storage of more than 2,500 cubic feet; detached storage structure.** Loose combustible fibers in quantities exceeding 2,500 cubic feet (70 $m^3$) but not exceeding 10,000 cubic feet (280 $m^3$) shall be stored in a detached structure suitably located, with openings protected against entrance of sparks. The structure shall not be occupied for any other purpose. Loose combustible fibers in quantities exceeding 10,000 cubic feet (280 $m^3$) may be stored only with the approval of the commissioner.

**2904.7 Separation from hazardous materials.** No hazardous material shall be stored in any room or detached structure containing loose combustible fibers.

## SECTION FC 2905
## BALED STORAGE

**2905.1 Bale size and separation.** Baled combustible fibers shall be limited to single blocks or piles not more than 25,000 cubic feet (700 $m^3$) in volume, not including aisles or clearances. Blocks or piles of baled fiber shall be separated from adjacent storage by aisles not less than 5 feet (1524 mm) wide, or by flash-fire barriers constructed of continuous sheets of noncombustible material extending from the floor to a minimum height of 1 foot (305 mm) above the highest point of the piles and projecting not less than 1 foot (305 mm) beyond the sides of the piles.

**2905.2 Special baling conditions.** Sisal and other fibers in bales bound with combustible tie ropes, jute and other fibers that swell when wet, shall be stored to allow for expansion in any direction without affecting building walls, ceilings or columns. A minimum clearance of 3 feet (914 mm) shall be required between walls and sides of piles, except that where the storage compartment is not more than 30 feet (9144 mm) wide, the minimum clearance at side walls shall be 1 foot (305 mm), provided that a center aisle not less than 5 feet (1524 mm) wide is maintained.

## SECTION FC 2906
## STORAGE OF COMBUSTIBLE FIBERS ON WATERFRONT STRUCTURES

**2906.1 Scope.** This section shall govern the storage and handling of combustible fibers on waterfront structures, including piers, wharfs and bulkheads except when combustible fibers are stored and handled exclusively in sealed metal shipping containers.

**2906.2 General.** Combustible fiber shall be stored and handled on waterfront structures in accordance with this section.

**2906.3 Prohibitions.** It shall be unlawful to:

1. Unload and store loose combustible fibers on a waterfront structure.

2. Conduct hot work operations on a waterfront structure where combustible fibers are in storage or being handled.

**2906.4 Supervision of standpipe and sprinkler systems.** A person holding a certificate of fitness for a standpipe system and a certificate of fitness for sprinkler system maintenance shall inspect the standpipe and sprinkler systems not more than 24 hours prior to the delivery of the combustible fibers. Combustible fibers shall not be unloaded if the standpipe or sprinkler system is out of service. While combustible fibers are present on the waterfront structure, the certificate of fitness holder shall inspect the standpipe and sprinkler systems, and portable fire extinguishers at least once each day. A record of all inspections shall be maintained on the premises and made available for inspection by any representative of the department.

**2906.5 Notification.** Before combustible fibers are unloaded to a waterfront structure from any marine vessel, watercraft or motor vehicle, advance notice of at least 48 hours shall be given to the department by the owner of the waterfront structure.

**2906.6 Fire protection.** Waterfront structures where combustible fibers are stored or handled shall be provided with fire protection in accordance with [Sections 2209.6.1 through 2209.6.4] FC 2906.6.1 through 2906.6.4.

**2906.6.1 Superstructure.** The superstructure of the waterfront structure shall be protected throughout by a sprinkler system.

**2906.6.2 Substructure.** The substructure of the waterfront structure shall be protected by one of the following methods:

1. Fire stops at intervals of 150 feet (45 720 mm); and

   1.1. A sprinkler system arranged for discharge of water to the entire substructure area; or

   1.2. Protected openings through decking for revolving nozzles or other water discharge equipment, so arranged as to permit water discharge onto the entire substructure area. Such openings shall be a minimum of [6.5] 6½ inches ([165.1] 165 mm) in diameter and spaced at 25 feet (7620 mm) intervals longitudinally and transversely. No cargo shall be stored on deck openings adjacent to the substructure fire stops and those in the main and fire hose aisles.

2. A system of water spray nozzles arranged to permit water discharge onto the entire substructure area and installed in accordance with the Building Code.

3. A system of trenches across the waterfront structure every 100 feet (30 480 mm). Such trenches shall not exceed 12 inches ([304.8] 305 mm) in width, shall be of substantial construction that conforms to the rest of the waterfront structure, shall extend to within 5 feet (1524 mm) of the sides of the waterfront structure, and shall have openings protected in sections not to exceed 25 feet (7620 mm) for access or removal in the event of fire. No cargo shall be placed directly above these openings, and durable signs shall be conspicuously posted on the waterfront structure to indicate the location of these openings.

4. A system of deck openings and under-deck sprinkler protection approved by the commissioner. Openings shall be spaced at 25 feet (7620 mm) intervals longitudinally and transversely. No cargo shall be placed directly above these openings, and durable signs shall be conspicuously posted on the waterfront structure to indicate the location of these openings.

**2906.6.3 LPG or gasoline-fueled equipment.** Any LPG or gasoline-fueled devices, equipment or systems used to handle combustible fibers, or operated in the immediate area of combustible fiber storage or handling, shall be equipped with exhaust spark arresters and carburetor traps.

**2906.6.4 Portable fire extinguishers.** The combustible fiber storage area shall be provided with portable fire extinguishers in accordance with [Section 906] FC906 governing extra-high hazards (Class A fires).

**2906.7 Storage and handling.** Bales of combustible fibers facing aisles shall be covered on top and sides with tarpaulins or other suitable covering. Whenever possible, the combustible fibers shall be stacked on one side of the waterfront structure only, preferably at the water end of waterfront structure. Combustible fibers shall be tiered no higher than 12 feet (3658 mm) and a clearance of not less than 18 inches ([457.2] 457 mm) between the sprinkler head and the upper level of the top tier shall be maintained. An aisle space of not less than 5 feet (1524 mm) extending to the side of the waterfront structure shall be provided at right angles to the main aisle at intervals not exceeding 75 feet (22 860 mm) in the combustible fiber storage area.

**2906.8 Operation and maintenance.** Waterfront structures upon which combustible fibers are stored or handled shall be operated and maintained in [accordance with Sections] compliance with the requirements of FC 2906.8.1 through 2906.8.3.

**2906.8.1 Fire guard.** A fire guard shall be required and positioned approximately every 200 feet (60 960 mm) throughout the length of the combustible fiber storage area. [~~Each fire guard shall be instructed:~~

~~1. To keep diligent watch for fires, take prompt measures for extinguishment of fires, and transmit an alarm to the department at the first sign of fire.~~

~~2. As to the location of all fire alarm manual pull stations in the area.~~

~~3. As to the location and the use of portable fire extinguishers and standpipe system valves and hoses.~~]

Persons conducting a fire watch shall have the duties and responsibilities set forth in FC901.7.2.1 with respect to the areas being monitored in connection with combustible fiber storage, and shall be familiar with the location of fire alarm manual pull stations, and standpipe system hose and hose connections in the area.

**2906.8.2 Access.** Access to combustible fibers and the aisles between the stored combustible fibers shall be restricted to personnel handling the combustible fibers, fire guards and representatives of the department.

**2906.8.3 Loading and unloading.** When loading and unloading combustible fibers, two persons shall be assigned to each loading or unloading operation to stand by with the standpipe hose. These persons shall be instructed as to the location and use of the standpipe system valves and hoses.

## CHAPTER 30
## COMPRESSED GASES

### SECTION FC 3001
### GENERAL

**3001.1 Scope.** This chapter shall govern the storage, handling and use of compressed gases in compressed gas containers and systems, including those gases regulated elsewhere in this code.

**Exceptions:**

1. Compressed gases used as refrigerants in refrigerating systems in accordance with FC Chapter 6.

2. Compressed natural gas (CNG) stored[, handled or] and used [as a vehicular fuel] on a motor vehicle for motive power in accordance with FC Chapter 22, NFPA 52 and the Fuel Gas Code.

3. Compressed gases connected for use in a fire extinguishing system.

**3001.2[.] Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**3001.3 General.** Compressed gases shall be stored, handled and used in accordance with this chapter.

**3001.3.1 Cutting and welding gases.** Cutting and welding gases shall additionally comply with the requirements of FC Chapter [27] 26.

**3001.3.2 Cryogenic fluids.** Cryogenic fluids shall additionally comply with the requirements of FC Chapter 32.

**3001.3.3 Hazardous materials.** Compressed gases classified as hazardous materials shall additionally comply with the requirements of FC Chapter 27 and any other applicable chapters of this code, including FC Chapters 35 (Flammable Gases), 37 (Highly Toxic and Toxic Materials), 40 (Oxidizers, Oxidizing Gases and Oxidizing Cryogenic Fluids) and 41 (Pyrophoric Materials), as applicable.

**3001.3.4 Liquefied petroleum gas (LPG).** LPG shall additionally comply with the requirements of FC Chapter 38 and the Fuel Gas Code.

**3001.4 Supervision.** The storage, handling, use and compression of compressed gases shall be supervised as set forth in [Sections] FC 3001.4.1 through [3001.4.3] 3001.4.4.

**3001.4.1 Handling and use.** The handling and use of compressed gases in quantities requiring a permit, including piped medical gas systems, shall be under the personal supervision of a person holding a certificate of fitness.

**3001.4.2 Storage.** The storage of compressed gases in quantities requiring a permit, including medical gases that are not piped, shall be under the general supervision of a person holding a certificate of fitness.

**3001.4.3 Compressing.** The compressing of gases requiring a permit shall be performed by or under the personal supervision of a person holding a certificate of fitness.

**Exception:** Compressing atmospheric air may be under the general supervision of a person holding a certificate of fitness.

**3001.4.4 Filling of containers**. The transfer of nonflammable compressed gases between containers shall be performed by a person holding a certificate of fitness.

## SECTION FC 3002
## DEFINITIONS

**3002.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**COMPRESSED GAS.** A material, or mixture of materials, that is a gas at 68°F (20°C) or less at 14.7 psia (101 kPa) of pressure; and has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa) that is either liquefied, nonliquefied or in solution at that temperature and pressure, except that gases which have no other health- or physical-hazard properties are not considered to be compressed until the pressure in the packaging exceeds 41 psia (28 kPa) at 68°F (20°C). Compressed gases shall be classified as follows:

**Nonliquefied compressed gases.** Gases, other than those in solution, that are in a packaging under the charged pressure and are entirely gaseous at a temperature of 68°F (20°C).

**Liquefied compressed gases.** Gases that, in a packaging under the charged pressure, are partially liquid at a temperature of 68°F (20°C).

**Compressed gases in solution**. Nonliquefied gases that are dissolved in a solvent.

**Compressed gas mixtures**. A mixture of two or more compressed gases contained in a single packaging, the hazard properties of which are represented by the properties of the mixture as a whole.

**COMPRESSED GAS CONTAINER.** A pressure container designed to hold compressed gases at pressures greater than one atmosphere at 68°F (20°C).

**COMPRESSED GAS SYSTEM.** An assembly of components, such as containers, reactors, pumps, compressors and connecting piping and tubing, designed to contain, distribute or transport compressed gases.

**NESTING.** A method of securing flat-bottomed compressed gas containers upright in a tight mass using a contiguous three-point contact system whereby all containers within a group have a minimum of three points of contact with other containers, walls or bracing.

**TUBE TRAILER.** A tractor trailer upon which a number of tubular gas containers have been installed, typically with a manifold connecting the container valves, that is used to deliver and dispense a compressed gas.

## SECTION FC 3003
## GENERAL REQUIREMENTS

**3003.1 Containers.** Compressed gas containers shall comply with the requirements of this section. [Compressed gas containers shall be designed and fabricated in accordance with the specifications of the ASME Boiler and Pressure Vessel Code or DOTn regulations, or be otherwise approved.] Compressed gas containers that are not designed for refillable use shall not be refilled after use of the original contents. [**3003.1.1 Partially full compressed gas containers.]** [Partially full compressed gas containers containing residual gases] Compressed gas containers that are partially full or contain residual fumes or vapors shall be considered as full for the purposes of [the controls required] complying with the requirements of this chapter.

**3003.1.1 Design and construction.** Compressed gas containers shall be designed, fabricated, tested, marked with the specifications of manufacture and maintained in accordance with Section VIII of the ASME Boiler and Pressure Vessel Code, or the regulations of the United States Department of Transportation, as set forth in 49 CFR Parts 100-180.

**3003.1.2 Pressure relief devices.** Pressure relief devices shall be designed in compliance with the requirements of FC 3003.1.2.1 through 3003.1.2.4.

**3003.1.2.1 Where required.** Containers and tanks for compressed gas storage shall be provided with pressure relief devices designed in accordance with CGA S-1.1, CGA S-1.2, CGA S-1.3, or Section VIII of the ASME Boiler and Pressure Vessel Code, as applicable, to protect such containers and tanks from rupture in the event of overpressure.

**3003.1.2.2 Size.** Pressure relief devices shall be sized in accordance with the specifications to which the container was fabricated and to material-specific requirements, as applicable.

**3003.1.2.3 Arrangement.** Pressure relief devices shall be arranged to discharge upward and unobstructed to the open air in such a manner as to prevent any impingement of escaping gas upon the container, adjacent structures or personnel.

**Exception:** DOTn specification containers having an internal volume of 30 SCF (0.855 $m^3$) or less.

**3003.1.2.4 Protection against freezing.** Pressure relief devices shall be designed and installed to prevent moisture from collecting and freezing in a manner that would impair the operation of the device.

**3003.2 Marking.** Stationary and portable compressed gas containers and systems shall be marked in [accordance with Sections] compliance with the requirements of FC 3003.2.1[, 3003.2.2 and 3003.2.3] through 3003.2.4.

**3003.2.1 Stationary compressed gas containers.** Stationary compressed gas containers shall be marked with the name of the gas [and] in accordance with [Sections] FC 2703.5 and 2703.6. Markings shall be visible from any direction of approach. All uninsulated stationary

outdoor compressed gas containers shall be of light-reflective design or painted with a light-reflecting color.

**3003.2.2 Portable containers.** Portable compressed gas containers shall be marked in accordance with CGA C-7 and DOTn regulations.

**3003.2.3 Piping systems.** Piping systems shall be marked in accordance with [ANSI] ASME A13.1. Markings used for piping systems shall consist of the name of the contents and include an arrow indicating direction of flow. Markings shall be provided at each valve; at wall, floor or ceiling penetrations; at each change of direction; and at a minimum of every 20 feet (6096 mm) or fraction thereof throughout the piping run.

**Exceptions:**

1. Piping that is designed or intended to carry more than one compressed gas at various times shall have appropriate signs or markings posted at the manifold, along the piping and at each point of use to provide clear identification and warning.

2. Piping within gas-manufacturing plants, gas-processing plants and similar occupancies shall be marked in an approved manner.

**3003.2.4 Out-of-service containers.** Out-of-service compressed gas containers shall be marked to indicate that they are no longer available for service.

**3003.3 Container protection.** Compressed gas containers and systems shall be secured and protected against physical damage and tampering in [accordance with Sections] compliance with the requirements of FC 2703.9.2, 3003.3.2 and 3003.3.3.

**3003.3.1** Reserved.

**3003.3.2 Physical protection.** Compressed gas containers and systems that could be exposed to physical damage shall be protected. Posts or other approved means shall be provided to protect compressed gas containers and systems indoors and outdoors from vehicular damage and shall comply with the requirements of [Section 312] FC312.

**3003.3.3 Securing compressed gas containers.** Compressed gas containers shall be secured to prevent movement from contact, vibration or seismic activity, utilizing one or more of the following methods:

1. Securing containers to a fixed object with one or more noncombustible restraints. Containers shall not be secured to plumbing systems or electrical conduits.

2. Securing containers on a cart or other mobile device designed for the movement of compressed gas containers.

3. Nesting of compressed gas containers at container filling or servicing facilities or in seller's warehouses not accessible to the public. Nesting [shall be allowed] may be used

provided the nested containers, if dislodged, do not obstruct any required means of egress.

4. Securing of compressed gas containers to or within a rack, framework, cabinet or similar assembly designed for such use, except when the containers are [in the process of examination, filling, transport or servicing] being inspected, serviced, filled or transported.

5. Securing stationary compressed gas containers to a foundation designed for such use in accordance with the construction codes, including the Building Code.

**3003.4 Valve protection.** Compressed gas container valves shall be protected from physical damage by means of protective caps, collars or similar devices, in [accordance with Sections] compliance with the requirements of FC 3003.4.1 and 3003.4.2.

**3003.4.1 Compressed gas container protective caps or collars.** Compressed gas containers designed to be fitted with protective caps, collars or other protective devices shall have such caps or devices in place except when the containers are in use or are being serviced or filled.

**3003.4.2 Caps and plugs.** Valves of compressed gas containers designed to accept protection caps or other protective devices shall have such caps or devices attached. Outlet caps or plugs shall be in place except when the compressed gas containers are in use or are being serviced or filled.

**3003.5 Separation from hazardous conditions.** Compressed gas containers and systems in storage or use shall be separated from materials and conditions that present potential hazards to them, or to which they present potential hazards. Compressed gas containers and systems in storage or use shall be separated in accordance with [Sections] FC 3003.5.1 through 3003.5.10.

**3003.5.1 Incompatible materials.** Compressed gas containers shall be separated from each other based on the hazard class of their contents. Compressed gas containers shall be separated from incompatible materials in accordance with [Section 2703.9.8] FC2703.9.8.

**3003.5.2 Combustible waste and vegetation.** Combustible waste and vegetation shall be kept a minimum of 10 feet (3048 mm) from compressed gas containers and systems. A noncombustible partition, without openings or penetrations extending not less than 18 inches (457 mm) above the height of the tallest container or system piping and not less than 18 inches (457 mm) to the sides of the storage area is allowed in lieu of such distance. The wall shall either be an independent structure, or the exterior wall of the building adjacent to the storage area.

**3003.5.3 Ledges, platforms and elevators.** Compressed gas containers shall not be placed near elevators, unprotected platform ledges or other areas where the container could drop a distance exceeding one-half the height of the container.

**3003.5.4 [Temperature extremes] Extreme temperature.** Compressed gas containers, [whether full or partially full] regardless of contents, shall not be exposed to temperatures

exceeding 125°F (52°C) or less than mean low atmospheric temperatures unless designed for use under [the exposed] such conditions.

**3003.5.5 Falling objects.** Compressed gas containers and systems shall not be placed in areas where they are exposed to damage from falling objects.

**3003.5.6 Heating.** Compressed gas containers shall not be heated by devices that could raise the surface temperature of the container to above 125°F (52°C). Heating devices shall comply with the requirements of the Mechanical Code and the Electrical Code. Approved heating methods not capable of producing surface temperatures above 125°F (52°C) are allowed to be used by trained personnel. Devices designed to maintain individual compressed gas containers at constant temperature shall be approved and shall be designed to be fail-safe.

**3003.5.7 Sources of ignition.** [Open flames and] Compressed gas containers and tanks shall not be exposed to open flames or high-temperature devices [shall not be used in a manner that creates] in a manner that could create a hazardous condition.

**3003.5.8 Exposure to chemicals.** Compressed gas containers and systems shall not be exposed to corrosive chemicals or fumes that could damage containers, valves or valve-protective caps.

**3003.5.9 Exhausted enclosures.** When exhausted enclosures are provided as a means to segregate compressed gas containers from exposure hazards, such enclosures shall comply with the requirements of [Section 2703.8.5] FC2703.8.5.

**3003.5.10 Gas cabinets.** When gas cabinets are provided as a means to separate compressed gas containers from exposure hazards, such gas cabinets shall comply with the requirements of [Section 2703.8.6] FC2703.8.6.

**3003.5.11 Tube trailers.** A tube trailer may be used to deliver compressed gas to a stationary compressed gas storage system, or, when approved, may serve as a temporary storage system to supply compressed gas for on-site equipment or operations. Except for the tube trailer's piping system connections, a minimum separation distance of 3 feet (914 mm) shall be maintained in all directions around tube trailers to allow for access, inspection and maintenance. The separation distance between individual tube trailers containing incompatible gases shall be in accordance with FC3003.5.1.

**3003.6 Wiring and equipment.** Electrical wiring and equipment shall comply with the requirements of the Electrical Code. Compressed gas containers and systems shall not be located where they could become part of an electrical circuit. Compressed gas containers and systems shall not be used for electrical grounding.

**3003.7 [Service and repair] Maintenance and alteration.** [Service, repair, modification or removal of valves, pressure-relief devices] Servicing, repairs and other maintenance work or alteration to a valve, pressure-relief device or other compressed gas container [appurtenances] or system component shall be performed by competent personnel.

**3003.8 Unauthorized use.** Compressed gas containers and systems shall not be used for any purpose other than as a vessel for the materials that they are designed to contain.

**3003.9 Exposure to fire.** Compressed gas containers that have been exposed to fire shall be removed from service. Containers so removed shall be handled by qualified persons under the personal supervision of a certificate of fitness holder. Containers exposed to fire shall not be used unless they have been requalified in accordance with the standards set forth in ASME or DOTn regulations, or otherwise approved by the commissioner.

**3003.10 Leaks, damage or corrosion.** Leaking, damaged or corroded compressed gas containers shall be removed from service under the personal supervision of a certificate of fitness holder, and properly repaired or disposed.

**3003.11 Protection against corrosion.** Except as otherwise provided in this section, compressed gas containers may be stored or used without being placed under overhead cover. Containers shall be protected from direct contact with soil or unimproved surfaces to prevent bottom corrosion. The surface of the area upon which the containers are placed shall be graded to prevent accumulation of water.

**3003.12 Overhead cover.** Compressed gas containers in quantities requiring a permit are allowed to be stored or used in the sun except in locations where extreme temperatures prevail. When extreme temperatures prevail, overhead covers shall be provided. Overhead covers shall also be provided to prevent accumulations of ice and snow on the valves of containers connected for use.

**3003.13 Lighting.** Areas used for the storage, handling and use of compressed gas containers and systems shall be provided with approved lighting by natural or artificial means.

## SECTION FC 3004
## STORAGE OF COMPRESSED GASES

**3004.1 Upright storage.** Compressed gas containers, except those designed for use in a horizontal position, and all compressed gas containers containing nonliquefied gases, shall be stored in an upright position with the valve end up. The axis of the container stored in the upright position may be inclined as much as 45 degrees (0.80 rad) from the vertical provided that it is properly secured.

> **Exception:** Compressed gas containers with an internal volume less than 0.174 $ft^3$ (0.005 $m^3$) may be stored in a horizontal position.

**3004.2 Material-specific regulations.** In addition to the requirements of this section, indoor and outdoor storage of compressed gases shall comply with the material-specific requirements of FC Chapters 31, 35 and 37 through 44.

## SECTION FC 3005
## HANDLING AND USE OF COMPRESSED GASES

**3005.1 Compressed gas systems.** Compressed gas systems shall be suitable for the use intended and shall be designed and installed by persons competent in such design and installation. Compressed gas devices and systems shall be listed or approved.

**3005.2 Controls.** Compressed gas system controls shall be designed to prevent materials from entering or leaving process or reaction systems at other than the intended time, rate or path. Automatic controls shall be designed to be fail-safe.

**3005.3 Piping systems.** Piping, including tubing, valves, fittings and pressure regulators, shall comply with the requirements of this section and FC Chapter 27. Piping, tubing, pressure regulators, valves and other apparatus shall be kept gas tight to prevent leakage. Adequate pressure-relief devices shall be provided where refrigerated liquefied gas can become trapped in the piping.

**3005.4 Valves.** Valves utilized on compressed gas systems shall be suitable for the use intended and shall be accessible. Valve handles or operators for required shutoff valves shall not be removed or otherwise altered to prevent access or hinder operation.

**3005.5 Venting.** Venting of gases shall be directed to an approved location. Venting shall comply with the requirements of the Mechanical Code.

**3005.6 Upright use.** Compressed gas containers, except those designed for use in a horizontal position, and all compressed gas containers containing nonliquefied gases, shall be used in an upright position with the valve end up. The axis of a container being used in an upright position may be inclined as much as 45 degrees (0.80 rad) from the vertical provided that it is properly secured. Use of nonflammable liquefied gases in the inverted position when the compressed gas is in the liquid state shall be allowed provided that the container is properly secured and the dispensing apparatus is designed for such liquefied gas use.

> **Exception**: Compressed gas containers with an internal volume less than 0.174 $ft^3$ (0.005 $m^3$) may be used in a horizontal position.

**3005.7 Transfer.** Transfer of nonflammable compressed gases between containers shall be performed using equipment and operating procedures specified in CGA P-1 and NFPA 99.

**3005.8 Use of compressed gas for inflation.** Inflatable equipment, devices or balloons shall be pressurized or filled only with nonflammable gases.

**3005.9 Material-specific regulations.** In addition to the requirements of this section, indoor and outdoor use of compressed gases shall comply with the material-specific requirements of FC Chapters 31, 35 and 37 through 44.

**3005.10 Handling.** The handling of compressed gas containers shall comply with the requirements of [Sections] FC 3005.10.1 and 3005.10.2.

> **3005.10.1 Carts and hand trucks.** Containers shall be moved using an approved method. Where containers are moved by [hand] cart, hand truck or other mobile device, such carts, hand trucks or devices shall be designed for the secure movement of containers. Carts and

hand trucks utilized for moving compressed gas containers indoors shall comply with the requirements of [Section 2703.10] FC2703.10. Carts and hand trucks utilized for moving compressed gas containers outdoors shall be designed so that the containers will be secured against dropping or otherwise striking against each other or other surfaces.

**3005.10.2 Lifting of containers.** Ropes, chains or slings shall not be used to suspend compressed gas containers unless such containers have been designed for such handling. Valves of compressed gas containers shall not be used for lifting.

## SECTION FC 3006
## MEDICAL GAS STORAGE

**3006.1 General.** The storage of compressed gases intended for inhalation or sedation including, but not limited to, analgesics for dentistry, podiatry, veterinary and similar uses at hospitals and other medical facilities shall comply with the requirements of this section in addition to other requirements of this chapter.

**3006.2 Storage locations within buildings.** Medical gases shall be stored in areas dedicated to the storage of such gases without other storage or uses. Where containers of medical gases in quantities greater than [the maximum allowable quantity] 1,500 SCF (42.5 $m^3$) per control area are located [inside buildings or structures] indoors, they shall be stored in a [1-hour] gas room in accordance with FC3006.2.1 or a gas cabinet in accordance with [Section 3006.2.1or 3006.2.3] FC3006.2.3. Rooms or areas where medical gases are stored or used in quantities exceeding 6,000 SCF (169.9 $m^3$) shall be designed and constructed in compliance with Building Code requirements for high-hazard occupancies.

**3006.2.1 [One-hour] Gas rooms.** A [1-hour] gas room shall be a room separated from the remainder of the building or structure by fire barriers with a fire-resistance rating of not less than 1 hour. Openings between the room and interior spaces shall be protected by self-closing smoke and draft-control assemblies having a fire protection rating of not less than 1 hour. Rooms having an exterior wall shall be provided with at least two vents in such wall, each having not less than 36 square inches (0.023 $m^2$) free area. One vent shall be within 6 inches (152 mm) of the floor and one shall be within 6 inches (152 mm) of the ceiling. Rooms with no exterior wall shall be exhausted through a duct to the outdoors. Supply and exhaust ducts shall be enclosed in a 1-hour-rated shaft enclosure from the room to the outdoors. Approved mechanical ventilation shall comply with the requirements of the Mechanical Code and be provided at a minimum rate of 1 cubic foot per minute per square foot [[0.00508 $m^3/(s \cdot m^2)$]] (0.00508 $m^3/s/m^2$) of the area of the room. Rooms shall be protected by a sprinkler system.

**3006.2.2** Reserved.

**3006.2.3 Gas cabinets.** Gas cabinets shall be constructed in accordance with [Section 2703.8.6] FC2703.8.6 and the following:

1. The average velocity of ventilation at the face of access ports or windows shall not be less than 200 feet per minute (61 m/s) with a minimum of 150 feet per minute (46 m/s) at any point of the access port or window.

2. Connected to an exhaust system.

3. Internally protected by a sprinkler system.

**3006.3 Outdoor storage locations.** The storage of oxidizing medical gases located outdoors in quantities greater than the amount requiring a permit shall be located in accordance with [Section 4004.2.1] FC4004.2.1.

**3006.4 Medical gas storage.** Medical gas storage, including containers, supply manifolds, connections, pressure regulators, relief devices, [and] valves, and monitoring and alarm systems shall comply with the requirements of NFPA 99 and this chapter.

## SECTION FC 3007
## COMPRESSED GASES NOT OTHERWISE REGULATED

**3007.1 General.** Compressed gases in storage or use not regulated by the material-specific provisions of FC Chapters 6, 31, 35 and 37 through 45, including asphyxiant, irritant and radioactive gases, shall comply with the requirements of this section in addition to other requirements of this chapter.

**3007.2 Ventilation.** Indoor storage and use areas and storage buildings shall be provided with mechanical exhaust ventilation or natural ventilation in accordance with [Section] FC 2704.3 or 2705.1.9. Mechanical exhaust ventilation shall be provided where required by [Section] FC 2705.2.1.1 or 2705.2.2.2. When mechanical ventilation is provided, the systems shall be operational during such time as the building or space is occupied.

## SECTION FC 3008
## ETHYLENE OXIDE

**3008.1 Scope.** This section shall govern the storage, handling and use of gases containing ethylene oxide used for sterilization purposes. The storage, handling and use of gases containing ethylene oxide for purposes other than sterilization shall comply with the other applicable requirements of this chapter. The storage, handling and use of flammable gases containing ethylene oxide shall additionally comply with the requirements of FC Chapter 35.

**3008.2 General.** The storage, handling and use of gases containing ethylene oxide used for sterilization purposes shall comply with the other requirements of this chapter, as applicable, and shall additionally be in accordance with this section.

**3008.3 Prohibitions.** It shall be unlawful to sterilize pressurized oxygen equipment with gases containing ethylene oxide.

**3008.4 Application.** Prior to storing or using gases containing ethylene oxide, or modifying an existing installation or system, the owner shall file with the department an application for the approval of the design and installation of the sterilization system which contains such information and documentation as the commissioner may prescribe.

**3008.5 Design and installation requirements.** The design and installation of sterilization systems shall comply with the requirements of [Sections] FC 3008.5.1 through 3008.5.3.

**3008.5.1 Compliance with other codes and standards.** The design and installation of sterilization systems and the storage of gases containing ethylene oxide shall be in accordance with the construction codes, including the Building Code, the Electrical Code, the manufacturer's specifications and the approved testing laboratory that listed the sterilizer.

**3008.5.2 Sterilization system room and local area ventilation.** Sterilization systems shall be installed in rooms that are ventilated as follows:

**3008.5.2.1 Room ventilation.** Sterilizers shall be installed in a well-ventilated room or other area provided with an independent, [non-recirculating] nonrecirculating mechanical ventilation system that discharges outdoors. Ventilation supply and exhaust registers shall be located such that there are no stagnant air spaces in the immediate area of the sterilizer and that the direction of air movement is away from the operator.

**3008.5.2.2 Local area ventilation.** Where a local ventilation system is required by the regulations of the United States Department of Labor, such ventilation system shall be an independent, dedicated and [non-recirculating] nonrecirculating system that discharges directly outdoors or to an emission control system and only metallic ductwork impervious to ethylene oxide shall be used. The amount of flexible ducting and the number of elbows in the duct shall be kept to a minimum.

**3008.5.3 Vent lines.** Sterilizer vent lines shall be designed and installed in [accordance] compliance with the following requirements:

1. Each sterilizer shall be equipped with an independent, dedicated and gas-tight vent line for the discharge of gases containing ethylene oxide.

2. Vent lines shall discharge directly outdoors or to an emission control system. Such vent lines shall not discharge into any other ventilation or exhaust system.

3. The piping and the point of discharge for all vent lines discharging outdoors shall be designed and installed to prevent moisture from entering the vent line.

4. Vent lines, including piping, fittings and other components, shall be in accordance with the specifications of the sterilizer manufacturer. Pipe lengths shall not exceed the maximum lengths specified by the manufacturer. Vertical travel distances, elbows, sharp bends and any reduction in vent line size shall be kept to a minimum.

**3008.6 Operation and maintenance.** [The operation and maintenance of sterilization] Sterilization systems shall be [as follows] operated and maintained in compliance with the following requirements:

1. Sterilization systems shall be operated and maintained in compliance with the manufacturer's specifications and the approved testing laboratory listing requirements.

2. Air compressors and their air intakes shall be located such that any gas that may leak from the sterilization system or stored containers will not enter the compressor.

3. Sterilizers shall not be operated if the room ventilation system, local area ventilation system or vent pipe is not operational.

**3008.7 Emergency plan.** Where required by the regulations of the United States Department of Labor, a written emergency plan to be implemented in the event of an ethylene oxide spill or leak shall be prepared, shall be maintained on the premises and made available for inspection by any representative of the department.

**3008.8 Recordkeeping.** A copy of the manufacturer's instructions for the installation, operation and maintenance of the sterilizer shall be maintained in the room or other area in which the sterilization system is located.

## CHAPTER 31
## CORROSIVE MATERIALS

### SECTION FC 3101
### GENERAL

**3101.1 Scope.** This chapter shall govern the storage, handling and use of corrosive materials.

**Exceptions:**

1. Display and storage in Group M and storage in Group S occupancies complying with the requirements of [Section 2703.11] FC2703.11.

2. Stationary [lead-acid] storage battery systems in accordance with [Section 608] FC608.

3. This chapter shall not apply to ammonia (R-717) when used as a refrigerant in a refrigerating system in accordance with [Section 606] FC606.

**3101.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**3101.3 General.** Corrosive materials shall be stored, handled and used in accordance with this chapter. Corrosive materials that are compressed gases shall additionally comply with the requirements of FC Chapter 30.

**3101.4 Supervision.** The handling and use of corrosive materials in quantities exceeding [550] 55 gallons ([2082] 208 L) of liquid or 1,000 pounds (454 kg) of solid shall be under the personal supervision of a certificate of fitness holder. The storage of corrosive materials in quantities exceeding [550] 55 gallons ([2082] 208 L) of liquid or 1,000 pounds (454 kg) of solid shall be under the general supervision of a certificate of fitness holder.

### SECTION FC 3102
### DEFINITIONS

**3102.1 Definition.** The following term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

**CORROSIVE MATERIAL.** A material that causes full thickness destruction of human skin at the site of contact within a specified period of time when tested by methods set forth in DOTn regulations 49 CFR Sections 173.136 and 173.137, or a liquid that has a severe corrosion rate on steel or aluminum based on the criteria set forth in DOTn [regulations] regulation 49 CFR Section 173.137(c)(2).

## SECTION FC 3103
## GENERAL REQUIREMENTS

**3103.1 Quantities not exceeding the maximum allowable quantity per control area.** The storage, handling and use of corrosive materials in amounts not exceeding the maximum allowable quantity per control area indicated in [Section 2703.1] FC2703.1 shall be in accordance with [Sections] FC 2701, 2703 and 3101.

**3103.2 Quantities exceeding the maximum allowable quantity per control area.** The storage, handling and use of corrosive materials in amounts exceeding the maximum allowable quantity per control area indicated in [Section 2703.1] FC2703.1 shall be in accordance with this chapter and FC Chapter 27.

## SECTION FC 3104
## STORAGE

**3104.1 Indoor storage.** Indoor storage of corrosive materials in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(2), shall be in accordance with [Sections] FC 2701, 2703, 2704 and this chapter.

**3104.1.1 Liquid-tight floor.** In addition to the provisions of [Section 2704.12] FC2704.12, floors in storage areas for corrosive liquids shall be of liquid-tight construction.

**3104.2 Outdoor storage.** Outdoor storage of corrosive materials in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(4) shall be in accordance with [Sections] FC 2701, 2703, 2704 and this chapter.

**3104.2.1 Aboveground outdoor storage tanks.** Aboveground outdoor storage tanks exceeding an aggregate quantity of 1,000 gallons (3785 L) of corrosive liquids shall be provided with secondary containment in accordance with [Section 2704.2.2] FC2704.2.2.

**3104.2.2 Distance from storage to exposures.** Outdoor storage of corrosive materials shall not be within 20 feet (6096 mm) of buildings not associated with the manufacturing or distribution of such materials, lot lines, public streets, private roads or means of egress. A 2-hour fire barrier wall without openings or penetrations, and extending not less than 30 inches (762 mm) above and to the sides of the storage area, is allowed in lieu of such distance. The wall shall either be an independent structure, or the exterior wall of the building adjacent to the storage area.

## SECTION FC 3105
## HANDLING AND USE

**3105.1 Indoor use.** The indoor handling and use of corrosive materials in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(2) shall be in accordance with [Sections] FC 2701, 2703, 2705 and this chapter.

**3105.1.1 Liquid transfer.** Corrosive liquids shall be transferred in accordance with [Section 2705.1.10] FC2705.1.10.

**3105.1.2 Ventilation.** When corrosive materials are dispensed or used, mechanical exhaust ventilation in accordance with [Section 2705.2.1.1] FC2705.2.1.1 shall be provided.

**3105.2 Outdoor use.** The outdoor handling and use of corrosive materials in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(4) shall be in accordance with [Sections] FC 2701, 2703, 2705 and this chapter.

**3105.2.1 Distance from use to exposures.** Outdoor handling and use of corrosive materials shall be located in accordance with [Section 3104.2.2] FC3104.2.2.

# CHAPTER 32
# CRYOGENIC FLUIDS

## SECTION FC 3201
## GENERAL

**3201.1 Scope.** This chapter shall govern the storage, handling and use of cryogenic fluids.

**Exception:** Fluids used as refrigerants in refrigerating systems (see [Section 606] FC606).

**3201.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**3201.3 General.** Cryogenic fluids shall be stored, handled and used in accordance with this chapter, except that liquefied natural gas (LNG) shall comply with the requirements of [Section 3206] FC3206 only. Containers that contain any amount of cryogenic fluid, including containers that are partially full or have residual gas, shall be considered as full for the purposes of the requirements of this chapter.

**3201.3.1 Oxidizing cryogenic fluids.** Oxidizing cryogenic fluids, including oxygen, shall additionally comply with the requirements of NFPA [50] 55 and FC Chapter 40, as applicable.

**3201.3.2 Flammable cryogenic fluids.** Flammable cryogenic fluids, including hydrogen, methane and carbon monoxide, shall additionally comply with the requirements of NFPA [50B] 55 and FC Chapter 35, as applicable.

**3201.3.3 Inert cryogenic fluids.** Inert cryogenic fluids, including argon, helium and nitrogen, shall additionally comply with the requirements of CGA P-18.

**3201.4 Supervision.** The storage, handling and use of cryogenic fluids shall be supervised as set forth in [Sections] FC 3201.4.1 through 3201.4.3.

**3201.4.1 Handling and use.** Handling and use of cryogenic fluid in quantities requiring a permit shall be performed under the personal supervision of a person holding a certificate of fitness.

**3201.4.2 Installation and maintenance.** The installation and maintenance of cryogenic containers and of systems containing cryogenic fluids, including the repair of such systems, shall be conducted under the personal supervision of a person holding a certificate of fitness.

**3201.4.3 Storage.** Storage of cryogenic fluids in quantities requiring a permit shall be under the general supervision of a person holding a certificate of fitness.

**[3201.5 Partially full containers.** Partially full cryogenic containers containing residual gases shall be treated as full.]

**3201.5 Prohibition.** It shall be unlawful to fill a container with a flammable cryogenic fluid except for containers mounted on a hydrogen-powered motor vehicle and used for motive power as authorized by FC2209.1.1(1).

## SECTION FC 3202
## DEFINITIONS

**3202.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**CRYOGENIC CONTAINER.** A pressure container, low-pressure container or atmospheric container of any size designed or used for the transportation, handling or storage of a cryogenic fluid, and which utilizes venting, insulation, refrigeration or a combination thereof to maintain the pressure within design parameters for such container and to keep the contents in a liquid state.

**CRYOGENIC FLUID.** A fluid having a boiling point lower than -130°F (-89.9°C) at 14.7 pounds per square inch absolute (psia) (an absolute pressure of 101.3 kPa).

**FLAMMABLE CRYOGENIC FLUID.** A cryogenic fluid that is flammable in its vapor state.

**LOW-PRESSURE CONTAINER.** A storage container designed to withstand an internal pressure greater than [0.5 pounds] ½ pound per square inch gauge (psig) (3.4 kPag) but not greater than 15 psig (103.4 kPag).

**MAXIMUM ALLOWABLE WORKING PRESSURE (MAWP).** The maximum pressure permissible at the top of a container in its operating position for a designated temperature, as established by the container manufacturer.

## SECTION FC 3203
## GENERAL REQUIREMENTS

**3203.1 Cryogenic container.** Cryogenic containers shall comply with the requirements of [Sections] FC 3203.1.1 through 3203.1.3.3 and FC Chapter 27.

**3203.1.1 Cryogenic container standards.** Cryogenic containers shall be designed, constructed, operated and maintained in accordance with the ASME Boiler and Pressure Vessel Code or United States Department of Transportation regulations, or as otherwise approved.

**3203.1.1.1 Pressure gauges.** Cryogenic containers shall be provided with pressure gauges. The maximum face reading for dial-type gauges shall not be less than 133 percent nor more than 250 percent of the MAWP of the cryogenic container.

**3203.1.1.2 Liquid [level indicating] level-indicating devices.** Cryogenic containers shall be provided with a liquid [level indicating] level-indicating device. It shall be unlawful to use cryogenic containers with glass liquid level gauges in direct contact with the contents of such containers.

**3203.1.2** Reserved.

**3203.1.3 Foundations and supports.** Cryogenic containers shall be installed upon substantial concrete or masonry foundations or structural steel supports on firm concrete or masonry foundations. Cryogenic containers shall be supported to prevent the concentration of excessive loads on the supporting portion of the shell. Foundations for horizontal cryogenic containers shall be constructed to accommodate expansion and contraction of the cryogenic container. Foundations shall be provided to support the weight of vaporizers and heat exchangers.

**3203.1.3.1 Temperature effects.** When cryogenic container foundations or supports are subject to exposure to temperatures below -130°F (-89.9°C), the foundations or supports shall be constructed of materials to withstand the low-temperature effects of cryogenic fluid spillage.

**3203.1.3.2 Corrosion protection.** Portions of cryogenic containers in contact with foundations or saddles shall be painted to protect against corrosion. Precautions shall be taken to avoid or minimize corrosion due to galvanic action.

**3203.1.3.3 Fill connection supports.** Fill connection supports shall be designed and maintained to withstand the repeated application of force required to connect and disconnect hoses of cargo tanks.

**3203.2 Pressure relief devices.** Pressure relief devices shall be provided in accordance with [Sections] FC 3203.2.1 through 3203.2.6 to protect cryogenic containers and systems containing cryogenic fluids from rupture in the event of overpressure. Pressure relief devices shall be designed in accordance with CGA S-1.1, CGA S-1.2 and CGA S-1.3.

**3203.2.1 Cryogenic containers.** Cryogenic containers shall be provided with pressure relief devices. Precautions shall be taken to prevent overpressurization of atmospheric tanks. Such pressure relief devices shall communicate with the vapor space of the container, not the cryogenic fluid.

**3203.2.2 Equipment other than cryogenic containers.** Heat exchangers, vaporizers, insulation casings surrounding cryogenic containers, and sections of coaxial or single wall piping systems in which liquefied cryogenic fluids could be trapped because of leakage from cryogenic containers or isolation by valves shall be provided with pressure relief devices.

**3203.2.3 Sizing.** Pressure relief devices shall be sized in accordance with the specifications to which the cryogenic container was fabricated. The relief devices shall have sufficient capacity to prevent the MAWP of the cryogenic container or system from being exceeded. It shall be unlawful to use pressure relief devices that are not clearly marked by the manufacturer with their set pressure.

**3203.2.4 Accessibility.** Pressure relief devices shall be located such that they are readily accessible for inspection, [and] repair and other maintenance.

**3203.2.5 Arrangement.** Pressure relief devices shall be arranged to discharge unobstructed, at rated capacity, to the outdoors in such a manner as to prevent escaping gas from impinging on personnel, cryogenic containers, equipment and adjacent structures or from entering enclosed spaces.

> **Exception:** United States Department of Transportation specification cryogenic containers with an internal volume of 2 cubic feet (0.057 $m^3$) or less.

**3203.2.6 Shutoffs between pressure relief devices and cryogenic containers.** Shutoff valves shall not be installed between pressure relief devices and cryogenic containers.

> **Exception:** A shutoff valve is allowed on cryogenic containers equipped with multiple pressure-relief device installations where the design and arrangement of the valves provide sufficient relief capacity for the pressure relief devices to prevent the MAWP of the cryogenic container or system from being exceeded at all times.

**3203.3 Pressure-relief vent piping.** Pressure-relief vent-piping systems shall be constructed and arranged so as to remain functional and direct the flow of gas to a safe location in accordance with [Sections] FC 3203.3.1 and 3203.3.2.

**3203.3.1 Sizing.** Pressure-relief-device vent piping shall have a cross-sectional area not less than that of the pressure-relief-device vent opening and shall be arranged so as not to restrict the flow of escaping gas.

**3203.3.2 Arrangement.** Pressure-relief-device vent piping and drains in vent lines shall be arranged so that escaping gas will discharge unobstructed to the outdoors and not impinge on personnel, containers, equipment, foundations and adjacent structures or enter enclosed spaces. Pressure-relief-device vent lines shall be installed in such a manner to exclude or

remove moisture and condensation and prevent malfunction of the pressure relief device because of freezing or ice accumulation or other types of obstruction.

**3203.4 Marking.** Cryogenic containers and systems shall be marked in accordance with [Sections] FC 3203.4.1 through 3203.4.6.

**3203.4.1 Identification signs.** Visible hazard identification signs in accordance with NFPA 704 shall be provided at entrances to areas in which cryogenic fluids are stored, handled or used.

**3203.4.2 Identification of contents.** Stationary and portable cryogenic containers shall be clearly marked with the name of the cryogenic fluid contained therein. Stationary aboveground cryogenic containers shall be placarded in accordance with [Sections] FC 2703.5 and 2703.6. Portable cryogenic containers shall be identified in accordance with CGA C-7.

**3203.4.3 Identification of cryogenic containers.** Stationary cryogenic containers shall be identified with a permanent nameplate indicating the manufacturing specification and MAWP. The nameplate shall be installed on the cryogenic container in an accessible location. The nameplate shall be marked in accordance with the ASME Boiler and Pressure Vessel Code or [DOTn] the regulations of the United States Department of Transportation, as set forth in 49 CFR [Part 178] Parts 100-180.

**3203.4.4 Identification of cryogenic container connections.** Cryogenic container inlet and outlet connections, liquid level indicating devices, liquid level limit controls, valves, pressure gauges, regulators, and safety devices shall be marked with a permanent tag or label identifying their function or identified by a schematic drawing designating their function and whether they are connected to the vapor or liquid space of the cryogenic container. Where a schematic drawing is provided, it shall be permanently attached to the cryogenic container and maintained in a legible condition.

**3203.4.5 Identification of piping systems.** Piping systems shall be identified in accordance with [Section 3003.2.3] FC3003.2.3.

**3203.4.6 Identification of emergency shutoff valves.** Emergency shutoff valves shall be identified by posting a durable sign at a conspicuous location at or near the valve.

**3203.5 Container protection.** Cryogenic containers and systems shall be secured and protected against physical damage and tampering in accordance with [Sections 2703.9.2] FC2703.9.2, and FC 3203.5.2 through 3203.5.4.

**3203.5.1** Reserved.

**3203.5.2 Securing of cryogenic containers.** Stationary containers shall be secured to foundations in accordance with the Building Code. Portable cryogenic containers shall be secured to prevent movement from contact, vibration or seismic activity. Nesting shall be an acceptable means of securing cryogenic containers. Cryogenic containers shall not be secured to plumbing pipes or electrical conduits.

**3203.5.3 Securing of vaporizers.** Vaporizers, heat exchangers and similar equipment shall be anchored to a suitable foundation. Connecting piping shall be sufficiently flexible to provide for the effects of expansion and contraction due to temperature changes.

**3203.5.4 Physical protection.** Cryogenic containers, piping, valves, pressure relief devices, regulating equipment and other appurtenances which could be exposed to physical damage and tampering shall be protected by posts or other approved means.

**[3203.6 Separation from hazardous conditions.** Cryogenic containers and systems in storage or use shall be separated from materials and conditions which pose exposure hazards to or from each other in accordance with Sections 3203.6.1 through 3203.6.2.1.

**3203.6.1 Stationary cryogenic containers.** Stationary cryogenic containers shall be separated from exposure hazards in accordance with the provisions applicable to the type of cryogenic fluid contained and the minimum separation distances indicated in Table 3203.6.1.

**TABLE 3203.6.1**
**SEPARATION OF STATIONARY CRYOGENIC CONTAINERS FROM EXPOSURE HAZARDS**

| EXPOSURE | MINIMUM DISTANCE (feet) |
|---|---|
| Buildings, regardless of construction type | 1, or minimum required for service access |
| Building exit | 10 |
| Building openings other than building exits | 1 |
| Air intakes | 10 |
| Lot lines | 5 |
| Group A occupancies and other public gathering places | 50 |
| Nonambulatory patient areas | 50 |
| Combustible waste or vegetation | 15 |
| Other hazardous materials | In accordance with FC Chapter 27 |

For SI: 1 foot = 304.8 mm.

**3203.6.1.1 Point-of-fill connections.** Fill connections for stationary cryogenic containers shall not be positioned closer to exposures than the minimum distances required for stationary cryogenic containers. Fill connections for stationary cryogenic containers shall be located and maintained to afford cargo tank operator access to valves and indicators on the cryogenic containers and cargo tank.

**3203.6.1.2 Surfaces beneath cryogenic containers.** The surface of the area on which stationary cryogenic containers are placed, including the surface of the area located below the point where connections are made for the purpose of filling such cryogenic containers, shall be compatible with the cryogenic fluid in the cryogenic container. The surface shall be capable of withstanding temperatures of cryogenic fluid that may be released during normal filling operations, without cracking, shifting or other impact upon the stability of the installation.

**3203.6.1.3 Prohibited locations.** It shall be unlawful to install stationary cryogenic containers on the roof of any building or structure.

**3203.6.2 Portable cryogenic containers.** Portable cryogenic containers shall be separated from exposure hazards in accordance with Table 3203.6.2.

**TABLE 3203.6.2**

**SEPARATION OF PORTABLE CRYOGENIC CONTAINERS FROM EXPOSURE HAZARDS**

| EXPOSURE | MINIMUM DISTANCE (feet) |
|---|---|
| Building exits | 10 |
| Building openings other than building exits | 1 |
| Air intakes | 10 |
| Lot lines | 5 |
| Room or area exits | 3[a] |
| Combustible waste or vegetation | 15 |
| Other hazardous materials | In accordance with Chapter 27 |

For SI: 1 foot = 304.8 mm.

**3203.6.2.1 Surfaces beneath cryogenic containers.** Cryogenic containers shall be placed on surfaces that are compatible with the cryogenic fluid in the cryogenic container.

**3203.6.2.2 Pressure relief valve discharge.** Cryogenic containers shall be positioned such that the pressure relief valve discharge is directed away from any building exit.]

**[3203.7] 3203.6 Electrical wiring and equipment.** Electrical wiring and equipment shall comply with the requirements of the Electrical Code and [Sections 3203.7.1] FC 3203.6.1 and [3203.7.2] 3203.6.2.

**[3203.7.1] 3203.6.1 Location.** Cryogenic containers and systems shall not be located where they could become part of an electrical circuit.

**[3203.7.2] 3203.6.2 Electrical grounding and bonding.** Cryogenic containers and systems shall not be used for electrical grounding. When electrical grounding and bonding is required, the grounding and bonding system shall comply with the requirements of the Electrical Code. The grounding system shall be protected against corrosion, including corrosion caused by stray electric currents or galvanic action.

**[3203.8] 3203.7 Service and repair.** Service, repair, modification or removal of valves, pressure relief devices or other cryogenic container appurtenances, shall comply with the requirements of [Sections 3203.8.1 and 3203.8.2] FC 3203.7.1 and 3203.7.2 and the ASME Boiler and Pressure Vessel Code, Section VIII or the regulations of the United States Department of Transportation, [regulations] as set forth in 49 CFR [Part 178] Parts 100-180, as applicable.

**[3203.8.1] 3203.7.1 Cryogenic containers.** Cryogenic containers that have been removed from service shall be repaired or disposed of lawfully.

**[3203.8.2] 3203.7.2 System inspection.** Cryogenic containers and systems shall be inspected by competent personnel at least once a month.

**[3203.9] 3203.8 Unauthorized use.** Cryogenic containers shall not be used for any purpose other than as a container for the product that it is designed to contain.

**[3203.10] 3203.9 Leaks, damage and corrosion.** Leaking, damaged or corroded cryogenic containers shall be immediately removed from service. Leaking, damaged or corroded systems shall be replaced, repaired or disposed of lawfully in accordance with [Section 3203.8] FC3203.7.

**[3203.11] 3203.10 Lighting.** Lighting shall be provided for equipment such as control valves, gauges, regulators, vaporizers and heat exchangers and operating facilities such as walkways and gates ancillary to stationary cryogenic container installations.

## SECTION FC 3204
## STORAGE

**3204.1 General.** Storage of cryogenic containers shall be in accordance with this section.

**3204.2 Indoor storage.** Indoor storage of cryogenic containers shall be in accordance with [Sections] FC 3204.2.1 through 3204.2.1.3.

**3204.2.1 Cryogenic containers.** Cryogenic containers shall be installed in accordance with the provisions applicable to the type of cryogenic fluid stored and this section.

**3204.2.1.1 Cryogenic containers.** Cryogenic containers shall be in accordance with [Section 3203.1] FC3203.1.

**3204.2.1.2 Construction of indoor areas.** Cryogenic containers stored indoors shall be located in buildings, rooms or areas constructed in accordance with the Building Code.

**3204.2.1.3 Ventilation.** Storage areas for cryogenic containers shall be ventilated in accordance with the Mechanical Code.

**3204.3 Outdoor cryogenic storage.** Outdoor storage of cryogenic containers shall be in accordance with [Sections 3204.3.1 and 3204.3.2] FC 3204.3.1 through 3204.3.1.2.5.

**[3204.3.1 Stationary cryogenic containers.** The outdoor storage of stationary cryogenic containers shall be in accordance with Section 3203 and this section.]

**[3204.3.1.1 Location.** Stationary cryogenic containers shall be located in accordance with Section 3203.6. Cryogenic containers shall not be located within diked areas containing other hazardous materials.]

**3204.3.1 Separation from hazardous conditions.** Cryogenic containers and systems in storage or use shall be separated from materials and conditions which pose exposure hazards to or from each other in accordance with FC 3204.3.1.1 through 3204.3.1.1.5.

**3204.3.1.1 Stationary cryogenic containers.** Stationary cryogenic containers shall be separated from exposure hazards in accordance with the minimum separation distances set forth in FC Table 3204.3.1.1.

**FC TABLE 3204.3.1.1**
**SEPARATION OF STATIONARY CRYOGENIC CONTAINERS FROM EXPOSURE HAZARDS**

| EXPOSURE | MINIMUM DISTANCE (feet) |
|---|---|
| Buildings, regardless of construction type | 1, or minimum required for service access |
| Building exit | 10 |
| Building openings other than building exits | 1 |
| Air intakes | 10 |

| | |
|---|---|
| Lot lines | 5 |
| Group A occupancies and other public gathering places | 50 |
| Nonambulatory patient areas | 50 |
| Combustible waste or vegetation | 15 |
| Other hazardous materials | In accordance with FC Chapter 27 |

For SI: 1 foot = 304.8 mm.

**3204.3.1.1.1 Point-of-fill connections.** Fill connections for stationary cryogenic containers shall not be positioned closer to exposure hazards than the minimum distances required for stationary cryogenic containers. Fill connections for stationary cryogenic containers shall be located and maintained to afford cargo tank operator access to valves and indicators on the cryogenic containers and cargo tank.

**3204.3.1.1.2 Surfaces beneath cryogenic containers.** The surface of the area on which stationary cryogenic containers are placed, including the surface of the area located below the point where connections are made for the purpose of filling such cryogenic containers, shall be compatible with the cryogenic fluid in the cryogenic container. The surface shall be capable of withstanding temperatures of cryogenic fluid that may be released during normal filling operations, without cracking, shifting or other impact upon the stability of the installation.

**3204.3.1.1.3 Location.** Containers of cryogenic fluids shall not be stored or used within diked areas containing other hazardous materials.

**3204.3.1.1.3.1 Prohibited locations.** It shall be unlawful to install stationary cryogenic containers on the roof of any building or structure.

**[3204.3.1.2] 3204.3.1.1.4 Areas subject to flooding.** Stationary cryogenic containers, vaporizers, heat exchangers and connecting piping located in areas subject to flooding shall be securely anchored or elevated to prevent separation of the cryogenic containers and related equipment from foundations or supports.

**[3204.3.1.3] 3204.3.1.1.5 Drainage.** The area surrounding stationary cryogenic containers shall be provided with a means to prevent accidental discharge of cryogenic fluid from endangering personnel, cryogenic containers, equipment and adjacent structures or to enter enclosed spaces. The stationary cryogenic container shall not be placed where spilled or discharged fluid will be retained around the cryogenic container.

**Exception:** These drainage requirements shall not apply when it is determined by the commissioner that the cryogenic container does not constitute a hazard, upon consideration of special features such as crushed rock utilized as a heat sink, topographical conditions, nature of occupancy, proximity to structures on the same or adjacent property, and the capacity and construction of cryogenic containers and character of cryogenic fluid to be stored.

**[3204.3.2] 3204.3.1.2 Portable cryogenic containers.** Outdoor storage of portable cryogenic containers shall comply with the requirements of [Section 3203] FC3203 and this section.

**[3204.3.2.1 Location.** Portable cryogenic containers shall be located in accordance with Section 3203.6.]

**3204.3.1.2.1 Exposure hazard separation.** Portable cryogenic containers shall be separated from exposure hazards in accordance with FC Table 3204.3.1.2.1.

**FC TABLE 3204.3.1.2.1**
**SEPARATION OF PORTABLE CRYOGENIC CONTAINERS FROM EXPOSURE HAZARDS**

| EXPOSURE | MINIMUM DISTANCE (feet) |
|---|---|
| Building exits | 10 |
| Building openings other than building exits | 1 |
| Air intakes | 10 |
| Lot lines | 5 |
| Combustible waste or vegetation | 15 |
| Other hazardous materials | In accordance with FC Chapter 27 |

For SI: 1 foot = 304.8 mm.

**3204.3.1.2.2 Surfaces beneath cryogenic containers.** Cryogenic containers shall be placed on surfaces that are compatible with the cryogenic fluid in the cryogenic container.

**[3204.3.2.2] 3204.3.1.2.3 Drainage.** The area surrounding portable cryogenic containers shall be provided with a means to prevent accidental discharge of fluids from endangering adjacent containers, buildings, equipment or adjoining property.

**Exception:** These requirements shall not apply when it is determined by the commissioner that the cryogenic container does not constitute a hazard.

**[3204.3.2.3] 3204.3.1.2.4 Areas subject to flooding.** Portable cryogenic containers located in areas subject to flooding shall be properly secured to prevent movement.

**3204.3.1.2.5 Pressure relief valve discharge.** Cryogenic containers shall be positioned such that the pressure relief valve discharge is directed away from any building exit.

## SECTION FC 3205
## HANDLING AND USE

**3205.1 Applicability.** Handling and use of cryogenic containers and systems shall be in accordance with this section.

**3205.1.1 Cryogenic fluid systems.** Cryogenic systems shall be suitable for the use intended and designed by persons competent in such design. Equipment and processes shall be listed or approved.

**3205.1.2 Piping systems.** Piping, tubing, valves, joints and fittings used in cryogenic systems shall be designed and installed in accordance with the material-specific provisions of [Sections] FC 3201.3.1, 3201.3.2, 3201.3.3 and 3205.1.2.1 through 3205.1.2.6.

**3205.1.2.1 Design and construction.** Piping systems shall be suitable for the use intended through the full range of pressure and temperature to which they will be subjected. Piping systems shall be designed and constructed to provide adequate allowance for expansion, contraction, vibration, settlement and fire exposure.

**3205.1.2.2 Joints.** Joints on cryogenic container piping and tubing shall be threaded, welded, silver brazed or flanged.

**3205.1.2.3 Valves and piping components.** Valves and piping components shall be suitable for the intended use at the temperatures of the application and shall be designed and constructed to withstand the maximum pressure at the minimum temperature to which they will be subjected. Valves shall be oriented so that the stem is above the horizontal plane and discharge is directed away from supporting elements.

**3205.1.2.3.1 Shutoff valves on cryogenic containers.** Shutoff valves shall be provided on all cryogenic container connections except for pressure relief devices. Shutoff valves shall be readily accessible and located as close as practical to the cryogenic container. Manually-operated shutoff valves shall be designed and installed to minimize accidental opening and closing.

**Exception:** Valves before pressure relief devices shall be installed in accordance with [Section 3203.2.6] FC3203.2.6.

**3205.1.2.3.2 Shutoff valves on piping.** Shutoff valves shall be installed in piping containing cryogenic fluids where needed to limit the volume of liquid discharged in the event of piping or equipment failure. Pressure relief valves shall be installed on all sections of piping systems where liquid is capable of being trapped (see [Section 3203.2] FC3203.2). Shutoff valves shall be installed so that piping components can be isolated for maintenance. Check valves shall be installed on discharge lines where pumps or other [pressure increasing] pressure-increasing equipment operate in parallel.

**3205.1.2.4 Physical protection and support.** [Aboveground piping] Piping systems shall be supported and protected from physical damage. Piping passing through floors or walls shall be protected from damage caused by movement of the floors or walls.

**3205.1.2.5 Corrosion protection.** Aboveground piping that is subject to corrosion because of exposure to corrosive atmospheres, shall be constructed of materials to resist the corrosive environment or otherwise protected against corrosion. Underground piping shall be protected against corrosion.

**3205.1.2.6 Testing.** Piping systems shall be tested and proven free of leaks after installation as required by the standards to which they were designed and constructed. Test pressures shall not be less than 150 percent of the MAWP when hydraulic testing is conducted or 110 percent when testing is conducted pneumatically.

**3205.2 Indoor use.** Indoor use of cryogenic fluids shall comply with the material-specific requirements of [Sections] FC 3201.3.1 through 3201.3.3.

**3205.3 Outdoor use.** Outdoor use of cryogenic fluids shall comply with the material specific requirements of [Sections] FC 3201.3.1, 3201.3.2, 3201.3.3, 3205.3.1 and 3205.3.2.

**3205.3.1 Separation.** Distances from property lines, buildings and exposure hazards shall comply with the requirements of [Section 3203.6] FC3204.3 and the material specific requirements of [Sections] FC 3201.3.1 through 3201.3.3.

**3205.3.2 Emergency shutoff valves.** [Readily available] Approved manual or automatic emergency shutoff valves shall be provided to shut off the cryogenic fluid supply in case of emergency. [A] An emergency shutoff valve shall be located at the source of supply and at the point where the system enters the building.

**3205.4 Filling and dispensing.** Filling and dispensing of cryogenic fluids shall comply with the requirements of [Sections] FC 3205.4.1 through 3205.4.4.

**3205.4.1 Dispensing areas.** Dispensing of cryogenic fluids shall be conducted in approved locations. Dispensing indoors shall be conducted in areas constructed in accordance with the construction codes, including the Building Code.

**3205.4.1.1 Ventilation.** Indoor areas where cryogenic fluids are dispensed shall be ventilated in accordance with the Mechanical Code in a manner that captures any vapor at the point of generation.

**3205.4.1.1.1 Alarms.** Oxygen sensors equipped with an audible alarm shall be provided in dispensing areas to continuously monitor the level of oxygen in the area. The alarm shall actuate when oxygen concentration drops below 19.5 percent.

**3205.4.1.2 Piping systems.** Piping systems utilized for filling or dispensing of cryogenic fluids shall be designed and constructed in accordance with [Section 3205.1.2] FC3205.1.2.

**3205.4.2 Vehicle loading and unloading areas.** Loading or unloading areas shall be designed and maintained in accordance with the standards referenced in [Sections] FC 3201.3.1 through 3201.3.3. Loading and unloading areas shall additionally comply with the requirements of [Sections 3203.6.1 and 3203.6.2] FC 3204.3.1 through 3204.3.1.2.5 and shall be capable of withstanding the weight of the fully loaded cargo tank.

**3205.4.2.1 Vehicle loading and unloading operations.** Vehicle loading and unloading operations shall be conducted in an approved manner in accordance with the standards referenced in [Sections] FC 3201.3.1 through 3201.3.3.

**3205.4.3 Limit procedures.** Limit procedures shall be established to prevent overfilling of stationary cryogenic containers during filling operations.

**3205.4.4 Prohibited filling of flammable cryogenic fluid.** It shall be unlawful to fill cryogenic containers with flammable cryogenic fluid.

**3205.5 Handling.** Handling of cryogenic containers shall be in accordance with this section.

**3205.5.1 Carts and hand trucks.** Cryogenic containers shall be moved using an approved method. Where cryogenic containers are moved by [hand] cart, hand truck or other mobile device, such carts, hand trucks or devices shall be designed for the secure movement of containers, including a means of restraining the containers.

**3205.5.2 Closed cryogenic containers.** Pressurized portable cryogenic containers shall be moved with all operable valves in a closed position. Cryogenic containers designed for use at atmospheric conditions shall be moved with appropriate loose fitting covers in place to prevent spillage.

**3205.5.3 Stationary cryogenic containers.** Stationary cryogenic containers shall not be moved while containing cryogenic fluid. Handling of cryogenic containers shall be in accordance with the manufacturer's instructions.

## SECTION FC 3206
## LNG INSTALLATIONS AND FACILITIES

**3206.1 New LNG installations and facilities.** It shall be unlawful to construct any new LNG installation or facility. It shall be unlawful to operate any LNG installation or facility that was not lawfully existing on the effective date of this code.

**3206.2 Existing LNG installations and facilities.** LNG installations and facilities lawfully existing on the effective date of this code shall be designed, installed, operated and maintained in accordance with this code, the rules and the regulations of the United States Department of Transportation, as set forth in 49 CFR Part 193, except as otherwise provided in [Section 102.3] FC 102.3, 102.4 and 102.5.

**3206.2.1 Out-of-service LNG storage tanks.** Notwithstanding any other provision of law, rule or regulation, any storage tank erected prior to the effective date of this code which has not been used for the storage of liquefied natural gas for a period in excess of [two] 2 years from the date of completion of the construction of the tank structure shall be recertified by the various city agencies in the same manner as if filing design and installation documents of a new tank before a certificate of occupancy be issued if the tank is to be placed in service.

# CHAPTER 33
# EXPLOSIVES, FIREWORKS AND SPECIAL EFFECTS

## SECTION FC 3301
## GENERAL

**3301.1 Scope.** This chapter shall govern the possession, manufacture, storage, handling, use, transportation and sale of explosives, fireworks, materials used to create a special effect, including pyrotechnic materials, and model and high-power rockets.

**Exceptions:**

1. Manufacture, storage, handling, use, transportation and sale of such materials by the Armed Forces of the United States, Coast Guard or National Guard.

2. Explosives in forms prescribed by the official United States Pharmacopoeia.

3. Reserved.

4. Reserved.

5. The use of explosives by federal and state, law enforcement and public safety agencies acting in their official capacity.

[6. Special industrial explosive devices which individually contain a quantity of explosives of not more than 0.056 ounces (1.6 grams) net explosive weight and which the aggregate do not exceed 1 pound (0.454 kg) net explosive weight.]

[7] 6. The storage, handling, use, transportation and sale of blank industrial-power load cartridges when packaged in accordance with United States Department of Transportation packaging regulations.

**3301.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**3301.2.1** Reserved.

**3301.2.2** Reserved.

**3301.2.3 Permit restrictions.** The commissioner, as a condition to the granting of a permit, may impose further restrictions on the storage, handling, use, transportation or sale of an explosive, fireworks display or special effects that the commissioner deems necessary or appropriate in the interest of public safety, including further restricting the quantity of materials, and designating the locations, days and times of days allowed for the permitted activity.

**3301.2.4 Financial responsibility.** Applicants for a permit shall submit proof satisfactory to the commissioner that the applicant has obtained and will maintain for the duration of the permit period a liability and casualty insurance policy, [or equivalent surety bond,] covering the permit holder, its officers, employees and agents, for personal injuries and property damage resulting from the permitted activity or the failure of the permit holder, its officers, employees and agents, to comply with any requirement of this chapter, any rule promulgated hereunder or the terms and conditions of the permit. Such insurance policy [or surety bond] shall name the city of New York as an additional insured and shall provide for notice to the commissioner at least ten days prior to any material change, cancellation or termination thereof. Such insurance policy [or surety bond] shall be in the following amounts, as applicable.

1. **High explosives.** The insurance policy [or surety bond] for the storage or use of high explosive, including any blasting operation, shall be in an amount to be determined by the commissioner but not less than five million dollars.

2. **Low explosives.** The insurance policy [or surety bond] for the storage of low explosives, small arms ammunition, primers, black powder or smokeless propellants shall be in an amount to be determined by the commissioner but not less than one hundred thousand dollars.

3. **Fireworks.** The insurance policy [or surety bond] for the discharge of fireworks, including any fireworks display, shall be in an amount to be determined by the commissioner but not less than two million dollars.

4. **Special effects.** The insurance policy [or surety bond] for the conduct of any special effects, including any special effects involving the storage or use of a pyrotechnic material, article or device, shall be in an amount to be determined by the commissioner but not less than one million dollars.

**3301.3 Prohibited materials, operations and facilities.**

**3301.3.1 Explosives.** It shall be unlawful to:

1. Manufacture any explosive, including small arms ammunition, primers, black powder and smokeless propellants.

2. Store for sale or display for sale any explosive in an area that is not secured from unauthorized access, including any unsecured display in an area accessible to the public.

3. Store, handle or use any explosive for any purpose other than one authorized by this chapter or other federal, state or city law, rule or regulation.

4. Store, handle or use any explosive in a residential building, or within 100 feet (30 480 mm) thereof, except for approved blasting operations, special effects and lawful storage of small arms ammunition for personal use and not for resale in accordance with [Section 3306] FC3306.

5. Store, handle or use any explosive without the permit, certificate of fitness and/or other approval required by this section.

6. Store, handle, use or sell the following explosives:

   6.1. Liquid nitroglycerin.

   6.2. Dynamite containing more than 60 percent liquid explosive ingredient.

   **Exception[.]:** Gelatin dynamite used for building implosions approved by the commissioner.

6.3. Dynamite without an approved absorbent, or in packaging that permits leakage of a liquid explosive ingredient under any conditions liable to exist during storage.

6.4. Nitrocellulose in a dry and uncompressed condition in a quantity greater than 10 pounds (4.54 kg) of net weight in one package.

6.5. Fulminate of mercury in a dry condition and fulminate of all other metals in any condition except as a component of manufactured articles not hereinafter forbidden.

6.6. Explosive compositions that ignite spontaneously or undergo marked decomposition, rendering the products of their use more hazardous, when subjected to a temperature of 167$^{o}$F (75$^{o}$C) for a continuous period of 48 hours or less.

6.7. Explosives containing an ammonium salt and a chlorate.

6.8. Explosives that have not been approved or have been forbidden in accordance with the regulations of the United States Department of Transportation, as set forth in 49 CFR Sections 173.51 and/or 173.54.

6.9. Explosives that have not been packaged or marked in accordance with the regulations of the United States Department of Transportation, as set forth in 49 CFR Parts 100-[178] 180, and the requirements of [Sections] FC 3303 and 3306.

7. Use any high explosive that has not been approved by the commissioner.

8. Operate or maintain safe havens and interchange lots for motor vehicles transporting explosives as set forth in NFPA 498.

**3301.3.2 Fireworks.** It shall be unlawful to:

1. Manufacture fireworks.

2. Sell fireworks, or offer or display fireworks for sale.

3. Store, handle, use or possess fireworks for any purpose other than conducting a fireworks display approved in accordance with this chapter.

4. Store fireworks, except temporary storage incidental to a fireworks display.

5. Conduct a fireworks display [inside a building] indoors.

6. Conduct a fireworks display without the fireworks contractor certificate and certificates of fitness required by this chapter.

7. Manually discharge a fireworks display, or conduct a fireworks display without an electrical control panel.

8. Store, handle, use or sell fireworks that have not been approved or have been forbidden in accordance with the regulations of the United States Department of Transportation, as set forth in 49 CFR Sections 173.51 and/or 173.54.

9. Store, handle, use or sell fireworks that have not been packaged or marked in accordance with the regulations of the United States Department of Transportation, as set forth in CFR 49 Parts 100-[178] 180, and [Sections] FC 3303 and 3306.

**3301.3.3 Pyrotechnic material.** It shall be unlawful to:

1. Manufacture any pyrotechnic material, article or device.

2. Store for sale or display for sale any pyrotechnic material, article or device in an area that is not secured from unauthorized access, including any unsecured display in an area accessible to the public.

3. Store, handle or use any pyrotechnic material, article or device in any residential building or within 100 feet (30 480 mm) thereof.

4. Sell any pyrotechnic material, article or device designed to create a special effect without the pyrotechnic supplier certificate required by this chapter.

5. Conduct any special effects using a pyrotechnic material, article or device without the certificate of fitness required by this chapter.

6. Store, handle, use or sell pyrotechnic material that has not been approved or have been forbidden in accordance with the regulations of the United States Department of Transportation, as set forth in 49 CFR Sections 173.51 and/or 173.54.

7. Store, handle, use or sell pyrotechnic material that has not been packed or marked in accordance with the regulations of the United States Department of Transportation, as set forth in 49 CFR Parts 100-[178] 180, and this chapter.

**3301.3.4 Rocketry.** It shall be unlawful to manufacture, store, handle or use model rocketry or high-power rocketry, as defined in and consistent with the scope of NFPA 1122 and NFPA 1127.

**3301.3.5 Smoking prohibited.** It shall be unlawful to smoke, light or maintain an open flame, or conduct hot work operations within 100 feet ([3050] 30 480 mm) of any location:

1. Where explosives or fireworks are stored, handled, used or otherwise discharged.

2. Where any material, article or device of an explosive, flammable or combustible nature, including pyrotechnic materials, articles and devices and fireworks, 1.4G, used to create a special effect are stored, handled, used or otherwise discharged.

**3301.3.6 Sobriety.** It shall be unlawful to be under the influence of intoxicating beverages, narcotics, controlled substances, and prescription or nonprescription drugs that can impair judgment as follows:

1. When supervising storage, or handling, or otherwise discharging or using explosives or fireworks.

2. When supervising storage, or handling, or otherwise discharging or using materials, articles or devices of an explosive, flammable or combustible nature, including pyrotechnic materials, articles and devices and fireworks, 1.4G, used to create a special effect.

**3301.4** Reserved.

**3301.5 Supervision.** The storage, handling, use and transportation of explosives, fireworks and pyrotechnic materials, articles and devices designed to create a special effect, including the discharge thereof, and special effects operations, shall be supervised in accordance with [Sections] FC 3301.5.1 through 3301.5.3.

**3301.5.1 Explosives.** Any blasting operations shall be conducted by a company holding a blasting contractor certificate and by persons holding a certificate of fitness in accordance with [Sections] FC 3301.5.1.1 through 3301.5.1.5.

**3301.5.1.1 Blasting contractor certificate.** The storage, handling, discharge or other use and transportation of explosives for blasting operations shall be conducted by a blasting contractor holding a blasting contractor certificate issued pursuant to this section. Such a certificate shall be issued only to a company whose owners, principals and officers demonstrate to the satisfaction of the commissioner that they possess the requisite character and fitness, education, experience, licenses, facilities, equipment and qualified staff to safely conduct blasting operations. The commissioner may adopt rules prescribing the requisite qualifications and other requirements for the issuance of such a certificate. The blaster shall be responsible for all blasting operations, and ensuring compliance with all applicable laws, rules and regulations.

**3301.5.1.2 Storage of high explosives.** The storage of high explosives shall be under the personal supervision of a magazine keeper holding a certificate of fitness for explosive storage. Such person shall have no duties other than safeguarding, operating and maintaining the magazine and its contents, including opening and closing the magazine and locking and otherwise securing the magazine from unauthorized entry and its contents from unauthorized access; receiving and dispensing or returning explosives; maintaining complete and accurate records of the explosives received, dispensed and returned; and visually inspecting and verifying the quantity and condition of the explosives in the magazine at the beginning and end of each work shift, and documenting same at the end of each work shift by signing an inventory slip in the presence of the succeeding magazine keeper. The unloading and loading of motor vehicles delivering explosives to the magazine or removing explosives therefrom shall be under the personal supervision of the certificate of fitness holder supervising the magazine.

**3301.5.1.3 Handling of high explosives.** All handling of high explosives, including handling in connection with blasting operations or other use, and handling incidental to transportation (other than transportation set forth in [Section 2707.4] FC2707.4), shall be performed by a blaster holding a certificate of fitness for blasting operations, an assistant blaster holding a certificate of fitness for blasting assistant, a magazine keeper holding a certificate of fitness for explosives storage, or an explosives handler holding a certificate of fitness for explosives handling.

**3301.5.1.4 Use of high explosives.** Blasting operations or other use of high explosives shall be conducted under the personal supervision of a blaster holding [of] a certificate of fitness for blasting operations. The blaster shall be in charge of and responsible for all blasting operations. The blaster shall ensure compliance with all applicable laws, rules, regulations, permit conditions and blasting procedures, and ensure that the blasting crew is trained and knowledgeable in the use of explosives. The blaster shall prescribe the blast area and danger zone and check that all persons, including the blasting crew, other job site personnel, pedestrians and traffic, are outside the danger zone before firing a blast. The duties of the blaster, except giving the direction to initiate the blast, may be delegated to an assistant blaster holding a certificate of fitness for blasting assistant.

**3301.5.1.5 Other job site personnel.** Other persons whose work causes them to be present within 100 feet (30 480 mm) of the storage, handling or use of high explosives shall hold a certificate of fitness for blasting job site personnel.

**3301.5.2 Fireworks.** Fireworks displays shall be conducted by a company holding a fireworks contractor certificate and persons holding a certificate of fitness for fireworks display in accordance with [Sections] FC 3301.5.2.1 through 3301.5.2.3.

**3301.5.2.1 Fireworks contractor certificate.** Each display or other event involving the discharge or other use of fireworks shall be conducted by a fireworks contractor holding a fireworks contractor certificate issued pursuant to this section. Such a certificate shall be issued only to a company whose owners, principals and officers demonstrate to the satisfaction of the commissioner that they possess the requisite character and fitness, education, experience, licenses, facilities, equipment and qualified staff to safely conduct fireworks displays or other events involving the discharge or other use of fireworks. The commissioner may adopt rules prescribing the requisite qualifications and other requirements for the issuance of such a certificate. The fireworks contractor shall be responsible for the safe conduct of the display or other event, in the manner prescribed by the commissioner, including:

1. Arranging for the preparation and submission of the fireworks display permit application, including the fireworks display plan, and obtaining the fireworks display permit.

2. Obtaining any necessary permit or authorization, including but not limited to any permit or authorization required by the United States Coast Guard, the New York City Department of Parks and Recreation, the Port Authority of New York and New Jersey, and the United States Federal Aviation Administration.

3. Ensuring compliance with all federal, state and local laws, rules and regulations governing the transportation of explosives.

4. Ensuring adequate facilities, fire protection, and staffing by qualified personnel, including the certificate of fitness holders required by this section.

5. Ensuring compliance with the directions of the department representatives.

6. In conjunction with the sponsor, ensuring maintenance of viewing areas at a safe distance from the location of the fireworks discharge, and other appropriate safety and crowd control measures, as prescribed by the commissioner.

7. Obtaining a liability and casualty insurance policy as set forth in [Section 3301.2.4] FC3301.2.4.

8. Conducting an inspection of the display site not more than 48 hours nor less than 24 hours prior to the scheduled display to determine whether there have been any changes in conditions at the display site or other area encompassed by the fireworks display plan (such as the presence of any new combustible or flammable material) that could render the area unsafe for a fireworks display. The fireworks display contractor shall notify the department of any such conditions and arrange for them to be removed.

9. Ensuring that the site of the display or other event is left in a safe condition.

**3301.5.2.2 Storage and handling of fireworks.** All handling of fireworks, including unloading from motor vehicles, and loading and placement of mortars and fusing of shells, and all temporary storage of fireworks incidental to a fireworks display shall be conducted under the personal supervision of a holder of a certificate of fitness for fireworks display.

**3301.5.2.3 Use of fireworks.** The use of fireworks for a fireworks display, including the discharge of fireworks during the display, shall be conducted by a person holding a certificate of fitness for fireworks display. Each fireworks display or other discharge of fireworks shall be under the personal supervision of at least two persons holding a certificate of fitness for fireworks display. The certificate of fitness holders conducting a fireworks display or other event shall be responsible for the safe handling, installation and discharge of fireworks and post-display site safety measures, in compliance with the requirements of this section, any rules promulgated hereunder, the terms and conditions of the fireworks display permit, and all other applicable laws, rules and regulations.

**3301.5.3 Special effects.** The storage, handling, discharge or other use and transportation of any material, article or device of an explosive, flammable or combustible nature, including fireworks, 1.4G, for special effects, and any sale or offering for sale of a pyrotechnic material, article or device, shall be conducted by persons holding a certificate of fitness or a pyrotechnic supplier certificate in accordance with [Sections] FC 3301.5.3.1 through 3301.5.3.4.

**3301.5.3.1 Special effects or other use of pyrotechnic materials, articles and devices.** Special effects displays or other events involving the conduct of a special effect, including the discharge or other use of any pyrotechnic material, article or device and fireworks, 1.4G, shall be conducted by a person holding a certificate of fitness for special effects issued pursuant to this section. Each discharge or other use of materials, articles or devices used for a special effect shall be performed by, or, if authorized by a special effects permit, under the personal supervision of, such certificate of fitness holder. The certificate of fitness holder conducting a special effect shall be responsible for the safe handling, installation and discharge of the special effect and post-discharge site safety measures in compliance with the requirements of this section, any rules promulgated hereunder, the terms and conditions of the special effects permit, and all other applicable laws, rules and regulations. A certificate of fitness for special effects shall be issued only to a person who demonstrates to the satisfaction of the commissioner that he or she possesses such education, training or experience in the manufacture, storage, use and display of pyrotechnic materials, articles and devices and other special effects as to qualify him or her to safely conduct one or more special effects. The commissioner may adopt rules prescribing the requisite qualifications and other requirements for the issuance of such certificate.

**3301.5.3.2 Storage and handling of pyrotechnic materials, articles or devices.** The storage of pyrotechnic materials, articles and devices in connection with a special effects display shall be under the general supervision of a certificate of fitness holder for pyrotechnic special effects materials. The handling of such materials, articles and devices shall be performed under the personal supervision of a certificate of fitness holder for special effects operations or a certificate of fitness for pyrotechnic materials.

**3301.5.3.3 Storage and handling of [non-pyrotechnic] <u>nonpyrotechnic</u> materials, articles and devices used for special effects.** The storage of materials, articles and devices of a flammable or combustible nature in connection with a special effects display shall be under the general supervision of a certificate of fitness holder for [non-pyrotechnic] <u>nonpyrotechnic</u> special effects materials. The handling of such materials, articles and devices shall be performed under the personal supervision of a certificate of fitness holder for special effects operations or a certificate of fitness for [non-pyrotechnic] <u>nonpyrotechnic</u> materials.

**3301.5.3.4 Pyrotechnic supplier certificate.** The sale or offering for sale of any pyrotechnic material, article or device to create a special effect shall be conducted by a company holding a pyrotechnic supplier certificate issued pursuant to this section. A pyrotechnic supplier certificate shall be issued only to a company whose owners, principals or officers demonstrate to the satisfaction of the commissioner that they possess the requisite character and fitness, education, experience, licenses, facilities, equipment and qualified staff to safely store, handle and transport pyrotechnic materials, articles or devices, and to ensure the lawful sale of such materials, articles and devices. The commissioner may adopt rules prescribing the requisite qualifications and other requirements for the issuance of such certificate. The holder of a pyrotechnic supplier certificate shall store, handle, transport, offer for sale, and sell pyrotechnic materials, articles and devices in compliance with the requirements of this section, the rules of the commissioner and all applicable federal and state laws, rules and regulations, including those restricting the selling or offering for sale of such materials, articles and devices only to a person holding a certificate of fitness for

pyrotechnic special effects or a company holding a production company special effects permit.

**3301.6** Reserved.

**3301.7** Reserved.

**3301.8** Reserved.

**3301.9 Transportation.** Explosives and fireworks shall be transported in accordance with [Section 2707] FC2707.

**3301.10 Monitoring by department.** Any material, operation or facility subject to the permit requirements of this chapter, including blasting operations, fireworks displays and special effects operations, may be monitored by representatives of the department to ensure compliance with the requirements of this chapter, the rules, and the terms and conditions of the permit. Such department representatives may order the immediate discontinuance of any storage, handling or use of explosives, fireworks or special effect materials, articles or devices in the interest of public safety.

**3301.11 Reporting of personal injury or property damage.** The owner and the certificate of fitness holder responsible for the material, operation or facility shall immediately report to the department any accident involving the storage, handling or use of explosives, fireworks or special effects materials, articles or devices, that results in personal injury or property damage.

**3301.12 Photography.** The department may restrict the taking of photographs at locations at which high explosives are being stored, handled and used.

## SECTION FC 3302
## DEFINITIONS

**3302.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**AIRBLAST.** The airborne shock wave or acoustic transient generated by an explosion.

**AMMONIUM NITRATE.** A chemical compound represented by the formula $NH_4NO_3$.

**ASSISTANT BLASTER.** A person holding a certificate of fitness for blasting assistant who is qualified to supervise explosives storage and handling and blasting operations, sometimes referred to as a powder carrier, and who assists the blaster in performing such duties.

**BARRICADE.** A structure or other artificial or natural barrier constructed in connection with the storage, handling and use of explosives that is designed to withstand the rapid release of energy in an explosion and provides a shield from the impact of the explosion. A straight line from the top of any sidewall of a building containing explosives to the eave line of any magazine or other building or to a point 12 feet (3658 mm) above the center of a railway or highway shall pass through such barrier.

**Artificial barricade.** An artificial mound or revetment, including a barrier constructed of sandbags, with a minimum thickness of 3 feet (914 mm).

**Natural barricade.** Terrain or other natural features of the ground.

**BARRICADED.** Protected by a barricade.

**BLAST AREA.** The blast site and surrounding area within the influence of flying rock, missiles and concussion.

**BLAST SITE.** The area in which explosives are being or have been loaded and which includes all holes loaded or to be loaded for the same blast and a distance of 50 feet (15 240 mm) in all directions.

**BLASTER.** A person holding a certificate of fitness for blasting operations, who is in charge of and responsible for a blasting operation.

**BLASTING AGENT.** A mixture consisting of fuel and an oxidizer that is used for blasting and classified by United States Department of Transportation regulations as Division 1.5, provided that the finished product, as mixed for use or shipment, cannot be detonated by means of a No. 8 test detonator when unconfined.

**BLASTING CONTRACTOR CERTIFICATE.** A written statement issued by the commissioner to a company authorizing such company to conduct blasting operations, and to be responsible for all storage, handling, use and transportation of explosives in connection therewith.

**BLASTING CREW.** Members of a work force trained and knowledgeable in the safe storage, handling and use of explosives, including assistant blasters, loaders and the magazine keepers.

**BLASTING OPERATION.** The use of explosives in conjunction with construction or demolition projects or other lawful purposes approved by the commissioner.

**BULLET RESISTANT.** Constructed so as to resist penetration of a bullet of 150-grain M2 ball ammunition having a nominal muzzle velocity of 2,700 feet per second (fps) (824 mps) when fired from a 30-caliber rifle at a distance of 100 feet (30 480 mm), measured perpendicular to the target.

**DANGER ZONE.** The area established by the blaster, including the blast area, to be cleared of all persons prior to discharging explosives.

**DETONATING CORD.** A flexible cord containing a center core of high explosive designed to initiate other explosives when activated.

**DETONATION.** An exothermic reaction with explosive effect that utilizes shock compression as the principal heating mechanism and generates a shock wave in the material that establishes

and maintains a reaction that progresses through the material at a rate greater than the velocity of sound.

**DETONATOR.** A device containing any initiating or primary explosive used for initiating detonation that contains no more than 154.32 grains (10 grams) of total explosives by weight, excluding ignition or delay charges. The term includes electric blasting caps of instantaneous and delay types, blasting caps for use with safety fuses, detonating cord delay connectors, and noninstantaneous and delay blasting caps which use detonating cord, shock tube or any other replacement for electric leg wires.

**DISCHARGE SITE.** The immediate area surrounding the mortars or other devices discharging fireworks for purposes of an outdoor fireworks display.

**DISPLAY SITE.** The area in which an outdoor fireworks display is conducted, including the discharge site, the fallout area, and the required separation distance from the discharge site to spectator viewing areas, but excluding spectator viewing areas.

**EXPLOSIVE.** A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord and igniters. The term "explosive" includes any material determined to be within the scope of Chapter 40 of Title 18 of the United States Codes, and any material classified as an explosive by the hazardous materials regulations of the United States Department of Transportation, as set forth in 49 CFR Section 173.52, except fireworks. Explosives are classified in accordance with the following United States Department of Transportation classification and other terms in common usage:

**United States Department of Transportation Class 1 explosives.**

**Division 1.1.** Explosives that present a mass explosion hazard.

**Division 1.2.** Explosives that present a projection hazard but not a mass explosion hazard.

**Division 1.3.** Explosives that present a fire hazard and either a minor blast hazard or a minor projection hazard, or both, but not a mass explosion hazard.

**Division 1.4.** Explosives that present a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. Such explosives are not subject to mass explosion when exposed to fire.

**Division 1.5.** Explosives that present a mass explosion hazard but which are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.

**Division 1.6.** Explosives consisting of extremely insensitive articles that [that] do not present a mass explosion hazard, and present a negligible probability of accidental initiation or propagation.

**High explosive.** Explosives, including dynamite, that, when detonated, are characterized by a high rate of reaction, high pressure development, and the presence of a detonation wave, and that can be caused to detonate by means of a No. 8 test blasting cap, when unconfined.

**Low explosive.** Explosives that will burn or deflagrate when ignited, and which are characterized by a rate of reaction that is less than the speed of sound, and low pressure development. Examples of low explosives include black powder, igniter cords, igniters, safety fuses, small arms ammunition and primers, and propellants, 1.3C.

**Mass-detonating explosives.** Division 1.1, 1.2 and 1.5 explosives that, whether individually or in combination, or loaded into ammunition or containers, explode virtually instantaneously when a small portion is subjected to fire, concussion, impact, the impulse of an initiating agent, or the effect of a considerable discharge of energy from without, with severe explosive effect, including the potential for structural damage to adjacent objects, and explosive propagation to other explosives stored in proximity, such that two or more quantities in proximity must be considered as one for quantity-distance purposes.

**FALLOUT AREA.** The area over which aerial shells or other aerial fireworks are fired and intended to combust, deflagrate or detonate, including the area into which debris and unexploded aerial fireworks are expected to fall given the direction and strength of the wind, and the angle or placement of the mortars or other devices discharging fireworks.

**FIREWORKS.** An article or device that does not present a mass explosion hazard, that is manufactured or used to produce a visible or an audible effect for entertainment or other display purposes by combustion, deflagration or detonation, and that meets the definition of 1.4G fireworks or 1.3G fireworks as set forth herein.

**Fireworks, 1.4G.** Small fireworks devices, classified as UN 0336 by United States Department of Transportation regulations, containing restricted amounts of pyrotechnic materials designed primarily to produce visible or audible effects by combustion.

**Fireworks, 1.3G.** Large fireworks devices classified as UN0335 by the United States Department of Transportation regulations, intended for use in fireworks displays and designed to produce audible or visible effects by combustion, deflagration or detonation, including firecrackers containing more than 130 milligrams (2 grains) of explosive composition, aerial shells containing more than 40 grams of pyrotechnic material, and other display pieces which exceed the limits for classification as 1.4G fireworks.

**FIREWORKS CONTRACTOR CERTIFICATE.** A written statement issued by the commissioner to a company authorizing such company to conduct a fireworks display and to be responsible for all storage, handling, use and transportation of fireworks in connection therewith.

**FIREWORKS DISPLAY.** The discharge of fireworks for an outdoors public display.

**FUME CLASS 1.** A classification established by the Institute of Makers of Explosives. Explosives meeting the requirements of this classification will provide less than 0.16 cubic feet (0.00453 $m^3$) of poisonous gases upon detonation of 0.44 pounds (200 grams) of explosive.

**HIGHWAY.** A public street.

**INHABITED BUILDING.** A building regularly occupied in whole or in part as a habitation for human beings, or any house of worship, school building, railroad station, store or other structure where people are accustomed to assemble.

**JOB SITE.** The construction site at which blasting operations are being conducted, including the blast site and blast area.

**LOADER.** A person holding a certificate of fitness for explosives handling, who handles explosives and performs explosives loading operations.

**MAGAZINE.** A building, structure or container approved for storage of explosives.

**Indoor.** A portable structure, such as a box, bin or other container, constructed as required for Type 2, 4 or 5 magazines in accordance with NFPA 495, NFPA 1124 or the regulations of the Bureau of Alcohol, Tobacco, Firearms and Explosives of the United States Department of Justice, as set forth in 27 CFR Part 555, so as to be fire resistant and theft resistant.

**Type 1.** A permanent structure, such as a building or other permanent structure constructed in accordance with the requirements of NFPA 495, NFPA 1124, or the regulations of the Bureau of Alcohol, Tobacco, Firearms and Explosives of the United States Department of Justice, as set forth in 27 CFR Part 555, that is bullet-resistant, fire-resistant, theft-resistant, weather-resistant and ventilated.

**Type 2.** A portable or mobile structure, such as a box, skid-magazine, trailer or semitrailer, constructed in accordance with NFPA 495, NFPA 1124 or the regulations of the Bureau of Alcohol, Tobacco, Firearms and Explosives of the United States Department of Justice, as set forth in 27 CFR Part 555, that is fire resistant, theft resistant, weather resistant and ventilated, and if used outdoors, bullet resistant.

**Type 3.** A portable structure for the temporary storage of explosives, such as a "day box,"[,] constructed in accordance with NFPA 495, NFPA 1124, or the regulations of the Bureau of Alcohol, Tobacco, Firearms and Explosives of the United States Department of Justice, as set forth in 27 CFR Part 555, that is fire-resistant, theft-resistant and weather-resistant.

**Type 4.** A permanent, portable or mobile structure such as a building, box, semitrailer or other mobile container constructed in accordance with NFPA 495, NFPA 1124, or the regulations of the Bureau of Alcohol, Tobacco, Firearms and Explosives of the United States Department of Justice, as set forth in 27 CFR Part 555, that is fire-resistant, theft-resistant and weather-resistant.

**Type 5.** A permanent, portable or mobile structure such as a building, box, bin, tank, semitrailer, bulk trailer, tank trailer, bulk truck, tank truck or other mobile container constructed in accordance with NFPA 495, NFPA 1124, or the regulations of the Bureau of Alcohol, Tobacco, Firearms and Explosives of the United States Department of Justice, as set forth in 27 CFR Part 555, that is theft resistant.

**MAGAZINE KEEPER.** A person holding a certificate of fitness for explosives storage who is in charge of and responsible for the storage and handling of explosives in an explosives magazine.

**MINIMUM SECURED RADIUS.** A minimum separation distance based on the size of the largest fireworks shell to be used in the display.

**MORTAR.** A tube or similar device in which fireworks, shells or other aerial fireworks are directed and discharged into the air.

**MUCKING.** The removal, usually by heavy machinery, of debris or other broken material resulting from a blast.

**NET EXPLOSIVE WEIGHT (net weight).** The weight of an explosive expressed in pounds, representing the aggregate amount of explosives contained within a building or structure, including a magazine, used to establish quantity-distance relationships.

**PRIMER.** A unit, package or cartridge of explosives, including a detonator or detonator/detonating cord combination, that is used to initiate a main charge of explosives or blasting agents.

**PROTECTED EXPOSURE.** Any premises, building, structure, facility, installation, street, railway, natural feature or other thing or place determined by the department to require protection from a fireworks display by reason of its proximity to the discharge site and the fallout area and the risk of resulting harm from aerial or other fireworks.

**PROXIMATE AUDIENCE.** An audience closer to pyrotechnic devices than [permitted] allowed by NFPA 1123.

**PYROTECHNIC ARTICLE OR DEVICE.** Any article or device containing a pyrotechnic material.

**PYROTECHNIC MATERIAL.** A chemical mixture consisting predominantly of solids that, upon ignition, are capable of producing a controlled, self-sustaining, and self-contained exothermic reaction, that functions without external oxygen, resulting in a visible or audible effect by combustion, deflagration, or detonation.

**PYROTECHNIC SUPPLIER CERTIFICATE.** A written statement issued by the commissioner to a company authorizing such company to engage in the business of selling any pyrotechnic material, article or device designed for the purpose of creating a special effect.

**RAILWAY.** A subway, railroad, railway or other similar means of transportation.

**READY BOX.** A container with a self-closing cover that is of a material and construction sufficient to protect fireworks from burning debris and from precipitation or other weather conditions. A tarpaulin structure shall not be deemed sufficient for use as a ready box.

**SEPARATION DISTANCE.** The distance that is to be maintained during the fireworks display from the outer perimeter of the discharge area to each viewing area or protected area. The separation distance represents the distance determined by the department to be necessary and sufficient to secure viewing areas and protected areas from hazards associated with a fireworks display, including but not limited to blast, fire, fallout and noise hazards.

**SMALL ARMS AMMUNITION.** A shotgun, rifle or pistol cartridge, and any cartridge for propellant-actuated devices, excluding ammunition containing bursting charges or incendiary, trace, spotting or pyrotechnic projectiles.

**SMALL ARMS AMMUNITION PRIMERS.** Small percussion-sensitive explosive charges, encased in a cap, used to ignite propellant powder.

**SMOKELESS PROPELLANTS.** Solid propellants, commonly referred to as smokeless powders, used in small arms ammunition, cannons, rockets, propellant-actuated devices and similar articles.

**SPECIAL EFFECT.** A visible or audible effect used for entertainment or other display purposes, created by any material, article or device of an explosive, flammable or combustible nature, including pyrotechnic materials, articles and devices and fireworks, 1.4G, but excluding fireworks, 1.3G.

**SPECIAL INDUSTRIAL EXPLOSIVE DEVICE.** An explosive power pack containing an explosive charge in the form of a cartridge or construction device, including, but not limited to, explosive rivets, explosive bolts, explosive charges for driving pins or studs, cartridges for explosive-actuated power tools and charges of explosives used in automotive air bag inflators, jet tapping of open hearth furnaces and jet perforation of oil well casings.

**SPONSOR.** The person that has retained a fireworks contractor to conduct a fireworks display, and to whom the fireworks display permit is issued.

**TNT EQUIVALENT.** A measurement of the quantity of an explosive calculated by reference to the quantity of trinitrotoluene that contains the equivalent explosive energy.

**THEFT RESISTANT.** Construction designed to deter unauthorized entry into magazines or other explosives storage facilities, so as to prevent unauthorized access to stored explosives.

**VENDOR.** Any person engaged in the transportation and storage of explosives in connection with the sale of such explosives for blasting operations.

**VIEWING AREA.** Areas designated for viewing a fireworks display, to which spectators are restricted.

## SECTION FC 3303
## EXPLOSIVES RECORDKEEPING AND REPORTING

**3303.1 General.** Records shall be maintained of the storage, handling and use of high explosives, detonators, blasting agents, emulsion explosives, including the receipt and disposal

of such explosives and the reporting of accidents, loss or theft of explosives, or unauthorized activities in accordance with this section.

**3303.2 Transaction record.** Vendors of high explosives and blasting contractors shall maintain, on forms prescribed by the commissioner, a record of all transactions involving the receipt, removal, use or disposal of high explosives, including the date and time, name and certificate of fitness number of the magazine keeper, type of high explosives, total amounts deposited and withdrawn, and department serial numbers. These records shall be signed by the blaster, assistant blaster and magazine keeper. Such records shall be maintained for a period of 5 years, and submitted to the department in accordance with department procedures.

**3303.2.1 Records of vendors.** Vendors of high explosives shall maintain the following records:

1. A weekly record of high explosives delivered from outside New York City to any vendor facility located within New York City.

2. A daily record of high explosives removed from a vendor's facility, delivered to and/or returned from a job site.

3. A daily record of high explosives delivered in and removed from an explosives vehicle at each job site.

**3303.2.2 Records of blasting contractors.** Blasting contractors shall maintain the following records:

1. A daily record of high explosives, including the department's serial number codes, delivered by a vendor to each job site.

2. A daily record of high explosives, including the department's serial number codes, received at and removed from each job site magazine.

3. A daily shot record indicating the amount of high explosives received from job site magazines, the date and time of each blast, the amount of high explosives used and the disposition of any unused high explosives.

**3303.2.3 Submission to the department.** The following records shall be submitted to the department on a daily basis:

1. A magazine inventory slip with an entry for each shift indicating the quantity and condition of the high explosives stored therein.

2. A daily shot record.

3. Central station company documentation of each entry into a Class I magazine, when such monitoring is required by this chapter.

**3303.3 Loss, theft or unauthorized removal.** The loss, theft or unauthorized removal of blasting agents, detonators, emulsion explosives or high explosives from a magazine or permitted facility shall be reported to the department, and all other law enforcement authorities requiring such reporting, including the United States Federal Bureau of Investigation and Bureau of Alcohol, Tobacco, Firearms and Explosives, immediately upon discovery of such loss, theft or unauthorized removal.

**3303.4** Reserved.

**3303.5 Misfires.** The blaster shall keep a record of all charges that fail to detonate.

**3303.6 Hazard communication.** Vendors shall maintain records of chemicals, chemical compounds and mixtures required by the United States Department of Labor regulations as set forth in 29 CFR Section 1910.1200.

**3303.7 Safety rules.** Safety rules covering the operation of magazines, as described in [Section 3304.7] FC3304.7, shall be posted on the interior of the magazine in a visible location.

**3303.8 Marking of explosives for blasting.** Explosives to be stored, handled, used, transported or sold for blasting purposes shall be marked in accordance with [Sections] FC 3308.1 through 3308.4.

**3303.8.1 High explosives.** High explosives packaging shall be conspicuously marked with:

1. The manufacturer's name, brand name, date shift code, and classification code.

2. The words **"HIGH EXPLOSIVES – DANGEROUS – HANDLE CAREFULLY"** on the top.

3. The actual number of cartridges within the package, cartridge dimensions, the case weight and any storage instructions.

4. The department's ten-digit serial number code.

**3303.8.2 High explosives cartridges.** High explosive cartridges, sticks, tubes, wrappers, bags, casts, or other forms of packaged high explosives shall be of vermillion in color, unless otherwise approved, and marked with:

1. The manufacturer's name, date shift code and brand of explosive.

2. The words **"HIGH EXPLOSIVES – DANGEROUS – HANDLE CAREFULLY.**"[**.]**

3. The department's ten-digit serial number code on both ends of the cartridge.

**3303.8.3 Detonator packaging.** Detonator packaging shall be marked with:

1. The manufacturer's name, brand name and date shift code.

2. The words **"DETONATORS – DANGEROUS – HANDLE CAREFULLY**" on two sides.

3. The actual number of detonators in the package, or the number of packages and detonators per package.

4. The department's two-letter, three-digit serial numbers for each detonator or package of detonators contained therein. The first package shall be designated as AA 001 and each subsequent package numbered consecutively as AA 002 through AA 999. The second sequence shall begin with AB 001 and shall continue in the same alpha-numeric fashion for subsequent packages.

5. For tunnel blasting, the contractor's name and the job site location, or an approved abbreviation, shall be used.

**3303.8.4 Individual detonators.** Individual detonators shall be marked with:

1. A shell, band or tag with the manufacturer's name and brand name.

2. The words **"EXPLOSIVES – DANGEROUS – DETONATOR"** or **"EXPLOSIVES – DANGEROUS – BLASTING CAP,**"[,] as applicable, on the shell, band or tag.

3. A tag or sticker bearing the department's two-letter/three-digit serial number, the delay period, and date shift code.

## SECTION FC 3304
## EXPLOSIVES STORAGE AND HANDLING

**3304.1 General.** All explosives, including black powder, propellant-actuated cartridges, small arms ammunition and primers, and smokeless propellants, shall be stored, handled, used and sold in accordance with this chapter and NFPA 495. Unclassified detonable organic peroxide, detonable pyrophoric materials, detonable unstable (reactive) materials and detonable water-reactive materials shall additionally comply with the requirements of other chapters of this code applicable to such materials.

**3304.1.1 Calculation of quantity of explosives.** The quantity of explosives stored at any location and the distance from such storage to protected exposures shall be in accordance with the quantity-distance [Tables] tables in [Section 3304.5] FC3304.5. The net explosive weight of the explosives shall be determined in accordance with [Sections] FC 3304.1.1.1 through 3304.1.1.6.

**3304.1.1.1 Mass explosion hazard explosives.** For Division 1.1, 1.2 or 1.5 explosives, the total net explosive weight of all such explosives, or the TNT equivalent, shall be used for purposes of quantity-distance requirements in accordance with FC Table 3304.5.2(2).

**3304.1.1.2 Non-mass explosion hazard explosives, except Division 1.4.**

1. For Division 1.3 propellants, the total weight of the propellants alone shall be the net explosive weight for purposes of quantity-distance requirements in accordance with FC Table 3304.5.2(3).

2. The sum of the net weights of metal powders and pyrotechnic materials shall be the net explosive weight for purposes of quantity-distance requirements in accordance with FC Table 3304.5.2(3).

**3304.1.1.3 Combination of mass explosion hazard and non-mass explosion hazard explosives, except Division 1.4.**

1. When Division 1.1 and 1.2 explosives are located in the same site, determine the distance for the total quantity considered first as if the total quantity were in Division 1.1 and then as if the total quantity were in Division 1.2. The required distance is the greater of the two. When the Division 1.1 requirements are controlling and the TNT equivalent of the Division 1.2 explosive is known, the TNT equivalent weight of the Division 1.2 explosives shall be added to the total explosive weight of Division 1.1 explosives to determine the net explosive weight for the Division 1.1 distance determination, for purposes of quantity-distance requirements in accordance with FC Table 3304.5.2(2).

2. When Division 1.1 and 1.3 explosives are located in the same site, determine the distances for the total quantity considered first as if the total quantity were in Division 1.1 and then as if the total quantity were in Division 1.3. The required distance is the greater of the two. When the Division 1.1 requirements are controlling and the TNT equivalent of the Division 1.3 explosives is known, the TNT equivalent weight of the Division 1.3 explosives shall be added to the total explosive weight of Division 1.1 explosives to determine the net explosive weight for the Division 1.1 distance determination, for purposes of quantity-distance requirements in accordance with FC Table 3304.5.2(2) or 3304.5.2 (3), as appropriate.

3. When Division 1.1, 1.2 and 1.3 explosives are located in the same site, determine the distances for the total quantity considered first as if the total quantity were in Division 1.1, next as if the total quantity were in Division 1.2 and finally as if the total quantity were in Division 1.3. The required distance is the greatest of the three. When the Division 1.1 requirements are controlling and the TNT equivalent of the Division 1.2 and Division 1.3 explosives are known, the TNT equivalent weight of the Division 1.2 and Division 1.3 explosives shall be added to the total explosive weight of Division 1.1 explosives to determine the net explosive weight for the Division 1.1 distance determination, for purposes of quantity-distance requirements in accordance with FC Table 3304.5.2(2).

4. For any composite pyrotechnic material and Division 1.1 or Division 1.3 explosives, the sum of the net weights of the pyrotechnic material and the explosives shall be used for the distance determination, for purposes of quantity-distance requirements in accordance with FC Tables 3304.5.2 (2) and 3304.5.2 (3).

**3304.1.1.4 Division 1.4 explosives.** For Division 1.4 explosives, the total weight of the explosive alone is the net weight for the distance determination, for purposes of quantity-distance requirements in accordance with FC Table 3304.5.2 (4).

**3304.1.1.5 Detonating cord.** Detonating cord of 50 grains per foot shall be calculated as equivalent to 8 pounds (4 kg) of high explosives per 1,000 feet ([305 m] 304 800 mm), for purposes of quantity-distance requirements. Heavier or lighter core loads shall be rated proportionally.

**3304.1.1.6 Detonators.** All types of detonators in strengths through No. 8 cap shall be rated at [1.5] 1½ pounds (0.68 kg) of explosives per 1,000 caps, for purposes of quantity-distance requirements. Detonators in strengths higher than No. 8 cap shall be rated as prescribed by the manufacturer.

**3304.2 Storage facility locations.** High explosives may only be stored for use in blasting operations conducted in New York City, and only in a magazine or other approved storage facility at a vendor's facility or job site. High explosives to be used in New York City shall first be delivered to a vendor's facility located within New York City. Thereafter, high explosives may be transported from such vendor's facility to approved storage facilities at job sites located in New York City. No explosives shall be delivered to any job site without the prior authorization of the Department. The commissioner shall promulgate rules governing the delivery and removal of explosives to and from the job site.

**3304.3 Magazines.** The storage of explosives in magazines shall comply with the requirements of [Section] FC 3304.3.1 through 3304.3.4.1 and FC Table 3304.3. Explosives shall be stored in magazines constructed, installed, operated and maintained in accordance with the requirements of this [Section] section, NFPA 495, NFPA 1124 and, except for portable or mobile magazines not exceeding 120 square feet (11 $m^2$) in area, the construction codes including the Building Code.

**3304.3.1 High explosives.** Explosives classified as Division 1.1 or 1.2 shall be stored in Type 1, 2 or 3 magazines.

**Exceptions:**

1. Black powder shall be stored in a Type 1, 2, 3 or 4 magazine.

2. Cap-sensitive explosives that are demonstrated not to be bullet sensitive shall be stored in a Type 1, 2, 3, 4 or 5 magazine.

**3304.3.1.1 Barricades.** All magazines storing high explosives shall be barricaded in an approved manner.

**3304.3.1.2 Classes of high explosives magazines.** Magazines for high explosives shall be classified based upon the maximum quantity of high explosives stored as follows:

1. First class magazines. High explosives magazines containing not more than 1,000 pounds (454 kg) of explosives.

2. Second class magazines. High explosives magazines containing not more than 500 pounds (227 kg) of explosives.

3. Third class magazines. High explosives magazines containing not more than 250 pounds (113.5 kg) of explosives.

**3304.3.1.3 Detonator magazines.** No more than 20,000 detonators may be stored in a single magazine. Only first class magazines may be used for storage of 1,000 detonators or more.

**3304.3.2 Low explosives.** Explosives that are not cap sensitive shall be stored in a Type 1, 2, 3, 4 or 5 magazine.

**3304.3.3** Reserved.

**3304.3.4 Access.** The owner or operator of a magazine shall restrict access to the magazine and only allow entry by the blaster and magazine keeper and other blasting contractor personnel or vendor personnel whose responsibilities in connection with the storage, handling, use or transportation of explosives require that they enter the magazine. Access to the keys to the magazine shall be restricted to the blaster, the powder carrier and the magazine keeper. The department may restrict the personnel authorized to enter the magazine for purposes of ensuring compliance with the requirements of this section. This provision shall not be construed to restrict department access to magazines.

**3304.4 Prohibited storage.** Detonators shall be stored in a separate magazine that does not contain other explosives. Black powder, blasting powder, and smokeless propellant shall be stored in a separate magazine that does not contain detonators or other explosives.

**FC TABLE 3304.3**
**STORAGE AMOUNTS AND MAGAZINE REQUIREMENTS FOR EXPLOSIVES**
**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA**

| NEW UN/ DOTn DIVISION | OLD DOTn CLASS | ATF/OSHA CLASS | INDOOR[a] (pounds) | | | | OUTDOORS (pounds) | MAGAZINE TYPE ALLOWED | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unprotected | Cabinet | Sprinklers | Sprinklers & cabinet | | 1 | 2 | 3 | 4 | 5 |
| 1.1 | A | High | 0 | 0 | 0 | 0 | 0 | X | X | X | — | — |
| 1.2 | A | High | 0 | 0 | 1 | 2 | 0 | X | X | X | — | — |
| 1.2 | B | Low | 0 | 0 | 1 | 2 | 0 | X | X | X | X | — |
| 1.3[b] | B | Low | 0 | 0 | 5 | 10 | 0 | X | X | X | X | — |
| 1.4 | B | Low | 0 | 0 | 50 | 100 | 0 | X | X | X | X | — |
| 1.5 | C | Low | 0 | 0 | 1 | 2 | 0 | X | X | X | X | — |
| 1.5 | Blasting Agent | Blasting Agent | 0 | 0 | 1 | 2 | 0 | X | X | X | X | X |
| 1.6 | N/A | N/A | 0 | 0 | 1 | 2 | 0 | X | X | X | X | X |

For SI: 1 pound = 0.454 kg, 1 pound per gallon = 0.12 kg per liter, 1 ounce = 28.35 g.
a. A factor of 10 pounds per gallon shall be used for converting pounds (solid) to gallons (liquid) in accordance with [Section 2703.1.2] FC2703.1.2.
b. Black powder shall be stored in a Type 1, 2, 3 or 4 magazine as provided for in [Section 3304.3.1] FC3304.3.1.

**3304.5 Location.** Magazines for storage of explosives shall be maintained and operated in accordance with [Sections] FC 3304.5.1 through 3304.5.3.3.

**3304.5.1 Indoor magazines.** It shall be unlawful to maintain or operate a magazine indoors for the storage of Division 1.1 explosives. Indoor magazines may be maintained and operated for the storage of explosives, other than those classified as Division 1.1, in accordance with this section.

**3304.5.1.1 Occupancies.** Indoor magazines for storage of explosives shall be maintained and operated only in Group F, H, M or S occupancies, when approved. It shall be unlawful to maintain or operate an indoor magazine in any building containing a Group R occupancy.

**3304.5.1.2 Construction.** Indoor magazines shall be designed and installed in compliance with the following requirements:

1. The magazine shall be fire resistant and theft resistant.

2. The exterior of the magazine shall be painted red.

3. The base of the magazine shall be fitted with wheels, casters or rollers to facilitate removal from the building in an emergency.

4. The lid or door of the magazine shall be marked with conspicuous white lettering not less than 3 inches (76 mm) high and minimum [0.5 inch (12.7 mm)] ½-inch (12.7-mm) stroke, reading "EXPLOSIVES — KEEP FIRE AWAY — NO SMOKING."

5. The least horizontal dimension of the magazine shall not exceed the clear width of the entrance door.

**3304.5.1.3 Quantity limit.** Not more than 50 pounds (23 kg) of explosives shall be stored in an indoor magazine.

**3304.5.1.4** Reserved.

**3304.5.1.5 Location.** Indoor magazines shall be located within 10 feet (3048 mm) of a means of egress and only on floors at or having ramp access to the outdoors at grade level.

**3304.5.1.6 Limitation on number.** Only one indoor magazine shall be maintained or operated in a single building or structure.

**3304.5.2 Outdoor magazines.** Outdoor magazines shall be maintained and operated in accordance with this section.

**3304.5.2.1 Location.** All outdoor magazines, other than Type 3 magazines, shall be located so as to be in accordance with FC Table 3304.5.2(2), [Table] 3304.5.2(3) or [Table] 3304.5.2(4) as set forth in FC Table 3304.5.2(1).

**3304.5.2.2 Detonator storage.** Magazines storing detonators, including magazines on drill boats, shall be located 100 feet ([30.5 m] 30 480 mm) from magazines storing high explosives, except [that where] as otherwise approved by the department. Where the magazine is barricaded the distance between magazines may be reduced as set forth in FC Table 3304.5.2(2).

**3304.5.2.3 Tunnel or under-decking.** When a suitable aboveground storage site is unavailable, barricaded magazines, located in the excavation below decking in compliance with the distance requirements as set forth in FC Table 3304.5.2(2), may be approved. The blasting contractor for the job site shall submit to the department a plan detailing the load carrying capacity of the decking above the magazine location. For deep underground excavations, the use of a gated coyote hole with overnight storage may be approved for a magazine that is constructed to first class magazine requirements.

**3304.5.3 Additional requirements for Type 3 magazines.** Type 3 magazines shall comply with the requirements of [Sections] FC 3304.5.3.1 through 3304.5.3.3.

**3304.5.3.1 Location.** Wherever practicable, Type 3 magazines shall be located away from neighboring inhabited buildings, railways, public streets, and other magazines in accordance with FC Table 3304.5.2(2), 3304.5.2(3) or 3304.5.2(4) as applicable.

**[3304.5.3.1.1 Detonator storage.** Upon a determination by the commissioner that the interest of public safety warrants such measures, magazines storing detonators shall be located 100 feet (30.5 m) from other magazines storing high explosives, except that if the magazines are separated by a barricade, the distance between magazines may be reduced as set forth in Table 3304.5.2(2).

**3304.5.3.1.2. Drill boats.** Upon a determination by the commissioner that the interest of public safety warrants such measures, detonator magazines on drill boats shall be located 100 feet (30.5 m) from other magazines storing high explosives.]

**3304.5.3.2 Storage of explosives.** Explosives shall be removed from Type 3 magazines to appropriate storage magazines at the end of the work day, unless approved.

**3304.5.3.3 Limitation on number.** Not more than two Type 3 magazines shall be located at the same blast site, unless approved. Where two or more Type 3 magazines are located at the same blast site, one magazine shall be used solely for the storage of detonators.

**FC TABLE 3304.5.2(1)**
**APPLICATION OF SEPARATION DISTANCE TABLE[a]**

| DOTn DIVISION | AMERICAN TABLE OF DISTANCES FOR STORAGE OF EXPLOSIVES 3304.5.2(2) (DOJ 27 CFR Part 555.218) | TABLE OF SEPARATION DISTANCES FOR LOW EXPLOSIVES 3304.5.2(3) (DOJ 27 CFR Part 555.219) | TABLE OF DISTANCES FOR OUTDOOR MAGAZINES OR BUILDINGS CONTAINING EXPLOSIVES DIVISION 1.4 3304.5.2(4) |
|---|---|---|---|
| 1.1 | X | — | — |
| 1.2 | X | — | — |
| 1.3 | — | X | — |
| 1.4G or 1.4S | — | — | X |

| | | | |
|---|---|---|---|
| 1.4B or 1.4S detonators | — | — | X |
| 1.5 | X | — | — |
| 1.6 | Not Applicable | Not Applicable | Not Applicable |

a. Where adjacent magazines contain different classes of explosives the separation between magazines shall be as prescribed by FC Table 3304.5.2(2).

**FC TABLE 3304.5.2(2)**
**AMERICAN TABLE OF DISTANCES FOR STORAGE OF EXPLOSIVES (AS REVISED JUNE 1991)[a]**

| QUANTITY OF EXPLOSIVES[b,e] | | DISTANCES IN FEET | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Inhabited buildings | | Public highways with traffic volume less than 3,000 vehicles per day | | Public highways with traffic volume greater than 3,000 vehicles per day and passenger railways | | Separation of magazines[d] | |
| Pounds over | Pounds not over | Barricaded | Unbarricaded | Barricaded | Unbarricaded | Barricaded | Unbarricaded | Barricaded | Unbarricaded |
| 0 | 5 | 70 | 140 | 30 | 60 | 51 | 102 | 6 | 12 |
| 5 | 10 | 90 | 180 | 35 | 70 | 64 | 128 | 8 | 16 |
| 10 | 20 | 110 | 220 | 45 | 90 | 81 | 162 | 10 | 20 |
| 20 | 30 | 125 | 250 | 50 | 100 | 93 | 186 | 11 | 22 |
| 30 | 40 | 140 | 280 | 55 | 110 | 103 | 206 | 12 | 24 |
| 40 | 50 | 150 | 300 | 60 | 120 | 110 | 220 | 14 | 28 |
| 50 | 75 | 170 | 340 | 70 | 140 | 127 | 254 | 15 | 30 |
| 75 | 100 | 190 | 380 | 75 | 150 | 139 | 278 | 16 | 32 |
| 100 | 125 | 200 | 400 | 80 | 160 | 150 | 300 | 18 | 36 |
| 125 | 150 | 215 | 430 | 85 | 170 | 159 | 318 | 19 | 38 |
| 150 | 200 | 235 | 470 | 95 | 190 | 175 | 350 | 21 | 42 |
| 200 | 250 | 255 | 510 | 105 | 210 | 189 | 378 | 23 | 46 |
| 250 | 300 | 270 | 540 | 110 | 220 | 201 | 402 | 24 | 48 |
| 300 | 400 | 295 | 590 | 120 | 240 | 221 | 442 | 27 | 54 |
| 400 | 500 | 320 | 640 | 130 | 260 | 238 | 476 | 29 | 58 |
| 500 | 600 | 240 | 480 | 135 | 270 | 253 | 506 | 31 | 62 |
| 600 | 700 | 355 | 710 | 145 | 290 | 266 | 532 | 32 | 64 |
| 700 | 800 | 375 | 750 | 150 | 300 | 278 | 556 | 33 | 66 |
| 800 | 900 | 390 | 780 | 155 | 310 | 289 | 578 | 35 | 70 |
| 900 | 1,000 | 400 | 800 | 160 | 320 | 300 | 600 | 36 | 72 |

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg.
a. This table applies to the storage of explosives, except for temporary storage incidental to transportation.
b. Storage of explosives in a quantity exceeding 1,000 pounds in one magazine is prohibited.
c. Reserved.
d. Where two or more storage magazines are located on the same property, each magazine shall comply with the minimum distance specified from inhabited buildings, railways and highways, and, in addition, they should be separated from each other by not less than the distances shown for separation of magazines, except that the quantity of explosives in detonator magazines shall govern in regard to the spacing of said detonator magazines from magazines containing other explosives. Where any two or more magazines are separated from each other by less than the specified separation of magazine distances, then two or more such magazines, as a group, shall be considered as one magazine, and the total quantity of explosives stored in such group shall be treated as if stored in a single magazine located on the site of any magazine in the group and shall comply with the minimum distances specified from other magazines, inhabited buildings, railways and highways.
e. The quantity of explosives refers to pounds of trinitrotoluene (TNT), or for other type explosives, the quantity of TNT with the equivalent explosive energy.

**FC TABLE 3304.5.2(3)**
**TABLE OF DISTANCES FOR OUTDOOR MAGAZINES OR BUILDINGS CONTAINING EXPLOSIVES—DIVISION 1.3—MASS-FIRE HAZARD[a,b,c]**

| QUANTITY OF DIVISION 1.3 EXPLOSIVES | | DISTANCES IN FEET | |
|---|---|---|---|
| Pounds over | Pounds not over | Inhabited buildings, railways and public highways | Magazines |
| 0 | 1,000 | 75 | 50 |

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg.
a. Black powder, when stored in magazines, is defined as low explosive by the Bureau of Alcohol, Tobacco and Firearms (BATF).
b. For quantities less than 1,000 pounds, the required distances are those specified for 1,000 pounds. The commissioner may authorize storage of such explosives in quantities less than 1000 pounds at lesser distances from protected exposures.
c. No more than 50 pounds of explosives may be stored in a building.

**FC TABLE 3304.5.2(4)**
**TABLE OF DISTANCES FOR OUTDOOR MAGAZINES OR BUILDINGS CONTAINING EXPLOSIVES - DIVISION 1.4[c,d]**

| QUANTITY OF DIVISION 1.4 EXPLOSIVES | | DISTANCES IN FEET | | |
|---|---|---|---|---|
| Pounds Over | Pounds Not Over | From Inhabited Building | From Public Railroad and Highway | From Aboveground Magazine and Operating Buildings[a, b] |
| 50 | 1000 | 100 | 100 | 50 |

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg.

a. A separation distance of 100 feet is required for buildings of other than Type I or Type II construction as defined in the Building Code.

b. For earth-covered magazines, no specified separation is required.

(1) Earth cover material used for magazines shall be relatively cohesive. Solid or wet clay and similar types of soil are to cohesive and shall not be used. Soil shall be free from unsanitary organic matter, trash, debris and stones heavier than 10 pounds or larger than 6 inches in diameter. Compaction and surface preparation shall be provided, as necessary, to maintain structural integrity and avoid erosion. Where cohesive material cannot be used, as in sandy soil, the earth cover over magazines shall be finished with a suitable material to ensure structural integrity.

(2) The earth fill or earth cover between earth-covered magazines shall be either solid or sloped, in accordance with the requirements of other construction features, but a minimum of 2 feet of earth cover shall be maintained over the top of each magazines. To reduce erosion and facilitate maintenance operations, the cover shall have a slope of 2 horizontal to 1 vertical.

c. Restricted to articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco and Firearms regulations, or unpacked articles used in process operations that do not propagate a detonation of deflagration between articles.

d. No more than 50 pounds of explosives may be stored in a building.

**3304.6 Installation.** Magazines shall be designed and installed in accordance with [Sections] FC 3304.6.1 through 3304.6.8.

**3304.6.1 Drainage.** The ground around a magazine shall be graded so that water drains away from the magazine.

**3304.6.2 Heating.** Magazines requiring heat shall be heated as prescribed in NFPA 495 by either hot water radiant heating within the magazine or by indirect warm air heating.

**3304.6.3 Lighting.** All electric lights, electric safety flashlights or electric safety lanterns used in a magazine shall be listed as intrinsically safe or otherwise suitable for use in hazardous locations and shall comply with the requirements of NFPA 495.

**3304.6.4 Nonsparking materials.** It shall be unlawful to maintain or operate a magazine, other than a Type 5 magazine, with exposed ferrous metal on any interior surface.

**3304.6.5 Warning signs.** Any premises upon which explosives are stored in magazines shall have signs posted in accordance with [Sections] FC 3304.6.5.1 and 3304.6.5.2. Signs shall be durable, weather resistant and of contrasting colors with a minimum letter height of 3 inches (76 mm) with a minimum brush stroke of [0.5] ½ inch (12.7 mm).

**3304.6.5.1 Job sites.** The owner shall **c**onspicuously post on the exterior of the construction fence or other exterior wall of the premises the following sign at approved locations:

DANGER!
NEVER FIGHT EXPLOSIVES FIRES—CALL 911.
EXPLOSIVES ARE STORED ON THIS SITE

**3304.6.5.2 Vendor facilities.** Signs complying with the requirements of [Section 3304.6.5.1] FC3304.6.5.1 shall be conspicuously posted at approved locations at vendor facilities.

**3304.6.5.3 Placards.** Type 5 magazines containing Division 1.5 blasting agents shall be prominently placarded as required during transportation by the regulations of the United States Department of Transportation, as set forth in 49 CFR Part 172 and the regulations

of the Bureau of Alcohol, Tobacco, Firearms and Explosives of the United States Department of Justice, as set forth in 27 CFR Part 555.

**3304.6.6 Security for magazines at vendor facilities.** Vendor magazines shall be provided with the following security measures:

1. A magazine keeper shall be present on the premises and continuously monitor the magazine at all times.

2. A suitable shelter for the magazine keeper shall be provided.

3. The magazine and surrounding area shall be illuminated at night.

4. A dedicated, non-coin-operated telephone shall be provided inside the shelter for the use of the magazine keeper.

5. A door alarm and holdup alarm, monitored by an approved central station company, shall be provided. The central station company shall not have the capability to shut off the alarms. The central station shall:

   5.1. Record all openings and closings of the magazine doors.

   5.2. Notify the department of any unusual occurrences and outages.

   5.3. Provide written procedures concerning the opening and closing of magazine doors.

6. An audible and visible alarm system shall be provided that is activated by opening the magazine door, and that is continuously monitored at an approved location on the premises.

7. A local perimeter intrusion alarm shall be provided that is capable of being deactivated during normal delivery hours.

8. First class magazines shall additionally comply with the following installation requirements:

   8.1. Circuits used for the doors and holdup alarm shall be dedicated and use fire alarm wiring and wiring methods as set forth in the construction codes, including the Building Code and the Electrical Code. The door and holdup alarm shall use an approved transmitter, operate on alternating current, be provided with battery backup, and be monitored by an approved central station company. There shall be no control on the premises for shutting down the alarm transmission to the central station company other than disconnecting all power to the alarm system.

   8.2. Electrical wiring on the premises from the magazine doors to the central station company and the magazine keeper's shelter shall be protected by rigid conduit. Overhead wiring shall use a weatherhead fitting and have a minimum 15 feet

(4572 mm) clearance from the ground. Underground wiring shall be protected in galvanized conduit, buried at a minimum depth of 18 inches ([457.2] 457 mm) or 12 inches ([304.8] 305 mm) deep with 6 inches ([152.4] 152 mm) concrete cover.

8.3. Overhead telephone lines feeding the magazine keeper's shelter shall be protected for a distance of 15 feet (4572 mm) in height by a conduit service pipe suitably braced for strain. Underground telephone lines shall be protected in galvanized conduit, buried 18 inches ([457.2] 457 mm) minimum or 12 inches ([304.8] 305 mm) deep with 6 inches ([152.4] 152 mm) concrete cover.

**3304.6.7 Security for magazines.** All first class magazines at job sites and all other magazines storing high explosives overnight shall comply with the requirements of [Section 3304.6.6] FC3304.6.6.

**3304.6.8 Magazine cars.** Approved magazine cars shall be used to transport explosives through tunnels to working headings.

**3304.7 Operation.** Magazines shall be operated in accordance with [Sections] FC 3304.7.1 through 3304.7.9.

**3304.7.1 Security.** Magazines shall be kept locked and otherwise secured in the manner prescribed in NFPA 495 at all times except during delivery or removal of explosives or during inspection.

**3304.7.2 Open flames and lights.** Smoking, matches, hot work, flame-producing devices, open flames, firearms and firearms cartridges shall not be [permitted] allowed inside of or within 100 feet (30 480 mm) of portable or permanent magazines in which explosives are stored.

**3304.7.2.1 Capping and primers.** [no] No cartridge shall be capped or primer readied within 100 feet (30 480 mm) of a magazine.

**3304.7.3 Vegetation and combustible waste.** The area located around a magazine shall be kept clear of brush, grass, vines, weeds, rubbish and other combustible waste for a distance of 25 feet (7620 mm).

**3304.7.4 Combustible material storage.** Combustible materials shall not be stored within 100 feet (30 480 mm) of magazines.

**3304.7.5 Unpacking and repacking explosives.** Containers of explosives, except fiberboard containers, and packages of damaged or deteriorated explosives shall not be unpacked or repacked inside or within 50 feet (15 240 mm) of a magazine or in close proximity to other explosives.

**3304.7.5.1 Storage of opened packages.** Packages of explosives that have been opened shall be closed before being placed in a magazine.

**3304.7.5.2 Nonsparking tools.** Tools used for the opening and closing of packages of explosives, other than metal slitters for opening paper, plastic or fiberboard containers, shall be made of nonsparking materials.

**3304.7.5.3 Disposal of packaging.** Empty containers and paper and fiber packaging materials that previously contained explosives shall be disposed of or reused in a approved manner.

**3304.7.6 Tools and equipment.** Metal tools, other than nonferrous transfer conveyors and ferrous metal conveyor stands protected by a coat of paint, shall not be stored or used in a magazine containing explosives.

**3304.7.7 Contents.** Magazines shall be used exclusively for the storage of explosives.

**3304.7.8 Compatibility.** Corresponding grades and brands of explosives shall be stored together and in such a manner that the grade and brand marks are visible. The inventory of explosives shall be stored in a manner that allows ready access for counting and checking its condition. Packages of explosives shall be stacked in a stable manner not exceeding 8 feet (2438 mm) in height.

**3304.7.9 Stock rotation.** When explosives are removed from a magazine for use, the oldest usable stock shall be removed first.

**3304.8 Maintenance.** Maintenance of magazines shall comply with the requirements of [Sections] FC 3304.8.1 through 3304.8.3.

**3304.8.1 Housekeeping.** Magazine floors shall be regularly swept and be kept clean, dry and free of grit, paper, empty packages and rubbish. Brooms and other cleaning utensils shall not have any spark-producing metal parts. Sweepings from magazine floors shall be removed from the premises and disposed of lawfully.

**3304.8.2 Repairs.** Explosives shall be removed from the magazine before repairs are made to the interior of a magazine. Explosives shall be removed from the magazine before repairs are made to the exterior of the magazine when there is a possibility of causing a fire. Explosives removed from a magazine under repair shall either be placed in another magazine or placed a safe distance from the magazine, where they shall be properly guarded and protected until repairs have been completed. Upon completion of repairs, the explosives shall be promptly returned to the magazine. Floors shall be cleaned before and after repairs. Under no circumstances shall explosives be stored outside the magazine overnight.

**3304.8.3 Floors.** Magazine floors stained with liquid from explosives shall be cleaned or replaced in accordance with the explosives manufacturer instructions.

**3304.9 Inspection.** Magazines storing explosives shall be opened and inspected daily. The magazine keeper shall lock and otherwise secure the magazine from unauthorized entry and its contents from unauthorized access; receive and dispense explosives; and maintain complete and accurate records of the explosives received and dispensed. At the beginning and end of each work shift, the magazine keeper shall visually inspect and verify the quantity and condition of

the explosives in the magazine, determine whether there has been an unauthorized or attempted entry into the magazine or an unauthorized removal, and document same at the end of each work shift by signing an inventory slip in the presence of the succeeding magazine keeper. The magazine keeper shall personally supervise the unloading and loading of motor vehicles delivering explosives to the magazine or removing explosives therefrom.

**3304.10 Disposal of explosives.** Explosives shall be disposed of in accordance with [Sections] FC 3304.10.1 through 3304.10.5.

**3304.10.1 Notification.** The department shall be notified immediately when explosives are determined to be deteriorated or leaking or otherwise unstable or in need of disposal.

**3304.10.2 Deteriorated explosives.** When an explosive has deteriorated to an extent that it is in an unstable or dangerous condition, or when a liquid has leaked from an explosive, the person in possession of such explosives shall immediately contact the manufacturer to obtain handling and disposal instructions.

**3304.10.3 Destruction of explosives.** Unused explosives may be destroyed at the job site only when approved. When approved, such destruction of explosives shall be conducted by a qualified person at an approved location under the supervision of department representatives. It shall be unlawful to dispose of explosives by burning.

**3304.10.4 Storage of misfires.** Explosives that fail to detonate during blasting operations shall be handled in accordance with [Section 3307.15] FC3307.15 and other approved procedures until the blaster has determined the proper method for disposal in consultation with the department.

**3304.10.5 Unused high explosives.** High explosives in storage at a job site at the completion of blasting operations, or which are not otherwise to be used at the job site, shall be removed from the job site and transported to a vendor's facility. The vendor may store and supply for use unopened cases of high explosives. The vendor may not supply open cases of high explosives for use unless the explosives are packaged in an approved manner, and their condition certified in writing in an approved manner by the magazine keeper previously responsible for their storage.

## SECTION FC 3305
## RESERVED

## SECTION FC 3306
## [STORAGE OF] SMALL ARMS AMMUNITION [AND PRIMERS], POWDER-ACTUATED TOOL LOADS, BLACK POWDER AND SMOKELESS PROPELLANTS

**3306.1 General.** Indoor storage and display of small arms ammunition, powder-actuated tool loads, black powder and smokeless propellants shall comply with the requirements of this section and NFPA 495.

**3306.2 Storage.** The storage and display of small arms ammunition and primers, black powder and smokeless propellants shall be as set forth in [Sections] FC 3306.2.1 through 3306.7.

**3306.2.1 Occupancy restrictions.** It shall be unlawful to store small arms ammunition and primers, powder-actuated tool loads, black powder and smokeless propellants in any premises, building, structure or facility, except as authorized by this section.

**3306.2.2 Quantity restrictions.** It shall be unlawful to store small arms ammunition and primers, powder-actuated tool loads, black powder or smokeless propellants in quantities exceeding the following:

1. [300,000] Three hundred thousand loaded shells containing shot for shotguns not exceeding No. 8 gauge;

2. [2,500,000] One million cartridges for pistols and powder-actuated tool loads;

3. [500,000] Five hundred thousand cartridges for rifles of a caliber not larger than 0.45 inch ([137.2] 11.4 mm);

4. [10,000] Ten thousand cartridges for rifles of a caliber not larger than [0.5] ½ inch ([152.4] 12.7 mm);

5. [5,000] Five thousand cartridges for rifles of a caliber between [0.5] ½ inch ([152.4] 12.7 mm) and 0.58 inch ([176.8] 14.7 mm);

6. [5,000] Five thousand blank cartridges of a caliber not larger than 0.45 inch ([137.2] 11.4 mm);

7. [3,000,000] Three million primers for central fire ammunition;

8. [6,000,000] Six million percussion caps, or primers, without anvils;

9. [250] Fifty pounds ([113.5] 23 kg) aggregate of black powder or smokeless propellant;

10. Any storage in excess of the amounts authorized by permit.

**3306.2.3 Flammable and combustible liquid.** It shall be unlawful to store small arms ammunition and primers, black powder and smokeless propellant in any premises, building or structure wherein flammable or combustible liquids, flammable solids, oxidizing materials, or other flammable materials are manufactured, stored, handled or used.

**3306.2.4 Small arms ammunition and primers.** It shall be unlawful to store small arms ammunition and primers with Division 1.1, Division 1.2 or Division 1.3 explosives, unless approved.

**3306.3 Packaging and repackaging.** It shall be unlawful to package or repackage small arms ammunition and primers, powder-actuated tool loads, black powder and smokeless propellants, except as approved by the commissioner.

**3306.4 Storage in Group R-3 occupancies.** Where small arms ammunition and primers are stored together in Group R-3 occupancies, it shall be unlawful to store a combined quantity of more than 200, counting each round of ammunition and each primer separately.

**3306.5 Storage and display in Group M occupancies.** The storage and display of small arms ammunition and primers, powder-actuated tool loads, black powder and smokeless propellants in Group M occupancies shall be in accordance with [Sections] FC 3305.1 and 3306.5.2 [and this section].

**3306.5.1 Display.** The display of small arms ammunition and primers, powder-actuated tool loads, black powder or smokeless propellants in Group M occupancies shall comply with the requirements of [Sections] FC 3306.5.1.1 through [3306.5.1.3] 3306.5.1.4.

**3306.5.1.1 Smokeless propellant.** It shall be unlawful to display smokeless propellant.

**3306.5.1.2 Black powder.** It shall be unlawful to display black powder.

**3306.5.1.3 Small arms ammunition and primers.** Where small arms ammunition and primers are displayed together in areas accessible to the public, a combined quantity of not more than 10,000 may be displayed, counting each round of ammunition and each primer separately. Such ammunition and primers shall be secured from direct access from the public.

**3306.5.1.4 Powder-actuated tool loads.** A combined quantity of not more than ten thousand powder-actuated tool loads may be displayed. Powder-actuated tool loads shall be located in an area that is secured from direct access from the public, such as by placement in a locked glass showcase or metal cabinet.

**3306.5.2 Storage.** The storage of small arms ammunition and primers, powder-actuated tool loads, black powder and smokeless propellant shall comply with the requirements of [Sections] FC 3306.5.2.1 through [3306.5.2.3] 3306.5.2.4.

**3306.5.2.1 Smokeless propellant.** It shall be unlawful to store smokeless propellants in quantities exceeding 250 pounds (113 kg). Smokeless propellants in smaller amounts may be stored only if approved. Such storage shall be as follows:

1. Smokeless propellant in quantities not exceeding 100 pounds (45 kg), shall be stored in a Type 2 or Type 4 magazine.

2. Smokeless propellant in quantities exceeding 100 pounds (45 kg), shall be stored in a Type 1 magazine.

3. Storage of any quantity [in a building] indoors shall be in areas not accessible to the public.

**3306.5.2.2 Black powder.** It shall be unlawful to store black powder in quantities exceeding 250 pounds (113 kg). Black powder may be stored in smaller amounts only if approved. Black powder in quantities less than 50 pounds (23 kg), when such storage is

approved, shall be stored in a Type 2 or Type 4 indoor or outdoor magazine. Black powder in quantities of 50 pounds (23 kg) or greater, when such storage is approved, shall be stored in an outdoor Type 1 magazine. When black powder is stored with smokeless propellants in the same magazine, the total quantity shall not exceed that [permitted] allowed for black powder.

**3306.5.2.3 Small arms ammunition and primers.** Small arms ammunition and primers shall be stored as follows.

1. Reserved.

2. Where small arms ammunition and primers are stored in a building, a combined quantity of not more than 100,000 may be stored, counting each round of ammunition and each primer separately. Such storage shall be in compliance with the following requirements.

   2.1. The storage shall be in areas not accessible to the public.

   2.2. Small arms ammunition and primers shall be stored in nonportable storage cabinets having walls at least 1 inch ([25.4] 25 mm) nominal thickness.

   2.3. Shelves in cabinets shall have vertical separation of at least 2 feet (610 mm).

   2.4. Cabinets shall be located against a building exterior wall with not less than 40 feet (12 192 mm) between cabinets.

   2.5. The minimum required separation between cabinets may be reduced to 20 feet (6096 mm) provided that barricades twice the height of the cabinets are attached to the wall, midway between each cabinet. The barricades shall be firmly attached to the wall, and shall be constructed of steel not less than 0.25 inch thick (6.4 mm), 2-inch ([51 mm] 51-mm) nominal thickness wood, brick, or concrete block.

**3306.5.2.4 Powder-actuated tool loads.** A combined quantity of not more than 100,000 powder-actuated tool loads may be stored and displayed in a building. Quantities in excess of those authorized for display as set forth in FC3306.5.1.4 shall be stored in accordance with FC3306.5.2.3.

**3306.6 Blanks for salute cannon.** Blank shells or cartridges may be stored for use in salute cannons only as approved.

**3306.7 Sprinkler protection.** Any building or structure in which small arms ammunition and primers, powder-actuated tool loads, black powder or smokeless propellant are stored in quantities requiring a permit shall be protected throughout by a sprinkler system.

## SECTION FC 3307
## BLASTING OPERATIONS

**3307.1 General.** Blasting operations shall be conducted in accordance with this chapter, including this section, and NFPA 495.

**3307.1.1 Supervision.** The storage, handling and use of explosives at a job site shall be supervised as set forth in [Section 3301.5] FC3301.5.

**3307.1.2 Blasting related-construction.** All construction work necessary and appropriate to ensure a safe blasting operation, including shoring and underpinning of affected buildings, structures and infrastructure shall be performed in accordance with the Building Code.

**3307.1.3 Permits.** A permit issued pursuant to [Section 105.6] FC105.6 for the use of explosives for blasting operations, including excavation and demolition work, shall be issued for a period of up to [nine] 9 months. Such permit may be renewed for additional periods of up to [nine] 9 months, provided that the owner and blasting contractor have complied with the requirements of this chapter.

**3307.2 Manufacturer's instructions and training.** Blasting operations shall be performed in accordance with the instructions of the manufacturer of the explosives being used. Prior to conducting a blasting operation using explosives with which the blasting crew is unfamiliar, the blasting contractor shall ensure that the manufacturer of such explosives conducts an on-site training session for such crew. A record of attendance shall be kept of such training session and upon completion, the manufacturer and the blasting contractor shall certify that the blasting crew is qualified to use the explosives.

**3307.3 Blasting safety.** Blasting operations shall be conducted in accordance with [Sections] FC 3307.3.1 through 3307.3.4.

**3307.3.1 Safety precautions.** The following safety precautions and procedures shall be observed at a blast site:

1. Only explosives approved by the commissioner may be used for blasting operations. Ammonium nitrate shall not be used as a blasting agent, except when approved for a specific blasting operation.

2. The quantity of explosives used in a blast shall be no more than necessary to accomplish the task and shall be approved by the department.

3. Blasting and job site personnel shall not fight fires in close proximity to explosives. [all] All persons shall be removed to a safe area, the area affected by the fire shall be secured from entry, and the department shall be notified immediately.

4. Primers shall be made only at the blast site, as needed. [they] They shall be kept separate from all other explosives at all times until placed into the boreholes.

5. Loading operations shall not take place on a cut or heading within 25 feet (7620 mm) of drilling or mucking operations.

6. When tunnel blasting is to be performed:

6.1. Advance or probe drilling shall be used to determine the nature of face ahead. Face shall be removed by the blaster using the smallest quantity of explosive necessary to achieve the desired blast.

6.2. Only the blasters, assistant blasters and loaders may transport explosives from the magazine to the blast site.

6.3. When blasting under compressed air is to be performed, detonators and high explosives shall be taken separately through the air lock with no other equipment to the pressure working chamber and immediately loaded. Unused explosives shall be returned to magazines before engaging the blasting circuit.

6.4. Before firing an underground blast, the blaster shall have guards posted to all entrances to the danger zone, including any drift, raise, or other opening that may be expected to hole through.

6.5. Only high explosives of [fume class] Fume Class 1 shall be used in shaft, tunnel or under decking blasting operations.

7. When demolition blasting is to be performed, the building to be demolished, as well as adjacent buildings within the blast area, shall be searched just prior to the blast to ensure that they are unoccupied.

8. When submarine (underwater) blasting is to be performed:

8.1. The drill boat shall be moored outside of navigation channels at night, equipped with a hose reel line capable of reaching any point on the deck for protection against fires, and durable "NO SMOKING" signs in compliance with the requirements of FC310 shall be conspicuously posted at approved locations on the boat. A red flag shall be flown during the day and approved United States Coast Guard warning lights shall be lit at night to indicate explosives storage aboard the drill boat.

8.2. Warning buoys shall be positioned to indicate areas blasting operations are being conducted.

8.3. Blasting operations shall cease while any marine traffic or divers are within a 1,500 ft. (457 200 mm) radius of the drill boat.

9. Prior to the commencement of excavation blasting at a job site, and at such other time as the department may require, the blaster shall review with a department representative the blasting patterns to be utilized in connection with such blasting operations.

**3307.3.2 Blasting in congested areas.** When blasting is conducted in a congested area or in close proximity to buildings, structures or infrastructure that may be damaged, or whose use and occupancy may be seriously affected by blasting operations, the blaster shall schedule the timing of each blast and take appropriate precautions in its loading, confinement and

initiation, so as to minimize the effect of the blast upon surrounding uses and occupancies, and to control the ground vibrations and airblast effects. Shoring or other means approved by the commissioner of buildings shall be used to reinforce buildings, retaining walls and other structures and infrastructure that are susceptible to damage from vibration and airblast effects, and weak rock shall be manually removed by gads, picks or crowbars, without the use of explosives. When blasting is unavoidable in the vicinity of such buildings, structures and infrastructure, only light face blasts with short lines of resistance and small charges shall be used.

**3307.3.3 Weather conditions.** The blasting contractor shall monitor weather conditions to alert the blaster at the job site of approaching electrical storms. The commissioner may require that the blasting contractor use an approved device for such purpose.

**3307.3.3.1 Electrical storms.** During an electrical storm, the handling and use of explosives, including loading, shall cease and the following procedures shall be observed:

1. All unused explosives at the blast site shall be immediately returned to their proper magazines.

2. Electrical blasting cap leg wires and lead lines shall be shunted.

3. The danger zone shall be cleared of all persons until the storm has passed.

**3307.3.4 Unsafe conditions and complaints.** The blasting contractor shall immediately suspend blasting operations and immediately notify the department should any condition arise from blasting operations that involves the structural integrity of a building, structure or infrastructure or that otherwise threatens the safety of the general public. The blasting contractor shall also immediately notify the Department of Buildings of any condition that involves the structural integrity of a building, structure or infrastructure. Blasting operations shall not resume until authorized by the department. The blasting contractor shall notify the department within 24 hours of all other complaints, including complaints of noise and minor damage.

**3307.4 Hours of operation.** Blasting operations shall be conducted between the hours of 7:00 am (0700 hours) and 7:00 pm (1900 hours), Monday through Saturday. The written authorization of the commissioner shall be required in order to conduct blasting operations at any other times, or on Sunday, and may be granted or revoked by the commissioner in the interest of public safety.

**3307.5 Notifications and permit survey meeting.** Prior to the issuance of any permit for the use of explosives for blasting operations, a permit survey meeting shall be arranged by the owner or the owner's blasting contractor and conducted at the job site at which blasting operations are to occur, for the purpose of reviewing the measures that the blasting contractor will be required to undertake to safeguard affected buildings, structures and infrastructure. Such permit survey meeting shall be attended by representatives of the department, general contractor[,] and blasting contractor. The owner or the owner's blasting contractor shall invite the participation of owners of affected buildings, structures and infrastructure as determined by the department to be appropriate, and shall in addition notify the Department of Buildings of the meeting. The

commissioner may also require notification of and coordination with other federal, state and city officials and agencies, including the Department of Environmental Protection, Office of Emergency Management, Metropolitan Transportation Authority, United States Coast Guard and United States Army Corps of Engineers, as appropriate.

**3307.5.1 Utility coordination and notification.** Owners of electrical, natural gas, water and other utility infrastructure shall provide information to the department and the blasting contractor, including the location, depth, size, construction, condition and age of such infrastructure, including location of isolation valves, and any other information that the department may require to determine the measures that the blasting contractor will be required to undertake to safeguard such infrastructure during blasting operations. Such information shall be readily available for the duration of blasting operations.

**3307.5.1.1 Blasting operations near or adjacent to natural gas utility infrastructure.** For blasting operations near or adjacent to a natural gas utility infrastructure, the utility company may require access to the job site so that a leak survey may be conducted prior and subsequent to blasting operations. The blasting contractor shall provide the utility company with access to the job site for such purpose.

**3307.5.1.2 Demolition blasting.** For demolition blasting, the blasting contractor shall coordinate with and provide access to the utility company to disconnect all power lines within 100 feet ([30 408] <u>30 480</u> mm) of the structure to be demolished, and sever physically from the main street lines, and cap as close to the main as possible, all services extending into the structure. Blasting shall not be conducted unless existing utility service street lines are cut and capped.

**3307.5.1.3 Submarine (underwater) blasting.** For submarine (underwater) blasting, the utility companies shall provide the department and blasting contractor with the locations of any and all underwater infrastructure within 1 mile (1.6 km) of the blast site.

**3307.5.2 Affected uses and occupancies coordination and notification.** The blasting contractor shall conduct blasting operations in a manner that minimizes the impact of such blasting operation on public safety. Good faith measures shall be made to schedule blasting at those times when students in affected schools are not arriving, departing or outdoors, and when services are not being held at houses of worship, and to otherwise coordinate the timing of blasting operations to minimize the impact on affected uses and occupancies. Appropriate procedures for coordination and notification shall be established at the permit survey meeting.

**3307.5.3 Notice of permit issuance.** Within [five] <u>5 calendar</u> days of issuance of a permit for the use of explosives for demolition or excavation work, the owner or the owner's blasting contractor shall provide written notice to each council member and community board whose respective district includes the job site or property within 100 feet (30 480 mm) thereof, and the local fire company. Such notice shall contain the effective and expiration dates of the permit. Proof of the delivery or mailing of such notice shall be filed with the department.

**3307.5.4 Notice of the commencement of blasting operations.** Not less than [two] <u>2 calendar</u> days nor more than [five] <u>5 calendar</u> days prior to the commencement of blasting

operations, the owner or the owner's blasting contractor shall provide written notice of same to each council member and community board whose respective districts include the job site or property within 100 feet (30 480 mm) thereof, and the local fire company. Such notice shall contain the date or dates on which blasting operations are anticipated to take place and telephone numbers for the blasting contractor and the department to which complaints and inquiries about the blasting operations may be made. The owner or the owner's blasting contractor shall in addition forward a copy of the written notice to the owners of all buildings within 100 feet (30 480 mm) of the job site. Owners of such buildings shall post such notice at a conspicuous location within each such building in a manner prescribed by the department to ensure adequate visibility. If blasting operations continue for a period of more than [one] 1 month, additional notice shall be given to owners of such buildings and posted by such owners on a monthly basis for any month in which blasting operations are to be conducted.

**3307.5.5 Fire company notification.** The blasting contractor shall provide advance notification of blasting operations to the fire company in whose administrative district the job site is located. [On any job site] Except where overnight storage of explosives is [not] approved[,] and except as may be approved for underground job sites, after the final blast has been fired for the day, the blasting contractor shall arrange with such fire company for an inspection of the job site to confirm removal of explosives as required by this chapter.

**3307.5.6 Demolition projects notification.** If a demolition project is in proximity to blasting operations, the blasting contractor shall advise the demolition contractor of the blasting contractor's warning signals.

**3307.6 Detonator safety.** Detonators shall be stored, handled and used in accordance with [Sections] FC 3307.6.1 through 3307.6.3.

**3307.6.1 Prohibited detonators.** It shall be unlawful to fire explosives by means of a timer or a slow burning or safety fuse.

**3307.6.2 Approved detonators.** Only approved electric and [non-electric] nonelectric detonators shall be used.

**3307.6.3 Safety precautions.** Detonators shall be stored, handled and used in accordance with the following safety precautions:

1. Detonators used in a single blast shall be of the same manufacture, style and function to ensure compatibility.

2. Signs reading "**DANGER—BLASTING AREA—NO RADIO TRANSMITTING**" shall be conspicuously posted on the street side of the job site or on the drill boat.

3. Prior to loading explosives, the blast site shall be tested for any stray currents. Such currents shall be eliminated before loading explosives.

4. Care shall be taken in the selection of the blasting circuit and an adequate energy source for initiation, and in making electrical connections. Circuits shall be tested to

ensure the current is 50 mA or less, and only with a blaster's galvanometer or blaster's multimeter.

5. Detonators shall be shunted or short circuited until wired into the blasting circuit. The lead line shall also be shunted, unless testing the blasting circuit or preparing to fire.

6. Precautions shall be taken to prevent accidental discharge of electric detonators from currents induced by radar and radio station transmitters, adjacent power lines, [sub-stations] substations, third rails, dust, lightening and snow storms, or other stray electrical currents.

7. No radio transmission with any handie-talkies, CB radios, cell phones or other devices shall be allowed within 100 feet (30 480 mm) of electric detonators.

8. For tunnel blasting, only an approved type of loading light shall be used. All regular light and power circuits shall be disconnected and removed to a location at least 100 feet (30 480 mm) from where explosives are being loaded. The only circuit allowed within 100 feet (30 480 mm) of the blast site shall be the one being used to fire the charges.

9. Detonators and explosives shall not be transported together on the job site, except in magazine cars and carry boxes in which the detonators and explosives are kept in separate approved containers or compartments.

10. During compressed air operations, all metal pipes, rails, air-locks and steel tunnel-lining shall be electrically bonded and grounded at or near the portal or shaft, and shall be cross-bonded at 1,000 feet (304 800 mm) intervals throughout the length of the tunnel. In addition, each low air supply pipe shall be grounded at its delivery point.

**3307.7** Reserved.

**3307.8 Security.** The blasting crew shall be trained in the safe storage, handling and use of explosives. During the time that holes are being loaded or are loaded with explosives, blasting agents or detonators, only authorized persons engaged in drilling and loading operations and department representatives shall be allowed at the blast site. The blaster may authorize other persons to enter the blast site but such persons shall remain under the personal supervision of the blaster at all times. When necessary to ensure that the danger zone is and remains clear, the blaster shall post blasting contractor personnel with red flags at the perimeter of the danger zone to prevent pedestrians and traffic from entering. The job site shall be barricaded and the assistance of law enforcement personnel requested, as necessary, to ensure compliance with these requirements. Job site security shall be maintained until the post-blast procedures have been completed.

**3307.9 Drill holes.** Holes drilled for the loading of explosive charges shall be of a diameter sufficient to insert explosives to the bottom of the borehole without forcing or ramming. The following drilling precautions shall be observed:

1. Only poles made of wood or plastic that have no metal parts shall be used for loading or tamping explosives.

2. Explosives shall be set in place or pressed in place by steady, even pressure with the tamping pole, avoiding forceful blows.

**3307.9.1 Protective covering.** Blasting mats or other approved protective measures shall be used to prevent the ejection of projectiles in accordance with [Sections] FC 3307.9.1.1 through 3307.9.1.4.

**3307.9.1.1 Open cut and under-decking blasting.** Before firing explosives, blasting mats or other approved protective measures, made of woven matting rope, rubber tire, steel cable or other approved material, shall be placed as necessary to prevent the ejection of projectiles. The type, amount and manner of application of the protective covering is subject to approval.

**3307.9.1.2 Tunnel blasting.** Blasting mats or other approved protective measures may not be required when the heading to be blasted is situated more than 100 feet (30 480 mm) from the mouth or opening of a tunnel and is at least 10 feet (3048 mm) below the outer surface of the surrounding rock.

**3307.9.1.3 Shaft blasting.** When shaft blasting, approved shaft covers shall be used.

**3307.9.1.4 Demolition blasting.** The commissioner may waive the requirements of blasting mats or other approved covering in connection with demolition blasting upon a determination that the use of such mats would not provide protection from the blast. The blasting contractor shall take precautions to protect subsurface infrastructure from blast damage, including protecting manholes, transformers and sewer grades or covers with metal plates, timber and/or soil. The blasting contractor shall take such other precautions as the commissioner may prescribe in the interest of public safety.

**3307.10 Removal of excess explosives.** After loading for a blast is completed and before firing, excess explosives shall be removed from the area and returned to the proper storage facilities.

**3307.11 Initiation.** The initiation of blasts shall be by means conforming to the provisions of NFPA 495.

**3307.12 Connections.** The blaster shall supervise the connecting of the blastholes and the connection of the lead line to the power source or initiation point. Connections shall be made progressively from the blasthole back to the initiation point. Blasting machines and all other equipment used to fire blasts shall be under the personal supervision of the blaster. Blasting lead lines shall remain shunted or short circuited and shall not be connected to the blasting machine or other source of current until the blast is to be fired.

**3307.13 Firing control.** No blast shall be fired until the blaster has made certain that all excess explosives are in a safe location in accordance with [Section 3307.10] FC3307.10, all persons and equipment are at a safe distance or under sufficient cover, and that an adequate warning signal has been given. The blaster shall be the last person to leave the danger zone. The blaster

shall fire each shot or designate the assistant blaster to do so, provided the assistant blaster is in a direct line of sight of the blaster and awaits the firing signal which only the blaster shall give.

**3307.13.1 Blast warning signal system.** A shot shall be fired as soon as possible after loading is complete. An audible warning signal made by an air whistle, air horn or other similar device shall sound before each shot is fired. All personnel working in or near the blast area shall be familiar with the warning signal system. Signs describing the warning signal system shall be posted at conspicuous locations at the job site, as approved by the department. The following audible warning signal system shall be used:

1. One long signal—Preparing to blast, (clear the blast area and danger zone).

2. Two short signals—Ready to blast, (after the blaster checks that the blast area and danger zone are clear).

3. Three short signals—All clear, (after the blaster completes post-blast procedures).

**3307.14 Post-blasting procedures.** After the blast, the following procedures shall be observed:

1. Immediately after the blast has been fired, the firing line on electrically initiated shots shall be disconnected from the blasting machine. No person shall return to the blast area until allowed to do so by the blaster.

2. The blaster shall allow 20 minutes time for smoke and fumes to dissipate and for dust to settle before returning to or approaching the blast area.

3. The blaster shall inspect the entire blast area for misfires before allowing other personnel to return to the blast area. No mucking or drilling operations shall take place until all misfires are rendered safe in accordance with [Section 3307.15] FC3307.15. Once mucking commences, the blasting crew shall continuously check for undetonated cartridges, wrappers, caps and cap wires, which shall be removed from the muck pile prior to haulage to rock dumps, and handled in accordance with [Section 3304.10] FC3304.10.

4. In demolition blasting, the muck pile shall be wetted down and the blasting crew shall make a second search for undetonated explosives as set forth in [Section 3307.14(3)] FC3307.14(3). The blasting contractor shall restore adjacent buildings and structures to their pre-existing condition by removing all dust, dirt and debris caused by blasting operations.

**3307.15 Misfires.** Where a misfire is suspected, all initiating circuits shall be traced and a search made for unexploded charges. Where a misfire is found, the blaster shall immediately implement safeguards in compliance with the following requirements:

1. Cordon off and otherwise secure the blast area from entry.

2. Report the misfire to the department.

3. No other work shall be performed except that necessary to remove the hazard of the misfire.

4. No attempt shall be made to extract explosives from any charged or misfired hole; a new primer shall be loaded and the hole reblasted, if such action does not present a hazard. If refiring of the misfired hole presents a hazard, the explosives may be removed by washing out with water or blown out with air.

5. No drilling, digging, or picking shall be allowed until all missed holes have been detonated or the blaster determines that work can proceed, but no drilling shall be conducted into a previously fired hole.

6. All misfires and the disposition of explosives involved shall be recorded on forms prescribed by the commissioner.

**3307.16 Pre-blasting survey, post-blasting survey and blasting plan.** The owner or the owner's blasting contractor shall retain the services of a professional engineer, licensed to practice in New York State, to conduct a pre-blasting survey and, where applicable, to prepare a blasting plan, and conduct a post-blasting survey, as set forth in [Sections] FC 3307.16.1 through 3307.16.3.

**3307.16.1 Pre-blasting survey.** Prior to commencement of blasting operations, such professional engineer shall conduct a structural survey of all buildings, structures, and infrastructure, including all landmarks and monuments, within 100 feet (30 480 mm) of the property line of the job site. The pre-blasting survey shall determine and document the existing structural condition of the interior and exterior of such buildings, structures and infrastructure, provided that if, after reasonable good faith efforts, access to the interior of a building, structure or infrastructure cannot be gained, it shall be sufficient that such survey determine and document the condition of the exterior of such building, structure or infrastructure. The report of such pre-blasting survey shall include photographs and/or videotapes, documenting any pre-existing conditions that may be exacerbated by blasting operations, including cracks and structural defects, and their location, length, size, thickness, and type. Where demolition blasting is to be conducted, the pre-blasting survey report shall identify the location and elevation of vertical control points on such buildings, structures and infrastructure, and shall set forth the type and location of any monitoring devices to be used, including tell-tales. If application is made for renewal of the permit for excavation or demolition blasting at a job site, the owner or the owner's blasting contractor shall cause any pre-blasting survey to be updated as necessary to address any change in conditions in the area to be surveyed.

**3307.16.2 Blasting plan for demolition blasting.** Applications for a permit for use of explosives in connection with demolition work shall include a blasting plan. The blasting plan shall include the following information:

1. The location and dimensions of the safety zone to be maintained during blasting, including clearance to the surrounding buildings, structures and infrastructure.

2. Construction plans detailing the location of the main bearing supports of the structure which will be utilized in the demolition.

3. The types of explosives to be used, quantities, charge weight per initiation, blast sequence and pattern, and number, depth and diameter of drill holes.

**3307.16.3 Post-blasting survey.** A post-blasting survey shall be prepared when required by [Sections] FC 3307.16.3.1 and 3307.16.3.2.

**3307.16.3.1 Demolition blasting.** Whenever demolition blasting is conducted, such professional engineer shall, upon the completion of the blasting operations at the job site, conduct a structural survey of all of the buildings, structures and infrastructure previously surveyed and submit to the department a report documenting the elevations of the vertical control points and the absence of any observable changes in the pre-existing condition of such buildings, structures and infrastructure, or identifying any changes and the conclusions to be drawn therefrom. Elevations of the control points shall again be measured by such professional engineer at intervals of [one] 1 and [six] 6 months after the completion of the demolition work, and a report containing this data, and conclusions to be drawn therefrom, shall be promptly submitted to the department as an addendum to the original post-blasting survey.

**3307.16.3.2 Excavation blasting.** The commissioner may require the owner or the owner's blasting contractor to retain such a professional engineer to conduct a post-blasting survey at any time during or upon the completion of blasting operations upon a determination that such a survey is necessary or appropriate as a result of ground vibration levels exceeding the reporting level set by the department, or other good cause.

**3307.16.4 Recordkeeping.** A copy of the pre-blasting survey, the blasting plan for demolition blasting, the blasting patterns utilized for excavation blasting operations, and the vibration and airblast measurements required by this section, shall be maintained at the job site until the completion of blasting operations, and, together with any post-blasting survey required by [Section 3307.16.3] FC3307.16.3, shall thereafter be kept by the owner or the owner's blasting contractor for a period of [three] 3 years from the completion of blasting operations at the job site. Such records shall be made available for inspection by any representative of the department and the Department of Buildings.

**3307.17 Vibrations and airblast.** The owner or the owner's blasting contractor shall retain a seismic services consultant to measure and record ground vibration and airblast overpressure levels at specified locations. Such measurements shall be taken every time explosives are detonated during blasting operations. A copy of such measurements shall be filed with the department on a schedule to be established by the department, but not less frequently than once per week. Throughout blasting operations, locations for the monitoring equipment shall be selected by the blasting contractor and the seismic consultant in consultation with the department and subject to department approval. The commissioner may require monitoring of water shock when submarine blasting is conducted.

**3307.17.1 Limits.** The limit for ground vibration peak particle velocity is 2.0 ips (50.8 mm/s) for frequencies from 40 Hz to 100 Hz. For frequencies below 40 Hz, vibration limits are 0.75

ips (19.1 mm/s) and 0.5 ips (12.7 mm/s), with graphical data transition lines equivalent to constant displacements. Airblast overpressure shall be limited to 134 dB. Vibration and noise shall not exceed the limits established by the Metropolitan Transit Authority, Department of Environmental Protection, Department of Transportation and Department of Buildings and other agencies responsible for ensuring the structural integrity of affected buildings, structures and infrastructure.

**3307.17.2 Report.** The seismic consultant shall prepare a report of all required measurements and data, acceptance criteria and analysis. In the event that readings exceed the acceptance criteria, the department shall be immediately notified, and the blasting contractor shall propose revised drilling and blasting patterns, charge weight per initiation and other measures to reduce the ground vibration and/or airblast overpressure, as appropriate.

**3307.18 [Inter-agency] Interagency coordination.** The department shall develop and establish a protocol with the Department of Buildings, and such other agencies as the department determines to be necessary and appropriate, by which notification of blasting operations and reporting of unsafe conditions and complaints is to be coordinated.

## SECTION FC 3308
## FIREWORKS DISPLAYS

**3308.1 Scope.** The discharge or other use of fireworks shall comply with the requirements of the New York State Penal Law Article 405, this chapter, the rules, NFPA 1123, and all other applicable laws, rules and regulations.

**3308.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**3308.2.1 Fireworks display sponsor.** A fireworks display permit shall be obtained for each display or other event involving the discharge or other use of fireworks. The sponsor of such display or other event shall retain a company holding a fireworks contractor certificate issued pursuant to this chapter to apply for and obtain the fireworks display permit and to conduct the fireworks display or other event.

**3308.2.2 Fireworks display permit conditions.** A fireworks display permit shall be issued in the name of the sponsor of the display or other event and shall specify the date, time and location of the display or other event, the amount and types of fireworks to be discharged, and such other terms and conditions as the commissioner may prescribe as necessary or appropriate for the safe conduct of the display or other event.

**3308.2.3 Permit applications.** Applications for a fireworks display permit shall be submitted to the department at least 30 calendar days prior to the requested date for the fireworks display permit. Applications shall be in the form specified by the department and shall be signed by the sponsor and the fireworks contractor conducting the fireworks display. The commissioner shall review each application for a fireworks display permit and shall grant such application only if the commissioner is satisfied that the display or other event can be safely conducted. Permit applications shall contain the following information, and such other information and documentation as the commissioner may prescribe:

1. The name, address, telephone number and fax number of the sponsor.

2. The name, address, telephone number and fax number of the fireworks display contractor.

3. The date, rain date, time, and exact location proposed for the fireworks display and its approximate duration.

4. The number and size of the fireworks to be discharged or otherwise used or stored for use for the display or other event.

5. The written authorization of the sponsor of the display or other event.

6. The name of all persons personally supervising the discharge or other use of fireworks and the number of each person's certificate of fitness. There shall be not less than two such persons for any fireworks display.

7. The number, size, type, and approval number of the fireworks to be discharged. The approval number shall be the EX-number issued by the United States Department of Transportation.

8. For onshore displays, a dimensional diagram of the display site containing the following information:

   8.1. The location where the fireworks are to be stored.

   8.2. The discharge site.

   8.3. The location of all buildings, structures, infrastructure, streets, piers, bridges, railways, parking lots, utility lines and bulk plants and terminals within 1,500 feet (457 200 mm) of the discharge site, and, as determined by the department, other protected exposures within such distance, the occupancy thereof, the use, and the distance from the outer perimeter of the discharge site to such buildings, structures, infrastructure, streets, piers, bridges, railways, parking lots, utility lines, bulk plants and terminals or other protected exposures.

   8.4. The location of any trees and overhead obstructions within 1,000 feet (304 800 mm) of the discharge site, including the distance to such locations from the outer perimeter of the discharge site.

   8.5 The viewing areas to which all observers will be restricted, including the distance to such locations from the outer perimeter of the discharge site.

9. For offshore displays, a dimensional diagram of the display site containing the following information:

9.1. The discharge site, by reference to the shorelines and nearby structures, indicating the distances thereto.

9.2. The layout of the barge, including the discharge site and the location of the control panel, all safety barriers and structures, and fireworks storage.

9.3. The location of all buildings, structures, infrastructure, streets, piers, bridges, railways, parking lots, utility lines and bulk plants and terminals within [1500] 1,500 feet (457 200 mm) of the discharge site, and, as determined by the department, other protected exposures within such distance, the use or occupancy thereof, and the distance from the outer perimeter of the discharge site to such buildings, structures, infrastructure, streets, piers, bridges, railways, parking lots, utility lines, bulk plants and terminals or other protected exposures.

9.4 All viewing areas at or near the shorelines, including the distance to such locations from the outer perimeter of the discharge site.

**3308.2.4 Site inspection.** The department may conduct an inspection of the display site and its surroundings, including the command post, viewing areas, and protected exposures, prior to issuance of a permit and/or prior to the fireworks display. Representatives of the fireworks contractor and the sponsor shall attend any such site inspection and cooperate with the department in determining the suitability of the site for the proposed fireworks display, and appropriate separation distances and other safety measures. The fireworks contractor or the sponsor shall arrange for access by department representatives to the display site, command post and all other areas, for purposes of the site inspection and during the fireworks display.

**3308.2.5 Permit denial.** An application for a fireworks display permit shall be denied if the department determines that the display cannot be safely conducted. The department may take into consideration the time and place of the display or event for which a permit is sought, other scheduled events, and the ability of the department to effectively monitor such display or event, in determining whether to grant or deny such application. The department may also deny an application if it is incomplete or for lack of cooperation by the fireworks contractor or the sponsor.

**3308.2.6 Permit conditions.** The fireworks display permit shall be issued to the sponsor. The permit shall specify the exact location of the display, the date and approximate time of commencement of the display, and such other conditions as the department may prescribe to ensure the safe conduct of the display. The fireworks display permit shall be deemed to incorporate the terms and conditions set forth on the fireworks display plan approved by the department, including the separation distances required by the department. Firework displays shall be scheduled to commence no later than 9:30 pm (2130 hours).

**3308.2.7 Penalty for noncompliance.** The fireworks display shall be conducted in accordance with the fireworks display permit and the directions of department representatives. Failure to conduct a display in accordance with the terms of the permit or such directions may result in denial of future applications for such permits, suspension or revocation of the fireworks contractor certificate, suspension or revocation of the certificate of fitness, and such other penalties as may be provided by law, rule or regulation.

**3308.3 Approved fireworks.** Fireworks displays shall be conducted using [Division] 1.3G, 1.4G, and 1.4S fireworks. The fireworks shall be arranged, located and discharged in a manner that will not endanger any person or damage any property.

**3308.3.1 Shell size restrictions.** Aerial shells or other aerial fireworks shall not exceed 12 inches ([204.8] 305 mm) in diameter and salute shells shall not exceed 3 inches (76.2 mm) in diameter or length unless authorized by the fireworks display permit. Such authorization shall only be granted if the applicant can demonstrate to the satisfaction of the department special circumstances warranting the use of such oversize shell and that such shell can safely be discharged within the confines of the display site. No such request shall be considered on the day of the fireworks display.

**3308.4 Clearance requirements.** Viewing areas, parking areas, and dwellings, buildings or structures shall not be located within the display site. The required distances shall be maintained from the display site to the viewing areas and all protected exposures, including the minimum secured radius as set forth in FC Tables 3308.4.1 and 3308.4.2, any additional distance necessary to accommodate the fallout area, as calculated by the fireworks contractor and approved by the department, and any protected exposures as set forth in [Section 3308.4.3] FC3308.4.3, or as determined by the department.

**3308.4.1 Onshore displays.** For an onshore display, the display site shall be of a size sufficient to allow the applicable minimum secured radius set forth in FC Table 3308.4.1.

**FC TABLE 3308.4.1**
**ONSHORE DISPLAYS**

| Size of Largest Mortar (inches) | Minimum Secured Radius (feet) |
|---|---|
| <3 | 300 |
| 4 | 400 |
| 5 | 500 |
| 6 | 600 |
| 7 | 700 |
| 8 | 800 |
| 10 | [1000] 1,000 |
| 12 | [1200] 1,200 |

**3308.4.2 Offshore displays.** For an offshore display, the display site shall be of a size sufficient to allow the applicable minimum secured radius set forth in FC Table 3308.4.2.

**FC TABLE 3308.4.2**
**OFFSHORE DISPLAYS**

| Size of Largest Mortar (inches) | Minimum Secured Radius (feet) |
|---|---|
| Up to 10 | 1,000 |
| 12 | 1,200 |

**3308.4.3 Protected exposure distance separation.** The minimum secured radius to the property line of any bulk plant or terminal, or facility for combustible, flammable, explosive, or toxic materials, or any institutional occupancy, shall be twice the distance specified in FC Table 3308.4.1 or [Table] 3308.4.2, as applicable, but in no case less than 1,000 feet (304 800 mm). The commissioner may prescribe a clearance requirement for any other protected exposure.

**3308.5 Incidental storage of fireworks at display site.** The storage of fireworks at the display site shall comply with the requirements of this section and NFPA 1123. Fireworks may be delivered and stored at the display site not earlier than 12 hours before the permitted display. Only fireworks to be used for the permitted display may be stored at the display site.

**3308.5.1 Supervision.** Fireworks shall not be left unattended at the display site, but shall be under the personal supervision of a certificate of fitness holder for fireworks display.

**3308.5.2 Weather protection.** Fireworks shall be stored in weatherproof containers, under a waterproof cover or otherwise kept dry at the display site, prior to the fireworks display.

**3308.5.3 Inspection.** Shells and other fireworks shall be inspected by the certificate of fitness holder for fireworks display at the display site.

**3308.5.4** Reserved

**3308.5.5 Ready boxes.** Any shells and other fireworks that are not to be used during a fireworks display, including fireworks that are defective or damaged, shall be temporarily stored during the fireworks display in ready boxes located upwind and at least 25 feet (7620 mm) from the mortar placement.

**3308.6 Discharge of fireworks.** Fireworks displays and any other discharge or use of fireworks shall be conducted outdoors, except that fireworks, 1.4G, may be discharged indoors in connection with the conduct of a special effect for which a special effects permit has been issued pursuant to [Section 3309] FC3309.

**3308.6.1 Mortar placement.** Mortars shall be positioned and discharged as follows:

1. Mortars shall not be set up during night hours (between sunset and sunrise).

2. Mortars shall be of sufficient strength and shall be arranged and positioned so that the shells may be safely discharged.

3. Mortars shall be placed in as near a vertical position as possible. Mortars and other devices used to discharge fireworks shall be installed in accordance with NFPA 1123 and shall be positioned such that the shells are projected in a direction that ensures that they combust, deflagrate or detonate above the fallout area and all unexploded fireworks fall into the fallout area. Under no circumstances shall mortars be angled toward the viewing area.

4. Mortars shall be of sufficient length to cause aerial shells to be projected to safe heights.

5. Mortars shall be placed in sand-filled steel drums or heavy plastic drums no less than 32 gallons (121 L) in capacity. Wood racks or troughs filled with sand may also be used in lieu of drums for firing barrages or finales.

6. Except for mortars placed in wood racks, mortars shall be buried to a depth of between two-thirds to three-quarters of their length.

7. Except for mortars placed in wood racks and as may otherwise be provided in this section, mortars shall be separated from adjacent mortars by a distance of at least 2 inches ([50.8] 51 mm) or the diameter of the larger mortar, whichever is greater.

8. Except as otherwise provided in this section, there shall be a separation distance of at least 2 inches ([50.8] 51 mm) or one-half of the diameter of the mortar, whichever is greater, between the mortar and the wall of the drum or trough.

9. Prior to placement, mortars shall be inspected for defects, such as dents, bent ends, damaged interiors and damaged plugs. Defective mortars shall not be used. Any scale found on the inside surface of the mortars shall be removed prior to placement.

10. Wood racks. Wood racks used in conjunction with firework displays shall be designed and operated as follows:

    10.1. Wood racks shall be of sufficient strength to prevent adjacent mortars from being repositioned in the event that a shell detonates in a mortar, causing the mortar to burst.

    10.2. The use of wood racks shall be limited to single break shells not exceeding [six] 6 inches (152 mm) in diameter.

    10.3. Wood racks with chain fused mortars 3 inches ([76.2] 76 mm) or less in diameter shall be limited to a maximum of 15 mortars per unit. Racks containing mortars 4 inches ([101.7] 102 mm) in diameter shall be limited to a maximum of 12 mortars. Racks containing mortars 5 inches (127 mm) to 6 inches ([152.4] 152 mm) in diameter shall be limited to a maximum of 10 mortars.

    10.4. Mortars placed in wood racks shall not be reloaded during the display.

**3308.6.2 Mortar loading.** Mortars shall be loaded as follows:

1. Mortars shall be loaded during daylight hours (between sunrise and sunset). Mortars shall not be loaded during night hours (between sunset and sunrise).

2. All unloading of fireworks from the delivery vehicle and loading and fusing of the fireworks shall be conducted under the supervision of a certificate of fitness holder in the presence of a department representative.

3. All shells shall be inspected by a certificate of fitness holder for fireworks display immediately prior to placement. Any shells that are torn, leaking, show signs of having been wet or have broken fuses shall not be used.

4. The certificate of fitness holder for fireworks display shall verify that the proper lifting charge has been attached to each shell to ensure the safe control of discharge height.

5. When loading into mortars, shells shall be held by their lowering cords (if provided) or their fuses (if no lowering cord is provided).

6. Shells shall be lowered carefully into the mortar, such that they are properly seated in the bottom of the mortar. Shells shall never be forced into a mortar.

7. No person shall place any part of his or her body over the mortar during its loading.

**3308.6.3 Control panel for firework displays.** Control panels used to conduct firework displays shall be designed, installed and operated as follows:

1. The control panel and all related equipment, including any junction boxes, shall be located within the display site, at least 50 feet (15 240 mm) from the discharge site, with a clear line of sight to the discharge site.

2. A protective barrier capable of withstanding the impact of falling debris or a misfired shell and made of or covered with a fire-retardant material shall be provided between the control panel and the discharge site and above the control panel. Such protective barrier shall be of sufficient size to protect the control panel and all persons who will be positioned at the control panel during the fireworks display, including at least one department representative.

3. The control panel shall be provided with a double safety switch to prevent premature activation of current to the shells, such as combination of keys or single throw switches connected in series, both of which must be activated for current to flow.

4. Each switch on the control panel, including testing and firing controls, shall be clearly marked to indicate its function. The control panel shall be equipped with an indicator, such as a light, a sound device, or both, to indicate when the control panel is armed for firing.

5. If the control panel has a built-in test circuit, the unit shall be designed to limit the test current to 0.05 ampere or to 20 percent of the no-fire current of the electric match being used, whichever is less.

6. Multi-testers, such as volt-ohm meters, shall not be used for testing electric matches unless the tester's maximum current delivery potential has been measured to be not more than 0.05 ampere or 20 percent of the no-fire current of the electric match being used, whichever is less.

7. Control panels shall be powered by batteries or isolated power supplies used for firing purposes only. If batteries are used, they shall be self-contained in the firing unit or otherwise covered or protected to prevent accidental contact with wires leading to the fireworks. Control panels powered by commercial power may be used, provided that an isolation transformer is used. The transformer shall be located within the firing unit or elsewhere in the firing system.

**3308.6.4 Ground display pieces.** Ground display pieces shall be positioned and discharged in compliance with the following requirements:

1. Combustible materials located beneath ground display pieces shall be wet down before the display. Vegetation within 50 feet ([152 400] 15 240 mm) shall be removed as set forth in [Section 304.1.2] FC304.1.2.

2. Poles for ground display pieces shall be securely placed and braced so that they maintain the proper position when fireworks are displayed.

**3308.6.5 Fireworks discharge.** The discharge of fireworks shall be conducted in compliance with the following requirements:

1. All persons conducting the fireworks display shall wear clothing and protective gear in compliance with the requirements of the regulations of the United States Department of Labor, as set forth in 29 CFR Part 1910.

2. Communication shall be maintained at all times between the certificate of fitness holders for fireworks display and the command post.

3. No fireworks shall be discharged if any person is at an unsafe distance from the point of discharge. The certificate of fitness holders for firework displays shall ensure that all persons have moved a safe distance away from such mortar or ground display piece before firing it.

4. No more than [100] one hundred shells may be ignited by a single fuse.

5. Control panel operation.

   5.1. The control panel and all cables, junctions, and attached electric matches shall be visually inspected immediately prior to the display. The control panel shall not be in "test" status or "arm" status during this inspection.

   5.2. Mortars shall be connected to the control panel and the circuit tested only after all the shells have been loaded into the mortars and all electric matches are connected to the fuses. Ground display pieces shall be connected to the control panel and the circuit tested only after the fireworks have been loaded onto the display.

   5.3. No person shall be in the discharge site when any circuit testing is performed.

   5.4. If the testing of the circuits indicates a problem, the certificate of fitness holder for fireworks display shall reinspect any cables, connections, or electric matches and correct the problem. This reinspection shall be performed only after the control panel has been switched off or disconnected from the power source.

   5.5. Only such fireworks contractor personnel as are necessary for the proper and safe operation of the display and department representatives shall be allowed at the control panel when fireworks are being discharged.

5.6. No person shall be in the discharge site when fireworks are being discharged. The certificate of fitness holder conducting an electrically-fired display shall personally visually check the discharge site prior to commencing a display to ensure that the area is clear of all persons, and shall not commence the display, or shall discontinue it, at any time persons are observed within such area.

5.7. The control panel shall be switched off and all cables disconnected after the conclusion of the display, prior to any cleanup or other work in the discharge site.

**3308.6.6 Offshore displays.** Offshore firework displays shall be conducted in compliance with the following requirements:

1. Offshore firework displays shall be conducted in accordance with the requirements of this chapter except as they may be inconsistent with this section.

2. Offshore firework displays shall be conducted from a barge maintained at a fixed position, as designated on the firework display permit. No fireworks shall be discharged from any tugboat or other vessel or platform.

3. Only fireworks to be discharged during the display shall be allowed on the fireworks barges. Storage of excess fireworks on the barges is prohibited.

4. Fireworks to be used in an offshore fireworks display shall be installed, loaded and fused in the presence of department representatives while the barge is moored at a lawful and safe location in New York City acceptable to the department. The department may authorize such installation, loading and fusing at a mooring outside of New York City at a location acceptable to the department. No installation, loading or fusing shall be conducted on the barge after the barge departs from its mooring. Department representatives shall accompany the barge from its mooring to the display site.

5. The fireworks display barge shall be towed into position by a tugboat authorized to operate in New York City. The tugboat shall be under power at all times during the display, so that all necessary maneuvering of the barge can be effected. The tugboat shall be equipped with an instrument to measure the distance to the shore to enable the tugboat to ascertain and maintain its position.

6. Barge design and construction. Barges used in conjunction with firework displays shall be designed, constructed and maintained in compliance with the following requirements:

6.1. Only steel barges acceptable to the United States Coast Guard shall be used as fireworks display barges.

6.2. Fireworks display barges shall bear durable signs on both sides reading "Fireworks—Stay Clear". The lettering shall be at least 18 inches (457 mm) high in red on a white background.

6.3. The control panel shall be located on the fireworks display barge.

6.4. Fireworks display barges shall be provided with suitable barriers constructed and arranged so as to protect the control panel, persons at the control panel, and the tugboat from misfired shells, fireworks and falling debris.

6.5. Railings shall be provided around the control panel area to prevent persons from falling overboard.

7. All personnel on board the fireworks barge or tugboat shall wear United States Coast Guard approved [life preservers] flotation devices.

8. Department representatives shall be present on the fireworks barge and the tugboat at all times during a fireworks display.

9. Conduct of the display. Offshore firework displays shall be conducted in compliance with the following requirements:

9.1. All fireworks shall be discharged and directed in such a manner that any falling debris, sparks or embers will not land upon the shore, or a wharf, pier, bulkhead or other structure.

9.2. Reloading of mortars during the display is prohibited.

9.3. Communication shall be maintained at all times between the certificate of fitness holders for fireworks display conducting the display, the tugboat pilot and the command post.

9.4. One certificate of fitness holder for fireworks display shall be responsible for monitoring the position of the barge and the trajectory of the fireworks and the fireworks debris, and communicating to department representatives any change in wind direction or other condition requiring repositioning of the barge or other safety measure. Such certificate of fitness holder shall have no other duties during the display.

**3308.7 Handling.** Aerial shells shall be carried to mortars by the shell body. Shells shall never be held by their fuses except when they are being loaded into mortars. For the purpose of loading mortars, aerial shells shall be held by the thick portion of the fuse and carefully loaded into mortars.

**3308.8 Supervision and department monitoring.** Fireworks displays shall be conducted by a company holding a fireworks contractor certificate, and under the personal supervision of two certificate of fitness holders for firework displays as set forth in [Section 3301.5.2] FC3301.5.2, and shall be subject to monitoring by the department as set forth in this section.

**3308.8.1 Department monitoring.** The commissioner may require department personnel and equipment to monitor the delivery, unloading, loading, and discharge of fireworks, and post-

display site safety measures upon a determination that the presence of such monitoring is in the interest of public safety.

**3308.8.1.1 Loading and unloading.** Fireworks displays, including all unloading of transport vehicles, loading and fusing of mortars and ground display pieces, and discharging of fireworks, shall be conducted in the presence of one or more representatives of the department.

**3308.8.1.2 On scene directions.** The fireworks contractor's personnel, the certificate of fitness holders conducting the display, and all other persons at the display site shall comply with the directions of department representatives, including any requirement different from or in addition to those set forth in the fireworks display permit, when, in the judgment of the department representative, such different or additional requirement is necessitated by a change in site or weather conditions or is otherwise necessary to ensure the safe conduct of the display.

**3308.8.1.3 Delays and cancellations.** No fireworks display shall commence until approval has been given by the department representatives on the scene. Department representatives may delay commencement of the display, or suspend or cancel the display, upon a determination that such action is in the interest of public safety, by reason of weather or other site conditions, the use of unapproved equipment or shells, the improper installation or unsafe operation of the display, the presence of any unauthorized person within the discharge site, the failure of any person to comply with the directions of the department representatives, or other good cause. In no case shall a display commence or continue when wind velocity exceeds 30 miles per hour (48.28 km per hour).

**3308.8.1.4 Command post.** The representative of the fireworks contractor overseeing the conduct of the display shall provide a command post from which the fireworks display may be monitored by department representatives and a representative of the fireworks contractor responsible for the conduct of the display. Such command post shall be located onshore, in an area acceptable to the department that is outside of the discharge site, display site and viewing areas, and that has an unobstructed line of sight to such areas.

**3308.8.1.5 Communication.** The representatives of the fireworks contractor overseeing the conduct of the display shall be present at the command post prior to the scheduled time of the fireworks discharge, and shall be in radio or telephone contact with the certificate of fitness holders conducting the display, the spotter, and for offshore displays, the tugboat pilot. Such representative shall relay to such personnel or pilot any directions of department representatives concerning the fireworks display, including authorization to commence the display. No fireworks display shall be authorized to commence until such representative is present at the command post.

**3308.8.2 Spotter.** At least one fireworks contractor employee shall be designated as the spotter, whose sole responsibility during the display shall be to watch the flight and behavior of the shells and to notify department representatives of any dangerous conditions occurring during the display, such as hazardous debris falling into the audience. The spotter shall be in direct radio or telephone communication with the command post.

**3308.8.3 Discharge height.** The maximum height of discharge shall be determined by the United States Federal Aviation Administration for each display. In no case shall any shell break at a height greater than 1,200 feet (365 760 mm) above sea level.

**3308.9 Post-display site safety measures.** Immediately upon conclusion of the fireworks display, the certificate of fitness holders shall conduct an inspection of the display site, including each mortar or other device used to discharge fireworks, for the purpose of locating unexploded fireworks. This inspection shall be conducted before public access to the site is permitted. Certificate of fitness holders conducting a nighttime display shall conduct a daylight search of the display site at the next sunrise. The certificate of fitness holder shall keep a record of all aerial shells that fail to fire.

**3308.9.1 Post-display inspection affidavit.** The certificate of fitness holders conducting any fireworks display shall, within 24 hours of the completion of the display, submit to the department a notarized post-display affidavit attesting to the fact that the area was found to be free and clear of any fireworks or other explosive materials or devices.

**3308.10 Disposal.** Any fireworks found during the inspection required in [Section 3308.9] FC3308.9 shall not be handled until at least 15 minutes have elapsed from the time the fireworks were fired. The fireworks shall then be doused with water and allowed to remain for at least 5 additional minutes before being placed in a plastic bucket or fiberboard box and disposed of lawfully in accordance the manufacturer's instructions.

**3308.11** Reserved.

**3308.12 Fees.** Fees for firework displays shall be as set forth in FC Appendix A.

1. The department shall bill the fireworks contractor for the time spent by department representatives inspecting or monitoring the fireworks display, including the unloading, installation, loading and discharge of the fireworks, post-display site safety measures, and any travel time and expenses associated with such inspection and monitoring at a mooring outside of New York City.

2. The department shall bill the sponsor after a fireworks display for the assignment of any department firefighting apparatus.

## SECTION FC 3309
## SPECIAL EFFECTS

**3309.1 Scope.** The storage, handling and discharge or other use of any material, article or device of an explosive, flammable, or combustible nature used to create a special effect, including any pyrotechnic material, article or device, fireworks, 1.4G, and open flames, shall be in accordance with this section, the rules and NFPA 1126.

**3309.2 Prohibited conduct.** It shall be unlawful to:

1. Store, handle, discharge or otherwise use any material, article or device of an explosive, flammable, or combustible nature used to create a special effect, without a special effects permit or production company special effects permit issued pursuant to this section.

2. Conduct a special effect [inside a building] indoors or other enclosed structure if the materials, articles or devices used to create such special effects contain or use antimony, arsenic, cadmium, chromium, lead, mercury, naphthalene, nickel, selenium, or zinc, in amounts greater than trace quantities.

**3309.3 General requirements.** Materials used to create a special effect shall be stored, handled and used in accordance with [Sections] FC 3309.3.1 through 3309.3.7.

**3309.3.1 Use of minimum amount necessary.** The quantity of material, article, or device used in a special effect shall be no greater than necessary to produce the desired special effect.

**3309.3.2 Demonstration.** The commissioner may require a demonstration of the materials, articles or devices used to create a special effect.

**3309.3.3 Monitoring.** The commissioner may require department personnel and apparatus to monitor the preparation and conduct of a special effect upon a determination that such monitoring is in the interest of public safety.

**3309.3.4 Limitation on quantity stored.** The commissioner may prescribe the maximum quantity of special effects material, article or device allowed to be stored in any approved storage facility. The location and design of the storage facility shall be approved by the commissioner.

**3309.3.5 Temporary storage.** For temporary storage, special effects materials, articles or devices shall remain in their approved containers until required for use.

**3309.3.6 Prompt use.** The time between removal from storage and use shall be the shortest time practicable.

**3309.3.7 Access to storage facility.** Pyrotechnic materials, articles or devices shall not be left unattended, except in a secured storage facility. Unauthorized access to the storage facilities shall be prevented either through the means of a locking mechanism or through continuous supervision.

**3309.4 Special effects permit.** Except as otherwise provided in [Section 3309.5] FC3309.5, a special effects permit shall be obtained for each display or other event involving the conduct of a special effect by the sponsor of the display or other event or, with the sponsor's written authorization, by a person holding a certificate of fitness for special effects issued pursuant to this section. A special effects permit shall be issued in the name of the applicant and shall specify the name of the sponsor, the date, time and location of the display or other event, the number and kind of pyrotechnic articles or devices to be discharged or otherwise used, or other materials, articles or devices used to create the special effects, and such other terms and conditions as the commissioner may prescribe as necessary or appropriate for the safe conduct of the display or other event.

**3309.4.1 Site inspection.** The department may conduct an inspection of the special effects display site and its surroundings, prior to issuance of a permit and/or prior to the special effects operation. Representatives of the applicant shall attend any such site inspection and cooperate with the department in determining the suitability of the site for the proposed special effects operation, and, if suitable, appropriate separation distances and other safety measures. The applicant shall arrange for access by department representatives to the display site, for purposes of the site inspection and during the special effects operation.

**3309.4.2 Permit applications.** The commissioner shall review each application for a special effects permit and shall grant such application only if the commissioner is satisfied that the display or other event can be safely conducted. Permit applications shall contain a special effects display plan, including the following information and such other information and documentation as the commissioner may prescribe:

1. The name of the person, group, or organization responsible for the special effects display.

2. The date, time and exact location of the display or other event.

3. The written authorization of the sponsor of the display or other event.

4. A description of the special effects to be created.

5. The amount and types of the pyrotechnic material, articles or devices to be discharged or otherwise used or stored for use, or other materials, articles or devices to be used or stored for use in creating the special effects.

6. The name of all persons personally supervising the temporary storage, handling and discharge or other use of the materials, articles or devices used to conduct the special effects and their certificate of fitness numbers.

7. The names, ages and duties of all assistants who will be present in connection with the special effects.

8. A dimensional diagram of the area where special effects are to be conducted that includes the following information:

    8.1. The location at which the materials, articles or devices used for the special effects are to be discharged or otherwise used and stored for use.

    8.2. Location of audiences, performers and support personnel in relation to the special effects, and the duties of the performers and support personnel in connection with the special effects.

    8.3. If using pyrotechnic article or device, the fallout radius for each article or device.

8.4. If the special effects are displayed in front of an audience or bystanders, the lines behind which the audience or bystanders shall be restrained.

8.5. Such other information as the commissioner may prescribe relating to the safe conduct of the display or other event.

9. The manner, place, and quantity of storage for the materials, articles or devices to be used in creating the special effects.

10. Certifications that the set, scenery, curtains, and rigging materials are inherently flame-retardant or have been treated to achieve flame resistance.

**3309.4.3 Applicant responsibility.** The applicant for a special effects permit shall be responsible for the safe conduct of the display or other event including:

1. Arranging for the preparation and submission of the special effects display plan, and obtaining the special effects permit.

2. Obtaining any necessary permit or authorization, including any permit or authorization required by the United States Coast Guard, the Department of Parks and Recreation, the Port Authority of New York and New Jersey, and the United States Federal Aviation Administration.

3. Ensuring compliance with all applicable laws, rules and regulations, including the federal, state and local laws, rules and regulations governing the transportation of explosives and other hazardous materials, and the permit, labeling and fire protection requirements thereof.

4. Ensuring adequate facilities, fire protection, and staffing by qualified personnel, including the certificate of fitness holder required by this section.

5. In conjunction with the sponsor, ensuring maintenance of viewing areas at a safe distance from the location of the special effects discharge, and other appropriate safety and crowd control measures, as prescribed by the commissioner.

6. Ensuring compliance with the directions of department representatives.

7. Obtaining a liability and casualty insurance policy as set forth in [Section 3301.2.4(4)] FC3301.2.4(4).

8. Ensuring that the site of the display or other event is left in a safe condition.

**3309.5 Production company special effects permit.** The commissioner may issue a production company special effects permit to a television, motion picture or theatrical production company that regularly conducts special effects at a designated location within a specific building or structure in accordance with [Sections] FC 3309.5.1 through 3309.5.4.

**3309.5.1 Permit limitations.** A production company special effects permit shall authorize the permit holder to conduct certain special effects at one or more designated locations within a specific building or structure for a specified period of time, not to exceed [one] 1 year, without obtaining special effects permits for each display or other event, and shall authorize the permit holder to store in a central storage facility the materials, articles or devices used to create such special effects.

**3309.5.2 Permit conditions.** A production company special effects permit shall specify the number and kind of materials, articles or devices to be used and stored for use, and shall set forth such other terms and conditions as the commissioner may prescribe for the safe conduct of the special effects or the storage of such materials, articles or devices at such locations.

**3309.5.3 Permit applications.** The commissioner shall review each application for a production company special effects permit and shall grant such application only if the commissioner is satisfied that the production company can meet the requirements of this section. Permit applications shall contain a special effects display plan, including the following information and such other information and documentation as the commissioner may prescribe:

1. The address of the designated building or structure and the specific location or locations within such building or structure at which the special effects or other events are to be conducted.

2. A description of the type of productions in connection with which special effects are to be conducted.

3. A plan of the layout of each special effects location, including the arrangement of any set, scenery, rigging, or equipment, and the proximity of the persons conducting the special effects and any assistants, performers, or audience.

4. A description of the special effect to be created.

5. The amount and types of the pyrotechnic material, articles or devices to be discharged or otherwise used or stored for use, or other materials, articles or devices to be used or stored for use in creating the special effects.

6. The frequency with which the special effects are to be conducted.

7. The names of all persons personally supervising the storage, handling and discharge or other use of the materials, articles or devices used for the special effects and their certificate of fitness numbers.

8. Design and installation documents for the central storage facility in which the materials, articles or devices used to create the special effects are to be stored.

**3309.5.4 Permit holder responsibilities.** A production company special effects permit holder shall be responsible for the safe conduct of the special effects and the safe storage and handling of all materials, articles or devices used therefore, in the manner prescribed by the commissioner, including:

1. The construction and maintenance of a central storage facility in compliance with all applicable federal, state and local laws, rules and regulations, including all permit and fire protection requirements, and ensuring adequate security of such facility.

2. Ensuring compliance with all applicable laws, rules and regulations, including the federal, state and local laws, rules and regulations governing the transportation of all pyrotechnic materials, articles and devices and all other materials, articles or devices of an explosive, flammable, or combustible nature, and the permit, labeling and fire protection requirements thereof.

3. Ensuring that all special effects are conducted by a person holding a certificate of fitness for special effects, and all materials, articles or devices for such purpose are handled and stored by or under the supervision of such a person, as required by this section.

4. Ensuring compliance with the directions of department representatives.

5. Obtaining a liability and casualty insurance policy as set forth in [Section 3301.2.4(4)] FC3301.2.4(4).

**3309.6 Storage permit.** Except as otherwise provided in [Section 3309.5] FC3309.5, it shall be unlawful to store for use in a special effects display or other event any material, article or device of an explosive, flammable, or combustible nature, including any pyrotechnic material, article or device and fireworks, 1.4G, without a permit issued pursuant to this section.

**3309.7 Sales pyrotechnic supplier certificate.** It shall be unlawful to sell any pyrotechnic material, article or device designed to create a special effect or to exhibit any such material, article or device for sale without a pyrotechnic supplier certificate issued pursuant to [Section 3301.5.3.4] FC3301.5.3.4, and such materials, articles and devices shall be sold or offered for sale only to a person holding a certificate of fitness for pyrotechnic special effects issued pursuant to this section or to a production company holding a production company special effects permit issued pursuant to this section, and only in conjunction with a special effects display or other event for which a permit has been issued pursuant to this section.

**3309.8 Supervision.** Special effects, including the storage, handling and use of pyrotechnic and other special effects materials, articles and devices, shall be supervised as set forth in [Section 3301.5] FC3301.5.

**3309.9 Fire protection requirements.** Fire protection shall be provided in connection with special effects as set forth in [Sections] FC 3309.9.1 through 3309.9.3.

**3309.9.1 Portable fire extinguishers.** At least two portable fire extinguishers of the proper classification and size applicable to the hazard associated, shall be readily accessible while the special effects materials, articles or devices are being handled.

**3309.9.2 [Out-of-service] Out of service.** When the conduct of a special effects display requires that a fire protection device, equipment or system be placed [out-of-service] out of service to avoid a false alarm, the out-of-service procedures, as set forth in FC Chapter 9,

shall be observed. The impairment coordinator shall ensure that the device, equipment or system is returned to normal operating condition upon completion of the special effects display or as soon as the likelihood of false alarm has passed.

**3309.9.3 Obscuring egress.** Special effects shall not generate a quantity of smoke or mist that would obscure the visibility of exit signs or paths of egress travel.

**3309.10 Product information.** The commissioner may require the applicant to submit the following information regarding the materials, articles and devices to be used in connection with any special effects:

1. The name, address, and phone number of the manufacturer.

2. The name of the product and a description of its effect or use.

3. The performance characteristics, such as duration, height, and diameter of the special effects created.

4. A material safety data sheet [(MSDS)] for the special effect materials.

5. If a pyrotechnic article or device is used, whether the article or device is intended for indoor use and whether it is to be used with any cautions or special considerations and instructions for the proper method of placing, loading, and using the device.

**3309.11 Pyrotechnic material storage.** The storage of pyrotechnic material, articles and devices shall be as set forth in [Sections] FC 3309.3, 3309.11.1 and 3309.11.2.

**3309.11.1 Compliance with federal regulations.** All pyrotechnic materials, articles or devices shall be stored in accordance with regulations of the Bureau of Alcohol, Tobacco, Firearms and Explosives of the United States Department of Justice, as set forth in 27 CFR Part 555, Subpart K.

**3309.11.2 Ignition sources.** Pyrotechnic materials, articles or devices shall not be stored within 50 feet (152 400 mm) of any unprotected source of heat or open flame.

**3309.12 Pyrotechnic material separation distances.** If a pyrotechnic material, article or device is used to create a special effect before an audience or bystanders, the distance to the audience or bystanders shall be as set forth in [Sections] FC 3309.12.1 through 3309.12.3.

**3309.12.1 Fallout radius separation.** Each pyrotechnic material, article or device discharged or otherwise used to create a special effect shall be separated from any audience or bystanders by not less than twice the fallout radius of the device or 15 feet (4572 mm), whichever is greater.

**3309.12.2 Concussion mortar separation.** Concussion mortars shall be separated from the audience and bystanders by a minimum of 25 feet (7620 mm).

**3309.12.3 Flaming particle separation.** There shall be no glowing or flaming particles within 10 feet (3048 mm) of the audience or bystanders.

**3309.13 Special effects safety precautions.** Pre-firing safety precautions for pyrotechnic materials used to create a special effect shall be in accordance with [Sections] FC 3309.13.1 through 3309.13.9.

**3309.13.1 Mounting.** Special effects materials, articles or devices shall be mounted in a secure manner to ensure that when they are discharged or otherwise used they maintain the proper position in accordance with the approved permit application.

**3309.13.2 Performer protection.** Where a special effects material, article or device is placed on or in contact with a performer's body, appropriate shielding or other form of protection adequate to prevent any injury to the performer shall be provided. This protection shall be sufficient to protect against the normal functioning of the special effects material, article or device, as well as any possible malfunction.

**3309.13.3 Security.** The area where the special effects is to occur shall be secured from entry by unauthorized personal once the special effects material, article or device has been placed in position.

**3309.13.4 Communication.** Special effects materials, articles or devices shall be discharged or otherwise used only when the area wherein the effect is to occur is in clear view of the certificate of fitness holder for such special effects or in the clear view of a trained and knowledgeable assistant who is in direct communication with such certificate of fitness holder. Such communication may be accomplished through the use of lights or other nonverbal signals.

**3309.13.5 Container condition.** The certificate of fitness holder shall inspect the containers in which special effects materials, articles or devices have been shipped. Damaged special effects materials, articles or devices shall not be used and shall be promptly removed from the premises and disposed of lawfully.

**3309.13.6 Protective clothing and equipment.** All persons handling and using special effects materials, articles or devices shall wear protective clothing and gear appropriate to the hazard in accordance with the regulations of the United States Department of Labor.

**3309.13.7 Final inspection.** Immediately before any special effect, the certificate of fitness holder shall conduct a final inspection of all components of the special effects, including wiring, electrical connections and special effects materials, articles or devices, to ensure that they are in proper working order and to verify that all required safety distances are maintained.

**3309.13.8 Wiring placement.** Special effects materials, articles or devices shall be placed and wired in a manner designed to minimize the risk of performers and others.

**3309.13.9 Disposal of unused special effects material.** All special effects materials, articles and devices not needed for the conduct of the special effects shall be promptly returned to the

storage facility prior to the conduct of the special effects. All unused special effects materials articles or devices shall be promptly returned to the storage facility after the special effects display.

**3309.14 Pyrotechnic safety precautions.** Any special effects using a pyrotechnic special effects material, article or device shall be conducted in accordance with [Sections] FC 3309.13, and 3309.14.1 through 3309.14.7.

**3309.14.1 Projectile restrictions.** No pyrotechnic material, article or device shall be discharged in a manner that projects an article or device or debris therefrom above the audience or bystanders or causes damage to the premises.

**3309.14.2 Mortar construction.** Mortars and flash pots shall be constructed so that they are not damaged by the discharge or other use of the pyrotechnic material, article or device. Damaged mortars and flash pots shall not be used. Converted electrical switch boxes, lamp sockets, lamp holders, plug fuses, or other similar thin-walled, brittle devices shall not be used for concussion mortars or flash pots.

**3309.14.3 Flare placement.** Flares shall be placed so that any debris falls into a safe, flame-resistant area.

**3309.14.4 Securing of rotating devices.** Rotating pyrotechnic materials, articles or devices, such as wheels and saxons, shall be mounted securely so that their rotation does not cause the holder to fail.

**3309.14.5 Securing of rockets.** Where rockets are launched before a proximate audience, performers, or support personnel, the rockets shall be attached securely to a guide wire or cable with both ends securely attached and placed on an impact-resistant surface located at the terminal end of the guide. This guide wire or cable shall be of sufficient strength and flame resistance to withstand the exhaust from the rocket. An effective arrangement to stop the rocket shall be provided.

**3309.14.6 Security.** Firing systems shall not be left unattended while connected to loaded pyrotechnic materials, articles or devices, unless such systems are disconnected from their power source and have a removable activator, keyswitch, or coded arming system.

**3309.14.7 Firing safeguards.** Pyrotechnic materials, articles or devices shall be discharged only from equipment specifically constructed for that purpose. All firing systems shall be designed to ensure against accidental discharge by providing at least a two-step interlock in which the firing circuit cannot be activated unless the operator intentionally enables or arms the firing system and deliberately activates the circuit.

**3309.15 Special effects post-discharge safety measures.** Safety measures shall be implemented after the discharge of special effects as set forth in [Sections] FC 3309.15.1 and 3309.15.2.

**3309.15.1 Post-discharge inspection.** At the earliest opportunity after the discharge of special effects, the certificate of fitness holder shall verify that the pyrotechnic materials, articles or devices have discharged, consumed or otherwise operated properly. Any special

effects materials, articles or devices that have not operated properly shall either be immediately discharged or otherwise used in place, or immediately removed from the performance area and disposed of lawfully.

**3309.15.2 Final inspection.** The certificate of fitness holder shall ensure that all special effects materials, articles and devices are removed from the premises after the performance in which the special effects was conducted.

**3309.16 Open flames.** Where approved, open flames may be used in connection with theatrical performances when adequate safety precautions have been taken in accordance with NFPA 160.

**3309.17 Storage of other special effects materials.** A material, article or device of an explosive, flammable or combustible used to create special effects shall be stored in compliance with the storage requirements for the particular material, article or device as prescribed in this code, the rules and other applicable laws, rules and regulations.

**3309.18 Storage of special effects materials in television studios.** The storage in television studios of special effects materials, articles and devices, including pyrotechnic materials, articles and devices, shall be in accordance with the rules.

**3309.19 Storage for sale of pyrotechnic materials.** Pyrotechnic suppliers storing pyrotechnic materials, articles and devices for sale shall store such pyrotechnic materials, articles and devices in an approved facility.

# CHAPTER 34
# FLAMMABLE AND COMBUSTIBLE LIQUIDS

## SECTION FC 3401
## GENERAL

**3401.1 Scope.** This chapter shall govern the storage, handling and use of flammable and combustible liquids, including the dispensing and mixing of such liquids, including flammable and combustible liquids subject to the New York State Department of Environmental Conservation regulations, as set forth in 6 NYCRR Parts 595 through 614.

**Exceptions**. This chapter shall not apply to:

1. Medicines, foodstuffs, cosmetics, and commercial, institutional and industrial products in the same concentration and packaging containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solution not being flammable, and alcoholic beverages in retail or wholesale sales or storage uses when packaged in individual containers not exceeding 1.3 gallons (5 L).

2. Installation of fuel oil storage tanks and auxiliary storage tanks for oil-burning equipment, except that this chapter shall apply with respect to permit requirements and requirements relating to out-of-service fuel oil tanks.

3. Refrigerant liquids and oils in refrigerating systems (see [Section 606] FC606).

4. Storage and display of aerosol products complying with the requirements of FC Chapter 28.

5. Storage and use of liquids that have no fire point when tested in accordance with ASTM D 92.

6. Liquids with a flash point greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion.

7. Liquids without flash points that can be flammable under some conditions, such as certain halogenated hydrocarbons and mixtures containing halogenated hydrocarbons.

8. The storage of distilled spirits and wines in wooden barrels and casks.

**3401.2** Reserved.

**3401.3 Design and installation documents.** The commissioner may require design and installation documents, specifications and calculations in connection with the installation, alteration or repair of tanks and related devices, equipment and systems pursuant to this chapter, including fire protection systems.

**3401.4 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**3401.5 Material classification.** Flammable and combustible liquids shall be classified in accordance with the definitions in [Section 3402.1] FC3402.1.

**3401.6 Supervision.** Manufacture, storage, handling and use of flammable and combustible liquids, including the dispensing of such liquids, shall be supervised as set forth in [Sections] FC 3401.6.1 through 3401.6.3.

**3401.6.1 Manufacture.** The manufacture of flammable and combustible liquids shall be under the personal supervision of a certificate of fitness holder.

**3401.6.2 Storage.** The storage of flammable liquids, and combustible liquids[, excluding combustible liquids] with a flash point [over] of 300ºF (149ºC)[, in quantities exceeding 275 gallons (1041 L) or in any building or structure classified as Group H occupancy] or less, shall be under the general supervision of a certificate of fitness holder[.] when the quantity of such stored liquids exceeds the following amounts:

1. 275 gallons (1041 L) in a closed system;

2. 275 gallons (1041 L) of alcohol-based hand rubs;

3. 20 gallons (76 L) of combustible liquid in portable containers;

4. 10 gallons (38 L) of flammable liquid in portable containers, except alcohol-based hand rubs and gasoline; or

5. 2½ gallons (9.5 L) of gasoline.

**3401.6.3 Handling and use.** The handling and use of flammable liquids, and combustible liquids[, including the dispensing of such liquids, excluding combustible liquids] with a flash point [over] of 300ºF (149ºC) or less, shall be under the personal supervision of a certificate of fitness holder when the [total quantities stored, handled and used in or upon a premises exceeds 275 gallons (1041L) or in any building or structure classified as Group H occupancy] quantity of such handled and used liquids exceeds the amounts set forth in FC3401.6.2.

**3401.7 Prohibitions.** It shall be unlawful to:

1. Manufacture, refine or distill petroleum or coal tar, or the liquid products thereof.

2. Operate a refinery.

3. Install an aboveground flammable liquid storage tank indoors.

4. Store or transport in the harbor or the city any flammable or combustible liquid, except in a barge, [or] marine vessel, or watercraft constructed, protected and operated in accordance with the regulations of the United States Coast Guard.

5. Store flammable liquids in basements, cellars or other areas below grade.

6. Clean number six fuel oil tanks by heating number two fuel oil and circulating it within such tanks.

**3401.8 Certificate of license.** Persons who install, alter, test or repair any flammable or combustible liquid storage system shall hold a certificate of license or shall be employed by and perform such duties under the general supervision of a person holding such certificate.

## SECTION FC 3402
## DEFINITIONS

**3402.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**ALCOHOL-BASED HAND RUB.** An alcohol-containing preparation designed for application to the hands for anti [micro-bacterial] microbacterial or other medicinal purpose [and containing] that contains ethanol or isopropanol [in an amount not exceeding 70 percent by volume].

**BULK PLANT OR TERMINAL.** Any premises upon which flammable or combustible liquids are received from marine vessel, watercraft, pipeline, tank car or cargo tank and are stored or blended in bulk for the purpose of distributing such liquids by marine vessel, watercraft, pipeline, tank car, cargo tank or container.

**BULK TRANSFER.** The loading or unloading of flammable or combustible liquids from or between marine vessels, watercraft, pipelines, tank cars, cargo tanks or storage tanks.

**COMBUSTIBLE LIQUID.** For purposes of transportation, a combustible liquid, as defined in the regulations of the United States Department of Transportation, as set forth in 49 CFR Section 173.120. For all other purposes, a liquid, other than a compressed gas or cryogenic fluid, having a closed cup flash point at or above 100°F (38°C), classified as follows:

**Class II.** Liquids having a closed cup flash point at or above 100°F (38°C) and below 140°F (60°C).

**Class IIIA.** Liquids having a closed cup flash point at or above 140°F (60°C) and below 200°F (93°C).

**Class IIIB.** Liquids having closed cup flash points at or above 200°F (93°C).

**FIRE POINT.** The lowest temperature at which a liquid will ignite and achieve sustained burning when exposed to a test flame in accordance with ASTM D 92.

**FLAMMABLE AND COMBUSTIBLE LIQUID STORAGE SYSTEM.** A flammable or combustible liquid storage tank and all devices, equipment and systems associated with such tank, including the tank, piping, valves, fill connection, vent lines, pumps and any other ancillary equipment, except liquid motor fuel storage and dispensing systems and flammable and combustible liquid storage systems at a bulk plant or terminal used for bulk transfer operations.

**FLAMMABLE LIQUID.** For purposes of transportation, a flammable liquid defined in the regulations of the United States Department of Transportation, as set forth in 49 CFR Section 173.120. For all other purposes, a liquid, other than a compressed gas or cryogenic fluid, having a closed cup flash point below 100°F (38°C), classified as follows:

**Class IA.** Liquids having a flash point below 73°F (23°C) and having a boiling point below 100°F (38°C).

**Class IB.** Liquids having a flash point below 73°F (23°C) and having a boiling point at or above 100°F (38°C).

**Class IC.** Liquids having a flash point at or above 73°F (23°C) and below 100°F (38°C).

**FLASH POINT.** The minimum temperature in degrees Fahrenheit at which a liquid will give off sufficient vapors to form an ignitable mixture with air near the surface or in the container, but will not sustain combustion. The flash point of a liquid shall be determined by appropriate test procedure and apparatus as specified in ASTM D 56, ASTM D 93 or ASTM D 3278.

**LIQUID STORAGE ROOM.** A room classified as a Group H-3 occupancy used for the storage of flammable or combustible liquids.

**LIQUID STORAGE WAREHOUSE.** A building classified as a Group H-2 or H-3 occupancy used for the storage of flammable or combustible liquids in closed containers.

**PROCESS TRANSFER.** The transfer of flammable or combustible liquids between cargo tanks or tank cars and containers, tanks piping and other equipment that is to be used in process operations.

**PROCESSING VESSEL.** A tank or other container used in manufacturing or other process operation that involves the use of a flammable or combustible liquid supplied from other than a cargo tank, tank car or pipeline.

**REFINERY.** A plant in which flammable or combustible liquids are produced on a commercial scale from crude petroleum, gasoline or other hydrocarbon sources.

**REMOTE SOLVENT RESERVOIR.** A liquid solvent container enclosed against evaporative losses to the atmosphere during periods when the container is not being utilized, except for a solvent return opening not larger than 16 square inches (10 322 $mm^2$), which allows pump-cycled used solvent to drain back into the reservoir from a separate solvent sink or work area.

**SOLVENT DISTILLATION UNIT.** An appliance that receives contaminated flammable or combustible liquids and which distills the contents to remove contaminants and recover the solvents.

**TANK, PRIMARY.** A listed atmospheric tank used to store liquid.

**[TANK, PROTECTED ABOVEGROUND.** An atmospheric aboveground tank listed in accordance with UL 2085 or equivalent standard that is provided with integral secondary containment, protection from physical damage, and an insulation system intended to reduce the heat transferred to the primary tank when the tank is exposed to a high intensity liquid pool fire.]

## SECTION FC 3403
## GENERAL REQUIREMENTS

**3403.1 Electrical.** Electrical wiring and equipment shall be installed and maintained in accordance with the Electrical Code.

**3403.1.1 Classified locations for flammable liquids.** Areas where flammable liquids are stored, handled or used, including the dispensing or mixing of such liquids, shall be in accordance with FC Table 3403.1.1 and the Electrical Code. A classified area shall not extend beyond any floor, roof or other solid partition having no openings. The extent of the classified area is allowed to be reduced, or eliminated, where sufficient technical justification is provided to the commissioner that a concentration in the area in excess of 25 percent of the lower flammable limit cannot be generated.

**3403.1.2 Classified locations for combustible liquids.** Areas where Class II or III liquids are heated above their flash points shall have electrical installations in accordance with [Section 3403.1] FC3403.1.1 and the Electrical Code.

**Exception:** Solvent distillation units in accordance with [Section 3405.4] FC3405.4.

**3403.1.3 Other applications.** The commissioner may determine the extent of the Class I electrical equipment and wiring location when a condition is not specifically covered by these requirements or the Electrical Code.

**3403.1.4 Tank grounding.** Tanks shall be properly grounded.

**3403.2 Fire protection.** Fire protection for the storage, handling, and use of flammable and combustible liquids, including the dispensing and mixing of such liquids, and on-site transportation, shall be provided in accordance with this chapter and FC Chapter 9.

**3403.2.1 Portable fire extinguishers and hose lines.** Portable fire extinguishers shall be provided in accordance with [Section 906] FC906. Where required, hose lines shall be provided in accordance with [Section 905] FC905.

**3403.3 Site assessment.** The commissioner may require [a] an owner or operator of a tank system to conduct a site assessment upon a determination that a potential fire or explosion hazard exists as a result of a spill, leak or discharge from such system. Such site assessments shall be conducted to ascertain potential fire hazards and shall be completed and submitted to the department within a time period established by the commissioner, not to exceed 60 calendar days.

**3403.4 Spill control and secondary containment.** Where the maximum allowable quantity per control area is exceeded, and when required by [Section 2704.2] FC2704.2, rooms, buildings or areas used for storage, handling or use of Class I, II and III-A liquids, including the dispensing or mixing of such liquids, shall be provided with spill control and secondary containment in accordance with [Section 2704.2] FC2704.2.

**3403.5 Labeling and signage.** The commissioner may require warning signs for the purpose of identifying the hazards of manufacturing, storing, handling or using flammable liquids, including the dispensing or mixing of such liquids. Signage for identification and warning such as for the inherent hazard of flammable liquids or smoking shall be provided in accordance with this chapter and [Sections] FC 2703.5 and 2703.6.

**3403.5.1 Style.** Warning signs shall be of a durable material. Signs warning of the hazard of flammable liquids shall have red, black or white lettering on a [red] contrasting background and shall read: DANGER—FLAMMABLE LIQUIDS. Letters shall not be less than 3 inches (76 mm) in height and [0.5] ½ inch (12.7 mm) in stroke.

**3403.5.2 Location.** Signs shall be posted in locations as required by the commissioner. Piping containing flammable liquids shall be identified in accordance with [ANSI] ASME A13.1.

**3403.5.3 Warning labels.** Individual containers, packages and cartons shall be identified, marked, labeled and placarded in accordance with federal regulations and applicable state laws.

**3403.5.4 Identification.** Color coding or other approved identification means consistent with the New York State Department of Environmental Conservation regulations, as set forth in 6 NYCRR Section 613.3(b), shall be provided on each loading and unloading riser for flammable or combustible liquids to identify the contents of the tank served by the riser.

**FC TABLE 3403.1.1**
**CLASS I ELECTRICAL EQUIPMENT LOCATIONS[a]**

| LOCATION | GROUP D DIVISION | EXTENT OF CLASSIFIED AREA |
|---|---|---|
| **Underground tank fill opening** | 1 | Pits, boxes or spaces below grade level, any part of which is within the Division 1 or 2 classified area. |
| | 2 | Up to 18 inches above grade level within a horizontal radius of 10 feet from a loose-fill connection and within a horizontal radius of 5 feet from a tight-fill connection. |
| **Vent—Discharging upward** | 1 | Within 3 feet of open end of vent, extending in all directions. |
| | 2 | Area between 3 feet and 5 feet of open end of vent, extending in all directions. |
| **Drum and container filling** | | |
| Outdoor or indoor with adequate ventilation | 1 | Within 3 feet of vent and fill opening, extending in all directions. |
| | 2 | Area between 3 feet and 5 feet from vent of fill opening, extending in all directions. Also up to 18 inches above floor or grade level within a horizontal radius of 10 feet from vent or fill opening. |
| **Pumps, bleeders, withdrawal fittings, meters and similar devices** | | |
| Indoor | 2 | Within 5 feet of any edge of such devices, extending in all directions. Also up to 3 feet above floor or grade level within 25 feet horizontally from any edge of such devices. |
| Outdoor | 2 | Within 3 feet of any edge of such devices, extending in all directions. Also up to 18 inches horizontally from an edge of such devices. |
| **Pits** | | |
| Without mechanical ventilation | 1 | Entire area within pit if any part is within a Division 1 or 2 classified area. |
| With mechanical ventilation | 2 | Entire area within pit if any part is within a Division 1 or 2 classified area. |
| Containing valves, fittings or piping, and not within a Division 1 or 2 classified area | 2 | Entire pit. |
| **Drainage ditches, separators, impounding basins** | | |
| Indoor | 1 or 2 | Same as pits. |
| Outdoor | 2 | Area up to 18 inches above ditch, separator or basin. Also up to 18 inches above grade within 15 feet horizontal from any edge. |
| **Cargo tank and tank car[b]** | | |
| Loading through open dome | 1 | Within 3 feet of edge of dome, extending in all directions. |
| | 2 | Area between 3 feet and 15 feet from edge of dome, extending in all directions. |
| Loading through bottom connections with atmospheric venting | 1 | Within 3 feet of point of venting to atmosphere, extending in all directions. |
| | 2 | Area between 3 feet and 15 feet from point of venting to atmosphere, extending in all directions. Also up to 18 inches above grade within a horizontal radius of 10 feet from point of loading connection. |
| Office and restrooms | Ordinary | Where there is an opening to these rooms within the extent of an indoor classified location, the room shall be classified the same as if the wall, curb or partition did not exist. |
| **Cargo tank and tank car[b]–continued** | | |
| Loading through closed dome with atmospheric venting | 1 | Within 3 feet of open end of vent, extending in all directions. |
| | 2 | Area between 3 feet and 15 feet from open end of vent, extending in all directions. Also within 3 feet of edge of dome, extending in all directions. |
| Loading through closed dome with vapor control | 2 | Within 3 feet of point of connection of both fill and vapor lines, extending in all directions. |
| Bottom loading with vapor control or any bottom unloading | 2 | Within 3 feet of point of connection, extending in all directions. Also up to 18 inches above grade within a horizontal radius of 10 feet from point of connection. |
| **Repair garage for cargo tanks** | 1 | Pits or spaces below floor level. |

| | | |
|---|---|---|
| | 2 | Area up to 18 inches above floor or grade level for entire storage or repair garage. |
| **Garages for other than cargo tanks** | Ordinary | Where there is an opening to these rooms within the extent of an outdoor classified area, the entire room shall be classified the same as the area classification at the point of the opening. |
| **Outdoor drum storage** | Ordinary | |
| **Indoor warehousing where there is no flammable liquid transfer** | Ordinary | Where there is an opening to these rooms within the extent of an indoor classified area, the room shall be classified the same as if the wall, curb or partition did not exist. |
| **Indoor equipment where flammable vapor/air mixtures could exist under normal operations** | 1<br>2 | Area within 5 feet of any edge of such equipment, extending in all directions.<br>Area between 5 feet and 8 feet of any edge of such equipment, extending in all directions. Also, area up to 3 feet above floor or grade level within 5 feet to 25 feet horizontally from any edge of such equipment.[c] |
| **Outdoor equipment where flammable vapor/air mixtures could exist under normal operations** | 1<br>2 | Area within 3 feet of any edge of such equipment, extending in all directions.<br>Area between 3 feet and 8 feet of any edge of such equipment extending in all directions. Also, area up to 3 feet above floor or grade level within 3 feet to 10 feet horizontally from any edge of such equipment. |
| **Tank—[Above ground] <u>Aboveground</u>**<br>Shell, ends or roof and dike area<br><br><br>Vent<br><br>Floating roof | <br>1<br><br>2<br><br>1<br>2<br>1 | <br>Area inside dike where dike height is greater than the distance from the tank to the dike for more than 50 percent of the tank circumference.<br>Area within 10 feet from shell, ends or roof of tank. Area inside dikes to level of top of dike.<br>Area within 5 feet of open end of vent, extending in all directions.<br>Area between 5 feet and 10 feet from open end of vent, extending in all directions.<br>Area above the roof and within the shell. |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Locations as classified in the Electrical Code.

b. When classifying extent of area, consideration shall be given to the fact that tank cars or cargo tanks can be situated at varying points. Therefore, the perimeter of the loading or unloading positions shall be used.

c. The release of Class I liquids can generate vapors to the extent that the entire building, and possibly a zone surrounding it, are considered a Class I, Division 2 location.

**3403.6 Piping systems.** Piping systems for flammable and combustible liquids shall be in accordance with this section.

**Exception:** Piping that is integral to stationary or portable engines, including engines in aircraft, marine vessels, watercraft and motor vehicles, and piping associated with boilers and pressure vessels regulated by the construction codes, including the Mechanical Code.

**3403.6.1** Reserved.

**3403.6.2 Design and manufacture of piping system components.** Piping system components shall be designed and manufactured in accordance with the applicable standard listed in FC Table 3403.6.2 and NFPA 30, [Chapter 3,] except as modified by this section.

**FC TABLE 3403.6.2**
**PIPING STANDARDS**

| PIPING USE | STANDARD |
|---|---|
| Power Piping | ASME B31.1 |
| Process Piping | ASME B31.3 |
| Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids | ASME B31.4 |
| Building Services Piping | ASME B31.9 |

**3403.6.2.1 Special materials.** Low-melting-point materials, such as aluminum, copper or brass, that soften on fire exposure, such as nonmetallic materials, and nonductile material, such as cast iron, shall be acceptable for use underground only in accordance with [ASME 31.9] the applicable standard listed in FC Table 3403.6.2. Aboveground piping system components shall be constructed of Schedule 40 steel or a higher [Schedule] schedule steel.

**3403.6.3 Testing.** Unless tested in accordance with the applicable section of [ANSI] ASME B31.9, piping, before being covered, enclosed or placed in use, shall be hydrostatically tested to 150 percent of the maximum anticipated operating pressure of the system, or pneumatically tested to 110 percent of the maximum anticipated pressure of the system, but not less than 15 pounds per square inch gauge (psig) (103.4 kPa) at the highest point of the system. This test shall be maintained for a sufficient time period to complete visual inspection of joints and connections. For a minimum of 60 minutes, there shall be no leakage or permanent distortion. Pneumatic testing shall be conducted using an inert gas, except that air may be used if the piping system does not contain flammable or combustible liquid vapors. Piping system tests shall be conducted at the owner's risk by his or her representative before a representative of the department. Care shall be exercised to ensure that these pressures are not applied to vented storage tanks. Such storage tanks shall be tested independently from the piping.

**3403.6.3.1 Existing piping.** Existing piping shall be tested in accordance with this section, upon a determination by the commissioner that such piping may be leaking. Piping that could contain flammable or combustible liquid vapors shall not be tested pneumatically, except that vapor-recovery piping may be tested pneumatically using an inert gas. Such tests shall be conducted at the owner's risk by his or her representative.

**3403.6.4 Protection from vehicles.** Posts or other approved means shall be provided in accordance with [Section 312] FC312 to protect piping, valves, fittings or ancillary equipment subject to vehicular damage.

**3403.6.5 Protection from corrosion and galvanic action.** Where subject to external corrosion, piping, related fluid-handling components and supports for both underground and aboveground applications shall be fabricated from noncorrosive materials, coated or otherwise provided with corrosion protection. Dissimilar metallic parts that promote galvanic action shall not be joined.

**3403.6.6 Valves.** Piping systems shall contain a sufficient number of manual control valves and check valves to operate the system properly and to protect the facility under both normal and emergency conditions. Piping systems in connection with pumps shall contain a sufficient number of such valves to control properly the flow of liquids in normal operation and in the event of physical damage or fire exposure.

**3403.6.6.1 Backflow protections.** Connections to pipelines or piping by which tank cars, cargo tanks, [or] marine vessels, watercraft or other equipment discharge liquids into storage tanks shall be provided with check valves or block valves for automatic protection against backflow where the piping arrangement is such that backflow from the system is possible. Where loading and unloading is done through a common pipe system, a check valve is not required except as required by the applicable provisions of the New York State Department of Environmental Conservation regulations, as set forth in 6 NYCRR Section 613.3(c)(4). However, a block valve shall be provided which is located so as to be readily accessible or remotely operable.

**3403.6.6.2 Manual drainage.** Manual drainage-control valves shall be located at approved locations remote from the tanks, diked area, drainage system and impounding basin to ensure their operation in a fire condition.

**3403.6.7 Connections.** Aboveground tanks with connections located below normal liquid level shall be provided with internal or external isolation valves located as close as practical to the shell of the tank. Except for liquids whose chemical characteristics are incompatible with steel, such valves, when external, and their connections to the tank shall be of steel.

**3403.6.8 Piping supports.** Piping systems shall be substantially supported and protected from physical damage and designed to accommodate settlement, vibration, expansion, contraction or exposure to fire. The supports shall be constructed of steel, concrete or other approved noncombustible material.

**3403.6.9 Flexible joints.** Flexible joints shall be listed and approved and shall be installed on underground liquid, vapor and vent piping at all of the following locations:

1. Where piping connects to underground tanks.

2. Where piping ends at pump islands and vent risers.

3. At points where differential movement in the piping can occur.

**3403.6.9.1 Fiberglass-reinforced plastic piping.** Fiberglass-reinforced plastic piping is not required to be provided with flexible joints in locations where both of the following conditions are present:

1. Piping does not exceed 4 inches (102 mm) in diameter.

2. Piping has a straight run of not less than 4 feet (1219 mm) on one side of the connection when such connections result in a change of direction.

**3403.6.9.1.1 Flexible joints.** In lieu of the minimum 4-foot (1219 mm) straight run length required in [Section 3403.6.9.1(2)] FC3403.6.9.1(2), approved and listed flexible joints are allowed to be used under dispensers and suction pumps, at submerged pumps and tanks, and where vents extend aboveground.

**3403.6.10 Pipe joints.** Joints shall be [liquid tight] liquid-tight and shall be welded, flanged or threaded except that listed flexible connectors are allowed in accordance with [Section 3403.6.9] FC3403.6.9. Threaded or flanged joints shall fit tightly by using approved methods and materials for the type of joint. Joints in piping systems used for Class I liquids shall be welded when located in concealed spaces within buildings or structures. Nonmetallic joints shall be subject to the approval of the commissioner and shall be installed in accordance with the manufacturer's instructions. Pipe joints that are dependent on the friction characteristics or resiliency of combustible materials for liquid tightness of piping shall not be used in buildings or structures. Piping shall be secured to prevent disengagement at the fitting.

**3403.6.11 Bends.** The bending of [pipe] piping and tubing shall be performed in accordance with [ANSI] ASME B31.9.

**3403.6.12 Contents.** Piping system components shall be documented as being compatible with the liquid to which such components will be exposed. Such documentation shall be approved and submitted to the department upon request.

## SECTION FC 3404
## STORAGE

**3404.1 General.** Flammable and combustible liquids in containers and tanks shall be stored in accordance with this section, FC Chapter 27 and the New York State Department of Environmental Conservation regulations, as set forth in 6 NYCRR Parts 596, 598, 599, 612, 613 and 614.

**3404.1.1 Aboveground storage prohibited.** Except as specifically authorized in [Section 3406] FC3406, it shall be unlawful to store flammable liquids in an aboveground storage tank.

**3404.1.2 Tank capacity limitations.** Except at a bulk plant or terminal or as otherwise specified in this chapter, the capacity of flammable and combustible liquid storage tanks shall not exceed the amounts set forth in [Sections] FC 3404.1.2.1 through 3404.1.2.4.

**3404.1.2.1 Underground flammable liquid tanks.** Individual underground flammable liquid storage tanks shall not exceed a capacity of 4,000 gallons (15 140 L). The aggregate capacity of underground flammable liquid storage tanks at a premises shall not exceed 20,000 gallons (75 700 L).

**3404.1.2.2 Underground combustible liquid tanks.** Individual underground combustible liquid storage tanks shall not exceed a capacity of 12,000 gallons (45 420 L). The aggregate capacity of underground combustible liquid storage tanks at a premises shall not exceed 40,000 gallons (151 400 L).

**3404.1.2.3 Aboveground, outdoor combustible liquid tanks.** The aggregate capacity of aboveground combustible liquid tanks installed outdoors at a premises shall not exceed 30,000 gallons (113 550 L).

**3404.1.2.4 Aboveground, indoor combustible liquid tanks.** The aggregate capacity of aboveground combustible liquid tanks installed indoors shall not exceed 20,000 gallons (75 700 L).

**3404.2 Tank storage.** The provisions of this section shall apply to:

1. The storage of flammable liquids in stationary aboveground tanks located outdoors and underground tanks.

2. The storage of combustible liquids in stationary aboveground tanks indoors and outdoors, and underground tanks.

3. Existing storage tank installations at bulk plants and terminals which have not been used for the storage of flammable or combustible liquids for a period in excess of 2 years from the date of completion of construction of the tank structure, if the tank is to be placed in service.

**3404.2.1 Change of tank contents.** Tanks subject to change in contents shall be subject to the approval of the commissioner and in accordance with this chapter, including [Section 3404.2.7] FC3404.2.7. Prior to a change in contents, the commissioner may require testing of a tank for leaks and documentation of compatibility. Tanks that have previously contained Class I liquids shall not be loaded with Class II or Class III liquids until such tanks and all piping, pumps, hoses and meters connected thereto have been completely drained and flushed.

**3404.2.2 Use of [cargo tanks, tank cars, barges and marine vessels as] transport containers as stationary storage tanks.** Cargo tanks, tank cars, barges, [and] marine vessels and watercraft shall not be used as stationary storage tanks unless approved.

**Exception:** A [barge or] marine vessel or watercraft moored or anchored to privately owned waterfront property storing fuel oil to be used on such waterfront property, when the barge or vessel is located within the bulkhead line and the riparian ownership to the bulkhead line is under the same ownership as the waterfront property, the fuel oil is used only by the owner of such [barge or] vessel or watercraft and the fuel oil is used beyond a

radius of 200 feet ([60 960mm] 60 960 mm) from the waterfront. Fuel oil stored shall have the specific gravity of not more than 16 degrees Baume. Such [barges and] marine vessels and watercraft shall be located wholly within the bulkhead line and in such a position as not to constitute an encumbrance to navigation, and shall be constructed, equipped and protected against fire in compliance with the requirements of the commissioner.

**3404.2.3 Labeling and signs.** Labeling and signs for storage tanks and storage tank areas shall comply with the requirements of [Sections] FC 3404.2.3.1 and 3404.2.3.2.

**3404.2.3.1 Smoking and open flame.** Signs shall be posted in storage areas prohibiting open flames and smoking. Signs shall comply with the requirements of [Section 3403.5] FC3403.5.

**3404.2.3.2 Label or placard.** Tanks more than 100 gallons (379 L) in capacity, which are used for the storage of Class I, II or [IIIA] III liquids, shall bear a label and placard identifying the material therein. Placards shall be in accordance with NFPA 704.

**Exception:** Tanks located underground.

**3404.2.4 Sources of ignition.** Open flames are prohibited in storage areas in accordance with [Section 2703.7] FC2703.7.

**3404.2.5 Explosion control.** Explosion control shall be provided in accordance with [Section 911] FC911.

**3404.2.6 Separation from incompatible materials.** Flammable and combustible liquids shall be stored separated from incompatible materials, in accordance with [Section 2703.9.8] FC2703.9.8.

**3404.2.7 Design and installation requirements for tanks.** Tanks shall be designed, constructed and installed in accordance with NFPA 30. Each tank shall bear a permanent nameplate or marking indicating the standard used as the basis of design.

**3404.2.7.1 Materials used in tank construction.** The materials used in tank construction shall be in accordance with NFPA 30.

**3404.2.7.2 Pressure limitations for tanks.** Tanks shall be designed for the pressures to which they will be subjected in accordance with NFPA 30.

**3404.2.7.3 Tank vents for normal venting.** Tank vents for normal venting shall be installed and maintained in accordance with [Sections] FC 3404.2.7.3.1 through 3404.2.7.3.6.

**3404.2.7.3.1 Vent lines.** Vent lines from tanks shall not be used for purposes other than venting unless approved.

**3404.2.7.3.2 Vent-line flame arresters and venting devices.** Vent-line flame arresters and venting devices shall be installed in accordance with their listings. Use of flame arresters in piping systems shall be in accordance with API 2028.

**3404.2.7.3.3 Vent pipe outlets.** Vent pipe outlets shall be located such that the vapors are released at a safe point outdoors and not less than 15 feet (4572 mm) above the adjacent ground level. Vapors shall be discharged upward or horizontally away from adjacent walls to assist in vapor dispersion. Vent outlets shall be located such that flammable or combustible vapors will not be trapped by eaves or other obstructions and shall be at least 10 feet (3048 mm) from building openings [or lot lines].

**3404.2.7.3.4 Installation of vent piping.** Vent piping shall be designed, sized, constructed and installed in accordance with [Section 3403.6] FC3403.6. Vent pipes shall be installed such that they will drain toward the tank without sags or traps in which liquid can collect. Vent pipes shall be installed in such a manner so as not to be subject to physical damage or vibration.

**3404.2.7.3.5 Manifolding.** Tank vent piping shall not be manifolded unless required for special purposes such as vapor recovery, vapor conservation or air pollution control.

**3404.2.7.3.5.1 Aboveground tanks.** For aboveground tanks, manifolded vent pipes shall be adequately sized to prevent system pressure limits from being exceeded when manifolded tanks are subject to the same fire exposure.

**3404.2.7.3.5.2 Underground tanks.** For underground tanks, manifolded vent pipes shall be sized to prevent system pressure limits from being exceeded when manifolded tanks are filled simultaneously.

**3404.2.7.3.5.3 Tanks storing Class I liquids.** Vent piping for tanks storing Class I liquids shall not be manifolded with vent piping for tanks storing Class II and III liquids unless positive means are provided to prevent the vapors from Class I liquids from entering tanks storing Class II and III liquids, to prevent contamination and possible change in classification of less volatile liquid.

**3404.2.7.3.6 Tank venting for tanks and pressure vessels storing Class IB and IC liquids.** Tanks and pressure vessels storing Class IB or IC liquids shall be equipped with venting devices which shall remain closed except when venting under pressure or vacuum conditions, or with listed flame arresters. The vents shall be installed and maintained in accordance with [Section 2.2.5.1 of] NFPA 30 or API 2000.

**3404.2.7.4 Emergency venting.** Aboveground tanks shall be equipped with additional venting that will relieve excessive internal pressure caused by exposure to fires. Emergency vents shall not discharge indoors. The venting shall be installed and maintained in accordance with [Section 2.2.5.2 of] NFPA 30.

**Exception:** Tanks storing Class IIIB liquids that are larger than 12,000 gallons (45 420 L) in capacity, located outdoors and not within the diked area or the drainage path of Class I or II liquids, do not require emergency relief venting.

**3404.2.7.5 Tank openings other than vents.** Tank openings for other than vents shall comply with the requirements of [Sections] FC 3404.2.7.5.1 through 3404.2.7.5.8.

**3404.2.7.5.1 Connections below liquid level.** Connections for tank openings below the liquid level shall be [liquid tight] liquid-tight.

**3404.2.7.5.2 Filling, emptying and vapor recovery connections.** Filling, emptying and vapor recovery connections to tanks shall be located outdoors at a location free from sources of ignition and not less than 10 feet (3048 mm) away from building openings [or lot lines]. Such openings shall be provided with a liquid-tight cap which shall be closed when not in use and properly identified.

**3404.2.7.5.3 Piping, connections and fittings.** Piping, connections, fittings and other appurtenances shall be installed in accordance with [Section 3403.6] FC3403.6.

**3404.2.7.5.4 Manual gauging.** Openings for manual gauging, if independent of the fill pipe, shall be provided with a liquid-tight cap or cover. Covers shall be kept closed when not gauging. Openings for manual gauging shall not be [permitted] allowed for tanks installed indoors.

**3404.2.7.5.5 Fill pipes and discharge lines.** For top-loaded tanks, a metallic fill pipe shall be designed and installed to minimize the generation of static electricity by terminating the pipe within 6 inches (152 mm) of the bottom of the tank, and it shall be installed in a manner which avoids excessive vibration.

**3404.2.7.5.5.1 Class I liquids.** For Class I liquids other than crude oil, gasoline and asphalt, the fill pipe shall be designed and installed in a manner which will minimize the possibility of generating static electricity by terminating within 6 inches (152 mm) of the bottom of the tank.

**3404.2.7.5.5.2 Underground tanks.** For underground tanks, fill pipe and discharge lines shall enter only through the top. Fill lines shall be sloped toward the tank. Underground tanks for Class I liquids shall be equipped with a [tight fill device for connecting the fill hose to the tank] vapor- and liquid-tight fill connection.

**3404.2.7.5.6 Location of connections.** Filling, withdrawal and vapor-recovery connections that are made and broken shall be located outdoors at a location away from sources of ignition and not less than [5] 10 feet ([1524] 3048 mm) away from building openings. Such connections shall be closed and [liquid tight] liquid-tight when not in use and shall be properly identified.

**3404.2.7.5.7 Protection against vapor release.** Tank openings provided for purposes of vapor recovery shall be protected against vapor release by means of a spring-

loaded check valve or dry-break connections, or other approved device, unless the opening is a pipe connected to a vapor processing system. Openings designed for combined fill and vapor recovery shall also be protected against vapor release unless connection of the liquid delivery line to the fill pipe simultaneously connects the vapor recovery line. Connections shall be [vapor tight] vapor-tight.

**3404.2.7.5.8 Overfill prevention.** An approved means or method in accordance with [Section 3404.2.9.6.6] FC 3404.2.9.4 and 3404.2.9.6.6 for aboveground storage and FC3404.2.11.4 for underground storage shall be provided to prevent the overfill of all flammable and combustible liquid storage tanks.

**3404.2.7.6 Repair or alteration of tanks and piping.** The repair or alteration, including welding, cutting and hot tapping of storage tanks and piping that have been placed in service, shall be in accordance with NFPA 30. Hot tapping shall only be [permitted] allowed with the approval of the commissioner.

**3404.2.7.7 Design of supports.** The design of the supporting structure for tanks shall be in accordance with the construction codes, including the Building Code and NFPA 30.

**3404.2.7.8 Locations subject to flooding.** When a tank is located in an area where it is subject to buoyancy because of a rise in the water table, flooding or accumulation of water from fire suppression operations, the tank shall be secured from movement in accordance with [Sections 2.3.2.6 and 2.3.3.5 of] NFPA 30.

**3404.2.7.9 Corrosion protection.** Where subject to external corrosion, tanks shall be fabricated from corrosion-resistant materials, coated or provided with corrosion protection in accordance with [Section 2.2.6.1 of] NFPA 30 and the New York State Department of Environmental Conservation regulations, as set forth in 6 NYCRR Part 614.

**3404.2.7.10 Leak reporting.** A consistent or accidental loss of liquid, or other indication of a leak from a tank system, shall be reported immediately to the department and other authorities having jurisdiction.

**3404.2.7.10.1 Leaking tank disposition.** Leaking tanks shall be promptly emptied, repaired and returned to service, sealed in place or removed in accordance with [Section] FC 3404.2.13 or 3404.2.14.

**3404.2.7.11 Tank lining.** Steel tanks are allowed to be lined only for the purpose of protecting the interior from corrosion or providing compatibility with a material to be stored. Only those liquids tested for compatibility with the lining material are allowed to be stored in lined tanks. Tank lining shall not be used for purposes of repairing a tank.

**3404.2.8** Reserved.

**3404.2.9 Aboveground tanks.** Aboveground storage of combustible liquids in tanks shall comply with the requirements of [Section 3404.2] FC3404.2, and [Sections] FC 3404.2.9.1.2

through 3404.2.9.6.10. Except as specifically authorized in [Section 3406] FC3406, the storage of flammable liquid in aboveground storage tanks is prohibited.

**3404.2.9.1** Reserved.

**3404.2.9.1.1** Reserved.

**3404.2.9.1.2 Foam fire protection system installation.** Where foam fire protection is approved for a required fire extinguishing system pursuant to this chapter, it shall be designed and installed in accordance with NFPA 11, as modified by FC Appendix B [and NFPA 11A].

**3404.2.9.1.2.1 Foam storage.** Where foam fire protection is approved for a required fire extinguishing system pursuant to this chapter, the foam-producing materials shall be stored on the premises.

**3404.2.9.1.3 Fire protection of supports.** Supports or pilings for aboveground tanks storing Class I, II or IIIA liquids elevated more than 12 inches (305 mm) above grade shall have a fire-resistance rating of not less than 2 hours in accordance with the fire exposure criteria specified in ASTM E 1529.

**Exception:** Structural supports tested as part of a protected aboveground tank in accordance with UL 2085.

**3404.2.9.1.4 Inerting of tanks with boilover liquids.** Liquids with boilover characteristics shall not be stored in fixed roof tanks larger than 150 feet (45 720 mm) in diameter unless an approved gas enrichment or inerting system is provided on the tank.

**3404.2.9.2 Supports, foundations and anchorage.** Supports, foundations and anchorages for aboveground tanks shall be designed and constructed in accordance with NFPA 30 and the construction codes, including the Building Code.

**3404.2.9.3 Stairs, platforms and walkways.** Stairs, platforms and walkways shall be of noncombustible construction and shall be designed and constructed in accordance with NFPA 30 and the construction codes, including the Building Code.

**3404.2.9.4 Aboveground tank overfill prevention.** Aboveground tanks shall not be filled in excess of 95 percent of their capacity. An approved overfill prevention system shall be provided for each tank. During tank-filling operations, the system shall automatically shut off the flow of liquid to the tank when the quantity of liquid in the tank reaches 95 percent of tank capacity. For rigid hose liquid-delivery systems, an approved means shall be provided to empty the fill hose into the tank after the automatic shutoff device is activated.

**3404.2.9.5 Outdoor aboveground tanks.** Outdoor aboveground tanks shall comply with the requirements of [Sections] FC 3404.2.9.5.1 through 3404.2.9.5.3.

**3404.2.9.5.1 Locations of aboveground tanks.** Outdoor aboveground tanks shall be located in accordance with [Sections] FC 3404.2.9.5.1.1 through 3404.2.9.5.1.5, as applicable.

**3404.2.9.5.1.1 Location of tanks with pressures 2.5 psig or less.** Aboveground tanks operating at pressures not exceeding 2.5 psig (17.2 kPa) for storage of Class I, II or IIIA liquids, which are designed with a floating roof or a weak roof-to-shell seam, or equipped with emergency venting devices limiting pressure to 2.5 psig (17.2 kPa), shall be located in accordance with [Table 2.3.2.1.1(a) of] NFPA 30.

**Exceptions:**

1. Vertical tanks having a weak roof-to-shell seam and storing Class IIIA liquids are allowed to be located at one-half the distances specified in [Table 2.3.2.1.1(a) of] NFPA 30, provided the tanks are not within a diked area or drainage path for a tank storing Class I or II liquids.

2. Liquids with boilover characteristics and unstable liquids in accordance with [Sections] FC 3404.2.9.5.1.4 and 3404.2.9.5.1.5.

3. For protected aboveground tanks in accordance with [Section 3404.2.9.6] FC3404.2.9.6, the distances in [Table 2.3.2.1.1(b) of] NFPA 30 shall apply and shall be reduced by one-half, but not to less than 5 feet (1524 mm).

**3404.2.9.5.1.2 Location of tanks with pressures exceeding 2.5 psig.** Aboveground tanks for the storage of Class I, II or IIIA liquids operating at pressures exceeding 2.5 psig (17.2 kPa) or equipped with emergency venting allowing pressures to exceed 2.5 psig (17.2 kPa) shall be located in accordance with [Table 2.3.2.1.2 of] NFPA 30.

**Exception:** Liquids with boilover characteristics and unstable liquids in accordance with [Sections] FC 3404.2.9.5.1.4 and 3404.2.9.5.1.5.

**3404.2.9.5.1.3 Location of tanks for boilover liquids.** Aboveground tanks for storage of liquids with boilover characteristics shall be located in accordance with [Table 2.3.2.1.3 of] NFPA 30.

**3404.2.9.5.1.4 Location of tanks for unstable liquids.** Aboveground tanks for the storage of unstable liquids shall be located in accordance with [Table 2.3.2.1.4 of] NFPA 30.

**3404.2.9.5.1.5 Location of tanks for Class IIIB liquids.** Aboveground tanks for the storage of Class IIIB liquids, excluding unstable liquids, shall be located in accordance with [Table 2.3.2.1.5 of] NFPA 30, except when located within a diked area or drainage path for a tank or tanks storing Class I or II liquids. Where a Class IIIB liquid storage tank is within the diked area or drainage path for a

Class I or II liquid, distances required by [Section 3404.2.9.5.1.2] FC3404.2.9.5.1.2 shall apply.

**3404.2.9.5.2 Separation between adjacent stable or unstable liquid tanks.** The separation between tanks containing stable liquids shall be in accordance with [Table 2.3.2.2.1 of] NFPA 30. Where tanks are in a diked area containing Class I or II liquids, or in the drainage path of Class I or II liquids, and are compacted in three or more rows or in an irregular pattern, the commissioner may require greater separation than specified in [Table 2.3.2.2.1 of] NFPA 30 or other means to make tanks in the interior of the pattern accessible for firefighting purposes. The separation between tanks containing unstable liquids shall not be less than one-half the sum of their diameters.

**Exception:** Tanks used for storing Class IIIB liquids are allowed to be spaced 3 feet (914 mm) apart unless within a diked area or drainage path for a tank storing Class I or II liquids.

**3404.2.9.5.3 Separation between adjacent tanks containing flammable or combustible liquids and LPG.** The minimum horizontal separation between an LPG container and a Class I, II or IIIA liquid storage tank shall be 20 feet (6096 mm) except in the case of Class I, II or IIIA liquid tanks operating at pressures exceeding 2.5 psig (17.2 kPa) or equipped with emergency venting allowing pressures to exceed 2.5 psig (17.2 kPa), in which case the provisions of [Section 3404.2.9.5.2] FC3404.2.9.5.2 shall apply. An approved means shall be provided to prevent the accumulation of Class I, II or IIIA liquids under adjacent LPG containers such as by dikes, diversion curbs or grading. When flammable or combustible liquid storage tanks are within a diked area, the LPG containers shall be outside the diked area and at least 10 feet (3048 mm) away from the centerline of the wall of the diked area.

**Exception:** Horizontal separation is not required between LPG containers and underground flammable and combustible liquid tanks.

**3404.2.9.6 Additional requirements for protected aboveground tanks.** In addition to the requirements of this chapter for aboveground tanks, the installation of protected aboveground tanks shall be in accordance with [Sections] FC 3404.2.9.6.1 through 3404.2.9.6.10.

**3404.2.9.6.1 Tank construction.** The construction of a protected aboveground tank and its primary tank shall be in accordance with [Section 3404.2.7] FC3404.2.7.

**3404.2.9.6.2 Normal and emergency venting.** Normal and emergency venting for protected aboveground tanks shall be provided in accordance with [Sections] FC 3404.2.7.3 and 3404.2.7.4. The vent capacity reduction factor shall not be allowed.

**3404.2.9.6.3 Flame arresters.** Approved flame arresters or pressure vacuum breather valves shall be installed in normal vents.

**3404.2.9.6.4 Secondary containment.** Protected aboveground tanks shall be provided with secondary containment, drainage control or diking in accordance with [Section 2704.2] FC2704.2 and 6 NYCRR Part 613.3(c)(6). A means shall be provided to establish the integrity of the secondary containment in accordance with NFPA 30.

**3404.2.9.6.5 Vehicle impact protection.** Where protected aboveground tanks, piping, electrical conduit or dispensers are subject to vehicular impact, they shall be protected therefrom, either by having the impact protection incorporated into the system design in compliance with the impact test protocol of UL 2085, or by meeting the provisions of [Section 312] FC312, or where necessary, a combination of both. Where posts or other approved barriers are provided, they shall be independent of each aboveground tank.

**3404.2.9.6.6 Overfill prevention sign.** A durable sign shall be conspicuously posted on or immediately adjacent to the fill point for the tank, setting forth the filling procedure and the tank calibration chart. The filling procedure shall require the person filling the tank to determine the [gallonage (literage)] number of gallons required to fill it to 90 percent of capacity before commencing the fill operation.

**3404.2.9.6.7 Fill pipe connections.** The fill pipe shall be provided with a means for making a direct connection to the cargo tank's fuel delivery hose so that the delivery of fuel by means of a liquid-tight connection is not exposed to the open air during the filling operation. Where any portion of the fill pipe exterior to the tank extends below the level of the top of the tank, a check valve shall be installed in the fill pipe not more than 12 inches (305 mm) from the fill hose connection.

**3404.2.9.6.8 Spill containers.** A spill container having a capacity of not less than 15 gallons (56.8 L) shall be provided for each fill connection. For tanks with a top fill connection, spill containers shall be noncombustible and shall be fixed to the tank and equipped with a manual drain valve that drains into the primary tank. For tanks with a remote fill connection, a portable spill container shall be allowed.

**3404.2.9.6.9 Tank openings.** Tank openings in protected aboveground tanks shall be through the top only.

**3404.2.9.6.10 Antisiphon devices.** Approved antisiphon devices shall be installed in each external pipe connected to the protected aboveground tank when the pipe extends below the level of the top of the tank.

**3404.2.10 Drainage and diking.** The area surrounding a tank or group of tanks shall be provided with drainage control or shall be diked to prevent accidental discharge of liquid from endangering adjacent tanks, adjoining property or reaching waterways. The area shall be in compliance with the requirements of the New York State Department of Environmental Conservation regulations, as set forth in 6 NYCRR Section 613.3(c)(6).

**Exceptions:**

1. For tanks having a capacity of less than 10,000 gallons (37 850 L), the commissioner may modify these requirements based on an approved technical report which demonstrates that such tank or group of tanks does not constitute a hazard to other tanks, waterways or adjoining property, after consideration of special features such as topographical conditions, nature of occupancy and proximity to buildings or structures on the same or adjacent property, capacity, and construction of proposed tanks and character of liquids to be stored, and nature and quantity of private and public fire protection provided.

2. Drainage control and diking is not required for listed secondary containment tanks.

**3404.2.10.1 Volumetric capacity.** The volumetric capacity of the diked area shall not be less than the greatest amount of liquid that can be released from the largest tank within the diked area. The capacity of the diked area enclosing more than one tank shall be calculated by deducting the volume of the tanks other than the largest tank below the height of the dike.

**3404.2.10.2 Diked areas containing multiple tanks.** Diked areas containing multiple tanks shall be subdivided in accordance with NFPA 30.

**3404.2.10.3 Protection of piping from exposure fires.** Piping shall not pass through adjacent diked areas or impounding basins, unless provided with a sealed sleeve or otherwise protected from exposure to fire.

**3404.2.10.4 Combustible materials in diked areas.** Diked areas shall be kept free from combustible materials, drums and barrels.

**3404.2.10.5 Equipment, controls and piping in diked areas.** Pumps, manifolds and fire protection equipment or controls shall not be located within diked areas or drainage basins or in a location where such equipment and controls would be endangered by fire in the diked area or drainage basin. [Piping above ground] <u>Aboveground piping</u> shall be minimized and located as close as practical to the shell of the tank in diked areas or drainage basins.

**Exceptions:**

1. Pumps, manifolds and piping integral to the tanks or equipment being served which is protected by intermediate diking, berms, drainage or fire protection, such as water spray, monitors or resistive coating.

2. Fire protection equipment or controls which are appurtenances to the tanks or equipment being protected, such as foam chambers or foam piping and water or foam monitors and hydrants, or hand and wheeled extinguishers.

**3404.2.10.6 Dike construction.** All dike walls shall be of steel or reinforced concrete, designed to be [liquid tight] <u>liquid-tight</u> and to withstand a full hydraulic head, and constructed to provide access to and from the diked area. Where stairways or other means

are required to provide such access, they shall be constructed of steel. No dike wall shall be higher than 60 percent of the tank height.

**3404.2.11 Underground tanks.** Underground storage of flammable and combustible liquids in tanks shall comply with the requirements of [Section 3404.2] FC 3404.2, and [Sections] 3404.2.11.1 through 3404.2.11.5.2.

**3404.2.11.1 Contents.** Underground tanks shall not store petroleum products containing mixtures of a nonpetroleum nature, such as ethanol or methanol blends, without evidence of compatibility.

**3404.2.11.2 Location.** Flammable and combustible liquid storage tanks located underground, either outdoors or under buildings, shall be in compliance with the following requirements:

1. Tanks shall be installed so that the external forces exerted from building foundations and support loads are not transmitted to the tanks. The distance from any part of a tank to the nearest wall of any basement, pit, cellar or any property line shall not be less than 3 feet (914 mm). Tanks shall not be placed less than 20 feet (6096 mm) from a subway wall.

2. Tanks shall be installed so that the highest point of the tank is not less than 2 feet ([609.6] 610 mm) below the level of the lowest cellar floor of any building within a radius of 10 feet (3048 mm) from the tank. No tank shall be located under a sidewalk or beyond the property line.

3. A minimum distance of [1 foot] 18 inches ([305] 458 mm), shell to shell, shall be maintained between underground tanks.

4. Manufacturer's installation instructions.

**3404.2.11.3 Depth and cover.** Excavation for underground storage tanks shall be made with due care to avoid undermining of foundations of existing structures. Underground tanks shall be set on firm foundations and surrounded with at least 6 inches (152 mm) of noncorrosive inert material, in accordance with the manufacturer's installation instructions.

**3404.2.11.4 Overfill protection and prevention systems.** Fill pipes shall be equipped with a spill container of not less than 15-gallon (56.8 L) capacity and an approved overfill prevention system to automatically prevent overflow in accordance with NFPA 30 and [Section 3404.2.9.4] FC3404.2.9.4.

**3404.2.11.5 Leak prevention.** Leak prevention for underground tanks shall comply with the requirements of [Sections] FC 3404.2.11.5.1 and 3404.2.11.5.2.

**3404.2.11.5.1 Inventory control.** Daily inventory records shall be maintained for underground storage tank systems.

**3404.2.11.5.2 Leak detection.** Underground storage tank systems shall be provided with an approved method of leak detection from any component of the system that is designed and installed in accordance with NFPA 30. Leak detection systems shall be tested at the time of installation at the owner's risk by his or her representative before a representative of the department.

**3404.2.11.6 Periodic tank and piping test**. Any underground single-walled flammable or combustible liquid storage tank existing prior to the effective date of this code that [is single-walled or] is not provided with a leak detection system meeting the requirements of [Section 3404.2.11.5.2] FC3404.2.11.5.2 shall be precision tested at least once every 5 years.

**Exception:** Bulk plant and terminal tanks.

**3404.2.11.7 Emergency tank and piping system test**. The commissioner may require a tank and piping system to be precision tested, pressure tested or tested by other approved method in accordance with this section to determine the condition of the tank or piping or when the commissioner has good cause to believe that a leak exists. Storage systems that may contain flammable or combustible liquid vapor shall not be tested pneumatically. Such tests shall be conducted at the owner's risk by his or her representative.

**3404.2.12 Testing.** Tank testing required by [Sections] FC 3404.2.12.1 through 3404.2.12.3 shall be at the owner's risk by his or her representative before a representative of the department.

**3404.2.12.1 Acceptance testing.** Prior to being placed into service, tanks shall be tested in accordance with [Section 2.4 of] NFPA 30.

**3404.2.12.2 Testing of underground tanks.** Underground tanks shall be tested hydrostatically at 15 pounds per square inch (psig)(103.4 kPa), or 150 percent of the maximum anticipated static head pressure, whichever is greater, for the inner tank, and pneumatically or hydrostatically at 5 pounds per square inch (psig)(34.5 kPa) for the annular space (secondary containment tank). When a pneumatic test is allowed, an inert gas shall be used; however, air may be used if the tank does not contain any flammable or combustible liquid vapor. Test pressure shall be maintained for sufficient time to complete visual inspection, but not less than 1 hour. A tank shall be deemed to have passed the test if it shows no evidence of leakage or permanent deformation.

**3404.2.12.3 Testing of aboveground tanks.** Aboveground tanks shall be tested hydrostatically at 15 pounds per square inch (psig)(103.4 kPa) for the inner tank, and pneumatically or hydrostatically at 5 pounds per square inch (psig)(34.5 kPa) for the annular space (secondary containment tank). When a pneumatic test is allowed, an inert gas shall be used; however, air may be used if the tank does not contain any flammable or combustible liquid vapor. Test pressure shall be maintained for sufficient time to complete visual inspection, but not less than 1 hour. A tank shall be deemed to have passed the test if it shows no evidence of leakage or permanent deformation.

**3404.2.13 Out-of-service tanks.** Tanks taken [out-of-service] out of service shall [be removed in accordance with Section 3404.2.14, or safeguarded in accordance with Sections] comply with the requirements of FC 3404.2.13.1 through 3404.2.13.2.3 and API 1604. Tanks taken out of service shall be removed, sealed in place or safeguarded by a certificate of license holder or a plumber in accordance with the rules.

**Exceptions:**

1. Tanks within operating facilities at bulk plants and terminals.

2. Tanks connected to fuel oil burning equipment that is used seasonally or as one of the fuels in dual-fueled equipment.

3. Tanks that are used for seasonal storage or standby storage.

**3404.2.13.1 Underground tanks.** Underground tanks taken [out-of-service] out of service shall comply with the requirements of [Sections 3404.2.13.1.2 through 3404.2.13.1.4] FC 3404.2.13.1.1 through 3404.2.13.1.3.

**3404.2.13.1.1 [**Reserved.] **Fuel conversions.** A fuel oil storage tank removed from service by reason of conversion of the heating system to an alternative fuel or power source, or other replacement of the tank, shall be sealed or removed from the premises in compliance with FC3404.2.13.1.3 at the time of conversion or replacement.

**3404.2.13.1.2 [Out-of-service] Out of service for 30 days.** [Underground] Except as otherwise provided in FC3404.2.13.1.1, underground tanks not used for a period of 30 calendar days or more shall be removed from the premises, or sealed in place in compliance with the requirements of FC3404.2.13.1.3, [in accordance with Section 3404.2.14] or safeguarded in compliance with the following requirements:

1. Flammable or combustible liquids shall be removed from the tank and connecting piping.

2. The tank and connecting piping shall be rendered free of flammable and combustible vapors using an inert gas.

3. Except for any active fire extinguishing system piping, the tank and connecting piping, including fill line, gauge opening, vapor return and pump connection, shall be capped or plugged and secured from tampering and the fill connection covered with concrete.

4. Vent lines shall remain open and be maintained in accordance with [Sections] FC 3404.2.7.3 and 3404.2.7.4.

**3404.2.13.1.3 [Out-of-service] Out of service for 1 year.** [Underground] Except as otherwise provided in FC3404.2.13.1.1, underground tanks that have been [out-of-service] out of service for a period of 1 year or more shall be removed from the

premises [in accordance with Section 3404.2.14] or sealed in place in compliance with the following requirements:

1. Flammable and combustible liquids shall be removed from the tank and connected piping.

2. The tank and connecting piping shall be rendered free of flammable and combustible vapors, using an inert gas.

3. The tank shall be disconnected from system piping and removed from the premises, or filled completely with an approved, inert solid material, and sealed in place.

[3] 4. All [tanks and connecting] system piping, including fire extinguishing system lines, fill line, gauge opening[,] and vapor return and pump connection, shall be disconnected[, capped or plugged] from the tank and removed from the premises, or sealed in place and secured from tampering[, and the fill connection sealed with concrete to prevent its use]. Unless other methods are approved, the fill connection shall be cut from the fill piping and removed; the fill piping shall be capped or plugged; and the fill box filled with concrete.

[4. The tank shall be filled completely with an approved, inert solid material]

5. Tank openings shall be capped and plugged, leaving a 0.125-inch to 0.25-inch-diameter (3.2-mm to 6.4-mm-diameter) opening for pressure equalization, when tanks are removed from the premises.

**3404.2.13.2 Aboveground tanks.** Aboveground tanks taken [out-of-service] out of service shall comply with the requirements of [Sections 3404.2.13.2.2 and 3404.2.13.2.3] FC 3404.2.13.2.1 through 3404.2.13.2.3.

**3404.2.13.2.1 [**Reserved.] **Fuel conversions.** A fuel oil storage tank removed from service by reason of conversion of the heating system to an alternative fuel or power source, or other replacement of the tank, shall be sealed or removed from the premises in compliance with FC3404.2.13.2.3 at the time of conversion or replacement.

**3404.2.13.2.2 [Out-of-service] Out of service for 30 days.** [Aboveground] Except as otherwise provided in FC3404.2.13.2.1, aboveground tanks not used for a period of 30 calendar days or more shall be removed from the premises [in accordance with Section 3404.2.14] or sealed in place in compliance with the requirements of FC3404.2.13.2.3, or safeguarded in compliance with the following requirements:

1. Tank and connecting piping shall be safeguarded in accordance with [Section 3404.2.13.1.2] FC3404.2.13.1.2.

2. The tank shall be protected from flotation in accordance with good engineering practice.

**3404.2.13.2.3 [Out-of-service] Out of service for 1 year.** [Aboveground] Except as otherwise provided in FC3404.2.13.2.1, aboveground tanks that have been [out-of-service] out of service for a period of 1 year or more shall be removed from the premises [in accordance with Section 3404.2.14] or sealed in place in compliance with the following requirements:

1. Flammable and combustible liquids shall be removed from the tank and connected piping.

2. The tank and connecting piping shall be rendered free of flammable and combustible vapors using an inert gas.

3. The tank shall be disconnected from system piping and removed from the premises, or filled completely with an approved, inert solid material, and sealed in place.

[3] 4. All system piping, including fire extinguishing system lines, fill line, gauge opening, and vapor return and pump connection, shall be disconnected[, capped or plugged] from the tank and removed from the premises, or sealed in place and secured from tampering[, and the fill connection sealed with concrete to prevent its use]. Unless other methods are approved, the fill connection shall be cut from the fill piping and removed; the fill piping shall be capped or plugged; and the spill containment box shall be removed.

5. Tank openings shall be capped and plugged, leaving a 0.125-inch to 0.25-inch-diameter (3.2-mm to 6.4-mm-diameter) opening for pressure equalization, when tanks are removed from the premises.

[4] 6. The tank shall be [adequately] protected from flotation in accordance with good engineering practice.

[5] 7. The tank shall be stenciled with the date that it was sealed in place.

**[3404.2.14 Removal and disposal of tanks.** Removal and disposal of tanks shall comply with the requirements of Sections 3404.2.14.1 and 3404.2.14.2.

**3404.2.14.1 Removal.** Removal of aboveground and underground tanks shall be in compliance with the following requirements:

1. Flammable and combustible liquids shall be removed from the tank and connecting piping.

2. The tank and connecting piping shall be rendered free of flammable and combustible vapors using an inert gas.

3. Piping at tank openings shall be disconnected.

4. Piping shall be removed from the premises.

**Exception:** Piping may be sealed-in-place where the commissioner determines that removal is not practical. Sealed in place piping shall be capped and safeguarded by filling with concrete or other approved material, and the fill connection removed from the fill pipe.

5. Tank openings shall be capped or plugged, leaving a 0.125-inch to 0.25-inch-diameter (3.2 mm to 6.4 mm) opening for pressure equalization.

6. Tanks shall be removed from the premises.

**3404.2.14.2 Disposal.** Tanks and piping shall be disposed of lawfully.]

**3404.3 Container storage.** Storage of flammable and combustible liquids in closed containers that do not exceed 60 gallons (227 L) in individual capacity, and transfers incidental thereto, shall comply with the requirements of this section. It shall be unlawful to store flammable and combustible liquids in containers with an individual capacity of greater than 60 gallons (227 L).

**3404.3.1 Design, construction and capacity of containers.** The design, construction and capacity of containers for the storage of flammable and combustible liquids shall be in accordance with this section and [Section 4.2 of] NFPA 30. It shall be unlawful to store flammable and combustible liquids in portable tanks, intermediate bulk containers and fiber drums.

**3404.3.1.1 Approved containers.** Only approved containers shall be used.

**3404.3.2 Liquid storage cabinets.** Where other sections of this code require that liquid containers be stored in storage cabinets, such cabinets and storage shall be in accordance with [Sections] FC 3404.3.2.1 through 3404.3.2.3.

**3404.3.2.1 Design of storage cabinets.** Design of liquid storage cabinets shall be in accordance with this section.

**3404.3.2.1.1 Materials.** Cabinets shall be listed in accordance with UL 1275.

**3404.3.2.1.2 Labeling.** Cabinets shall be provided with a conspicuous label in red letters on contrasting background which reads: FLAMMABLE—KEEP FIRE AWAY.

**3404.3.2.1.3 Doors.** Doors shall be well fitted, self-closing and equipped with a three-point latch.

**3404.3.2.1.4 Bottom.** The bottom of the cabinet shall be [liquid tight] liquid-tight to a height of at least 2 inches (51 mm).

**3404.3.2.2 Capacity.** The combined total quantity of liquids in a cabinet shall not exceed 120 gallons (454 L).

**3404.3.2.3 Number of storage cabinets.** Not more than three storage cabinets shall be located in a single fire area, except that in a Group F occupancy, additional cabinets are allowed to be located in the same fire area if the additional cabinets (or groups of up to three cabinets) are separated from other cabinets or groups of cabinets by at least 100 feet (30 480 mm).

**3404.3.3 Indoor storage.** Storage of flammable and combustible liquids indoors in containers shall be in accordance with this section.

**Exceptions:**

1. Liquids in the fuel tanks of motor vehicles, aircraft, marine vessel, watercraft or portable or stationary engines.

2. The storage of distilled spirits and wines in wooden barrels or casks.

**3404.3.3.1 Portable fire extinguishers.** Approved portable fire extinguishers shall be provided in accordance with specific sections of this chapter and [Section 906] FC906.

**3404.3.3.2 Incompatible materials.** Materials that will react with water or other liquids to produce a hazard shall not be stored in the same room with flammable and combustible liquids in accordance with [Section 2703.9.8] FC2703.9.8.

**3404.3.3.3 Clear means of egress.** Storage of any liquids, including stock for sale, shall not be stored near or be allowed to obstruct physically the route of egress.

**3404.3.3.4 Empty containers storage.** The storage of empty containers previously used for the storage of flammable or combustible liquids shall be stored as required for filled containers. Containers, when emptied, shall have the covers or plugs immediately replaced in openings, be removed to an outdoor location and, if not cleaned on the premises, the empty containers shall be removed from the premises as soon as practical, but at least daily.

**3404.3.3.5 Shelf storage.** Shelving shall be of approved noncombustible construction, adequately braced and anchored. Seismic requirements shall be in accordance with the construction codes, including the Building Code.

**3404.3.3.5.1** Reserved.

**3404.3.3.5.2 Displacement protection.** Shelves shall be of sufficient depth and provided with a lip or guard to prevent individual containers from being displaced.

**Exception:** Shelves in storage cabinets or on laboratory furniture specifically designed for such use.

**3404.3.3.5.3 Orderly storage.** Shelf storage of flammable and combustible liquids shall be maintained in an orderly manner.

**3404.3.3.6 Rack storage.** Where storage on racks is allowed elsewhere in this code, a minimum 4-foot-wide (1219 mm) aisle shall be provided between adjacent rack sections and any adjacent storage of liquids. Main aisles shall [be] have a minimum of 8 feet (2438 mm) [wide].

**3404.3.3.7 Pile or palletized storage.** Solid pile and palletized storage in liquid warehouses shall be arranged so that piles are separated from each other by at least 4 feet (1219 mm). Aisles shall be provided [and arranged] so that no container is more than 20 feet (6096 mm) from an aisle. Main aisles shall [be] have a minimum width of 8 feet (2438 mm) [wide].

**3404.3.3.8 [Limited combustible] Combustible materials storage.** [Limited quantities of combustible commodities are allowed to] Approved quantities of combustible materials may be stored in liquid storage areas, [where the ordinary combustibles, other than those used for packaging the liquids, are separated from the liquids in storage by a minimum of 8 feet (2438 mm) horizontally, either by open aisles or by open racks, and where protection is provided in accordance with Chapter 9] provided that a distance of not less than 8 feet (2438 mm) horizontally is maintained between the liquid storage area and combustible materials and fire protection systems are provided in accordance with this code and Chapter 9 of the Building Code.

**3404.3.3.9 Idle combustible pallets.** Storage of empty or idle combustible pallets inside an unprotected liquid storage area shall be limited to a maximum pile size of 2,500 square feet (232 $m^2$) and to a maximum storage height of 6 feet (1829 mm). Storage of empty or idle combustible pallets inside a protected liquid storage area shall comply with the requirements of NFPA 13, as modified by FC Appendix B. Pallet storage shall be separated from liquid storage by aisles [that are at least] with a minimum width of 8 feet (2438 mm).

**3404.3.3.10 Containers in piles.** Containers in piles shall be stacked in such a manner as to provide stability and to prevent excessive stress on container walls. Adequate material-handling equipment shall be available to handle containers safely at the upper tier level.

**3404.3.4 Quantity limits for storage.** Liquid storage quantity limitations shall comply with the requirements of [Sections] FC 3404.3.4.1 through 3404.3.4.5.

**3404.3.4.1 Maximum allowable quantity per control area.** For occupancies other than Group M wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall not exceed the maximum allowable quantities per control area indicated in FC Table 2703.1.1(1) and shall not exceed the additional limitations set forth in this section. For Group M occupancy wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall not exceed the maximum allowable quantities per control area indicated in FC Table 3404.3.4.1, except that no gasoline or flammable liquid motor fuel may be stored in portable containers for wholesale or retail sale. Storage of hazardous production material flammable and combustible liquids in Group H-5 occupancies shall be in accordance with FC Chapter 18.

**3404.3.4.2 Limitations on storage.** The quantity of flammable or combustible liquid stored shall be limited by occupancy as follows:

1. **Group A, B, E, F, I and S occupancies**. Flammable and combustible liquids shall be stored only for lawful uses incidental to the occupancy, including maintenance and operation of equipment, and in quantities not to exceed that which is necessary for such use.

2. **Group M occupancies.** Flammable and combustible liquids shall be stored only for lawful uses incidental to the occupancy, including maintenance and operation of equipment, and in quantities not to exceed that which is necessary for such use. The maximum allowable quantities for storage in wholesale and retail sales areas shall be in accordance with [Section 3404.3.4.1] FC3404.3.4.1.

3. **Group R occupancies.** Flammable and combustible liquids shall be stored only for maintenance and operation of equipment, and in quantities not to exceed that which is necessary for such use. Quantities within a dwelling unit shall be stored only for household use and in quantities below permit amounts. It shall be unlawful to store gasoline or other flammable liquid motor fuel within a dwelling unit.

4. **Gasoline and other flammable liquid motor fuel.** Storage of gasoline and other flammable liquid motor fuel in portable containers in quantities requiring a permit is subject to the approval of the commissioner, regardless of the occupancy classification of the premises.

**3404.3.4.3 Quantities exceeding limits for control areas.** Quantities exceeding those allowed in control areas set forth in [Section 3404.3.4.1] FC3404.3.4.1 shall be stored in liquid storage rooms or liquid storage warehouses in accordance with [Sections] FC 3404.3.7 and 3404.3.8.

**3404.3.4.4 Liquids for maintenance and operation of equipment.** In all occupancies, quantities of flammable and combustible liquids requiring a permit pursuant to [Section 105.6] FC105.6, used for maintenance purposes and the operation of equipment, shall be stored in liquid storage cabinets in accordance with [Section 3404.3.2] FC3404.3.2. Quantities not requiring a permit pursuant to [Section 105.6 are allowed to] FC105.6 shall be stored [outside of a cabinet when] in approved containers and locations.

**[3404.3.4.5 Citywide permits.** No citywide permit authorizing the storage and use of flammable or combustible liquids shall be valid for:

1. The storage or use of gasoline in quantities exceeding 5 gallons (19 L).

2. The storage or use of flammable liquids in quantities exceeding 250 gallons (946 L).

3. The storage or use of combustible liquids in quantities exceeding 300 gallons (1136 L).

4. The storage or use of any paint, varnish, or other flammable or combustible liquid commonly used for painting, varnishing, lacquering, staining, waxing or other finishing operations in quantities exceeding 200 gallons (757 L), except as otherwise limited in Chapter 15 for floor finishing operations.]

**3404.3.5 Storage in control areas.** Storage of flammable and combustible liquids in control areas shall be in accordance with [Sections] FC 3404.3.5.1 through 3404.3.5.4.

**3404.3.5.1 Storage of flammable and combustible liquids below grade.** [Class I] Flammable liquids shall not be [permitted] allowed in basements, cellars or other areas below grade. [Class II and III] Combustible liquids shall be allowed to be stored in basements, cellars or other areas below grade provided that such basement, cellar or other area below grade[ area] is protected throughout by a sprinkler system, and other fire protection is provided in accordance with FC Chapter 9 and the construction codes, including the Building Code.

**Exception:** Class IIIB combustible liquids may be stored in basements, cellars and other areas below grade that are not protected throughout by a sprinkler system when stored in a room or other area that is segregated, vertically and horizontally, from surrounding spaces by a fire separation of not less than 2-hour fire-resistance rating and such room or other area is protected throughout by a sprinkler system.

**3404.3.5.2 Storage pile heights.** Containers having less than a 30-gallon (114 L) capacity which contain Class I or II liquids shall not be stacked more than 3 feet ([914.4] 914 mm) or two containers high, whichever is greater, unless stacked on fixed shelving or otherwise satisfactorily secured. Containers of Class I or II liquids having a capacity of 30 gallons (114 L) or more shall not be stored more than one container high. Containers shall be stored in an upright position.

**3404.3.5.3 Storage distance from ceilings and roofs.** Piles of containers shall not be stored closer than 3 feet (914 mm) to the nearest beam, chord, girder or other obstruction, and shall be 3 feet (914 mm) below sprinkler deflectors or discharge orifices of water spray or other overhead fire extinguishing system.

**3404.3.5.4 Combustible materials.** In areas that are inaccessible to the public, Class I, II and IIIA liquids shall not be stored in the same pile or rack section as ordinary combustible commodities unless such materials are packaged together as kits.

**FC TABLE 3404.3.4.1**
**MAXIMUM ALLOWABLE QUANTITY OF FLAMMABLE AND COMBUSTIBLE LIQUIDS IN WHOLESALE AND RETAIL SALES USES PER CONTROL AREA[a]**

| TYPE OF LIQUID | MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA (gallons) | | |
|---|---|---|---|
| | Sprinklered[b] per footnote densities and arrangements | Sprinklered per FC Tables 3404.3.6.3(4) through 3404.3.6.3(8) and FC Table 3404.3.7.5.1 and the construction codes, including the Building Code | Nonsprinklered |
| Class IA | 60 | 60 | 30 |
| Class IB, IC, II and IIIA | 7,500[c] | 15,000[c] | 1,600 |
| Class IIIB | Unlimited | Unlimited | 13,200 |

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m$^2$, 1 gallon = 3.785 L, 1 gallon per minute per square foot = 40.75 L/min/m$^2$.

a. Control areas shall be separated from each other by not less than a 1-hour fire barrier wall.
b. To be considered as sprinklered, a building shall be protected throughout by a sprinkler system with a design providing minimum densities as follows:
   1. For uncartoned commodities on shelves 6 feet or less in height where the ceiling height does not exceed 18 feet, quantities are those [permitted] allowed with a minimum sprinkler design density of Ordinary Hazard Group 2.
   2. For cartoned, palletized or racked commodities where storage is 4 feet 6 inches or less in height and where the ceiling height does not exceed 18 feet, quantities are those [permitted] allowed with a minimum sprinkler design density of 0.21 gallon per minute per square foot over the most remote 1,500-squarefoot area.
c. Where wholesale and retail sales or storage areas exceed 50,000 square feet in area, the maximum allowable quantities are allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 50,000 square feet, up to a maximum of 100 percent of the table amounts. A control area separation is not required. The cumulative amounts, including amounts attained by having an additional control area, shall not exceed 30,000 gallons.

**3404.3.6 Wholesale and retail sales.** Flammable and combustible liquids in Group M occupancy wholesale and retail sales shall be in accordance with [Sections] FC 3404.3.6.1 through 3404.3.6.5, or NFPA 30 [Sections 4.4.3.3, 4.5.6.7, 4.8.2, Tables 4.8.2(a) through (f), and Figures 4.8.2(a) through (d)].

**3404.3.6.1 Container type.** Containers for Class I liquids shall be metal.

**Exception:** In sprinklered buildings, an aggregate quantity of 120 gallons (454 L) of water-miscible Class IB and Class IC liquids is allowed in nonmetallic containers, each having a capacity of 16 ounces (0.473 L) or less.

**3404.3.6.2 Container capacity.** Containers for Class I liquids shall not exceed a capacity of 5 gallons (19 L).

**Exception:** Metal containers not exceeding 55 gallons (208 L) are [permitted] allowed to store up to 240 gallons (908 L) of the maximum allowable quantity per control area of Class IB and IC liquids in a control area. The building shall be protected throughout by a sprinkler system in accordance with FC Table 3404.3.4.1. The containers shall be provided with plastic caps without cap seals and shall be stored upright. Containers shall not be stacked or stored in racks and shall not be located in areas accessible to the public.

**3404.3.6.3 Fire protection and storage arrangements.** Fire protection and container storage arrangements shall be in accordance with FC Table 3404.3.6.3(1) or the following:

1. Storage on shelves shall not exceed 6 feet (1829 mm) in height, and shelving shall be metal.

2. Storage on pallets or in piles greater than 4 feet 6 inches (1372 mm) in height, or where the ceiling exceeds 18 feet (5486 mm) in height, shall be protected by a sprinkler system in accordance with FC Table 3404.3.6.3(4), and the storage heights and arrangements shall be limited to those specified in FC Table 3404.3.6.3(2).

3. Storage on racks greater than 4 feet 6 inches (1372 mm) in height, or where the ceiling exceeds 18 feet (5486 mm) in height shall be protected in accordance with FC Tables 3404.3.6.3(5), 3404.3.6.3(6), 3404.3.6.3(7) and 3404.3.6.3(8) and the construction codes, including the Building Code as appropriate, and the storage

heights and arrangements shall be limited to those specified in FC Table 3404.3.6.3(3).

**3404.3.6.3.1 Combustible commodities.** Combustible commodities shall not be stored above flammable and combustible liquids.

**FC TABLE 3404.3.6.3(1)**
**MAXIMUM STORAGE HEIGHT IN CONTROL [AREA] AREAS**

| TYPE OF LIQUID | NONSPRINKLERED AREA (feet) | SPRINKLERED AREA (feet) | SPRINKLERED BUILDINGS[a, b] WITH IN-RACK PROTECTION (feet) |
|---|---|---|---|
| Flammable liquids: | | | |
| Class IA | 4 | 4 | 4 |
| Class IB | 4 | 8 | 12 |
| Class IC | 4 | 8 | 12 |
| Combustible liquids: | | | |
| Class II | 6 | 8 | 12 |
| Class IIIA | 8 | 12 | 16 |
| Class IIIB | 8 | 12 | 20 |

For SI: 1 foot = 304.8 mm.

a In buildings protected throughout by a sprinkler system, the storage height for metallic containers shall not exceed the maximum height allowed by NFPA 30 based on the type of fire protection systems provided, or the maximum height as determined by the department based on a full-scale fire test, whichever is greater. These storage heights do not apply to storage of nonmetallic containers.

[a] b. In-rack protection shall be in accordance with FC Table 3404.3.6.3(5), 3404.3.6.3(6), 3404.3.6.3(7) or 3404.3.6.3(8) and the construction codes, including the Building Code.

**FC TABLE 3404.3.6.3(2)**
**STORAGE ARRANGEMENTS FOR PALLETIZED OR SOLID-PILE STORAGE IN LIQUID STORAGE ROOMS AND WAREHOUSES**

| CLASS | STORAGE LEVEL | MAXIMUM STORAGE HEIGHT | | MAXIMUM QUANTITY PER PILE (gallons) | MAXIMUM QUANTITY PER ROOM[a] (gallons) |
|---|---|---|---|---|---|
| | | Drums | Containers[b] (feet) | Containers | Containers |
| IA | Ground floor | 1 | 5 | 3,000 | 12,000 |
| | Upper floors | 1 | 5 | 2,000 | 8,000 |
| | Basements[d] e | Not Allowed | Not Allowed | Not Allowed | Not Allowed |
| IB | Ground floor | 1 | 6.5 | 5,000 | 15,000 |
| | Upper floors | 1 | 6.5 | 3,000 | 12,000 |
| | Basements[d] e | Not Allowed | Not Allowed | Not Allowed | Not Allowed |
| IC | Ground floor[d] | 1 | 6.5[c] | 5,000 | 15,000 |
| | Upper floors | 1 | 6.5[c] | 3,000 | 12,000 |
| | Basements[d] e | Not Allowed | Not Allowed | Not Allowed | Not Allowed |
| II | Ground floor[d] | 3 | 10 | 10,000 | 25,000 |
| | Upper floors | 3 | 10 | 10,000 | 25,000 |
| | Basements[d] e | 1 | 5 | 7,500 | 7,500 |
| III | Ground floor | 5 | 20 | 15,000 | 50,000 |
| | Upper floors | 5 | 20 | 15,000 | 50,000 |
| | Basements[d] e | 3 | 10 | 10,000 | 25,000 |

For SI: 1 foot = 304.8 mm, 1 gallon = 3.785 L.

a. See [Section 3404.3.8.1] FC3404.3.8.1 for unlimited quantities in liquid storage warehouses.

b. [Storage heights are allowed to be increased for Class IB, IC, II and III liquids in metal containers having a capacity of 5 gallons or less where an automatic AFFF-water protection system has been approved by the commissioner and the commissioner of buildings.] In buildings protected throughout by a sprinkler system, the storage height for metallic containers shall not exceed the maximum height allowed by NFPA 30 based on the type of fire protection systems provided, or the maximum height as determined by the department based on a full-scale fire test, whichever is greater. These storage heights do not apply to storage of nonmetallic containers.

c. These height limitations are allowed to be increased to 10 feet for containers having a capacity of 5 gallons or less.

d. For palletized storage of unsaturated polyester resins (UPR) in relieving-style metal containers with 50 percent or less by weight Class IC or II liquid and no Class IA or IB liquid, height and pile quantity limits shall be allowed to be 10 feet and 15,000 gallons, respectively, provided that such storage is protected by sprinklers in accordance with NFPA 30 and that the UPR storage area is not located in the same containment area or drainage path for other Class I or II liquids.

[d] e. Basements include cellars and other areas below grade.

**FC TABLE 3404.3.6.3(3)**
**STORAGE ARRANGEMENTS FOR RACK STORAGE IN LIQUID STORAGE ROOMS AND WAREHOUSES**

| CLASS | TYPE RACK | STORAGE LEVEL | MAXIMUM STORAGE HEIGHT (feet)[b] | MAXIMUM QUANTITY PER ROOM[a] (gallons) |
|---|---|---|---|---|
| | | | Containers | Containers |
| IA | Double row or Single row | Ground floor | 25 | 7,500 |
| | | Upper floors | 15 | 4,500 |
| | | Basements | Not Allowed | Not Allowed |
| IB<br>IC | Double row or Single row | Ground floor | 25 | 15,000 |
| | | Upper floors | 15 | 9,000 |
| | | Basements | Not Allowed | Not Allowed |
| II | Double row or Single row | Ground floor | 25 | 24,000 |
| | | Upper floors | 25 | 24,000 |
| | | Basements | 15 | 9,000 |
| III | Multirow<br>Double room<br>Single row | Ground floor | 40 | 48,000 |
| | | Upper floors | 20 | 48,000 |
| | | Basements | 20 | 24,000 |

For SI: 1 foot = 304.8 mm, 1 gallon = 3.785 L.

a. See FC3404.3.8.1 for unlimited quantities in liquid storage warehouses.

b. In buildings protected throughout by a sprinkler system, the storage height for metallic containers shall not exceed the maximum height allowed by NFPA 30 based on the type of fire protection systems provided, or the maximum height as determined by the department based on a full-scale fire test, whichever is greater. These storage heights do not apply to storage of nonmetallic containers.

**FC TABLE 3404.3.6.3(4)**
**SPRINKLER SYSTEM PROTECTION FOR SOLID-PILE AND PALLETIZED STORAGE OF LIQUIDS IN METAL CONTAINERS AND PORTABLE TANKS[a]**

| STORAGE CONDITIONS | | CEILING SPRINKLER DESIGN AND DEMAND | | | | MINIMUM HOSE STREAM DEMAND (gpm) | MINIMUM DURATION SPRINKLERS AND HOSE STREAMS (hours) |
|---|---|---|---|---|---|---|---|
| | | | Area (square feet) | | | | |
| Class Liquid | Container size and arrangement | Density (gpm/ft$^2$) | High-temperature sprinklers | Ordinary temperature sprinklers | Maximum spacing (square feet) | | |
| IA | 5 gallons or less, with or without cartons, palletized or solid pile[b] | 0.30 | 3,000 | 5,000 | 100 | 750 | 2 |
| | Containers greater than 5 gallons, on end or side, palletized or solid pile | 0.60 | 5,000 | 8,000 | 80 | 750 | |
| IB, IC and II | 5 gallons or less, with or without cartons, palletized or solid pile[b] | 0.30 | 3,000 | 5,000 | 100 | 500 | 2 |
| | Containers greater than 5 gallons on pallets or solid pile, one high | 0.25 | 5,000 | 8,000 | 100 | | |
| II | Containers greater than 5 gallons on pallets or solid pile, more than one high, on end or side | 0.60 | 5,000 | 8,000 | 80 | 750 | 2 |
| III | 5 gallons or less, with or without cartons, palletized or solid pile | 0.25 | 3,000 | 5,000 | 120 | 500 | 1 |
| | Containers greater than 5 gallons on pallets or solid pile, on end or sides, up to three high | 0.25 | 3,000 | 5,000 | 120 | 500 | 1 |
| III | Containers greater than 5 gallons, on pallets or solid pile, on end or sides, up to 18 feet high | 0.35 | 3,000 | 5,000 | 100 | 750 | 2 |

For SI: 1 foot = 304.8 mm, 1 gallon = 3.785 L, 1 square foot = 0.0929 m$^2$, 1 gallon per minute = 3.785 L/m, 1 gallon per minute per square foot = 40.75 L/min/m$^2$.
a. The design area contemplates the use of Class II standpipe systems. Where Class I standpipe systems are used, the area of application shall be increased by 30 percent without revising density.
b. For storage heights above 4 feet or ceiling heights greater than 18 feet, an approved engineering design shall be provided in accordance with [Section 104.7.2] FC104.7.2.

**FC TABLE 3404.3.6.3(5)**
**SPRINKLER SYSTEM PROTECTION REQUIREMENTS FOR RACK STORAGE OF LIQUIDS IN METAL CONTAINERS OF 5-GALLON CAPACITY OR LESS WITH OR WITHOUT CARTONS ON CONVENTIONAL WOOD PALLETS[a]**

| | CEILING SPRINKLER DESIGN AND DEMAND | | | IN-RACK SPRINKLER ARRANGEMENT AND DEMAND | | | | | MINIMUM HOSE STREAM DEMAND (gpm) | MINIMUM DURATION SPRINKLER AND HOSE STREAM (hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Area (square feet) | | | | | 30 psi (standard orifice) | | | |
| CLASS LIQUID | Density (gpm/ft$^2$) | High- temperature sprinklers | Ordinary Temperature Sprinklers | Maximum Spacing | Racks up to 9 feet deep | Racks more than 9 feet to 12 feet deep | 14 psi (large orifice) | Number of sprinklers operating | | |
| I (maximum 25-foot height) | 0.40 | 3,000 | 5,000 | 80 ft$^2$/head | 1. Ordinary temperature, quick-response sprinklers, maximum 8 feet 3 inches | 1. Ordinary temperature, quick-response sprinklers, maximum 8 feet 3 inches | 30 psi (0.5-inch orifice) | 1. Eight sprinklers if only one level<br>2. Six sprinklers each on two | 750 | 2 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Option 1 | | | | | horizontal spacing<br>2. One line sprinklers above each level of storage<br>3. Locate in longitudinal flue space, staggered vertical<br>4. Shields required where multilevel | horizontal spacing<br>2. One line sprinklers above each level of storage<br>3. Locate in transverse flue spaces, staggered vertical and within 20 inches of aisle<br>4. Shields required where multilevel | | levels if only two levels<br>3. Six sprinklers each on top three levels, if three or more levels<br>4. Hydraulically most remote | | |
| I (maximum 25-foot height) Option 2 | 0.55 | 2,000[b] | Not Applicable | 100 $ft^2$/head | 1. Ordinary temperature, quick-response sprinklers, maximum 8 feet 3 inches horizontal spacing<br>2. See 2 above<br>3. See 3 above<br>4. See 4 above | 1. Ordinary temperature, quick-response sprinklers, maximum 8 feet 3 inches horizontal spacing<br>2. See 2 above<br>3. See 3 above<br>4. See 4 above | 14 psi (0.53-inch orifice) | See 1 through 4 above | 500 | 2 |
| I and II (maximum 14-foot storage height) (maximum three tiers) | 0.55[c] | 2,000[b, d] | Not Applicable | 100 $ft^2$/head | Not Applicable None for maximum 6-foot-deep racks | Not Applicable | Not Applicable | Not Applicable | 500 | 2 |
| II (maximum 25-foot height) | 0.30 | 3,000 | 5,000 | 100 $ft^2$/head | 1. Ordinary temperature sprinklers 8 feet apart horizontally<br>2. One line sprinklers between levels at nearest 10-foot vertical intervals<br>3. Locate in longitudinal flue space, staggered vertical<br>4. Shields required where multilevel | 1. Ordinary temperature sprinklers 8 feet apart horizontally<br>2. Two lines between levels at nearest 10-foot vertical intervals<br>3. Locate in transverse flue spaces, staggered vertical and within 20 inches of aisle<br>4. Shields required where multilevel | 30 psi | Hydraulically most remote—six sprinklers at each level, up to a maximum of three levels | 750 | 2 |
| III (40-foot height) | 0.25 | 3,000 | 5,000 | 120 $ft^2$/head | Same as for Class II liquids | Same as for Class II liquids | 30 psi | Same as for Class II liquids | 500 | 2 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 $m^2$, 1 pound per square inch = 6.895 kPa, 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m, 1 gallon per minute per square foot = 40.75 L/min/$m^2$.

a. The design area contemplates the use of Class II standpipe systems. Where Class I standpipe systems are used, the area of application shall be increased by 30 percent without revising density.

b. When the installation uses listed or approved extra-large orifices, high-temperature quick-response or standard element sprinklers, such spaces may be provided with a maximum 30-foot ceiling height provided minimum 7.5-foot aisles are maintained.

c. For friction lid cans and other metal containers equipped with plastic nozzles or caps, the density shall be increased to 0.65 gpm per square foot using listed or approved extra-large orifice, high-temperature quick-response sprinklers.

d. When the installation uses listed or approved extra-large orifice, high-temperature quick-response or standard element sprinklers, such spaces may be provided with a maximum 18-foot ceiling height provided minimum 7.5-foot aisles are maintained and only metal containers are stored.

**FC TABLE 3404.3.6.3(6)**
**SPRINKLER SYSTEM PROTECTION REQUIREMENTS FOR RACK STORAGE OF LIQUIDS IN METAL CONTAINERS GREATER THAN 5-GALLON CAPACITY[a]**

| CLASS LIQUID | CEILING SPRINKLER DESIGN AND DEMAND | | | IN-RACK SPRINKLER ARRANGEMENT AND DEMAND | | | | | MINIMUM HOSE STREAM DEMAND (gpm) | MINIMUM DURATION SPRINKLER AND HOSE STREAM (hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Density (gpm/ $ft^2$) | Area (square feet) | | Maximum spacing | On-side storage racks up to 9-foot-deep racks | On-end storage (on pallets) up to 9-foot-deep racks | Minimum nozzle Pressure | Number of sprinklers operating | | |
| | | High-temperature sprinklers | Ordinary Temperature Sprinklers | | | | | | | |
| IA (maximum 25-foot height) | 0.60 | 3,000 | 5,000 | 80 $ft^2$/head | 1. Ordinary temperature sprinklers 8 feet | 1. Ordinary temperature sprinklers 8 feet | 30 psi | Hydraulically most remote—six sprinklers at each | 1,000 | 2 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | apart horizontally<br>2. One line sprinklers above each tier of storage<br>3. Locate in longitudinal flue space, staggered vertical<br>4. Shields required where multilevel | apart horizontally<br>2. One line sprinklers above each tier of storage<br>3. Locate in longitudinal flue space, staggered vertical<br>4. Shields required where multilevel | | level | | |
| IB, IC and II (maximum 25-foot height) | 0.60 | 3,000 | 5,000 | 100 $ft^2$/head | 1. See 1 above<br>2. One line sprinklers every three tiers of storage<br>3. See 3 above<br>4. See 4 above | 1. See 1 above<br>2. See 2 above<br>3. See 3 above<br>4. See 4 above | 30 psi | Hydraulically most remote—six sprinklers at each level | 750 | 2 |
| III (maximum 40-foot height) | 0.25 | 3,000 | 5,000 | 120 $ft^2$/head | 1. See 1 above<br>2. One line sprinklers every sixth level (maximum)<br>3. See 3 above<br>4. See 4 above | 1. See 1 above<br>2. One line sprinklers every third level (maximum)<br>3. See 3 above<br>4. See 4 above | 15 psi | Hydraulically most remote—six sprinklers at each level | 500 | 1 |

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 $m^2$, 1 pound per square inch = 6.895 kPa, 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m, 1 gallon per minute per square foot = 40.75 L/min/$m^2$.

a. The design assumes the use of Class II standpipe systems. Where a Class I standpipe system is used, the area of application shall be increased by 30 percent without revising density.

**FC TABLE 3404.3.6.3(7)**
**AUTOMATIC AFFF WATER PROTECTION REQUIREMENTS FOR RACK STORAGE OF LIQUIDS IN METAL CONTAINERS GREATER THAN 5-GALLON CAPACITY[a,b]**

| CLASS LIQUID | CEILING SPRINKLER DESIGN AND DEMAND | | | IN-RACK SPRINKLER ARRANGEMENT AND DEMAND[c] | | | | DURATION AFFF SUPPLY (minimum) | DURATION WATER SUPPLY (hours) |
|---|---|---|---|---|---|---|---|---|---|
| | Density (gpm/$ft^2$) | Area (square feet) | | On-end storage of drums on pallets, up to 25 feet | Minimum nozzle pressure (psi) | Number of Sprinklers Operating | Hose stream demand[d] (gpm | | |
| | | High-temperature Sprinklers | Ordinary temperature sprinklers | | | | | | |
| IA, IB, IC and II | 0.30 | 1,500 | 2,500 | 1. Ordinary temperature sprinkler up to 10 feet apart horizontally<br>2. One line sprinklers above each level of storage<br>3. Locate in longitudinal flue space, staggered vertically | 30 | Three sprinklers per level | 500 | 15 | 2 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 4. Shields required for multilevel | | | | | |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 $m^2$, 1 pound per square inch = 6.895 kPa, 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m, 1 gallon per minute per square foot = 40.75 L/min/$m^2$.
a. System shall be a closed-head wet system with approved devices for proportioning aqueous film-forming foam.
b. Except as modified by this table, in-rack sprinklers shall be installed in accordance with NFPA [231C] 13, as modified by FC Appendix B.
c. Storage heights shall not exceed 25 feet.
d. Hose stream demand includes [1.5]1½-inch inside hand hose, when required.

**FC TABLE 3404.3.6.3(8)**
**SPRINKLER SYSTEM PROTECTION REQUIREMENTS FOR CLASS I LIQUID STORAGE IN METAL CONTAINERS OF 1-GALLON CAPACITY OR LESS WITH UNCARTONED OR CASE-CUT SHELF DISPLAY UP TO 6.5 FEET, AND PALLETIZED STORAGE ABOVE IN A DOUBLE-ROW RACK ARRAY[a]**

| STORAGE HEIGHT | CEILING SPRINKLER DESIGN AND DEMAND | | | | IN-RACK SPRINKLER ARRANGEMENT AND DEMAND | | | | MINIMUM HOSE STREAM DEMAND (gpm) | MINIMUM DURATION SPRINKLERS AND HOSE STREAM (hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Density (gpm/$ft^2$) | Area (square feet) | | Maximum spacing | Racks up to 9 feet deep | Racks 9 to 12 feet | Minimum nozzle pressure | Number of sprinklers operating | | |
| | | High temperature | Ordinary Temperature | | | | | | | |
| Maximum 20-foot storage height | 0.60 | 2,000[b] | Not Applicable | 100 $ft^2$/head | 1. Ordinary temperature, quick-response sprinklers, maximum 8 feet 3 inches horizontal spacing<br>2. One line of sprinklers at the 6-foot level and the 11.5-foot level of storage<br>3. Locate in longitudinal flue space, staggered vertical<br>4. Shields required where multilevel | Not Applicable | 30 psi (standard orifice) or 14 psi (large orifice) | 1. Six sprinklers each on two levels<br>2. Hydraulically most remote 12 sprinklers | 500 | 2 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 $m^2$, 1 pound per square inch = 6.895 kPa, 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m, 1 gallon per minute per square foot = 40.75 L/min/$m^2$.
a. This table shall not apply to racks with solid shelves.
b. When the installation uses extra-large orifice sprinklers, such spaces may be provided with a maximum 30-foot ceiling height provided minimum 7.5-foot aisles are maintained.

**3404.3.6.4 Container warning labels.** All containers of flammable liquids offered for sale shall bear a warning label in accordance with federal laws, rules and regulations, painted or printed on the container, [indicating] cautioning that the liquid is flammable[,] and [shall] must be kept away from heat and [an] open [flame] flames.

**3404.3.6.5 Storage plan.** The commissioner may require that aisle and storage plans be submitted to the department in accordance with FC Chapter 27.

**3404.3.7 Liquid storage rooms.** Liquid storage rooms shall comply with the requirements of [Sections] FC 3404.3.7.1 through 3404.3.7.5.2.

**3404.3.7.1 General.** Quantities of liquids exceeding those set forth in [Section 3404.3.4.1] FC3404.3.4.1 for storage in control areas shall be stored in a liquid storage room complying with the requirements of this section and constructed and separated as required by the construction codes, including the Building Code.

**3404.3.7.2 Quantities and arrangement of storage.** The quantity limits and storage arrangements in liquid storage rooms shall be in accordance with FC Tables 3404.3.6.3(2) and 3404.3.6.3(3) and [Sections] FC 3404.3.7.2.1 through 3404.3.7.2.3.

**3404.3.7.2.1 Mixed storage.** Where two or more classes of liquids are stored in a pile or rack section:

1. The quantity in that pile or rack shall not exceed the smallest of the maximum quantities for the classes of liquids stored in accordance with FC Table 3404.3.6.3(2) or 3404.3.6.3(3); and

2. The height of storage in that pile or rack shall not exceed the smallest of the maximum heights for the classes of liquids stored in accordance with FC Table 3404.3.6.3(2) or 3404.3.6.3(3).

**3404.3.7.2.2 Separation and aisles.** Piles shall be separated from each other by at least 4-foot (1219 mm) aisles. Aisles shall be provided so that all containers are 20 feet (6096 mm) or less from an aisle. Where the storage of liquids is on racks, a minimum 4-foot-wide (1219 mm) aisle shall be provided between adjacent rows of racks and adjacent storage of liquids. Main aisles shall be a minimum of 8 feet (2438 mm) wide. Additional aisles shall be provided for access to doors, required windows and ventilation openings, standpipe connections, mechanical equipment and switches. Such aisles shall be at least 3 feet (914 mm) in width, unless greater widths are required for separation of piles or racks, in which case the greater width shall be provided.

**3404.3.7.2.3 Stabilizing and supports.** Containers and piles shall be separated by pallets or dunnage to provide stability and to prevent excessive stress to container walls. Adequate material-handling equipment shall be readily available and used to handle containers safely at upper tier levels.

**3404.3.7.3 Spill control and secondary containment.** Liquid storage rooms shall be provided with spill control and secondary containment in accordance with [Section 2704.2] FC2704.2.

**3404.3.7.4 Ventilation.** Liquid storage rooms shall be ventilated in accordance with [Section 2704.3] FC2704.3.

**3404.3.7.5 Fire protection.** Fire protection for liquid storage rooms shall comply with the requirements of [Sections] FC 3404.3.7.5.1 and 3404.3.7.5.2.

**3404.3.7.5.1 Fire extinguishing systems.** Liquid storage rooms shall be protected throughout by sprinkler systems installed in accordance with FC Chapter 9, FC Tables 3404.3.6.3(4) through 3404.3.6.3(8) and FC Table 3404.3.7.5.1 and the construction codes, including the Building Code. In-rack sprinklers shall additionally comply with the requirements of NFPA 13, as modified by FC Appendix B, and the construction codes, including the Building Code. Foam fire extinguishing systems and aqueous film-forming foam (AFFF) fire extinguishing systems shall not be used except when approved by the commissioner and the Commissioner of Buildings. Protection criteria developed from fire modeling or full-scale fire testing conducted at an approved testing laboratory are allowed in lieu of the protection as required in FC Tables 3404.3.6.3(2) through 3404.3.6.3(8) and FC Table 3404.3.7.5.1 and the construction codes, including the Building Code when approved by the commissioner and the Commissioner of Buildings.

**FC TABLE 3404.3.7.5.1**
**AUTOMATIC AFFF-WATER PROTECTION REQUIREMENTS FOR SOLID-PILE AND PALLETIZED STORAGE OF LIQUIDS IN METAL CONTAINERS OF 5-GALLON CAPACITY OR LESS[a,b]**

| PACKAGE TYPE | CLASS LIQUID | CEILING SPRINKLER DESIGN AND DEMAND | | | | | STORAGE HEIGHT (feet) | HOSE DEMAND (gpm)[c] | DURATION AFFF SUPPLY (minimum) | DURATION WATER SUPPLY (hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Density (gpm/ft$^2$) | Area (square feet) | Temperature rating | Maximum spacing | Orifice size (inch) | | | | |
| Cartoned | IB, IC, II and III | 0.40 | 2,000 | 286°F | 100 ft$^2$/head | 0.531 | 11 | 500 | 15 | 2 |
| Uncartoned | IB, IC, II and III | 0.30 | 2,000 | 286°F | 100 ft$^2$/head | 0.5 or 0.531 | 12 | 500 | 15 | 2 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 m$^2$, 1 gallon per minute = 3.785 L/m, 1 gallon per minute per square foot = 40.75 L/min/m$^2$, °C. = [[](°F[)]-32)[]]/1.8.
a. System shall be a closed-head wet system with approved devices for proportioning aqueous film-forming foam.
b. Ceiling heights shall not exceed 30 feet.
c. Hose stream demand includes [1.5]1½-inch inside hand hose, when required.

**3404.3.7.5.2 Portable fire extinguishers.** A minimum of one portable fire extinguisher complying with the requirements of [Section 906] FC906 and having a rating of not less than 20-B shall be located not less than 10 feet (3048 mm) or more than 50 feet ([15 240mm] 15 240 mm) from any Class I or II liquid storage area located outside of a liquid storage room. A minimum of one portable fire extinguisher having a rating of not less than 20-B shall be located outside of, but not more than 10 feet (3048 mm) from, the door opening into a liquid storage room.

**3404.3.8 Liquid warehouses.** Buildings used for storage of flammable or combustible liquids in quantities exceeding those set forth in [Section 3404.3.4] FC3404.3.4 for control areas and [Section 3404.3.7] FC3404.3.7 for liquid storage rooms shall comply with the requirements of [Sections] FC 3404.3.8.1 through 3404.3.8.5 and shall be constructed and separated as required by the construction codes, including the Building Code.

**3404.3.8.1 Quantities and storage arrangement.** Except as may be limited by the commissioner at a particular premises in the interest of public safety, any amount of flammable and combustible liquids may be stored in a liquid warehouse as defined in NFPA 30. The arrangement of such storage shall be in accordance with FC Table 3404.3.6.3(2) or 3404.3.6.3(3).

**3404.3.8.1.1 Mixed storage.** Mixed storage shall be in accordance with [Section 3404.3.7.2.1] FC3404.3.7.2.1.

**3404.3.8.1.2 Separation and aisles.** Separation and aisles shall be in accordance with [Section 3404.3.7.2.2] FC3404.3.7.2.2.

**3404.3.8.2 Spill control and secondary containment.** Liquid warehouses shall be provided with spill control and secondary containment as set forth in [Section 2704.2] FC2704.2.

**3404.3.8.3 Ventilation.** Liquid warehouses storing containers greater than 5 gallons (19 L) in capacity shall be ventilated in accordance with the Mechanical Code.

**3404.3.8.4 Fire extinguishing systems.** Liquid warehouses shall be protected throughout by sprinkler systems installed in accordance with FC Chapter 9 and FC Tables 3404.3.6.3(4) through 3404.3.6.3(8) and FC Table 3404.3.7.5.1, or [Section 4.8.2 and Tables 4.8.2(a) through (f) of] NFPA 30. In-rack sprinklers shall additionally comply with the requirements of NFPA 13, as modified by FC Appendix B, and the construction codes, including the Building Code. Foam fire extinguishing systems and automatic aqueous film-forming foam fire extinguishing systems shall not be used except when approved. Protection criteria developed from fire modeling or full-scale fire testing conducted at an approved testing laboratory are allowed in lieu of the protection as required in FC Tables 3404.3.6.3(2) through 3404.3.6.3(8) and FC Table 3404.3.7.5.1 and the construction codes, including the Building Code, when approved by the commissioner and the Commissioner of Buildings.

**3404.3.8.5 Warehouse hose lines.** In liquid warehouses, either [1.5-inch (38 mm)] 1½-inch (8-mm) lined or 1-inch ([25 mm] 25-mm) hard rubber hand hose lines shall be provided in sufficient number to reach all liquid storage areas and shall be in accordance with [Section 905] FC905 and the construction codes, including the Building Code.

**3404.4 Outdoor storage of containers.** [Storage] Outdoor storage areas for portable containers of flammable and combustible liquids [in closed containers outdoors] shall be [in accordance with Section 3403] designed, installed, operated and maintained in compliance with the

requirements of FC3403, and [Sections] 3404.4.1 through 3404.4.8. [Capacity limits for containers shall be in accordance with Section 3404.3.]

**3404.4.1 [Plans] Design and construction.** [Storage shall be in accordance with approved plans.] Outdoor portable container storage areas shall be designed and constructed in accordance with approved design and installation documents.

**3404.4.2 Location on property.** Outdoor [storage of liquids in containers] portable container storage areas shall be designed, installed, operated and maintained in accordance with FC Table 3404.4.2 and in compliance with the requirements of FC3404.4.2.1 through 3404.4.2.4. [Storage of liquids near buildings located on the same property shall be in accordance with this section.]

**3404.4.2.1 Mixed liquid piles.** Where two or more classes of liquids are stored in a single pile, the quantity in the pile shall not exceed the smallest of maximum quantities for the classes of material stored.

**3404.4.2.2 Fire apparatus access.** [Storage of containers] Outdoor portable container storage areas shall be provided with fire apparatus access [roads] in accordance with [Chapter 5 and the construction codes, including the Building Code] FC319.7.1.

**3404.4.2.3** Reserved.

**3404.4.2.4 Storage adjacent to buildings.** A maximum amount of 1,100 gallons (4163 L) of flammable and combustible liquids stored in [closed] portable containers [is allowed] may be stored adjacent to a building located on the same premises and under the same [owner] ownership, provided that:

1. The building does not exceed one story in height. Such building shall be of fire-resistance-rated construction with noncombustible exterior surfaces or noncombustible construction and shall be used principally for the storage of liquids; or

2. The exterior building wall adjacent to the storage area shall have a fire-resistance rating of not less than 2 hours, having no openings to [abovegrade] above grade areas within 10 feet (3048 mm) horizontally of such storage and no openings to [belowgrade] below grade areas within 50 feet (15 240 mm) horizontally of such storage.

**3404.4.2.4.1 Separation.** The quantity of liquids stored adjacent to a building protected in accordance with [Section 3404.4.2.4(2)] FC3404.4.2.4(2) may exceed 1,100 gallons (4163 L), provided that the maximum quantity per pile does not exceed 1,100 gallons (4163 L) and each pile is separated by a 10-foot-minimum (3048 mm) clear space along the common wall. Where the quantity stored exceeds 1,100 gallons (4163 L) adjacent to a building complying with [Section 3404.4.2.4(1)] FC3404.4.2.4(1), or the provisions of [Section 3404.4.2.4(1)] FC3404.4.2.4(1) cannot

be met, a minimum distance in accordance with the column for distance to a lot line in FC Table 3404.4.2 shall be maintained between buildings and the nearest container.

**FC TABLE 3404.4.2**
**OUTDOOR LIQUID STORAGE IN CONTAINERS**

| CLASS OF LIQUID | CONTAINER STORAGE—MAXIMUM PER PILE | | MINIMUM DISTANCE BETWEEN PILES OR RACKS (feet) | MINIMUM DISTANCE TO LOT LINE[d] (feet) | MINIMUM DISTANCE TO PUBLIC STREET OR PRIVATE ROAD[d] (feet) |
|---|---|---|---|---|---|
| | Quantity[a, b] (gallons) | Height (feet) | | | |
| IA | 1,100 | 10 | 5 | 50 | 10 |
| IB | 2,200 | 12 | 5 | 50 | 10 |
| IC | 4,400 | 12 | 5 | 50 | 10 |
| II | 8,800 | 12 | 5 | 25 | 5 |
| III | 22,000 | 18 | 5 | 10 | 5 |

For SI: 1 foot = 304.8 mm, 1 gallon 3.785 L.
a. For mixed class storage, see [Section 3404.4.2] FC3404.4.2.
b. For storage in racks, the quantity limits per pile do not apply, but the rack arrangement shall be limited to a maximum of 50 feet in length and two rows or 9 feet in depth.
c. Reserved.
d. When the total quantity stored does not exceed 50 percent of the maximum allowed per pile, the distances are allowed to be reduced 50 percent, but not less than 3 feet.

**3404.4.3 Spill control and secondary containment.** [Storage] Outdoor portable container storage areas shall be provided with spill control and secondary containment in accordance with [Section 3403.4] FC3403.4.

**Exception:** Containers stored on approved containment pallets in accordance with [Section 2704.2.3] FC2704.2.3 and containers stored in cabinets and lockers with integral spill containment.

**3404.4.4 Security.** [Storage] Outdoor portable container storage areas shall be protected against tampering or trespassers by fencing or other approved control measures.

**3404.4.5 Protection from vehicles.** Posts or other means shall be provided to protect outdoor portable container storage [tanks] areas from vehicular damage. When posts are installed, the posts shall be installed in accordance with [Section 312] FC312.

**3404.4.6 Clearance from combustibles.** [The storage location] Outdoor portable container storage areas shall be kept free from vegetation and other combustible waste as set forth in [Sections 3404.6.1 and 3404.6.2] FC 3404.4.6.1 and 3404.4.6.2.

**3404.4.6.1 Vegetation.** Brush, grass, vines, weeds and other vegetation capable of being ignited that is located within 15 feet (4572 mm) of [a flammable or combustible liquid storage location] an outdoor portable container storage area shall be regularly mowed or pruned and the clippings removed from the premises.

**3404.4.6.2 Combustible waste.** Rubbish and other combustible waste shall not be allowed to accumulate within 15 feet (4572 mm) of [a flammable or combustible liquid storage location] an outdoor portable container storage area.

**3404.4.7 Weather protection.** Weather protection for outdoor [storage] portable container storage areas shall be in accordance with [Section 2704.13] FC2704.13.

**3404.4.8 Empty containers storage.** The storage of empty containers previously used for the storage of flammable or combustible liquids shall be stored as required for filled containers. Containers when emptied shall have the covers or plugs immediately replaced in openings.

## SECTION FC 3405
## HANDLING AND USE

**3405.1 Scope.** The handling and use of flammable and combustible liquids, including the dispensing and mixing of such liquids, shall be conducted in accordance with this chapter. Cargo tank and tank car loading and unloading and other special operations shall be conducted in accordance with [Section 3406] FC3406.

**Exception:** Containers of organic coatings having no fire point and which are opened for pigmentation are not required to comply with the requirements of this section.

**3405.2 Liquid transfer.** Liquid transfer equipment and methods for transfer of Class I, II and IIIA liquids shall be subject to the approval of the commissioner and [be in accordance with Sections] conducted in compliance with the requirements of FC 3405.2.1 through [3405.2.6] 3405.2.7.

**3405.2.1 Pumps.** Positive-displacement pumps shall be provided with pressure relief discharging back to the tank, pump suction or other approved location, or shall be provided with interlocks to prevent over-pressure.

**3405.2.2 Pressured systems.** Gases shall not be used to pressurize containers or tanks to provide for transfer.

**3405.2.3 Piping, hoses and valves.** Piping, hoses and valves used in liquid transfer operations shall be subject to the approval of the commissioner or listed for the intended use.

**3405.2.4 Class I, II and III liquids.** Class I and II liquids or Class III liquids in containers exceeding 5.3 gallons (20 L) capacity that are at a temperature higher than 20°F (11°C) less than their flash points shall not be dispensed by gravity, but shall be transferred by one of the following methods:

1. From safety cans complying with the requirements of UL 30.

2. Through an approved closed piping system.

3. From containers or tanks by an approved pump taking suction through an opening in the top of the container or tank.

4. Approved engineered liquid transfer systems.

**3405.2.5 Manual container filling operations for Class I liquids.** Class I liquids and Class II or III liquids at a temperature higher than 20°F (11°C) less than their flash points shall not be transferred into containers unless the nozzle and containers are electrically interconnected. Acceptable methods of electrical interconnection include:

1. Metallic floor plates on which containers stand while filling, when such floor plates are electrically connected to the fill stem; or

2. Where the fill stem is bonded to the container during filling by means of a bond wire.

**3405.2.6 Automatic container-filling operations for [Class I] flammable liquids.** Container-filling operations for [Class I] flammable liquids involving conveyor belts or other automatic-feeding operations shall be designed to prevent static accumulations.

**3405.2.7 Portable container dispensing**. When a portable container is used to dispense gasoline or other flammable or combustible liquids into portable fueled equipment or stationary fuel-burning equipment by means of pouring or other gravity dispensing, the individual capacity of the portable container shall not exceed 2½ gallons (9.5L), except as authorized by this code at construction sites.

**3405.3 Indoor use.** Indoor use of flammable and combustible liquids, including the dispensing and mixing of such liquids, shall be in accordance with [Sections 3405.2] FC3405.2, and FC 3405.3.1 through 3405.3.5.3.

**3405.3.1 Closure of mixing or blending vessels.** Vessels used for mixing or blending of [Class I] flammable liquids and [Class II or III] combustible liquids at a temperature higher than 20°F (11°C) less than their flash points shall be provided with self-closing, tight-fitting, noncombustible lids that will control a fire within such vessel.

**Exception:** Where such devices are determined by the commissioner to be impractical, a fire extinguishing system shall be provided.

**3405.3.2 Bonding of vessels.** Where differences of potential could be created, vessels containing [Class I] flammable liquids, or [Class II or III] combustible liquids at a temperature higher than 20°F (11°C) less than their flash points shall be electrically connected by bond wires, ground cables, piping or similar means to a static grounding system to maintain equipment at the same electrical potential to prevent sparking.

**3405.3.3 Heating, lighting and cooking devices, equipment and systems.** Heating, lighting and cooking devices, equipment and systems which utilize [Class I] flammable liquids shall not be operated indoors, and shall comply with the requirements of FC Chapters 3 and 14, as applicable.

**3405.3.4 Location of processing vessels.** Processing vessels shall be located with respect to distances to lot lines, in accordance with FC Tables 3405.3.4(1) and 3405.3.4(2). Processing vessels for flammable liquids shall be limited to not more than 550 gallons (2082 L). Processing vessels for Class II and IIIA combustible liquids shall be limited to not more than 1,100 gallons (4164 L). Processing vessels for Class IIIB combustible liquids shall be limited to not more than 20,000 gallons (75 700 L).

**Exception:** Where the exterior wall facing the adjoining lot line is a blank wall having a fire-resistance rating of not less than 4 hours, the commissioner may modify the distances. The distance shall not be less than that set forth in the construction codes, including the Building Code, and when Class IA or unstable liquids are involved, explosion control shall be provided in accordance with [Section 911] FC911.

**FC TABLE 3405.3.4(1)**
**SEPARATION OF PROCESSING VESSELS FROM LOT LINES**

| PROCESSING VESSELS WITH EMERGENCY RELIEF VENTING | LOCATION | |
|---|---|---|
| | Stable liquids | Unstable liquids |
| Not in excess of 2.5 psig | FC Table 3405.3.4(2) | [2.5] two and one-half times FC Table 3405.3.4(2) |
| Over 2.5 psig | [1.5] one and one-half times FC Table 3405.3.4(2) | [4] four times FC Table 3405.3.4(2) |

For SI: 1 pound per square inch gauge = 6.895 kPa.

**FC TABLE 3405.3.4(2)**
**REFERENCE TABLE FOR USE WITH FC TABLE 3405.3.4(1)**

| TANK CAPACITY (gallons) | MINIMUM DISTANCE FROM LOT LINE (feet) | MINIMUM DISTANCE FROM A BUILDING, PUBLIC STREET OR PRIVATE ROAD (feet) |
|---|---|---|
| 275 or less | 5 | 5 |
| Over 275 to 750 | 10 | 5 |
| Over 750 to 12,000 | 15 | 5 |
| Over 12,000 to 20,000 | 20 | 5 |

For SI: 1 foot = 304.8 mm, 1 gallon = 3.785 L.

**3405.3.5 Quantity limits for use.** Liquid use quantity limitations shall comply with the requirements of [Sections] FC 3405.3.5.1 through 3405.3.5.3.

**3405.3.5.1 Maximum allowable quantity per control area.** Indoor use of flammable and combustible liquids, including the dispensing and mixing of such liquids, shall not exceed the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1) and shall not exceed the additional limitations set forth in [Section 3405.3.5] FC3405.3.5.

**[Exception] Exceptions:**

1. Cleaning with Class I, II and IIIA liquids shall be in accordance with [Section 3405.3.6] FC3405.3.6.

2. Use of hazardous production material flammable and combustible liquids in Group H-5 occupancies shall be in accordance with FC Chapter 18.

**3405.3.5.2 Limitations on handling and use.** The quantity of flammable or combustible liquid handled and used, including the quantity dispensed and mixed, shall be limited by occupancy as follows:

1. **Group A, B, E, F, I and S occupancies**. Flammable and combustible liquids shall be handled and used only for lawful uses incidental to the occupancy, including maintenance and operation of equipment, and in quantities not to exceed those which are necessary for such use.

2. **Group M occupancies.** Flammable and combustible liquids shall be handled and used only for lawful uses incidental to the occupancy, including maintenance and operation of equipment, and in quantities not to exceed those which are necessary for such use.

3. **Group R occupancies.** Flammable and combustible liquids shall be handled and used only for maintenance and operation of equipment, and in quantities not to exceed those which are necessary for such use. Quantities used within a dwelling unit shall be for household uses only and in quantities below permit amounts. It shall be unlawful to handle or use gasoline or other flammable liquid motor fuel within a dwelling unit.

4. **Gasoline and other flammable liquid motor fuel.** Gasoline and other flammable liquid motor fuel in portable containers in quantities requiring a permit is subject to the approval of the commissioner, regardless of the occupancy classification of the premises.

**[3405.3.5.2.1 Citywide permits.** A citywide permit authorizing the use of flammable or combustible liquids shall not be deemed to authorize the handling and use of such liquids in amounts exceeding the quantity limitations set forth in Section 3404.3.4.5.]

**3405.3.5.3 Quantities exceeding limits for control areas.** Quantities exceeding the maximum allowable quantity per control area indicated in [Sections] FC 3405.3.5.1 and 3405.3.5.2 shall be in compliance with the following requirements:

1. For open systems, indoor use of flammable and combustible liquids, including the dispensing and mixing of such liquids, shall be within a room or building complying with the construction codes, including the Building Code and [Sections] FC 3405.3.7.1 through 3405.3.7.5.

2. For closed systems, indoor use of flammable and combustible liquids, including the dispensing and mixing of such liquids, shall be within a room or building complying with the requirements of the construction codes, including the Building Code and [Sections] FC 3405.3.7 through 3405.3.7.4 and 3405.3.7.6.

**3405.3.6 Cleaning with flammable and combustible liquids.** Cleaning with Class I, II and IIIA liquids shall be accordance with this section.

**Exceptions:**

1. Dry cleaning shall be in accordance with FC Chapter 12.

2. Spray-nozzle cleaning shall be in accordance with [Section 1503.3.5] FC1503.3.5.

**3405.3.6.1 Cleaning operations.** Class [I-A] IA liquids and gasoline shall not be used to clean facilities or for other maintenance purposes, except as authorized by this code or the rules in connection with commercial and industrial process-related operations. The cleaning with Class [I-B] IB, [I-C] IC or II liquids shall be conducted as follows:

1. In a room or building in accordance with [Section 3405.3.7] FC3405.3.7; or

2. In a machine listed and approved for the purpose in accordance with [Section 3405.3.6.2] FC3405.3.6.2.

**3405.3.6.2 Listed and approved machines.** Parts cleaning and degreasing conducted in listed and approved machines in accordance with [Section 3405.3.6.1] FC3405.3.6.1 shall be in accordance with [Sections] FC 3405.3.6.2.1 through 3405.3.6.2.7.

**3405.3.6.2.1 Solvents.** Solvents shall be classified and shall be compatible with the machines within which they are used.

**3405.3.6.2.2 Machine capacities.** The quantity of solvent shall not exceed the listed design capacity of the machine for the solvent being used with the machine.

**3405.3.6.2.3 Solvent quantity limits.** Solvent quantities shall be limited as follows:

1. Machines without remote solvent reservoirs shall be limited to quantities set forth in [Section 3405.3.5] FC3405.3.5.

2. Machines with remote solvent reservoirs using a Class [I-B] IB or [I-C] IC liquid shall be limited to quantities set forth in [Section 3405.3.5] FC3405.3.5.

3. Machines with remote solvent reservoirs using Class II liquids shall be limited to 35 gallons (132 L) per machine. The total quantities shall not exceed an aggregate of 240 gallons (908 L) per control area in buildings not protected throughout by a sprinkler system and an aggregate of 480 gallons (1817 L) per control area in buildings protected throughout by a sprinkler system.

4. Machines with remote solvent reservoirs using Class IIIA liquids shall be limited to 80 gallons (303 L) per machine.

**3405.3.6.2.4 Immersion soaking of parts.** Work areas of machines with remote solvent reservoirs shall not be used for immersion soaking of parts.

**3405.3.6.2.5 Separation.** Multiple machines shall be separated from each other by a distance of not less than 30 feet (9144 mm) or by a fire barrier with a minimum 1-hour fire-resistance rating.

**3405.3.6.2.6 Ventilation.** Machines shall be located in areas adequately ventilated to prevent accumulation of vapors.

**3405.3.6.2.7 Installation.** Machines shall be installed in accordance with their listings.

**3405.3.7 Rooms or buildings for quantities exceeding the maximum allowable quantity per control area.** Where required by [Section] FC 3405.3.5.3 or 3405.3.6.1, rooms or buildings used for the handling and use of flammable and combustible liquids, including the dispensing and mixing of such liquids, shall be in accordance with [Sections] FC 3405.3.7.1 through 3405.3.7.6.3.

**3405.3.7.1 Construction, location and fire protection.** Rooms or buildings classified in accordance with the Building Code as Group H-2 or H-3 occupancies based on use of flammable or combustible liquids, including the dispensing or mixing of such liquids, shall be constructed in accordance with the construction codes, including the Building Code.

**3405.3.7.2 Basements and other areas below grade.** In rooms or buildings classified in accordance with the Building Code as Group H-2 or H-3, dispensing or mixing of flammable or combustible liquids shall not be conducted in basements, cellars or other areas below grade.

**3405.3.7.3 Fire protection.** Rooms or buildings classified in accordance with the construction codes, including the Building Code, as Group H-2 or H-3 occupancies shall be protected throughout by a sprinkler system.

**3405.3.7.4 Doors.** Interior doors to rooms or portions of such buildings shall be self-closing fire doors in accordance with the construction codes, including the Building Code.

**3405.3.7.5 Open systems.** [Handling] The handling and use of flammable and combustible liquids, including the dispensing and mixing of such liquids, in open systems shall be in accordance with [Sections] FC 3405.3.7.5.1 through 3405.3.7.5.3.

**3405.3.7.5.1 Ventilation.** Continuous mechanical ventilation shall be provided and shall comply with the requirements of the construction codes, including the Building Code and the Mechanical Code.

**3405.3.7.5.2 Explosion control.** Explosion control shall be provided in accordance with [Section 911] FC911.

**3405.3.7.5.3 Spill control and secondary containment.** Spill control shall be provided in accordance with [Section 3403.4] FC3403.4 where Class I, II or IIIA liquids are dispensed into containers exceeding a 1.3-gallon (5 L) capacity or mixed or used in open containers or systems exceeding a 5.3-gallon (20 L) capacity. Spill control and secondary containment shall be provided in accordance with [Section 3403.4] FC3403.4 when the capacity of an individual container exceeds 55 gallons (208 L) or the aggregate capacity of multiple containers or tanks exceeds 100 gallons (378.5 L).

**3405.3.7.6 Closed systems.** [Handling] The handling and use of flammable or combustible liquids in closed containers, including the mixing of such liquids, shall be in accordance with [Sections] FC 3405.3.7.6.1 through 3405.3.7.6.3.

**3405.3.7.6.1 Ventilation.** Closed systems designed to be opened as part of normal operations shall be provided with ventilation in accordance with [Section 3405.3.7.5.1] FC3405.3.7.5.1.

**3405.3.7.6.2 Explosion control.** Explosion control shall be provided when an explosive environment can occur as a result of the use, including any mixing process. Explosion control shall be designed in accordance with [Section 911] FC911.

**Exception:** When process vessels are designed to contain fully the worst-case explosion anticipated within the vessel under process conditions considering the most likely failure.

**3405.3.7.6.3 Spill control and secondary containment.** Spill control shall be provided in accordance with [Section 3403.4] FC3403.4 when flammable or combustible liquids are dispensed into containers exceeding a 1.3-gallon (5 L) capacity or mixed or used in open containers or systems exceeding a 5.3-gallon (20 L) capacity. Spill control and secondary containment shall be provided in accordance with [Section 3403.4] FC3403.4 when the capacity of an individual container or tank exceeds 55 gallons (208 L) or the aggregate capacity of multiple containers or tanks exceeds 1,000 gallons (3785 L).

**3405.3.8 Outdoor handling and use.** Outdoor handling and use of flammable and combustible liquids, including the dispensing of such liquids, shall be in accordance with [Sections] FC 3405.3.8.1 through 3405.3.8.3.

**Exception:** Dispensing of liquids into motor vehicle fuel tanks at liquid motor fuel-dispensing facilities shall be in accordance with FC Chapter 22.

**3405.3.8.1 Spill control and drainage control.** Outdoor handling and use of flammable and combustible liquids, including the dispensing areas for such liquids, shall be provided with spill control as set forth in [Section 3403.4] FC3403.4.

**3405.3.8.2 Location [on property].** Dispensing activities which exceed the quantities set forth in FC Table 3405.3.8.2 shall not be conducted within 15 feet (4572 mm) of buildings or combustible materials or within 25 feet (7620 mm) of building openings, lot lines, public streets or private roads. Dispensing activities that exceed the quantities set forth in FC Table 3405.3.8.2 shall not be conducted within 15 feet (4572 mm) of storage of Class I, II or III liquids unless such liquids are stored in tanks which are listed and labeled as 2-hour protected tank assemblies in accordance with UL 2085. The commissioner may impose by rule, or as a condition of a permit, additional restrictions on dispensing activities, including dispensing locations, dispenser requirements, container requirements and fire protection requirements, upon a determination that such additional restrictions are required in the interest of public safety.

**Exceptions:**

1. The requirements shall not apply to areas where only the following liquids are dispensed: Class III liquids; liquids that are heavier than water; water-miscible liquids; and liquids with viscosities greater than 10,000 centipoise (cp).

2. Flammable and combustible liquid dispensing in chemical plants, process facilities, oil blending and packaging facilities, bulk plants and terminals.

**FC TABLE 3405.3.8.2**
**MAXIMUM ALLOWABLE QUANTITIES FOR DISPENSING OF FLAMMABLE AND COMBUSTIBLE LIQUIDS IN OUTDOOR CONTROL AREAS[a[,b]]**

| CLASS OF LIQUID | QUANTITY (gallons) |
|---|---|
| Flammable | |
| Class IA | 10 |
| Class IB | 15 |
| Class IC | 20 |
| Combination Class IA, IB and IC | 30[c] |
| Combustible | |
| Class II | 30 |
| Class IIIA | 80 |
| Class IIIB | 3,300 |

For SI: 1 gallon = 3.785 L.
a. For definition of "Outdoor Control Area," see [Section 2702.1] FC2702.1.
b. Reserved.
c. Containing not more than the maximum allowable quantity per control area of each individual class.

**3405.3.8.3 Location of processing vessels.** Processing vessels shall be located with respect to distances to lot lines in accordance with FC Table 3405.3.4(1).

**3405.3.9 Mobile trailers using fuel oil for heating and power generation.** Mobile trailers using fuel oil for heating and power generation shall comply with the requirements of the rules.

**3405.4 Solvent distillation units.** Solvent distillation units shall comply with the requirements of [Sections] FC 3405.4.1 through 3405.4.9.

**3405.4.1 Unit with a capacity of not more than 60 gallons [or less].** Solvent distillation units used to recycle Class I, II or IIIA liquids having a distillation chamber capacity of not

more than 60 gallons (227 L) [or less] shall be listed, labeled and installed in accordance with [Section 3405.4] FC3405.4 and UL 2208.

**Exceptions:**

1. Solvent distillation units installed in dry cleaning facilities in accordance with FC Chapter 12.

2. Solvent distillation units used in continuous through-put industrial processes where the source of heat is remotely supplied using steam, hot water, oil or other heat transfer fluids, the temperature of which is below the auto-ignition point of the solvent.

3. Solvent distillation units listed for and used in laboratories.

4. Approved research, testing and experimental processes.

**3405.4.2 Units with a capacity exceeding 60 gallons.** Solvent distillation units used to recycle Class I, II or IIIA liquids, having a distillation chamber capacity exceeding 60 gallons (227 L) shall be used in locations that comply with the use and mixing requirements of [Section 3405] FC3405 and other applicable provisions in this chapter.

**3405.4.3 Prohibited processing.** It shall be unlawful to process Class I, II and IIIA liquids also classified as unstable (reactive) in solvent distillation units.

**3405.4.4 Labeling.** Solvent distillation units shall [have affixed by the manufacturer] bear a permanent label indicating the capacity of the distillation chamber, the distance the unit shall be placed away from sources of ignition, and the products for which the unit has been listed for use.

**3405.4.5 Manufacturer's [instruction] manual and Material Safety Data Sheets.** [An instruction manual shall be provided.] The manufacturer's manual for the installation, operation and servicing of the solvent distillation unit shall be maintained on the premises, readily available to the user and for inspection by any department representative. [The manual shall include installation, use and servicing instructions. It shall identify the liquids for which the unit has been listed for distillation purposes along with each liquid's flash point and auto-ignition temperature. For units with adjustable controls, the manual shall include directions for setting the heater temperature for each liquid to be distilled.] In accordance with FC2703.4, material safety data sheets shall be maintained on the premises for each flammable or combustible liquid used in the distillation unit.

**3405.4.6 Location.** Solvent distillation units shall be [used in] installed at locations in accordance with the listing for the unit. Solvent distillation units shall not be used in basements, cellars or other areas below grade.

**3405.4.7 Storage of liquids.** Distilled liquids and liquids awaiting distillation shall be stored in accordance with [Section 3404] FC3404.

**3405.4.8 Storage of residues.** Hazardous residue from the distillation process shall be stored in accordance with [Section 3404] FC3404 and FC Chapter 27.

**3405.4.9 Portable fire extinguishers.** Portable fire extinguishers shall be provided in accordance with [Section 906] FC906. At least one portable fire extinguisher having a rating of not less than 40-B shall be located not less than 10 feet (3048 mm) or more than 30 feet (9144 mm) from any solvent distillation unit.

**3405.5 Alcohol-based hand rubs classified as Class I or Class II liquids.** The storage, handling and use of dispensers containing alcohol-based hand rubs classified as Class I or Class II liquids shall be in compliance with the following requirements:

1. Dispensers shall be of the [non-aerosol] nonaerosol, disposable and [non-refillable] nonrefillable type.

2. The maximum capacity of each dispenser shall be [34] 68 ounces ([1.0] 2.0 L).

3. The maximum alcohol content shall not exceed 95 percent by volume.

[3] 4. The minimum separation between dispensers shall be 48 inches (1219 mm).

[4] 5. Dispensers shall not be installed directly adjacent to, above or below any electrical receptacle, switch, appliance, device or other ignition source. The wall space between the dispenser and the floor shall remain clear and unobstructed.

[5] 6. Dispensers shall be wall mounted with the bottom of each dispenser a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1219 mm) above the finished floor.

[6] 7. Dispensers shall not release their contents except when the dispenser is manually activated.

[7 ]8. The storage of dispensers shall be in compliance with the applicable requirements of [Section 3404] FC3404.

[8] 9. In occupancies with carpeted floors, dispensers may only be installed in smoke compartments or fire areas protected throughout by a sprinkler system.

**3405.5.1 Corridor installations.** Dispensers installed in corridors shall additionally comply with the following requirements:

1. The maximum capacity of each dispenser shall be 41 ounces (1.21 L).

[1] 2. The maximum quantity allowed in a corridor within a control area shall be 10 gallons (38 L).

[2] 3. The minimum corridor width shall be 72 inches (1829 mm).

[3] 4. Projections into a corridor shall be in accordance with the construction codes, including the Building Code.

[4] 5. The corridor shall be protected throughout by a sprinkler system or smoke detection system.

## SECTION FC 3406
## SPECIAL OPERATIONS

**3406.1 Scope.** Flammable and combustible liquids shall be stored, handled and used in connection with special operations, including the following operations, in compliance with the requirements of this section:

1. Storage and dispensing of flammable and combustible liquids at construction sites.

2. Bulk plants or terminals.

3. Bulk transfer and process transfer operations utilizing cargo tanks and tank cars.

4. Cargo tanks and cargo tank operation.

5. Vapor recovery and vapor-processing systems.

**3406.1.1 General.** Special operations involving the storage, handling and use of flammable and combustible liquids shall be conducted in accordance with [Sections] FC 3401, 3403, 3404 and 3405, except as otherwise provided in this section.

**3406.1.2 Prohibition.** It shall be unlawful to dispense any flammable or combustible liquid from a cargo tank or tank car into the fuel tanks of motor vehicles, except for the transfer of liquids from a cargo tank to construction equipment at a construction site in accordance with FC3406.2.8.

**3406.2 Storage and dispensing of flammable and combustible liquids at construction sites.** Temporary storage and dispensing of flammable and combustible liquids at construction sites shall be in accordance with [Sections] FC 3406.2.1 through 3406.2.8.

**Exception:** Storage and use of fuel oil connected with nonportable oil-burning equipment regulated by the Mechanical Code.

**3406.2.1 Combustibles and open flames near tanks.** Storage areas shall be kept free from weeds and other combustible waste. It shall be unlawful to smoke, or light or maintain an open flame in a flammable or combustible liquid storage area.

**3406.2.2 Marking of tanks and containers.** Tanks and containers for aboveground storage of liquids shall be conspicuously marked with the name of the product which they contain and the words: FLAMMABLE—KEEP FIRE AND FLAME AWAY. Tanks shall bear the additional marking: KEEP 50 FEET FROM BUILDINGS.

**3406.2.3 Containers for storage and use.** Flammable and combustible liquid shall only be stored in metal containers of a type meeting the requirements of the regulations of the United States Department of Transportation, as set forth in 49 CFR Part 178, or in containers of an approved design.

**3406.2.3.1 Liquid handling devices.** Discharge devices shall be of a type that do not develop an internal pressure on the container. Pumping devices or approved self-closing faucets used for dispensing liquids shall not leak and shall be well-maintained. Individual containers shall not be interconnected and shall be kept closed when not in use.

**3406.2.3.2 Outdoor storage.** Containers stored outdoors shall be in accordance with [Section 3404] FC3404 and the construction codes, including the Building Code.

**3406.2.4 Temporary tanks.** The capacity of [temporary] a storage tank temporarily installed aboveground [tanks] containing flammable or combustible liquids shall not exceed 660 gallons (2498 L). Tanks shall be of the single-compartment design, shall be constructed of steel, and shall meet the requirements of the New York State Department of Environmental Conservation regulations, as set forth in 6 NYCRR Parts 613 and 614.

**3406.2.4.1 Fill-opening security.** Fill openings shall be equipped with a locking closure device. Fill openings shall be separate from vent openings.

**3406.2.4.2 Vents.** Tanks shall be provided with a method of normal and emergency venting. Normal vents shall also be in accordance with [Section 3404.2.7.3] FC3404.2.7.3. Emergency vents shall be in accordance with [Section 3404.2.7.4] FC3404.2.7.4. Emergency vents shall be arranged to discharge in a manner which prevents localized overheating or flame impingement on any part of the tank in the event that vapors from such vents are ignited.

**3406.2.4.3 Location.** Tanks containing flammable or combustible liquids shall be kept outdoors and at least 50 feet (15 240 mm) from buildings, combustible material and combustible waste. Additional distance shall be provided when necessary to ensure that vehicles, equipment and containers being filled directly from such tanks will not be less than 50 feet (15 240 mm) from structures or combustible storage.

**3406.2.5 Type of tank.** Tanks shall be provided with top openings only.

**Exception:** Aerial crane refueling operations when conducted in accordance with [Section 3406.2.5.2] FC3406.2.5.2.

**3406.2.5.1 Tanks with top openings only.** Tanks with top openings shall be mounted as follows:

1. On well-constructed metal legs connected to shoes or runners designed so that the tank is stabilized and the entire tank and its supports can be moved as a unit; or

2. For stationary tanks, on a stable base of timbers or blocks approximately 6 inches (152 mm) in height which prevents the tank from contacting the ground.

**3406.2.5.1.1 Pumps and fittings.** Tanks with top openings only shall be equipped with a tightly and permanently attached, approved pumping device having an approved hose of sufficient length for filling construction equipment or containers to be served from the tank. Either the pump or the hose shall be equipped with a padlock to its hanger to prevent tampering. An antisiphoning device shall be provided in the pump discharge unless a self-closing nozzle is used. Siphons or internal pressure discharge devices shall not be used.

**3406.2.5.2 Tanks for gravity discharge.** Tanks with a connection in the bottom or the end for gravity-dispensing liquids for aerial crane refueling operations shall be mounted and equipped as follows:

1. Support lugs used to elevate the tank for gravity discharge shall be designed to carry all required loads and provide stability.

2. Bottom or end openings for gravity discharge shall be equipped with a valve located adjacent to the tank shell which will close automatically in the event of fire through the operation of a heat-activated releasing device. Where this valve cannot be operated manually, it shall be supplemented by a second, manually operated valve.

3. The gravity discharge outlet shall be provided with an approved hose equipped with a self-closing valve at the discharge end of a type that can be padlocked to its hanger.

**3406.2.6 Spill control drainage control and diking.** Indoor storage and dispensing areas shall be provided with spill control and drainage control as set forth in [Section 3403.4] FC3403.4. Outdoor storage areas shall be provided with drainage control or diking as set forth in [Section 3404.2.10] FC3404.2.10.

**3406.2.7 Portable fire extinguishers.** Portable fire extinguishers with a minimum rating of 20-B:C and complying with the requirements of [Section 906] FC906 shall be provided where required by this code.

**3406.2.8 Dispensing from cargo tanks.** Where approved, liquids used as fuels are allowed to be transferred from cargo tanks into the fuel tanks of construction equipment at a construction site, subject to the following requirements:

1. The cargo tank is used solely for the purpose of supplying fuel to construction equipment at a construction site.

2. The dispensing hose does not exceed 100 feet (30 480 mm) in length.

3. The dispensing nozzle is an approved type.

4. The dispensing hose is properly placed on the approved reel or in a compartment provided before the cargo tank is moved.

5. Signs prohibiting smoking and open flames within 25 feet (7620 mm) of the cargo tank and construction equipment being refueled are prominently posted on the cargo tank.

6. Electrical devices and wiring in areas where fuel dispensing is conducted are in accordance with the Electrical Code.

7. Cargo tank-dispensing equipment is operated only by a person holding a certificate of fitness.

8. Provision has been made to control and mitigate the accidental or unauthorized release of flammable and combustible liquid.

9. The cargo tank has a capacity of not more than 1,920 gallons (7267 L), and contains no Class IA liquid and not more than 640 gallons (2422 L) of any other Class I liquid.

10. Dispensing is conducted at least 50 feet (15 240 mm) from buildings, structures, combustible material or combustible waste.

<u>11. A portable fire extinguisher with a minimum rating of 40-B:C shall be provided on the cargo tank with signage clearly indicating its location.</u>

<u>12. Absorbent materials, nonwater-absorbent pads, a 10-foot-long (3048 mm) containment boom, an approved container with lid and a nonmetallic shovel shall be provided to mitigate a minimum 5-gallon (19 L) fuel spill.</u>

<u>13. Operators of tank vehicles used for mobile fueling operations shall have in their possession at all times an approved means of notifying the department of a fire or other emergency.</u>

<u>14. Fuel dispensing shall be prohibited within 25 feet (7620 mm) of any source of ignition.</u>

<u>15. The engines of vehicles being fueled shall be shut off during dispensing operations.</u>

16. Nighttime fueling operations shall only be conducted in adequately lighted areas.

17. The cargo tank shall be positioned with respect to the construction equipment being fueled so as to prevent vehicular traffic from driving over the delivery hose.

18. During fueling operations, a cargo tank shall be secured from movement by setting the cargo tank's brakes and chocking the wheels, and the cargo tank's warning lights shall be activated.

**3406.3** Reserved.

**3406.4 Bulk plants and terminals.** Any premises in or upon which flammable and combustible liquids are received by marine vessels, watercraft, pipelines, tank cars or cargo tanks and which are stored or blended in bulk for the purpose of distributing such liquids by marine vessels, watercraft, pipelines, tanks cars, cargo tanks or containers shall be designed, installed, operated and maintained in accordance with [Sections] FC 3406.4.1 through 3406.4.10.4.

**3406.4.1 Building construction.** Buildings and structures housing bulk plant or terminal materials, operations and facilities shall be constructed in accordance with the construction codes, including the Building Code.

**3406.4.1.1 Design and installation documents.** A [complete set of design and installation documents, including] site plan of the bulk plant or terminal, indicating the location and dimensions of all buildings and structures housing bulk plan or terminal materials, operations and facilities, and all flammable and combustible liquid installations, shall be filed with the department, together with such other design and installation documents as the department may require.

**3406.4.2 Means of egress.** Rooms in which flammable and combustible liquids are stored, handled or used shall be arranged such that occupants engaging in such handling and use have readily available access to a means of egress in the event of fire.

**3406.4.3 Heating.** Rooms in which Class I liquids are stored, handled or used shall be heated only by means not constituting a source of ignition, such as steam or hot water.

**3406.4.4 Ventilation.** Ventilation shall be provided for rooms, enclosures and other areas in buildings or structures in which Class I liquids are handled or used, including any pumping or transfer. Ventilation systems shall be designed in a manner that takes into consideration the relatively high specific gravity of the vapors. When natural ventilation is approved, adequate openings in outside walls at floor level, unobstructed except by louvers or coarse screens, shall be provided. When natural ventilation is not approved, mechanical ventilation shall be provided in accordance with the construction codes, including the Mechanical Code.

**3406.4.4.1 Basements and other areas below grade.** Class I liquids shall not be stored, handled or used within a building or structure having a basement, cellar or other area

below grade into which flammable vapors can travel, unless such area is provided with ventilation designed to prevent the accumulation of flammable vapors therein.

**3406.4.4.2 Dispensing of Class I liquids.** Containers of Class I liquids shall not be drawn from or filled indoors unless a provision is made to prevent the accumulation of flammable vapors in hazardous concentrations. Where mechanical ventilation is required, it shall be kept in operation while flammable vapors could be present.

**3406.4.5 Storage.** Except as otherwise provided in [Section 3406.4] FC3406.4, storage of flammable and combustible liquids in bulk plants and terminals shall be in compliance with the applicable requirements of [Section 3404] FC3404.

**3406.4.5.1 Distance to lot line.** The distance between any part of an aboveground flammable or combustible liquid storage tank and the nearest lot line shall be as provided in FC Table 3406.4.5.1, except where [Sections] FC 3406.4.5.1.1 through [3406.4.5.1.4] 3406.4.5.1.5 require a greater distance.

**FC TABLE 3406.4.5.1**
**DISTANCE BETWEEN AN ABOVEGROUND STORAGE TANK AND LOT LINES**

| TANK CAPACITY | MINIMUM DISTANCE (FEET) |
|---|---|
| ≤30,000 gallons | 20 |
| Over 30,000 to 50,000 gallons | 30 |
| Over 50,000 to 100,000 | 50 |
| Over 100,000 to 500,000 | 80 |
| Over 500,000 to 1,000,000 | 100 |
| Over 1,000,000 to 2,000,000 | 135 |
| Over 2,000,000 to 3,000,000 | 165 |
| Over 3,000,000 to 6,000,000 | 175 |

**3406.4.5.1.1 Vertical cylindrical tanks over 50,000 gallons (189 250 L) storing a flammable liquid.** For vertical cylindrical tanks over 50,000 gallons (189 250 L) storing a flammable liquid, the distance shall not be less than the greater dimension of height or diameter of the tank, up to a maximum distance of 175 feet (53 340 mm).

**3406.4.5.1.2 Rectangular tanks over 50,000 gallons (189 250 L) storing a flammable liquid.** For rectangular tanks over 50,000 gallons (189 250 L) storing a flammable liquid, the distance shall not be less than the total of the length and the width of the tank divided by two, up to a maximum distance of 175 feet (53 340 mm).

**3406.4.5.1.3 Vertical cylindrical tanks over 50,000 gallons (189 250 L) storing a combustible liquid.** For vertical cylindrical tanks over 50,000 gallons (189 250 L) storing a combustible liquid, the distance shall not be less than 1/2 the greater dimension of height or diameter of the tank, up to a maximum distance of 175 feet (53 340 mm).

**3406.4.5.1.4 Rectangular tanks over 50,000 gallons (189 250 L) storing a combustible liquid.** For rectangular tanks over 50,000 gallons (189 250 L) storing a combustible liquid, the distance shall not be less than the total of the length and the width of the tank divided by 4, up to a maximum distance of 175 feet (53 340 mm).

**3406.4.5.1.5 Tank construction.** Newly constructed tanks shall be in accordance with API 650. Repairs and alterations to existing tanks shall be in accordance with API 653.

**3406.4.5.2 Distance between aboveground tanks.** The distance between any part of an aboveground storage tank and adjacent tanks shall be in accordance with FC Table 3406.4.5.2.

**FC TABLE 3406.4.5.2**
**DISTANCE BETWEEN ABOVEGROUND STORAGE TANKS**

| ADJACENT TANK CAPACITY | MINIMUM DISTANCE (FEET) |
|---|---|
| ≤ 50,000 gallons | 3 |
| Over 50,000 to 100,000 gallons | 6 |
| Over 100,000 to 200,000 gallons | 12 |
| Over 200,000 gallons | 25 |

**3406.4.5.3 Height of aboveground storage tanks.** The maximum height of aboveground flammable and combustible liquid storage tanks shall not exceed 40 feet (12 192 mm).

**Exception:** Aboveground vertical cylindrical tanks storing combustible liquids shall not exceed 48 feet (14 630 mm) in height.

**3406.4.5.4 Distance from aboveground tanks to buildings.** The distance between any part of an aboveground storage tank and buildings or structures used for housing of fire extinguishing equipment, central heating plant or electrical distribution equipment shall not be less than 50 feet (15 240 mm).

**3406.4.5.5 Maximum capacity for aboveground tanks.** The maximum capacity of any aboveground tank used for storage of a flammable liquid shall not exceed 500,000 gallons (1892 500 L). The maximum capacity of any aboveground tank used for storage of combustible liquid shall not exceed 6,000,000 gallons (22 710 000 L).

**3406.4.5.6 Distance from aboveground tanks to exposures.** No aboveground tank shall be installed within:

1. 1,000 feet (304 800 mm) of the nearest wall of a building occupied as a school or hospital, or an entrance to or exit from a tunnel for motor vehicles, subway or railroad trains, or the ventilating buildings or shafts of such tunnels.

2. 250 feet (76 200 mm) of any point under a bridge for pedestrians, motor vehicles, subway or railroad trains, a public park or a land zoned for residential purposes.

**3406.4.5.7 Depth of underground storage tanks.** The maximum distance between the top and bottom plates of an underground flammable and combustible liquid storage tank shall not exceed 40 feet (12 192 mm).

**3406.4.5.8 Underground tank location.** Underground tanks shall be located such that the top plate thereof shall be at least 2 feet ([609.6] 610 mm) below the established grade. No such tank shall be buried within 10 feet (3048 mm) of any building or adjoining property line. Individual underground tanks shall be covered with 2 feet ([609.6] 610 mm) of earth or 4 inches ([101.6] 102 mm) of reinforced concrete extending 10 feet (3048 mm) beyond all the vertical walls of the tank, and the excavation made to receive the tank shall be backfilled with well-compacted clean sand or earth, free of any ash or other corrosive substance, and free from stones larger than will pass through a 1-inch ([25.4 mm] 25-mm) mesh. Underground tanks may be erected in groups of 2 or more, when such tanks are separated by a space of 1 foot ([304.8] 305 mm), and provided the reinforced concrete top cover extends unbroken over the open space between the tanks.

**3406.4.5.9 Mounded-over tanks.** Mounded-over tanks shall be considered underground tanks. A mounded-over tank may be erected with its base at any desired elevation not higher than the grade plane of the premises. It shall be enclosed with a steel, reinforced-concrete, or closed-face-concrete cribbing wall extending from the established grade to the top of the top cover, with the exterior face of the wall at least 10 feet (3048 mm) from the exterior face of the wall of the tank, and backfilled between the tank and the enclosing wall with compacted clean earth or sand containing no ash or other corrosive substance. The wall and backfill may be replaced with compacted similar fill, extending from the established grade to the level of the top cover on the tank, at the normal angle of repose of the material so used, with the provision that the width of the sloped material at the level of the top of the top cover shall be at least 10 feet (3048 mm) wide. When two or more mounded-over tanks, either rectangular or vertical-cylindrical, are grouped together, the tanks shall be at least 1 foot ([304.8] 305 mm) apart from each other, and the group of tanks shall be enclosed around the periphery with the same type of wall and backfill described above for one mounded-over tank.

**3406.4.5.10 Maximum capacity of flammable liquid underground tanks.** Underground storage tanks used for storage of a flammable liquid shall not exceed 500,000 gallons (1892 500 L), except that the commissioner may approve the installation of underground tanks with a capacity not to exceed 6,000,000 gallons ([22 710 000L] 22 710 000 L) where such greater capacity is determined to be necessary because of the capacity of the marine vessel, watercraft, pipeline or tank car delivering such liquid and where such increased capacity does not endanger the public safety.

**3406.4.5.11 Maximum capacity of combustible liquid underground tanks.** Underground storage tanks used for storage of a combustible liquid shall not exceed 6,000,000 gallons (22 710 000 L). Such tanks may be compartmented; however, in no case shall any compartment exceed 4,000,000 gallons (15 140 000 L).

**3406.4.6 Overfill protection.** To prevent an overfill during the transfer of flammable or combustible liquid from a marine vessel, watercraft, pipeline, tank car, cargo tank or storage tank, each tank shall be equipped with an approved electrically operated overfill protection system. Such system shall be in accordance with API 2350.

**3406.4.6.1 Alarms.** Audible and visible alarms shall be activated automatically when the liquid level in the tank approaches 95 percent of tank capacity and again when it attains a level of 98 percent of tank capacity. This alarm shall be connected to both the marine vessel, watercraft, pipeline, tank car or cargo tank receiving point, as applicable, and to the [facilty] facility dispatcher's office.

**3406.4.6.2 Tanks filled from pipelines.** Tanks filled by [pipeline] pipelines shall be provided with a shutoff valve in the fill line that will automatically shut off the flow to the tank when the liquid level in the tank approaches 95 percent.

**3406.4.7 Wharves.** This section shall apply to all wharves, piers, bulkheads and other structures over or contiguous to navigable water having a primary function of transferring liquid cargo in bulk between shore installations and marine vessels and watercraft including barges, lighter boats or similar watercraft.

**Exception:** Marine liquid motor fuel-dispensing facilities designed, installed, operated and maintained in accordance with FC Chapter 22.

**3406.4.7.1 Transferring approvals.** Handling packaged cargo of liquids, including full and empty drums, bulk fuel and stores, over a wharf during cargo transfer shall be subject to the approval and under the personal supervision of the bulk plant or terminal certificate of fitness holder and the senior deck officer on duty.

**3406.4.7.2 Transferring location.** Wharves at which liquid cargoes are to be transferred in bulk quantities to or from marine vessels and watercraft shall be at least 100 feet (30 480 mm) from any bridge over a navigable waterway; or from any entrance to, or superstructure of, any vehicular or railroad tunnel under a waterway. The termination of the fixed piping used for loading or unloading at a wharf shall be at least 200 feet (60 960 mm) from a bridge or from an entrance to, or superstructures of, a tunnel.

**3406.4.7.3 Superstructure and decking material.** Superstructure and decking shall be designed for the intended use. Decking shall be constructed of materials that will afford the desired combination of flexibility, resistance to shock, durability, strength and fire resistance.

**3406.4.7.4 Wharf tanks prohibited.** It shall be unlawful to install, operate or maintain on wharfs any tanks containing flammable and combustible liquids.

**3406.4.7.5 Transferring equipment.** Loading pumps capable of building up pressures in excess of the safe working pressure of cargo hose or loading arms shall be provided with bypasses, relief valves or other arrangements to protect the loading facilities against excessive pressure. Relief devices shall be tested at least annually to determine that they function satisfactorily at their set pressure.

**3406.4.7.6 Piping, valves, fittings and ancillary equipment.** Piping systems shall be in accordance with [Section 3403.6] FC3403.6 except as otherwise provided as follows:

1. Piping systems shall be designed to protect against physical damage resulting from the motion of the wharf from wave action, currents, tides or the mooring of marine vessels and watercraft.

2. Pipe joints that depend on the friction characteristics of combustible materials or on the grooving of pipe ends for mechanical continuity of piping shall not be used.

3. Swivel joints may be used in piping to which hoses are connected and for articulated, swivel-joint transfer systems, provided that the design of the swivel joints is such that the mechanical strength of the joint will not be impaired if the packing materials fail such as by exposure to fire.

4. Each pipe used to convey Class I or II liquids leading to a wharf shall be provided with a readily accessible block valve located on shore near the approach to the wharf and outside of any diked area. Where more than one line is used to convey liquid, the valves shall be grouped in one location.

5. Means shall be provided for ready access to cargo line valves located below the wharf deck.

6. Piping systems shall contain a sufficient number of valves to operate the system properly and to control the flow of liquid both during normal operation and in the event of physical damage.

7. Piping on wharves shall be bonded and grounded where Class I and II liquids are transported. If excessive stray current conditions exist, insulating joints shall be installed. Bonding and grounding connections on piping shall be located on the wharf side of hose riser insulating flanges, where used, and shall be accessible for inspection.

8. Hose or articulated swivel-joint pipe connections used for cargo transfer shall be capable of accommodating the combined effects of change in draft and maximum tidal range, and mooring lines shall be kept adjusted to prevent surge of the marine vessel or watercraft from placing stress on the cargo transfer system.

9. Hoses shall be supported to avoid kinking and physical damage, including damage from chafing.

10. Piping, hoses, valves and fittings shall be constructed of steel. Valves shall be rated for not less than 150 pounds per square inch (psig)(1034 kPa).

**3406.4.7.7 Loading and unloading.** Loading or unloading shall not commence until the bulk plant or terminal certificate of fitness holder and officer in charge of the marine vessel or watercraft agree that the marine vessel or watercraft has been properly moored and connections have been properly made.

**3406.4.7.8 Construction work.** Construction work shall not be performed on the wharf except as approved by the commissioner upon a determination that such work can be safely performed, and subject to such terms and conditions as the commissioner may prescribe in the interest of public safety.

**3406.4.8 Sources of ignition.** Class I, II or IIIA liquids shall not be used, drawn or dispensed where flammable vapors can reach a source of ignition.

**3406.4.9 Drainage control.** Loading and unloading areas shall be provided with drainage control in accordance with [Section 3404.2.10] FC3404.2.10.

**3406.4.10 Fire protection.** Fire protection shall be in accordance with FC Chapter 9 and [Sections] FC 3406.4.10.1 through 3406.4.10.8.

**3406.4.10.1 Portable fire extinguishers.** Portable fire extinguishers with a rating of not less than 20-B and complying with the requirements of [Section 906] FC906 shall be located within 75 feet (22 860 mm) of hose connections, pumps and separator tanks.

**3406.4.10.2 Fire hoses.** Fire hose connected to a water supply in a size appropriate for the water supply shall be provided in accordance with [Section 905] FC905 and the construction codes, including the Building Code, so that manifolds where connections are made and broken can be reached by at least one hose stream.

**3406.4.10.3 Obstruction of equipment.** Material shall not be placed on wharves in such a manner that would obstruct access to firefighting apparatus or equipment or important pipeline or other delivery control valves.

**3406.4.10.4 Fire apparatus access.** An unobstructed fire apparatus access road to the shore end of the wharf shall be maintained in accordance with FC Chapter 5.

**3406.4.10.5 Fire protection systems.** Aboveground tanks, mounded-over tanks, underground tanks, tank car loading and unloading racks, cargo tank loading racks, cargo tank unloading areas, marine vessel and watercraft loading and unloading areas and all other portions of a bulk plant or terminal shall be provided with fire extinguishing systems that are approved by the commissioner, inspected by a representative of the department and tested at the owner's risk by his or her representative before a representative of the department. Such systems shall include an approved yard hydrant system and tank monitor nozzles.

**3406.4.10.5.1 Cargo tank loading racks.** A fire extinguishing system shall be provided over and under each cargo tank loading position. At least one remote control valve shall be provided to control the extinguishing agent for each three loading positions. Piping systems shall be installed so they can be thoroughly drained. The fire extinguishing system shall be sized to provide protection for the three largest adjacent loading positions.

**3406.4.10.6 Emergency alarm transmission.** Manual pull stations shall be provided at one or more approved locations that will automatically transmit a signal to the department via an approved central station.

**3406.4.10.7 Periodic tests.** Fire extinguishing systems, fire protection systems and tank overfill protection shall be tested once every 2 years at the owner's risk by his or her representative before a representative of the department. Tests of foam extinguishing systems shall produce foam at the most remote tank and produce water flow at each tank. In the event that the discharge of foam to the most remote tank would result in a reportable hazardous material release in accordance with federal, state or local laws, rules or regulations, such other test acceptable to the commissioner may be conducted.

**3406.4.10.8 Color coding and labeling.** Fire protection systems shall be color-coded and labeled in accordance with [Sections] FC 3406.4.10.8.1 through 3406.4.10.8.2. Copies of the color code shall be posted in all central locations for fire extinguishing media, such as the foam house location.

**3406.4.10.8.1 Color coding.** Fire protection systems shall be color-coded as follows:

1. Standpipe and/or yard hydrant systems:

    1.1. Piping, valve bodies and handles, hydrants and hydrant or hose houses: Red with contrasting white bands.

    1.2. [Department Siamese] Fire department connections: Red.

2. Sprinkler systems (wet or dry):

    2.1. Piping and valve bodies and handles: Red with contrasting bright green bands.

    2.2. [Department Siamese] Fire department connections: Red with green caps.

3. [Non-automatic] Nonautomatic sprinkler systems (including fog spray systems):

    3.1. Piping and valve bodies and handles: Red with contrasting aluminum bands.

    3.2. [Department Siamese] Fire department connections: Aluminum.

4. Carbon dioxide extinguishing systems—piping, valve bodies and handles: Red with contrasting brown bands.

5. Steam extinguishing systems—piping, valve bodies and handles: Red with contrasting black bands.

6. Foam extinguishing systems:

6.1. Piping, valve bodies and handles, hydrants and hydrant or hose houses: Red with contrasting bright orange bands.

6.2. Department water connections: Red. A durable sign that reads "WATER FOR FOAM SYSTEM,"[,] shall be conspicuously posted immediately adjacent to such connections.

6.3. Department foam connection: Red with contrasting bright orange band or caps. A durable sign that reads "CHEMICAL FOAM DIRECT TO TANKS" or "...% MECHANICAL FOAM SOLUTION DIRECT TO TANKS,"[,] shall be conspicuously posted immediately adjacent to such connections.

**3406.4.10.8.2 Labeling.** Bands, or piping immediately adjacent to bands, shall be labeled to indicate the names of the extinguishing media. The letters shall be in a contrasting color of a suitable size in proportion to the pipe diameters. The width of each band shall be not less than the pipe diameter and shall be spaced not more than 30 feet (9144 mm) apart. Bands, lettering and piping shall be painted in sun- and weather-resistant colors and paint; but bands and lettering may be applied by means of pressure sensitive tape that is sun- and weather-resistant.

**3406.4.11 Interconnected piping.** All tanks shall be connected by a system of steel pipes in a manner that the contents of each tank may be transferred to another tank without resulting in product contamination, or flash point reduction of the stored liquid.

**3406.4.12 Supervision.** Bulk plants and terminals, including transfer operations, shall be continuously under the personal supervision of a person holding a certificate of fitness for such facility. Such supervision shall satisfy the certificate of fitness supervision requirements of this code for all fire protection systems at the facility, including standpipe systems, sprinkler systems, yard hydrant systems and foam systems.

**3406.4.13 Oil spills.** Bulk plants and terminals storing petroleum products and petroleum product pipelines operating within the city shall provide [oil absorbent] oil-absorbent material, [oil dispersant] oil-dispersant material, booms and other such material and equipment for the control and remediation of oil spills in such quantity and at such locations as set forth in [Section] FC 3406.4.13.1 through 3406.4.13.4.

**Exceptions:**

1. Bulk plants and terminals storing petroleum products when such facility has in place a spill prevention control and countermeasure plan meeting the requirements

of United States Department of Transportation regulations, as set forth in 40 CFR Part 112.

2. Petroleum product pipelines when such pipeline operator has in place for its [city of] New York City operations a response plan for onshore oil pipelines meeting the requirements of United States Department of Transportation regulations, as set forth in 49 CFR Part 194.

**3406.4.13.1 Quantities of clean-up materials and equipment.** Oil spill clean-up materials and equipment shall be stored for use at each bulk plant and terminal and locations designated for pipeline operations in accordance with FC Table 3406.4.13.1, the rules or as a condition of the permit for the facility.

**FC TABLE 3406.4.13.1**
**OIL SPILL MATERIALS AND EQUIPMENT TO BE STORED AT EACH BULK PLANT AND TERMINAL OR PIPELINE**

| MATERIAL OR EQUIPMENT | TOTAL PETROLEUM PRODUCT STORAGE | | | |
|---|---|---|---|---|
| | 1,000,000 GALLONS OR LESS | 5,000,000 GALLONS OR LESS | 10,000,000 GALLONS OR LESS OR PIPELINE OPERATION | OVER 10,000,000 GALLONS |
| Absorbent material to recover | 3,000 gallons | 5,000 gallons | 10,000 gallons | 20,000 gallons |
| Boom | 300 feet | 300 feet plus enough to encircle marine vessel or watercraft, including [barge] barges which may be loading or unloading at the premises | | |

**3406.4.13.2 Availability.** Adequate storage facilities, [materials handling] materials-handling equipment and personnel shall be provided by the bulk plant and terminal or pipeline operator. Such [materials handling] materials-handling equipment and personnel shall be continuously available to properly deploy and apply the materials and equipment specified in [Section 3406.4.13.1] FC3406.4.13.1.

**3406.4.13.3 Use of clean-up service.** The commissioner may approve the utilization of an oil spill clean-up service as a "back-up" spill mitigation measure, authorizing the material quantities to be reduced by 2/3 of those specified in FC Table 3406.4.13.1, but to a quantity not less than 3,000 gallons (11 356 L) of absorbent material and 300 feet (91 440 mm) of boom, and subject to the following conditions:

1. A responsible officer of the bulk plant and terminal or pipeline operation shall submit a sworn affidavit identifying the oil spill clean-up service with which it has contracted to perform such services, averring that such oil spill clean-up service meets the standards set forth in [Section 3406.4.13.4] FC3406.4.13.4 and setting forth the nature of the services to be rendered.

2. The department shall be notified, in writing, within 10 business days of the date when the utilization of the clean-up service is cancelled or the service goes out of business.

3. Such approval may be rescinded by the commissioner for good cause for failure of the spill clean-up service to timely respond to an oil spill, to have adequate equipment, materials or personnel, or to obey or cooperate with the department representatives in charge of the scene of the oil spill.

**3406.4.13.4 Oil spill clean-up service standards.** An oil spill clean-up service may be retained by a bulk plant, bulk terminal or pipeline operation pursuant to [Section 3406.13.3] FC3406.4.13.3 provided it is capable of meeting the following standards:

1. It maintains the stockpile of material and equipment required by [Section 3406.4.13.1] FC3406.4.13.1 for storage of over 10,000,000 gallons (37 850 000 L) of petroleum products, regardless of the amount of petroleum products actually stored at the contracting bulk plants, bulk terminals or pipelines.

2. A supervisor will respond to the spill site within 1 hour from time of notification.

3. It is capable of delivering, on a 24-hour, 7-day-a-week basis, sufficient materials, equipment and personnel to the contracting bulk plant, bulk terminal or pipeline within 2 hours from time of notification.

4. Such service is licensed and operated in accordance with all applicable federal, state and local laws.

**3406.4.14 Valves.** All inlet and outlet nozzles of tanks shall be provided with a valve of steel construction of a 150 pounds per square inch (psig)(1034 kPa) rating located as close as practicable to the tank.

**3406.4.15 Dike construction.** All dike walls shall be of steel or reinforced concrete, designed to be [liquid tight] liquid-tight and to withstand a full hydraulic head, and constructed so as to afford ready access. Where stairways or other similar means are required to afford such access, they shall be constructed of steel or other approved noncombustible material.

**3406.4.16 Dike capacity.** Each single dike wall enclosure shall have a capacity equal to 110 percent of the tank's capacity. Tanks arranged in groups with a total capacity not exceeding 500,000 gallons (1892 500 L) may be enclosed in a single dike wall enclosure. Each group tank dike area shall have a net capacity not less than that of the largest tank plus 10 percent of the aggregate capacity of all other tanks served by the dike enclosure. That portion of the surface occupied by tank or tanks shall be included when computing the diked area.

**3406.4.17 Tank and piping test.** Tank and piping shall be tested at the time of installation at the owner's risk by his or her representative before a representative of the department as follows:

1. Aboveground, underground and mounded-over tanks shall be filled to capacity with water and maintained for not less than 24 hours.

2. Piping shall be hydrostatically tested to a pressure of 100 pounds per square inch (psig)(689.5 kPa) or 150 percent of the maximum operating pressure, whichever is greater, for 30 minutes.

**3406.4.17.1 Periodic test.** Underground piping shall be tested once every 10 years at the owner's risk by his or her representative before a representative of the department. Such test shall be made at 100 pounds per square inch (psig)(689.5 kPa) or 150 percent of the maximum operating pressure, whichever is greater, for 30 minutes.

**3406.5 Bulk transfer and process transfer operations.** Bulk transfer and process transfer operations shall be subject to the approval of the commissioner and be [in accordance with Sections 3406.5.1 through 3406.5.4.4. Liquid] conducted in compliance with the requirements of FC 3406.5.1 through 3406.5.18.3, except that liquid motor fuel-dispensing facilities shall comply with the requirements of FC Chapter 22.

**[3406.5.1 General.** The provisions of Sections 3406.5.1.1 through 3406.5.1.16 shall apply to bulk transfer operations and process transfer operations; Sections 3406.5.2 and 3406.5.2.1 shall apply to bulk transfer operations; Sections 3406.5.3 through 3406.5.3.3 shall apply to process transfer operations; and Sections 3406.5.4 through 3406.5.4.4 shall apply to dispensing from cargo tanks and tank cars.]

**[3406.5.1.1] 3406.5.1 Location.** Bulk transfer and process transfer operations shall be conducted in approved locations. Tank cars shall be unloaded only on private sidings or railroad-siding facilities equipped for transferring flammable or combustible liquids. Cargo tank and tank car transfer facilities shall be separated from buildings, aboveground tanks, combustible materials, lot lines, public streets and private roads by a distance of 25 feet (7620 mm) for [Class I] flammable liquids and 15 feet (4572 mm) for [Class II and III] combustible liquids measured from the nearest position of any loading or unloading valve or connection. Buildings for pumps or shelters for personnel shall be considered part of the transfer facility.

**[3406.5.1.2] 3406.5.2 Weather protection canopies.** Where weather protection canopies are provided, they shall be constructed in accordance with [Section 2704.13] FC2704.13. Weather protection canopies shall not be located within 15 feet (4572 mm) of a building or combustible material or within 25 feet (7620 mm) of building openings, lot lines, public streets or private roads.

**[3406.5.1.3] 3406.5.3 Ventilation.** Ventilation shall be provided to prevent accumulation of vapors in accordance with [Section 3405.3.7.5.1] FC3405.3.7.5.1.

**[3406.5.1.4] 3406.5.4 Sources of ignition.** Sources of ignition shall be controlled or eliminated in accordance with [Section 2703.7] FC2703.7.

**[3406.5.1.5] 3406.5.5 Spill control and secondary containment.** Areas where transfer operations are located shall be provided with spill control and secondary containment in accordance with [Section 3403.4] FC3403.4. The spill control and secondary containment system shall have a design capacity capable of containing the capacity of the largest tank compartment located in the area where transfer operations are conducted. Containment of the rainfall volume specified in [Section 2704.2.2.6] FC2704.2.2.6 is not required.

**[3406.5.1.6] 3406.5.6 Fire protection.** Fire protection shall be in accordance with [Section 3406.4.10.5] FC3406.4.10.5.

**[3406.5.1.7] 3406.5.7 Static protection.** Static protection shall be provided to prevent the accumulation of static charges during transfer operations. Bonding facilities shall be provided during the transfer through open domes where [Class I] flammable liquids are transferred, or where [Class II and III] combustible liquids are transferred into cargo tanks or tank cars which could contain vapors from previous cargoes of [Class I] flammable liquids. Protection shall consist of a metallic bond wire permanently electrically connected to the fill stem. The fill pipe assembly shall form a continuous electrically conductive path downstream from the point of bonding. The free end of such bond wire shall be provided with a clamp or equivalent device for convenient attachment to a metallic part in electrical contact with the cargo tank or tank car. For cargo tanks, protection shall consist of a flexible bond wire of adequate strength for the intended service and the electrical resistance shall not exceed 1 megohm. For tank cars, bonding shall be provided where the resistance of a tank car to ground through the rails is 25 ohms or greater. Such bonding connection shall be fastened to the cargo tank or tank car before dome covers are raised and shall remain in place until filling is complete and all dome covers have been closed and secured.

**Exceptions:**

1. Where cargo tanks or tank cars are loaded exclusively with products not having a static-accumulating tendency, such as asphalt, cutback asphalt, most crude oils, residual oils and water-miscible liquids.

2. When [Class I] flammable liquids are not handled at the transfer facility and the cargo tanks are used exclusively for [Class II and III] combustible liquids.

3. Where cargo tanks or tank cars are loaded or unloaded through closed top or bottom connections when the hose is conductive.

**[3406.5.1.7.1] 3406.5.7.1 Filling through open domes.** Filling through open domes into the tanks of cargo tanks or tank cars that contain vapor-air mixtures within the flammable range, or where the liquid being filled can form such a mixture, shall be by means of a downspout which extends to near the bottom of the tank. It shall be unlawful to fill a cargo tank or tank car with gasoline through an open dome.

**[3406.5.1.8] 3406.5.8 Stray current protection.** Tank car loading facilities where Class I, II or IIIA liquids are transferred through open domes shall be protected against stray currents by permanently bonding the pipe to at least one rail and to the transfer apparatus. Multiple pipes entering the transfer areas shall be permanently electrically bonded together. In areas where excessive stray currents are known to exist, all pipes entering the transfer area shall be provided with insulating sections to isolate electrically the transfer apparatus from the pipelines.

**[3406.5.1.9] 3406.5.9 Top loading.** When top loading a cargo tank with Class I and II liquids without vapor control, valves used for the final control of flow shall be of the self-closing type and shall be manually held open except where automatic means are provided for shutting off the flow when the tank is full. When used, automatic shutoff systems shall be provided with a manual shutoff valve located at a safe distance from the loading nozzle to stop the flow if the automatic system fails. When top loading a cargo tank with vapor control, flow control shall be in accordance with [Section 3406.5.1.10] FC3406.5.10. Self-closing valves shall not be tied or locked in the open position.

**[3406.5.1.10] 3406.5.10 Bottom loading.** When bottom loading a cargo tank or tank car with or without vapor control, a positive means shall be provided for loading a predetermined quantity of liquid, together with an automatic secondary shutoff control to prevent overfill. The connecting components between the transfer equipment and the cargo tank or tank car required to operate the secondary control shall be functionally compatible.

> **[3406.5.1.10.1] 3406.5.10.1 Dry disconnect coupling.** When bottom loading a cargo tank, the coupling between the liquid loading hose or pipe and the cargo tank piping shall be a dry disconnect coupling.
>
> **[3406.5.1.10.2] 3406.5.10.2 Venting.** When bottom loading a cargo tank or tank car that is equipped for vapor control and vapor control is not required or used for the product being loaded, the tank shall be vented to the atmosphere to prevent pressurization of the tank. Such venting shall be at a height equal to or greater than the top of the cargo tank or tank car.
>
> **[3406.5.1.10.3] 3406.5.10.3 Vapor-tight connection.** Connections to the plant vapor control system shall be designed to prevent the escape of vapor to the atmosphere when not connected to a cargo tank or tank car.
>
> **[3406.5.1.10.4] 3406.5.10.4 Vapor recovery and processing equipment.** Vapor recovery and processing equipment at bulk plants and terminals shall comply with the requirements of [Section 3406.8] FC3406.8.

**[3406.5.1.11] 3406.5.11 Switch loading.** Cargo tanks or tank cars which have previously contained [Class I] flammable liquids shall not be loaded with [Class II or III] combustible liquids until such tanks or cars and all piping, pumps, hoses and meters connected thereto have been completely drained and flushed.

**[3406.5.1.12] 3406.5.12 Loading racks.** Where provided, loading racks, stairs or platforms shall be constructed of noncombustible materials. Buildings for pumps or for shelter of loading personnel are allowed to be part of the loading rack. Wiring and electrical equipment located within 25 feet (7620 mm) of any portion of the loading rack shall be in accordance with [Section 3403.1.1] FC3403.1.1.

**[3406.5.1.13] 3406.5.13 Transfer apparatus.** Bulk and process transfer apparatus shall be of an approved type.

**[3406.5.1.14] 3406.5.14 [Inside buildings] Indoor transfers.** Cargo tanks and tank cars shall not be located indoors while transferring [Class I, II or III] flammable or combustible liquids.

**Exception:** Cargo tanks are allowed under weather protection canopies and canopies of automotive liquid motor fuel-dispensing facilities.

**[3406.5.1.15] 3406.5.15 Cargo tank and tank car [certification].** Cargo tanks and tank cars shall be certified and permitted in accordance with this section.

**3406.5.15.1 DOTn certification.** Certification shall be maintained for cargo tanks and tank cars in accordance with the regulations of the United States Department of Transportation, as set forth in Parts 100-[178] 180.

**[3406.5.1.15.1 Loading and unloading from cargo tanks.] 3406.5.15.2 Department permit.** It shall be unlawful for any person to load a cargo tank with any flammable liquid or Class II or IIIA combustible liquid or to receive or accept delivery of such products in or from a cargo tank, except in or from a cargo tank for which a department permit has been issued and is displayed pursuant to the provisions of FC Chapter 27. The provisions of this section shall not prohibit the loading of a cargo tank with any liquid products with a flash point over 200°F (93°C) nor the receiving or acceptance of delivery from a cargo tank of any liquid products with a flash point over 200°F (93°C), provided that such cargo tank is designed, constructed, and equipped in accordance with the regulations of the United States Department of Transportation governing the transportation of dangerous articles by common, contract, private and proprietary carriers engaged in interstate commerce.

**[3406.5.1.16 Cargo tank and tank car stability] 3406.5.16 Securing cargo tanks and tank cars from movement.** Cargo tanks and tank cars shall be [stabilized against] secured from movement during loading and unloading [in accordance with Sections 3406.5.1.16.1 through 3406.5.1.16.3] operations by setting the cargo tank's or tank car's brakes and by chocking or blocking the wheels. At least two wheel chocks not less than 5 inches by 5 inches by 12 inches (127 mm by 127 mm by 305 mm) in size and dished to fit the contour of the tires shall be used for cargo tanks.

**[3406.5.1.16.1 Cargo tanks.** When a cargo tank is parked for loading or unloading, such cargo tank shall be secured in a manner that will prevent unintentional movement.

**3406.5.1.16.2 Chock blocks.** At least two chock blocks not less than 5 inches by 5 inches by 12 inches (127 mm by 127 mm by 305 mm) in size and dished to fit the contour of the tires shall be used during transfer operations of cargo tanks.

**3406.5.1.16.3 Tank cars.** Brakes shall be set and the wheels shall be blocked to prevent rolling.]

**[3406.5.2 Bulk transfer.** Bulk transfer shall be in accordance with Sections 3406.5.1 and 3406.5.2.1.]

**[3406.5.2.1] 3406.5.17 Vehicle motor**. Motors of cargo tanks or tank cars shall be shut off during the making and breaking of hose connections and during the unloading operation except when unloading is performed with a pump deriving its power from the cargo tank motor.

> **[Exception:** Where the unloading is performed with a pump deriving its power from the cargo tank motor.]

**[3406.5.3 Process transfer.** Process transfer shall be in accordance with Section 3406.5.1 and Sections 3406.5.3.1 through 3406.5.3.3.]

**[3406.5.3.1] 3406.5.18 Piping, valves, hoses and fittings. [Piping]** During process transfers, piping, valves, hoses and fittings which are not a part of the cargo tank or tank car shall be designed and installed in accordance with [Section 3403.6] FC3403.6. Caps or plugs which prevent leakage or spillage shall be provided at all points of connection to transfer piping.

> **[3406.5.3.1.1] 3406.5.18.1 Shutoff valves.** Approved automatically or manually activated shutoff valves shall be provided where the transfer hose connects to the process piping, and on both sides of any exterior fire-resistance-rated wall through which the piping passes. Manual shutoff valves shall be arranged such that they are readily accessible from grade. Valves shall not be locked in the open position.
>
> **[3406.5.3.1.2] 3406.5.18.2 Hydrostatic relief.** Hydrostatic pressure-limiting or relief devices shall be provided where pressure buildup in trapped sections of the system could exceed the design pressure of the components of the system. Devices shall relieve to other portions of the system or to another approved location.
>
> **[3406.5.3.1.3] 3406.5.18.3 Antisiphon valves.** Antisiphon valves shall be provided when the system design would allow siphonage.

**[3406.5.3.2 Vents.** Normal and emergency vents shall be maintained in good working order at all times.

> **3406.5.3.3 Motive power.** Motors of cargo tanks and tank cars shall be shut off during the making and breaking of hose connections and during the unloading operation.
>
> > **Exception:** When unloading is performed with a pump deriving its power from the cargo tank motor.

**3406.5.4 Dispensing from cargo tanks and tank cars.** It shall be unlawful to dispense any flammable or combustible liquid from a cargo tank or tank car into the fuel tanks of motor

vehicles, except as authorized by and conducted in accordance with Sections 3406.5.4.3 and 3406.5.4.4.

**3406.5.4.1** Reserved.

**3406.5.4.2** Reserved.

**3406.5.4.3 Aircraft fueling.** Transfer of liquids from aircraft-refueling vehicles to the fuel tanks of aircraft shall be in accordance with Chapter 11.

**3406.5.4.4 Fueling of vehicles at construction sites.** The transfer of liquid from cargo tanks to construction equipment at construction sites shall be conducted in accordance with Section 3406.2.8.]

**3406.6** Reserved.

**3406.7** Reserved.

**3406.8 Vapor recovery and processing systems for use in bulk plants and terminals.** Vapor recovery and processing systems installed at bulk plants and terminals, including systems associated with piping, loading racks, dikes, fire detection and fire protection equipment, shall be designed, installed, operated and maintained in accordance with [Sections] FC 3406.8.1 through 3406.8.3. Such compliance shall be required for all vapor recovery processing systems, whether installed voluntarily or pursuant to the requirements of the United States Environmental Protection Agency, United States Coast Guard or New York State Department of Environmental Conservation. The requirements of FC 3406.8 through 3406.8.3 apply to both new and existing facilities.

**3406.8.1 General.** Vapor recovery and processing systems shall comply with the requirements of [Section 5.10 of] NFPA 30, except as otherwise provided in this section, the regulations of the United States Environmental Protection Agency, United States Coast Guard and New York State Department of Environmental Conservation, as applicable, and the following general requirements:

1. Electrical equipment shall comply with the requirements of the Electrical Code. Upon request, proof of compliance with the Electrical Code shall be filed with the department.

2. The installation of any refrigerating system shall comply with the requirements of FC Chapter 6 and the Mechanical Code.

3. All tanks and piping shall be grounded. Static bonding connections shall be made between loading arm, vehicle and vapor recovery unit. An interlock shall be provided to prevent pumping operations until properly grounded.

4. All product pumps and compressors shall be of a type approved for such use.

5. Pressure vessels shall conform to the ASME Boiler and Pressure Vessel Code. The manufacturer data sheet for the pressure vessel shall be maintained on the premises and made available for inspection to any representative of the department.

6. Knock-out vessels shall be provided with a high liquid level sensor that will initiate shutdown of the liquid transfer into the vessel and the vapor recovery or processing system.

7. A flame arrestor and mist eliminator element shall be provided at final emission vent.

8. A fire detection system shall be provided that will initiate shutdown of the vapor recovery and processing system in the event of fire.

9. An annunciator panel with audible and visible alarms shall be provided in the dispatcher's office. The annunciator panel shall monitor and shut down the vapor recovery and processing system upon any equipment malfunction, including a malfunction of the fire detection system.

10. Insulation material shall be noncombustible.

11. Lightning protection shall be provided in accordance with NFPA 780.

12. Pressure relief valves shall be provided on all pressure vessels and wherever else required by the system design, and shall be sized in accordance with the ASME Boiler and Pressure Vessel Code. Pressure relief valves shall discharge to a safe location. No shutoff valve [may] <u>shall</u> be [permitted] <u>installed</u> in the line of relief. Tanks and equipment shall have independent venting for over-pressure or vacuum conditions that might occur from malfunction of the vapor recovery or recovery unit.

13. A reinforced concrete base shall be provided and approved by the agency having jurisdiction.

14. Vapor recovery and processing systems shall be placed in an unpierced dike of such construction and capacity as the commissioner may prescribe. No drains shall be [permitted] <u>allowed</u>, and any drain pump used shall be manually activated.

15. Vapor recovery and processing systems shall be installed at least 25 feet (7620 mm) from bulk storage tanks, warehouses, loading racks, dispatchers' offices, transfer facilities, buildings housing fire protection systems, central heating plants or electrical distribution systems, other plant buildings, building lines and adjoining lot lines. When vessels in the vapor recovery and processing system operate in excess of 50 pounds per square inch gauge (psig)(345 kPa), but less than 150 pounds per square inch gauge (psig)(1034 kPa), the minimum distance shall be 50 feet (15 240 mm), unless a protective structure, such as masonry or concrete fire wall, is installed in the

line of sight between such vessel and the exposure, in which case the minimum distance of 25 feet (7620 mm) shall be applicable.

16. Vents on vapor-processing equipment shall be not less than 15 feet (4572 mm) from ground level, with outlets located and directed so that flammable vapors will disperse to below the lower flammable limit (LFL) before reaching a potential ignition source.

17. The vapor recovery and processing system shall be protected from physical damage, including damage by motor vehicles utilizing dikes, posts, or other approved means.

18. The entire vapor recovery and processing system shall be inspected for proper operation on a periodic basis, but not less than once every [six] 6 months, by a qualified person. Such inspection shall be documented in a log book maintained at the facility for such purpose.

19. Durable signs reading "DANGER—NO SMOKING, MATCHES, OPEN LIGHTS OR SPARKING DEVICES AT THIS EQUIPMENT" shall be conspicuously posted at or near the vapor recovery and processing system in addition to the "No Smoking" signs required throughout the facility.

20. One or more foam hydrants, yard hydrants, monitor nozzles and portable fire extinguishers having a minimum 40-B:C rating, shall be provided within 50 feet (15 240 mm) of the vapor recovery and processing system and shall be readily available for use.

21. All piping associated with a vapor recovery and processing system, including piping connecting such system to storage tanks, shall be hydrostatically tested to a pressure of 100 pounds per square inch gauge (psig)(690 kPa) or [1½] one and one-half (1.5) times the maximum working pressure, whichever is greater, for a period of 2 hours, and shall show no leaks. Such hydrostatic testing shall be conducted at the owner's risk by his or her representative before a representative of the department. In lieu of such hydrostatic testing, the commissioner may accept an affidavit from the manufacturer attesting to the integrity of piping integral to the vapor recovery and processing system.

22. Where a storage tank is connected to a vapor recovery and processing system, a mist eliminator shall be provided in the vapor line at or adjacent to the tank to remove entrained liquid and return same to the tank or an approved collection system.

23. The vapor recovery and processing system shall be designed to minimize and dissipate static electricity in accordance with NFPA 77.

**3406.8.2 Atmospheric condensation and refrigeration vapor recovery and processing systems.** A vapor condenser system shall be placed in an unpierced dike or within a concrete trench of adequate width and depth to hold at least 1 hour's vapor recovery.

**3406.8.3 Absorption vapor recovery and processing systems.** Absorption vapor recovery and processing systems shall comply with the following requirements:

1. A lean oil storage tank shall be protected by a foam fire extinguishing system.

2. The entire vapor recovery and processing system, including the lean oil storage tank, shall be placed in an unpierced dike. The height of the dike shall be based upon the size of the lean oil storage tank and shall have a capacity of at least 110[%] percent of such tank, but in any event not less than the maximum pumping capacity of the system for 20 minutes of operation.

3. Heaters used shall be of a type approved for such use and shall be equipped with an automatic [shut-off] shutoff device that activates upon reaching the high temperature limit for the absorption vapor recovery and processing system.

4. All absorbers, saturators, heat exchangers and condensers shall conform to ASME Boiler and Pressure Vessel Code and the provisions of FC Chapter 30.

5. A relief valve shall be provided for compressors, stripper columns and other pressure vessels.

6. Lean oil tanks and vapor vessels shall be constructed and installed in accordance with this chapter and API 650.

7. Upon installation, a vapor vessel bladder shall be pneumatically tested at [1¼] one and one quarter times the maximum operating pressure for 4 hours without leakage. A retest shall be performed annually. All such tests shall be conducted at the owner's risk by his or her representative before a representative of the department.

**3406.9 Cargo tank loading rack systems.** Loading rack systems shall be designed, installed, operated and maintained in accordance with the following requirements:

1. Any vapor recovery and processing system used in connection with a loading rack system shall comply with the requirements of [Sections] FC 3406.8.1 through 3406.8.3.

2. Loading racks shall be protected throughout by a fire extinguishing system as set forth in [Section 3406.4.10.5.1] FC3406.4.10.5.1.

3. Cargo tanks loaded at bulk plants or terminals shall be compatible with all safety features incorporated into the loading rack.

4. [Dry break] Dry-break adapters conforming to API standards shall be provided on the fill and vapor recovery lines. During loading, each cargo tank compartment shall be sealed except for the dry-break fill coupling and vapor recovery line.

5. An interlock shall be provided to prevent loading when the cargo tank vehicle motor is running and to prevent start up of the cargo tank vehicle motor during loading. Such interlock device shall further prevent the vehicle motor from starting before the product fill line and vapor return line have been disconnected.

6. An interlock device shall be provided so that no loading may take place unless the vapor recovery line is properly connected to the cargo tank.

7. Except when loading, protective caps shall cover all dry-break adapters as protection against the elements and physical damage from impact.

8. No more than [3] <u>three</u> compartments [may] <u>shall</u> be loaded at a time.

9. A two-stage preset meter shall be provided for each loading arm. Loading arms shall be equipped with manual or electronic dead-man control valves.

10. All electrical equipment shall be suitable for use in hazardous locations. The design of the electronic sending device shall be such that a source of higher voltage or current cannot be connected to same.

11 An approved overfill prevention system shall be provided at the loading rack and shall be designed to ensure at least 1[%] <u>percent</u> vapor space per compartment. In no event shall the vapor space in a compartment be less than 40 gallons (151 L) in capacity.

12. A liquid detector shall be provided in the vapor return line, to automatically shut off the loading system if liquid reaches the vapor line.

13. All components of the fill and vapor recovery loading arm assemblies making contact with the cargo tank, including the loading head, shall be constructed of [spark-proof] <u>sparkproof</u> material.

14. The fill line and the vapor recovery line in loading arm assemblies shall be of the same diameter. The maximum velocity in any liquid line shall not exceed 15 feet per second (4572 mm per second).

15. The fill line and vapor recovery line in loading arm assemblies shall be constructed of rigid steel, except that flexible hose may be used for fill or vapor recovery loading assemblies provided that such hose is no longer in length than necessary, has an inner diameter no greater than 4 inches (102 mm), is of steel construction and is rated for not less than 800 pounds per square inch gauge (psig)(5617 kPa).

16. Cargo tanks shall not be filled with flammable or combustible liquids unless one or more devices, equipment or systems are provided to immediately shut down the flow of such liquid in the event of cargo tank overfilling, faulty dome seal, cargo tank pressure exceeding 3 pounds per square inch gauge (psig)(21.7 kPa) and electrical grounding fault.

17. The loading arm assembly shall be grounded.

18. The loading arm assembly shall be designed to break away from the cargo tank without rupture should the cargo tank move with the loading arm still in place.

19. All liquid and vapor piping at the loading arm assembly shall be hydrostatically tested to a pressure of 100 pounds per square inch gauge (psig)(690 kPa) or [1½] one and one-half (1.5) times the maximum working pressure, whichever is greater, for a period of 2 hours. Such test shall be conducted at the owner's risk by his or her representative before a representative of the department.

20. The loading head unit seal against the cargo tank shall not exceed a force of 200 pounds (90.8 kg) or a pressure of 5 pounds per square inch gauge (psig)(34.5 kPa).

21. A mist eliminator shall be provided in the vapor line at or adjacent to the loading arm to remove entrained liquid and return same to the cargo tank, or to an approved collection system.

22. Cargo tanks containing flammable liquids in any compartment shall not be loaded with combustible liquids unless the loading rack is protected by a fire extinguishing system in accordance with this chapter.

23. The loading rate of combustible liquids into cargo tanks shall be such that the initial velocity in the liquid line is 3 feet per second ([914.4] 914 mm per second) and the final rate does not exceed 15 feet per second (4572 mm per second).

# CHAPTER 35
# FLAMMABLE GASES

## SECTION FC 3501
## GENERAL

**3501.1 Scope.** This chapter shall govern the storage, handling and use of flammable gases.

**Exceptions:**

1. Flammable gases used as refrigerants in refrigerating systems, as set forth in [Section 606] FC606.

2. Liquefied petroleum gases, as set forth in FC Chapter 38.

3. Fuel-gas systems, as set forth in the construction codes, including the Fuel Gas Code, other than gaseous hydrogen systems.

4. [Flammable] Compressed natural gas motor fuel-dispensing facilities as set forth in [Chapter 22] FC2208.

5. Pyrophoric gases, as set forth in FC Chapter 41.

[5] 6. Liquefied natural gas (LNG) as set forth in FC Chapter 32.

**3501.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**3501.3 General.** Flammable gases shall be stored, handled and used in accordance with this chapter, [and] FC Chapter 30 and NFPA 55. Cryogenic fluids shall additionally comply with the requirements of FC Chapter 32.

**[3501.3.1 Gaseous hydrogen.** Gaseous hydrogen systems at consumer sites shall additionally comply with the requirements of NFPA 50A.]

**3501.4 Supervision.** Except as otherwise provided for ethylene oxide, compressed natural gas and methane recovery, the handling and use of flammable gases in quantities requiring a permit shall be under the personal supervision of a certificate of fitness holder. The storage of flammable gases in quantities requiring a permit shall be under the general supervision of a certificate of fitness holder.

**3501.4.1 Ethylene oxide.** The handling and use of flammable compositions of ethylene oxide[,] in any amount, including the cleaning and maintenance of the sterilizer, shall be under the personal supervision of a person holding a certificate of fitness.

**3501.4.2 Compressed natural gas.** The connecting and disconnecting of CNG containers shall be performed by a person holding a certificate of fitness. The handling and use of CNG containers in quantities requiring a permit, or for purposes of operating a tar kettle, conducting torch operations, curing concrete, drying plaster and similar applications, or conducting hot air balloon operations, shall be under the personal supervision of a person holding a certificate of fitness applicable to such operation. In addition, a pilot's license issued by the United States Federal Aviation Administration shall be required for hot air balloon operations involving the handling and use of CNG.

**3501.4.3 Methane recovery.** Methane recovery facilities shall be operated under the personal supervision of a person holding a certificate of fitness to recover methane gas from landfills.

**3501.5 Prohibitions.** It shall be unlawful to:

1. fill a container with a flammable gas, except as authorized by this code or the rules, including FC 309.5.4, 2208, 2209 and 3507;

2. manufacture, generate or compress acetylene;

3. use an acetylene generator; or

4. fill balloons with hydrogen or any other flammable gas, or to possess, store, handle, use, transport, or sell any such balloon.

## SECTION FC 3502
## DEFINITIONS

**3502.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**FLAMMABLE GAS.** A material which [is] has a boiling point and becomes a gas at 68°F (20°C) or less at 14.7 pounds per square inch absolute (psia) (101 kPa) of pressure which:

1. Is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air, in accordance with testing procedures set forth in ASTM E 681; or

2. Has a flammable range at 14.7 psia (101 kPa) with air of at least 12 percent, regardless of the lower explosive limit, in accordance with testing procedures set forth in ASTM E 681.

**FLAMMABLE LIQUEFIED GAS.** A liquefied compressed gas which, under a charged pressure, is partially liquid at a temperature of 68°F (20°C) and which is a flammable gas.

**METAL HYDRIDE.** A chemical compound composed of one or more hydrogen-absorbing metallic elements, and hydrogen.

**METAL HYDRIDE HYDROGEN STORAGE SYSTEM.** A closed system designed to store and release hydrogen through the use of a metal hydride.

**MICROTURBINE.** A turbine-driven electrical generator with an electric generating capacity of not more than 500 kW, fueled by piped natural gas that is compressed by ancillary compressing equipment to a pressure exceeding 6 psig (689.5 kPa).

## SECTION FC 3503
## GENERAL REQUIREMENTS

**3503.1 Quantities not exceeding the maximum allowable quantity per control area**. Flammable gases in amounts not exceeding the maximum allowable quantity per control area set forth in [Section 2703.1] FC2703.1 shall be stored, handled and used in accordance with [Sections] FC 2701, 2703, 3501, 3503, 3506, 3507 and 3508.

**3503.1.1 Special limitations for indoor storage, handling and use.** Flammable gases shall not be stored, handled or used in Group A, B office, E, I or R occupancies.

**Exceptions:**

1. Containers not exceeding a capacity of 250 SCF (7.08 $m^3$) used for maintenance purposes or operation of equipment.

2. Food service operations conducted in accordance with [Section 3803.2.1.7] FC3803.2.1.7.

**3503.1.1.1 Medical gases.** It shall be unlawful to store, handle or use flammable gas as an anesthetizing agent. Medical gas systems using flammable gas for other approved purposes[,] shall be located in medical gas storage rooms or gas cabinets as set forth in [Section 3006] FC3006.

**3503.1.1.2 Aggregate quantity.** The aggregate quantities of flammable gases used for maintenance purposes and operation of portable equipment shall not exceed the maximum allowable quantity per control area set forth in FC Table 2703.1.1(1).

**3503.1.2 Storage containers.** Containers for flammable gases shall be designed, constructed, installed, operated and maintained in accordance with FC Chapter 30.

**3503.1.3 Emergency shutoff.** Flammable gas piping systems shall be provided with approved manual or automatic emergency shutoff valves that can be activated at each point of use and at each source of supply.

**3503.1.3.1 Shutoff at source.** A manual or automatic fail-safe emergency shutoff valve shall be installed on supply piping at the container or other source of supply. Manual or automatic valves on the containers supplying the flammable gas may serve as the emergency shutoff valve when the containers are the sole source of supply and are not manifolded.

**3503.1.3.2 Shutoff at point of use.** A manual or automatic emergency shutoff valve shall be installed on the supply piping at the point of use or at a point where the equipment using the gas is connected to the supply system.

**3503.1.4 [Ignition source control] Sources of ignition.** [Ignition sources] Protection against sources of ignition in areas [containing] in which flammable gases are being stored or used shall be [controlled] provided in accordance with [Section 2703.7] FC2703.7 and in compliance with the following requirements:

[1.] **3503.1.4.1 Static-producing equipment.** Static-producing equipment located in flammable gas storage areas shall be grounded.

[2.] **3503.1.4.2 Signs.** "No Smoking" signs shall be posted at entrances to and in areas containing flammable gas containers, piping and equipment in accordance with [Section 2703.6] FC2703.7.1.

**3503.1.5 Electrical.** Electrical wiring and equipment shall be installed and maintained in accordance with the Electrical Code.

**3503.1.5.1 Bonding of electrically conductive components.** Exposed noncurrent-carrying metal components, including metal gas piping, that are part of a flammable gas supply system located in a hazardous location shall be bonded to a grounded conductor in accordance with the provisions of the Electrical Code.

**3503.1.5.2 Static-producing equipment.** Static-producing equipment located in flammable gas storage or use areas shall be grounded.

**[3503.1.5] 3503.1.6 Liquefied flammable gases and flammable gases in solution.** Containers of liquefied flammable gases and flammable gases in solution shall be positioned in the upright position or positioned so that the pressure relief valve is in direct contact with the vapor space of the container.

**Exceptions:**

1. Containers of flammable gases in solution with a capacity of 1.3 gallons (5 L) or less.

2. Containers of flammable liquefied gases, with a capacity not exceeding 1.3 gallons (5 L), designed to preclude the discharge of liquid from safety relief devices.

**3503.2 Quantities exceeding the maximum allowable quantity per control area.** The storage, handling and use of flammable gases in amounts exceeding the maximum allowable quantity per control area set forth in [Section 2703.1] FC2703.1 shall be in accordance with FC Chapter 27 and this chapter.

**[3503.3 Filling of containers.** No container shall be filled in the city, except as authorized by this code or the rules. It shall be unlawful for any person to fill balloons with hydrogen or any other flammable gas, or to possess, store, handle, use, transport, or sell any such balloon.]

## SECTION FC 3504
## STORAGE

**3504.1 Indoor storage.** Indoor storage of flammable gases in amounts exceeding the maximum allowable quantity per control area set forth in FC Table 2703.1.1(1), is not allowed where outdoor storage is available on the premises. Indoor storage shall be in accordance with [Sections] FC 2701, 2703 and 2704, and this chapter.

**3504.1.1 Explosion control.** Buildings or portions thereof containing flammable gases shall be provided with explosion control in accordance with [Section 911] FC911.

**3504.1.2 Maximum storage quantity.** Storage of flammable gases shall not exceed 15,000 SCF (424.8 $m^3$) in any building or structure, except at construction sites where larger quantities of CNG are authorized by rule.

**3504.1.3 Flammable gas storage of 3,500 SCF (99.12 $m^3$) or less.** Indoor storage shall be protected against damage or injury from falling objects or surrounding activity, and be located not less than:

1. 20 feet (6096 mm) from all classes of flammable and combustible liquids, oxidizing gases and readily combustible materials, such as paper and combustible fibers.

2. 25 feet (7620 mm) from open flames, ordinary electrical equipment or other sources of ignition.

3. 50 feet (15 240 mm) from air-conditioning equipment, air compressors and intakes of ventilation.

4. 50 feet (15 240 mm) from other flammable gas storage.

**3504.1.4 Flammable gas storage of more than 3,500 SCF (99.12 $m^3$).** [There may be] Except as otherwise provided in the rules with respect to construction sites, a storage room may contain more than one storage [location of 3,500 SCF (99.12 $m^3$) in a room] area, provided that each storage [location] area does not exceed 3,500 SCF (99.12 $m^3$) and [the storage locations] storage areas are separated from each other by at least 50 feet (15 240 mm) or an approved masonry barrier having a minimum fire resistance rating of 2 hours. Each such storage [location] area shall additionally comply with the requirements of [Section] FC 3504.1.2 and 3504.1.3.

**3504.2 Outdoor storage.** Outdoor storage of flammable gases in amounts exceeding the maximum allowable quantity per control area set forth in FC Table 2703.1.1(3) shall be limited to a maximum storage of 3,500 SCF (99.12 $m^3$) except where the provisions of this code or the rules authorize storage in larger quantities at construction sites. Outdoor storage of flammable gases shall be in accordance with [Sections] FC 2701, 2703 and 2704, and this chapter.

**3504.2.1 Location of outdoor storage areas.** Outdoor storage areas for flammable gases shall be located at or above grade level, and in accordance with [Sections 3504.2.1.1] FC3504.2.1.1 and FC Table 3504.2.1, as applicable.

**3504.2.1.1 Proximity to hazards.** Storage shall not be located where the stored flammable gases would be exposed to the following hazards in the event of the failure of their structure or containment systems:

1. Electric power lines.

2. Piping containing flammable or combustible liquids.

3. [piping] Piping containing flammable gases.

4. [piping] Piping containing oxidizing materials.

**FC TABLE 3504.2.1**
**FLAMMABLE GASES DISTANCE FROM OUTDOOR STORAGE AREAS TO EXPOSURES**

| TYPE OF OUTDOOR EXPOSURE | FLAMMABLE GAS STORAGE AREA MORE THAN 1500 SCF UP TO MAXIMUM 3500 SCF MINIMUM DISTANCE TO OUTDOOR EXPOSURE (FEET) |
|---|---|
| Building or structure of combustible construction | 10[a] |
| Building or structure of noncombustible construction | 5[a] |
| Building openings | 10 |
| Flammable and combustible liquids<br>Aboveground – 1,000 gallons or less | 10[a] |
| Flammable and combustible liquids<br>Aboveground – in excess of 1,000 gallons | 20[a] |
| Flammable and combustible liquids<br>Underground tank – 1,000 gallons or less | 10[a] |
| Flammable and combustible liquids<br>Underground tank – 1,000 gallons or less<br>Vent or fill opening of tank | 15[a] |
| Flammable and combustible liquids<br>Underground tank – in excess of 1,000 gallons | 15[a] |
| Flammable and combustible liquids<br>Underground tank – in excess of 1,000 gallons<br>Vent or fill opening of tank | 15[a] |
| Flammable gas storage area, any pressure 1,500 SCF or less | 10[a] |
| Flammable gas storage area, any pressure<br>More than 1,500 SCF up to maximum 3,500 SCF | 20[a] |
| Oxygen storage – 20,000 SCF or less | In accordance with NFPA 51[a] |
| Oxygen storage – in excess of 20,000 SCF | In accordance with NFPA [50] 55 [a] |
| Combustible material or combustible waste | 10[a] |
| Air compressor intakes or inlets to ventilating or air-conditioning equipment | 5 |
| Group A occupancies and public gathering places | 25 |
| Public sidewalks and parked motor vehicles | 10 |
| Public streets, private roads and lot lines | 10[a] |

For SI: 1 foot = 304.8 mm, 1 cubic foot = 0.02832 $m^3$, 1 gallon = 3.785 L.

a. The minimum required distances shall be reduced to 5 feet when protective structures having a minimum fire-resistance rating of 2 hours interrupt the line of sight between the container and the exposure. The protective structure shall be at least 5 feet from the exposure. The configuration of the protective structure shall be designed to allow natural ventilation to prevent the accumulation of hazardous gas concentrations.

**3504.2.2 Proximity to flammable and combustible liquid storage.** Storage within 50 feet (15 240 mm) of aboveground storage of flammable and combustible liquids shall be located on ground higher than such storage, except where dikes, diversion curbs, grading or walls are used to prevent these liquids from accumulating under the flammable gas storage.

**3504.2.3 Electrical equipment.** Electrical equipment within 3 feet (914 mm) in any direction of an outdoor flammable gas storage area shall comply with the Class I, Division 2 wiring requirements of the Electrical Code for hazardous locations, unless such electrical equipment is separated from such area by a wall or other solid partition having no openings.

## SECTION FC 3505
## USE

**3505.1 General.** Flammable gases in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1) or 2703.1.1(3) shall be used in accordance with [Sections] FC 2701, 2703 and 2705, and this chapter.

## SECTION FC 3506
## ETHYLENE OXIDE

**3506.1 Scope.** This section shall govern the storage, handling and use of flammable gas containing ethylene oxide used for sterilization purposes.

**3506.2 General.** Flammable gases containing ethylene oxide used for sterilization purposes shall be stored, handled and used in compliance with the requirements of this chapter and FC Chapter 30. Ethylene oxide shall additionally be stored, handled and used in compliance with the requirements of NFPA 55.

**3506.3 Design and installation requirements.** The design and installation of sterilization systems shall comply with the requirements of [Sections] FC 3506.3.1 through 3506.3.7.

**3506.3.1 Sterilizer design.** The sterilization equipment shall be of a type listed by an approved testing laboratory, and approved by the department, and having a chamber volume of not more than 10 cubic feet (0.2832 $m^3$).

**3506.3.2 Sprinkler protection.** Sterilization systems shall be located in a room or other area protected by a sprinkler system.

**3506.3.3 Proximity to hazard.** Sterilization systems shall be installed away from sources of heat and ignition, means of egress and areas of activity, and shall not be installed in any room or other area in which flammable liquids or flammable gases, other than sterilizer gases, are stored, handled or used.

**3506.3.4 Sterilization system room and local area ventilation.** Room ventilation and local area ventilation shall comply with the requirements of [Sections] FC 3506.3.4.1 and 3506.3.4.2.

**3506.3.4.1 Room ventilation.** Rooms in which sterilization systems are installed shall be equipped with ventilation systems that provide not less than 10 air changes per hour.

**3506.3.4.2 Local area ventilation.** When a local ventilation system is required by the regulations of the United States Department of Labor, such ventilation system shall comply with the following requirements:

1. The discharge point of the ventilation system shall be at least 25 feet (7620 mm) from pedestrian traffic, building openings or sources of ignition. Prevailing wind direction and location of adjacent buildings shall be considered in selecting the discharge point.

2. At each discharge location there shall be a durable sign, conspicuously posted, that reads "DANGER—FLAMMABLE GAS."

3. Signage shall appear on the duct at intervals of not more than 20 feet (6090 mm) and at least once in each room and each story traversed by the duct. Such signage shall be by means of metal tags, stenciling, stamping or adhesive markers, which shall be attached or imprinted in a manner that is not readily removable.

4. A [spark-proof] sparkproof centrifugal fan with backward curved blades designed for continuous operation shall be used, and the impeller and the ring around the impeller drive shaft shall be [non-ferrous] nonferrous.

**3506.3.5 Vent lines.** Sterilization system vent lines shall be designed and installed in accordance with the following requirements:

1. The discharge point of vent lines shall be at least 25 feet (7620 mm) from pedestrian traffic, building openings and sources of ignition. Prevailing wind direction and location of adjacent buildings shall be considered in selecting the discharge point.

2. At each discharge location there shall be a durable sign, conspicuously posted, that reads "Danger—Flammable Gas."

3. Signage shall appear on the vent line at intervals of not more than 20 feet ([6090] 6096 mm) and shall be present in at least one place in each room and in each story traversed by the duct.

4. A [spark-proof] sparkproof centrifugal fan with backward curved blades designed for continuous operation shall be used, and the impeller and the ring around the impeller drive shaft shall be [non-ferrous] nonferrous.

5. Vent terminals shall be provided with a flash arrester, provided that the manufacturer of the sterilizer or the testing laboratory does not prohibit same. The flash arrester, when used, shall be constructed of material compatible with ethylene oxide and installed in such a manner as not to restrict gas flow.

**3506.3.6 Storage.** [The storage of flammable] Flammable gases containing ethylene oxide shall [comply] be stored in compliance with the following requirements:

1. Only containers of the type, composition and size approved by the manufacturer for the particular model of sterilization system shall be stored or used.

2. A one-day supply of flammable gases that [contain] contains ethylene oxide, but not more than 12 containers, may be stored in its original packaging in the room or other area in which the sterilizer is installed, provided that:

2.1. Such room or other area is above grade.

2.2. The containers are stored at room temperature, away from sources of heat and ignition.

2.3. The containers are stored not less than 5 feet (1524 mm) from the sterilizer, on open shelving protected by a sprinkler system or in an approved flammable liquid storage cabinet.

2.4. In addition to the amounts specified in [Section 3506.3.6(2)] FC3506.3.6(2), a maximum of 3 gallons (11.4 L) liquid volume (9908 grams, or [(]21.8 pounds[)]) of flammable gases that contain ethylene oxide may be stored in their original packaging in a flammable gas storage room, provided that such storage room meets the requirements of the construction codes, including the Building Code, is located above grade, is away from sources of heat and ignition, and is protected by a sprinkler system. Storage of flammable gases that contain ethylene oxide, in excess of 3 gallons (11.4 L) liquid volume, shall be in a detached above grade building designed for the storage of flammable gas in accordance with this chapter and the construction codes. For purposes of complying with the foregoing, 3-gallon (11.4 L) storage limitation, FC Table 3506.3.6 shall be used to determine the quantity of ethylene oxide being stored[:].

**FC TABLE 3506.3.6**
**MAXIMUM NUMBER OF ETHYLENE OXIDE CONTAINERS NOT EXCEEDING 3 GALLON LIMIT**

| Quantity of gas per container (grams) | Maximum number of containers not exceeding 3 gallon limit |
|---|---|
| 100 | 99 |
| 134 | 73 |
| 150 | 66 |
| 170 | 58 |
| 200 | 49 |

For SI: 1 gallon = 3.785 L.

**3506.3.7 [Installation documentation certification] Certification of installation.** The owner of the facility in which the sterilization system is installed shall maintain on the premises and make available for inspection by any representative of the department a written certification from the manufacturer of the sterilizer, the certificate of fitness holder responsible for the supervision of the sterilization system and/or a New York State licensed professional engineer, that the installation conforms to the requirements of the manufacturer, the approved testing laboratory that listed the sterilizer and this section.

**3506.4 Operation and maintenance.** Sterilization systems shall be operated and maintained [the] in compliance with the following requirements:

1. The quantity of flammable gases that contain ethylene oxide connected to the sterilizer at any one time shall be no more than required for a single sterilization cycle and in no [case] circumstance more than 200 grams (7 ounces) net weight. Containers shall be opened only while connected to the sterilizer in the manner specified by the manufacturer of the sterilizer.

2. Empty or underweight containers, containers with past expiration dates, and containers which fail to open in the sterilizer shall be kept separate from other containers and promptly removed from the premises and lawfully disposed of. Containers shall not be incinerated.

**3506.5 Portable fire extinguishers.** At least one portable fire extinguisher having a minimum 40 B:C rating shall be provided in the area where flammable gases containing ethylene oxide are stored or used. The maximum travel distance to such extinguisher shall not exceed 30 feet (9144 mm).

## SECTION 3507
## METAL HYDRIDE HYDROGEN STORAGE SYSTEMS

**3507.1 General.** Metal hydride hydrogen storage systems shall be designed, installed, operated and maintained in accordance with this section. Metal hydride hydrogen storage systems may only be used to provide motive power on powered industrial trucks.

**3507.2 Hazard classification.** Metal hydride hydrogen storage systems shall be classified pursuant to FC 2701.2 based on the hazard presented by the hydrogen it absorbs and/or stores, without regard for the metal hydride content.

**3507.3 Design requirements.** Metal hydride hydrogen storage systems shall be designed and installed in compliance with the requirements of this section.

**3507.3.1 Listing or approval for intended use.** Metal hydride hydrogen storage systems shall either be listed for the purpose for which they are used or be of the type for which a certificate of approval has been issued.

**3507.3.2 Containers.** Containers designed for use in metal hydride hydrogen storage systems shall be designed to be filled, refilled or emptied of metal hydride only by the original equipment manufacturer or a trained and knowledgeable supplier, constructed in accordance with FC 3003.1, and marked in accordance with FC3507.3.3.

**3507.3.3 Marking and labeling.** Metal hydride hydrogen storage systems shall be marked and labeled in accordance with FC3003.2, and FC 3507.3.3.1 through 3507.3.3.4.

**3507.3.3.1 System markings.** Metal hydride hydrogen storage systems shall be marked with the following.

1. Manufacturer's name;

2.Manufacturer's emergency contact information;

3. A unique code or serial number specific to the system;

4.System name or product code that identifies the system by the type of chemistry used in the system;

5. Limitations on refilling of containers that include rated charging pressure and capacity; and

6. Service life indicating the last date the metal hydride hydrogen storage system can be used.

**3507.3.3.2 Valve markings.** Metal hydride hydrogen storage system valves shall be marked with the following information:

1. Manufacturer's name;

2. The type of metal hydride hydrogen storage system with which the valve is compatible; and

3. Service life indicating the last date the valve can be used.

**3507.3.3.3 Pressure relief device markings.** Metal hydride hydrogen storage system pressure relief devices shall be marked with the following information (markings for pressure relief devices integral to a valve may be made on the valve):

1. Manufacturer's name;

2. The type of metal hydride hydrogen storage system with which the device is compatible; and

3. Activation parameters that include temperature and/or pressure.

**3507.3.3.4 Container markings.** Containers used in metal hydride hydrogen storage systems shall be marked with the following information:

1. Manufacturer's name;

2. Standard to which the container was designed and constructed;

3. Date of manufacturer's initial inspection and testing;

4. Individual serial number;

5. The type of metal hydride hydrogen storage system; and

6. Service life identifying the last date the container can be used.

**3507.3.4 Physical protection.** Metal hydride hydrogen storage systems installed on powered industrial trucks shall be designed and installed in compliance with the requirements of this section.

**3507.3.4.1 Securing containers.** The installation shall be designed to secure containers from movement when the truck is in motion.

**3507.3.4.2 Impact protection.** The installation shall be designed to minimize the risk of release of metal hydride or hydrogen gas in the event of a physical impact. System components shall not extend beyond the truck platform or chassis.

**3507.4 Operational and maintenance requirements.** Metal hydride hydrogen storage systems shall be operated and maintained in compliance with the requirements of this section.

**3507.4.1 Valves.** Container valves shall remain closed except when containers are connected for use and the hydrogen-powered equipment is in use.

**3507.4.2 Protection from temperature extremes and falling objects.** Metal hydride hydrogen storage systems shall comply with the requirements of FC 3003.5.4 and 3003.5.5.

**3507.4.3 Refilling of containers.** The refilling of metal hydride hydrogen storage system containers with metal hydride shall be in accordance with the listing or approval requirements and manufacturers' instructions. The refilling of metal hydride hydrogen storage systems with hydrogen shall be in accordance with FC 309 and 2209.

**3507.4.4 Periodic inspection and testing of containers.** Metal hydride hydrogen storage system containers shall be inspected, tested and requalified for service at least once every 5 years in accordance with the requirements of the United States Department of Transportation.

**3507.4.5 Hydrogen purity.** The purity of the hydrogen generated by a metal hydride hydrogen storage system shall meet or exceed the listing or approval requirements, and the design specifications of the truck to be powered by the hydrogen supplied.

## SECTION FC [3507] 3508
## COMPRESSED NATURAL GAS

**[3507.1] 3508.1 Scope.** This section shall govern the storage, handling and use of compressed natural gas (CNG).

**Exceptions:**

1. Storage, handling and use of CNG, including dispensing, for use as a fuel in motor vehicles, as set forth in FC Chapter 22.

2. The storage, handling and use of CNG in connection with special effects.

**[3507.2] 3508.2 General.** Compressed natural gas shall be stored, handled and used in accordance with this chapter, including this section, and the rules.

**[3507.3] 3508.3 General prohibitions.** It shall be unlawful to:

1. [Fill] fill a CNG container with CNG or transfer CNG from one container to another, except as authorized by [Section FC 2208] FC2208.

2. [Store] store, handle or use CNG in any container with a capacity greater than 381 SCF.

3. [Store] store, handle or use CNG in a basement, cellar or other area below grade[ area], except as authorized by the commissioner.

4. [Store] store, handle or use CNG without a permit when such storage, handling or use exceeds the quantities set forth in [Section 105.6] FC105.6.

5. [Store] store CNG in any outdoor or indoor storage facility, or store, handle or use CNG for a stationary CNG installation, that has not been approved.

6. [Store] store, handle or use in, or bring or allow into any residential occupancy, or on any lot containing a building used for a residential occupancy, any CNG container with a capacity greater than 8.7 SCF, except as authorized by the commissioner.

7. [Store] store, handle or use in, or bring or allow into any [non-residential] nonresidential building, any CNG container with a capacity greater than 8.7 SCF, except as authorized by the commissioner.

8. [Store] store CNG containers on the roof of any building.

9. [Handle] handle or use on the roof of any building CNG containers with a capacity greater than 8.7 SCF of gas, except as authorized by the commissioner.

10. [Store] store, handle or use CNG in or on motor vehicles, except as temporary storage incidental to transportation, or as a fuel for generating motive power for a motor vehicle, or otherwise authorized by the commissioner.

11. [Store] store, handle or use CNG for a stationary installation in any area where access to piped natural gas from a public utility is available, except as authorized by the commissioner.

12. [Store] store, handle or use CNG in any equipment used or previously used for LPG, except as may be authorized by the commissioner on an emergency basis.

13. [Store] store, handle or use CNG for space heating or water heating, except as authorized by the commissioner.

14. [Use non-metallic] use nonmetallic pipe, tubing and components for any installation, appliance or equipment using CNG, except as authorized by the commissioner.

15. [Store] store, handle or use CNG at bazaars, carnivals, street fairs and similar outdoor events, including public gathering places.

16. [Store] store, handle, use or sell any CNG that has not been satisfactorily odorized with mercaptans or other approved chemical.

## SECTION FC [3508] 3509
## METHANE RECOVERY FROM LANDFILLS

**[3508.1] 3509.1 Recovery operations.** The commissioner shall promulgate rules relating to the recovery of methane gas from landfills[ and other approved locations], to ensure the safe recovery and processing thereof.

## SECTION FC 3510
## MICROTURBINES

**3510.1 Scope.** This section shall govern the design, installation, operation and maintenance of microturbines when the aggregate electrical energy produced by all microturbines on or within a single building, including building roofs and setbacks, does not exceed 2,000 kW.

**3510.2 Permits.** Permits shall be required as set forth in FC105.6.

**3510.3 Supervision.** The operation of a microturbine during regular business hours shall be under the personal supervision of a certificate of fitness holder. At all other times, a microturbine shall be under the general supervision of a certificate of fitness holder. Certificate of fitness holders shall be trained by the manufacturer or other qualified and knowledgeable person in the safe operation of the equipment, including how to safely shut down the equipment in the event of an emergency.

**3510.3.1 Alarm monitoring.** The alarms initiated from the operation of a microturbine shall be annunciated both locally and remotely as required by the construction codes, including the Building Code and Mechanical Code, and the Electrical Code. The remote panel shall be located in a continuously supervised location on the premises.

**3510.4 Design and installation.** Microturbines shall be designed and installed in accordance with the construction codes, including the Building Code and the Mechanical Code, and the Electrical Code. A copy of the design and installation documents for microturbine installations

approved by the Department of Buildings shall be submitted to the department prior to installation.

**3510.5 Operation and maintenance.** Facilities housing microturbines shall be operated and maintained in compliance with the requirements of FC 3510.5.1 through 3510.5.4.

**3510.5.1 Signage and diagrams**. Signage and diagrams shall be provided in compliance with the requirements of FC 3510.5.1.1 through 3510.5.1.3.

**3510.5.1.1 Emergency gas shutoff valve.** The fail safe emergency natural gas shutoff valve shall have a durable sign conspicuously posted near such valve that reads: "MICROTURBINE EMERGENCY GAS SHUTOFF."

**3510.5.1.2 Fuel shutoff valve diagram.** A durable diagram shall be conspicuously posted on all doors and other entrances to a microturbine room or area indicating the location of all manual and automatic natural gas shutoff valves.

**3510.5.1.3 Gas piping.** A durable sign shall be conspicuously posted on or near each door or other entrance to a room or outdoor area in which a microturbine is located, and on or adjacent to the microturbine itself, that reads "HIGH PRESSURE NATURAL GAS."

**3510.5.2 Secured location.** The microturbine shall be located in an area protected from unauthorized entry. Doors to rooms containing a microturbine shall be kept locked, but a key to such locks shall be readily available on the premises to certificate of fitness holders, maintenance personnel, and emergency responders.

**3510.5.3 Combustible materials.** Combustible material shall not be stored and combustible waste shall not be allowed to accumulate in rooms or within 10 feet (3048 mm) of outdoor areas in which microturbines are located.

**3510.5.4 Service contract.** The owner of any microturbine installation shall maintain a service contract with the microturbine manufacturer or other qualified service company as long as the installation exists on the premises. A copy of the service contract shall be maintained on the premises and made available for inspection by any department representative.

# CHAPTER 36
# FLAMMABLE SOLIDS

## SECTION FC 3601
## GENERAL

**3601.1 Scope.** This chapter shall govern the storage, handling and use of flammable solids.

**3601.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**3601.3 General.** Flammable solids shall be stored, handled and used in accordance with this chapter.

**3601.4 Supervision.** The handling and use of flammable solids in quantities requiring a permit shall be performed under the personal supervision of a person holding a certificate of fitness. The storage of flammable solids in quantities requiring a permit shall be under the general supervision of a person holding a certificate of fitness.

## SECTION FC 3602
## DEFINITIONS

**3602.1 Definitions.** The following term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

**FLAMMABLE SOLID.** A solid, other than a blasting agent or other explosive, whether in elemental or alloy form, that is capable of causing fire through friction, absorption or moisture, spontaneous chemical change, or heat retained from manufacturing or processing, or which has an ignition temperature below 212°F (100°C) or which burns so vigorously and persistently when ignited as to create a serious hazard. A chemical shall be considered a flammable solid if upon testing using the method prescribed in CPSC regulations, as set forth in 16 CFR Section 1500.44, it ignites and burns with a self-sustained flame at a rate greater than 0.1 inch (2.5 mm) per second along its major axis.

## SECTION FC 3603
## GENERAL REQUIREMENTS

**3603.1 Quantities not exceeding the maximum allowable quantity per control area.** The storage, handling and use of flammable solids in amounts not exceeding the maximum allowable quantity per control area as indicated in [Section 2703.1] FC2703.1 shall be in accordance with [Sections] FC 2701, 2703, 3601 and this section.

**3603.2 Quantities exceeding the maximum allowable quantity per control area.** The storage, handling and use of flammable solids exceeding the maximum allowable quantity per control area as indicated in [Section 2703.1] FC2703.1 shall be in accordance with FC Chapter 27, this chapter, and NFPA 484.

## SECTION FC 3604
## STORAGE

**3604.1 Indoor storage.** Indoor storage of flammable solids in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1) shall be in accordance with [Sections] FC 2701, 2703, 2704, this chapter, and NFPA 484.

**3604.1.1 Pile size limits and location.** Flammable solids stored in quantities greater than 1,000 cubic feet (28 $m^3$) shall be separated into piles each not larger than 1,000 cubic feet (28 $m^3$).

**3604.1.2 Aisles.** Aisle widths between piles shall not be less than the height of the piles or 10 feet ([3.1 m] 3048 mm), whichever is greater.

**3604.1.3 Basement storage.** Flammable solids shall not be stored in basements or other areas below grade[ areas].

**3604.2 Outdoor storage.** Outdoor storage of flammable solids in amounts exceeding the maximum allowable quantities per control area indicated in FC Table 2703.1.1(3) shall be in accordance with [Sections] FC 2701, 2703, 2704, this chapter, and NFPA 484.

**3604.2.1 Distance from storage to exposures.** Outdoor storage of flammable solids shall not be located within 20 feet (6096 mm) of a building, lot line, public street, private road or means of egress. A 2-hour fire barrier without openings or penetrations and extending 30 inches (762 mm) above and to the sides of the storage area is allowed in lieu of such distance. The fire barrier shall either be an independent structure, or the exterior wall of the building adjacent to the storage area.

**3604.2.2 Pile size limits.** Outdoor storage of flammable solids shall be separated into piles not larger than 5,000 cubic feet (141 $m^3$) each. Piles shall be separated by aisles with a minimum width of not less than one-half the pile height or 10 feet (3048 mm), whichever is greater.

**3604.3 Combustible material and combustible waste.** Combustible material and combustible waste, including packing materials and oily rags, shall not be stored in the same area as that where solid combustible metal scraps or powders are stored.

## SECTION FC 3605
## HANDLING AND USE

**3605.1 General.** The handling and use of flammable solids in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1) or 2703.1.1(3) shall be in accordance with [Sections] FC 2701, 2703, 2705, this chapter, and NFPA 484.

# CHAPTER 37
# HIGHLY TOXIC AND TOXIC MATERIALS

## SECTION FC 3701
## GENERAL

**3701.1 Scope.** This chapter shall govern the storage, handling and use of highly toxic and toxic materials and ozone gas generators.

**Exceptions:**

1. Storage and display in Group M and storage in Group S occupancies complying with the requirements of [Section 2703.11] FC2703.11.

2. Storage, handling or use for agricultural purposes, including as a pesticide, herbicide, fertilizer or similar application, when approved for such use by the federal, state or city regulatory agency having jurisdiction and when such storage, handling or use is in accordance with the manufacturer's instructions.

3. Storage, handling or personal or domestic use as a pesticide, herbicide, fertilizer in and around a residential dwelling, when approved for such use by the federal, state or city regulatory agency having jurisdiction and when such storage, handling or use is in accordance with the manufacturer's instructions.

**3701.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**3701.3 General.** Highly toxic and toxic materials and ozone gas generators shall be stored, handled and used in accordance with this chapter. Highly toxic and toxic materials that are compressed gases shall additionally comply with the requirements of FC Chapter 30.

**3701.4 Highly toxic and toxic material mixtures.** The level of toxicity of highly toxic and toxic materials may be reduced by diluting such materials with other materials, such as water, to a degree that the resulting mixture may no longer be highly toxic or toxic. A mixture containing any amount of highly toxic and/or toxic material is presumed to be a highly toxic or toxic material, as applicable, unless it is otherwise certified and labeled by the manufacturer.

**3701.5 Supervision.** The handling and use of highly toxic and toxic materials in quantities requiring a permit shall be under the personal supervision of a certificate of fitness holder. The storage of highly toxic and toxic materials in quantities requiring a permit shall be under the general supervision of a certificate of fitness holder.

**3701.6 Prohibition.** It shall be unlawful to compress highly toxic and toxic materials.

## SECTION FC 3702
## DEFINITIONS

**3702.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**CONTAINMENT SYSTEM.** A gas-tight recovery system comprised of devices or equipment which, when placed over or around the portion of the compressed gas container that is leaking, stops or controls the escape of gas from the container.

**CONTAINMENT VESSEL.** A gas-tight vessel which, when installed or placed over or around a leaking compressed gas container, confines the container and the gas leaking therefrom.

**EXCESS FLOW VALVE.** A valve inserted into a compressed gas container that is designed to shut off the flow of gas in the event that its predetermined flow is exceeded.

**HIGHLY TOXIC MATERIAL.** A chemical that is lethal at the following doses or concentration[, including the following]:

1. A chemical that has a median lethal dose ($LD_{50}$) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each; or

2. A chemical that has a median lethal dose ($LD_{50}$) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each; or

3. A chemical that has a median lethal concentration ($LC_{50}$) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume or dust, when administered by continuous inhalation for [one] 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.

**OZONE GAS GENERATOR.** Equipment which produces ozone.

**REDUCED FLOW VALVE.** A valve equipped with a restricted flow orifice and inserted into a compressed gas container that is designed to reduce the maximum flow from the valve under full-flow conditions. The maximum flow rate from the valve is determined with the valve allowed to flow to atmosphere with no other piping or fittings attached.

**TOXIC MATERIAL.** A chemical that is lethal at the following doses or concentration:

1. A chemical that has a median lethal dose ($LD_{50}$) of more than 50 milligrams per kilogram, but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each; or

2. A chemical that has a median lethal dose ($LD_{50}$) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each; or

3. A chemical that has a median lethal concentration ($LC_{50}$) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than 2 milligrams per liter but not more than 20 milligrams per liter of mist, fume or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.

**Exception:** Chlorine. Although chlorine is, by definition, a toxic material, for [For] purposes of this code[,chlorine is] it shall be classified as a highly toxic material.

## SECTION FC 3703
## HIGHLY TOXIC AND TOXIC SOLIDS AND LIQUIDS

**3703.1 Indoor storage, handling and use.** The indoor storage, handling and use of highly toxic and toxic materials shall comply with the requirements of [Sections] FC 3703.1.1 through 3703.1.5.3.

**3703.1.1 Quantities not exceeding the maximum allowable quantity per control area.** The indoor storage, handling or use of highly toxic and toxic solids or liquids in amounts not exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(2) shall be in accordance with [Sections] FC 2701, 2703 and 3701.

**3703.1.2 Quantities exceeding the maximum allowable quantity per control area.** The indoor storage, handling or use of highly toxic and toxic solids or liquids in amounts exceeding the maximum allowable quantity per control area set forth in FC Table 2703.1.1(2) shall be in accordance with [Sections 3701] FC3701, FC 3703.1.3 through [3703.1.3] 3703.1.5.3 and FC Chapter 27.

**3703.1.3 Treatment system—highly toxic liquids.** Exhaust scrubbers or other systems for processing vapors of highly toxic liquids shall be provided where a spill or accidental release of such liquids can be expected to release highly toxic vapors at normal temperature and pressure. Treatment systems and other processing systems shall be installed in accordance with the construction codes, including the Mechanical Code.

**3703.1.4 Indoor storage.** Indoor storage of highly toxic and toxic solids and liquids shall comply with the requirements of [Sections] FC 3703.1.4.1 and 3703.1.4.2.

**3703.1.4.1 Floors.** In addition to the requirements set forth in [Section 2704.12] FC2704.12, floors of storage areas shall be of liquid-tight construction.

**3703.1.4.2 Separation—highly toxic solids and liquids.** In addition to the requirements set forth in [Section 2703.9.8] FC2703.9.8, highly toxic solids and liquids in storage shall be located in approved hazardous material storage cabinets or isolated from other hazardous material storage by construction in accordance with the construction codes, including the Building Code.

**3703.1.5 Indoor handling and use.** Indoor handling and use of highly toxic and toxic solids and liquids shall be in accordance with [Sections] FC 3703.1.5.1 through 3703.1.5.3.

**3703.1.5.1 Liquid transfer.** Highly toxic and toxic liquids shall be transferred in accordance with [Section 2705.1.10] FC2705.1.10.

**3703.1.5.2 Exhaust ventilation for open systems.** Mechanical exhaust ventilation shall be provided for highly toxic and toxic liquids used in open systems in accordance with [Section 2705.2.1.1] FC2705.2.1.1.

**Exception:** Liquids or solids that do not generate highly toxic or toxic fumes, mists or vapors.

**3703.1.5.3 Exhaust ventilation for closed systems.** Mechanical exhaust ventilation shall be provided for highly toxic and toxic liquids used in closed systems in accordance with [Section 2705.2.2.2] FC2705.2.2.2.

**Exception:** Liquids or solids that do not generate highly toxic or toxic fumes, mists or vapors.

**3703.2 Outdoor storage, handling and use.** Outdoor storage, handling and use of highly toxic and toxic materials shall be in accordance with [Sections] FC 3703.2.1 through 3703.2.6.

**3703.2.1 Quantities not exceeding the maximum allowable quantity per control area.** The outdoor storage, handling or use of highly toxic and toxic solids or liquids in amounts not exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(4) shall be in accordance with [Sections] FC 2701, 2703 and 3701.

**3703.2.2 Quantities exceeding the maximum allowable quantity per control area.** The outdoor storage, handling or use of highly toxic and toxic solids or liquids in amounts exceeding the maximum allowable quantity per control area set forth in FC Table 2703.1.1(4) shall be in accordance with [Sections] FC 3701 and 3703.2 and FC Chapter 27.

**3703.2.3 General outdoor requirements.** The general requirements applicable to the outdoor storage of highly toxic or toxic solids and liquids shall be in accordance with [Sections] FC 3703.2.3.1 and 3703.2.3.2.

**3703.2.3.1 Location.** Outdoor storage, handling or use of highly toxic or toxic solids and liquids shall not be located within 20 feet (6096 mm) of lot lines, public streets, private roads, exit discharges or exterior wall openings. A 2-hour fire barrier wall without openings or penetrations extending not less than 30 inches (762 mm) above and to the sides of the storage is allowed in lieu of such distance. The fire barrier wall shall be either an independent structure or the exterior wall of the building adjacent to the storage area.

**3703.2.3.2 Treatment system—highly toxic liquids.** Exhaust scrubbers or other systems for processing vapors of highly toxic liquid shall be installed where a spill or accidental release of such liquids can be expected to release highly toxic vapors at normal temperature and pressure (NTP). Treatment systems and other processing systems shall be installed in accordance with the construction codes, including the Mechanical Code.

**3703.2.4 Outdoor storage piles.** Outdoor storage piles of highly toxic and toxic solids and liquids shall be separated into piles not larger than 2,500 cubic feet (71 $m^3$). Aisle widths

between piles shall not be less than one-half the height of the pile or 10 feet (3048 mm), whichever is greater.

**3703.2.5 Weather protection—outdoor storage or use.** Where overhead weather protection is provided for outdoor storage or use of highly toxic and toxic liquids or solids, and the weather protection is attached to a building or structure, the storage or use area shall either be protected throughout by a sprinkler system, or storage or use vessels shall be fire-resistance rated. Weather protection shall be provided in accordance with [Section 2704.13] FC2704.13 for storage and [Section 2705.3.9] FC2705.3.9 for use.

**3703.2.6 Outdoor liquid transfer.** Highly toxic and toxic liquids shall be transferred in accordance with [Section 2705.1.10] FC2705.1.10.

## SECTION FC 3704
## HIGHLY TOXIC AND TOXIC COMPRESSED GASES

**3704.1 General.** The storage, handling and use of highly toxic and toxic compressed gases shall comply with the requirements of this section.

**3704.1.1 Prohibited indoor storage, handling and use by occupancy.** It shall be unlawful to store, handle or use highly toxic and toxic compressed gases in:

1. Group A, E, I, R or U occupancies.

2. [Offices in] Group B office occupancies, F, M or S occupancies, or any other areas of such occupancies that are accessible to the public.

**3704.1.2 Gas cabinets.** Gas cabinets containing highly toxic or toxic compressed gases shall comply with the requirements of [Section 2703.8.5] FC2703.8.6 and shall be ventilated in accordance with the Mechanical Code.

**3704.1.2.1 Capacity limits.** The maximum number of containers located in a single gas cabinet shall not exceed three, except that cabinets containing containers not over 1 pound (0.454 kg) net contents are allowed to contain up to 100 containers.

**3704.1.2.2 Fire protection.** Gas cabinets required by [Section] FC 3704.2 or 3704.3 shall be protected by a sprinkler system. Alternative fire extinguishing systems shall not be used in lieu of a sprinkler system.

**3704.1.3 Exhausted enclosures.** Exhausted enclosures containing highly toxic or toxic compressed gases shall be ventilated in accordance with the Mechanical Code.

**3704.1.3.1 Fire protection.** Exhausted enclosures required by [Section] FC 3704.2 or 3704.3 shall be protected by a sprinkler system. Alternative fire extinguishing systems shall not be used in lieu of a sprinkler system.

**3704.2 Indoor storage, handling and use.** The indoor storage, handling and use of highly toxic or toxic compressed gases shall be in accordance with [Sections] FC 3704.2.1 through 3704.2.2.10.3.

**3704.2.1 Applicability.** The applicability of regulations governing the indoor storage, handling and use of highly toxic and toxic compressed gases shall be as set forth in [Sections] FC 3704.2.1.1 through 3704.2.1.3.

**3704.2.1.1 Quantities not exceeding the maximum allowable quantity per control area.** The indoor storage, handling or use of highly toxic and toxic gases in amounts not exceeding the maximum allowable quantity per control area set forth in FC Table 2703.1.1(2) shall be in accordance with [Sections] FC 2701, 2703, 3701 and 3704.1.

**3704.2.1.2 Quantities exceeding the maximum allowable quantity per control area.** The indoor storage, handling or use of highly toxic and toxic gases in amounts exceeding the maximum allowable quantity per control area set forth in FC Table 2703.1.1(2) shall be in accordance with [Sections] FC 3701, 3704.1, 3704.2 and FC Chapter 27.

**3704.2.1.3 Ozone gas generators.** The indoor use of ozone gas-generating equipment shall be in accordance with [Section 3705] FC3705.

**3704.2.2 General indoor requirements.** The general requirements applicable to the indoor storage, handling and use of highly toxic and toxic compressed gases shall be in accordance with [Sections] FC 3704.2.2.1 through 3704.2.2.10.3.

**3704.2.2.1 Container location.** Portable containers shall be located within gas cabinets, exhausted enclosures or gas rooms. All other containers shall be located within gas rooms or exhausted enclosures.

**3704.2.2.2 Ventilated areas.** The room or other area in which gas cabinets or exhausted enclosures are located shall be provided with exhaust ventilation. Gas cabinets or exhausted enclosures shall not be used as the sole means of exhaust for any room or area.

**3704.2.2.3 Leaking containers.** One or more gas cabinets or exhausted enclosures shall be available on the premises to capture the gas from the containers until such time as the leaking container can be removed from the premises and disposed of lawfully.

**Exceptions:**

1. Where containers are located within gas cabinets or exhausted enclosures.

2. Where approved containment vessels or containment systems are provided in accordance with the following requirements:

   2.1. Containment vessels or containment systems shall be capable of fully containing or terminating a release.

2.2. Trained personnel shall be available at an approved location.

2.3. Containment vessels or containment systems shall be capable of being transported to the leaking container.

**3704.2.2.3.1 Location.** Gas cabinets and exhausted enclosures shall be located in gas rooms and connected to an exhaust system.

**3704.2.2.4 Local exhaust for portable containers.** A means of local exhaust shall be provided to capture leaks from portable containers. The local exhaust shall consist of portable ducts or collection systems designed to be applied to the site of a leak in a valve or fitting on the container. The local exhaust system shall be located in a gas room. Exhaust shall be directed to a treatment system in accordance with [Section 3704.2.2.7] FC3704.2.2.7.

**3704.2.2.5 Piping and controls—stationary containers.** In addition to the requirements of [Section 2703.2.2] FC2703.2.2, piping and controls on stationary containers shall comply with the following requirements:

1. Pressure relief devices shall be vented to a treatment system designed in accordance with [Section 3704.2.2.7] FC3704.2.2.7.

   **Exception:** Pressure relief devices on outdoor containers provided exclusively for relieving pressure due to fire exposure are not required to be vented to a treatment system provided that:

   1. The material in the container is not flammable.

   2. The container is not located in a diked area with other containers containing combustible materials.

   3. The container is located not less than 30 feet (9144 mm) from combustible materials or structures or is shielded by a fire barrier complying with the requirements of [Section 3704.3.2.1.1] FC3704.3.2.1.1.

2. Filling or dispensing connections shall be provided with a means of local exhaust. Such exhaust shall be designed to capture fumes and vapors. The exhaust shall be directed to a treatment system in accordance with [Section 3704.2.2.7] FC3704.2.2.7.

3. Stationary containers shall be provided with a means of excess flow control on all container inlet or outlet connections.

   **Exceptions:**

1. Inlet connections designed to prevent backflow.

2. Pressure relief devices.

**3704.2.2.6 Gas rooms.** Gas rooms shall comply with the requirements of [Section 2703.8.4] FC2703.8.4 and both of the following requirements:

1. The exhaust ventilation from gas rooms shall be directed to an exhaust system.

2. Gas rooms shall be protected throughout by a sprinkler system. Alternative fire extinguishing systems shall not be used in lieu of a sprinkler system.

**3704.2.2.7 Treatment systems.** The exhaust ventilation from gas cabinets, exhausted enclosures and gas rooms, and local exhaust systems required by [Sections] FC 3704.2.2.4 and 3704.2.2.5 shall be directed to a treatment system. The treatment system shall be utilized to handle the accidental release of gas and to process exhaust ventilation. The treatment system shall be designed in accordance with [Sections] FC 3704.2.2.7.1 through 3704.2.2.7.5 and [Section 510] Chapter 5 of the Mechanical Code.

**Exceptions:**

1. Highly toxic and toxic gases—storage. A treatment system is not required for containers in storage when the following controls are provided:

   1.1. Valve outlets are equipped with gas-tight outlet plugs or caps.

   1.2. Handwheel-operated valves have handles secured to prevent movement.

   1.3. Approved containment vessels or containment systems are provided in accordance with [Section 3704.2.2.3] FC3704.2.2.3.

2. Toxic gases—use. Treatment systems are not required for toxic gases supplied by portable containers not exceeding [660 gallons (2 498 L) liquid] 1,700 pounds (772 kg) water capacity when the following controls are provided:

   2.1. A listed or approved gas detection system with a sensing interval not exceeding 5 minutes.

   2.2. [An] A listed or approved automatic-closing fail-safe valve located immediately adjacent to container valves. The fail-safe valve shall close when gas is detected at the permissible exposure limit (PEL) by a gas detection system monitoring the exhaust system at the point of discharge from the gas cabinet, exhausted enclosure, ventilated enclosure or gas room. The gas detection shall comply with the requirements of [Section 3704.2.2.10] FC3704.2.2.10.

**3704.2.2.7.1 Design.** Treatment systems shall be capable of diluting, adsorbing, absorbing, containing, neutralizing, burning or otherwise processing the contents of the largest compressed gas container. Where a total containment system is used, the system shall be designed to handle the maximum anticipated pressure of release to the system when it reaches equilibrium.

**3704.2.2.7.2 Performance.** Treatment systems shall be designed to reduce the maximum allowable discharge concentrations of the gas to one-half immediate dangerous to life and health (IDLH) at the point of discharge to the atmosphere. Where more than one gas is emitted to the treatment system, the treatment system shall be designed to handle the worst-case release based on the release rate, the quantity and the IDLH for all compressed gases stored or used.

**3704.2.2.7.3 Sizing.** Treatment systems shall be sized to process the maximum worst-case release of gas based on the maximum flow rate of release and the entire contents from the largest container utilized.

**3704.2.2.7.4 Stationary containers.** Stationary containers shall be labeled with the maximum rate of release for the compressed gas contained based on valves or fittings that are inserted directly into the container. Where multiple valves or fittings are provided, the maximum flow rate of release for valves or fittings with the highest flow rate shall be indicated. Where liquefied compressed gases are in contact with valves or fittings, the liquid flow rate shall be utilized for computation purposes. Flow rates indicated on the label shall be converted to SCF.

**3704.2.2.7.5 Portable containers.** The maximum flow rate of release for portable containers shall be calculated based on the total release from the container within 5 minutes for containers with nonliquefied content and 30 minutes for containers with liquefied content. When portable containers are equipped with approved excess flow or reduced flow valves, the worst-case release shall be determined by the maximum achievable flow from the valve as determined by the valve manufacturer or compressed gas supplier. Reduced flow and excess flow valves shall be permanently marked by the valve manufacturer to indicate the maximum design flow rate. Such markings shall indicate the flow rate for air under normal temperature and pressure.

**3704.2.2.8 Emergency power.** Emergency power shall be provided in accordance with the Electrical Code and the Building Code where any of the following systems are required:

1. Exhaust ventilation system.

2. Treatment system.

3. Gas detection system.

4. Smoke detection system.

5. Temperature control system.

6. Fire alarm system.

7. Emergency alarm system.

**Exception:** Emergency power is not required for mechanical exhaust ventilation, treatment systems and temperature control systems where approved fail-safe engineered systems are installed.

**3704.2.2.9 Automatic fire detection system—highly toxic compressed gases.** An approved automatic fire detection system shall be installed in rooms or areas where highly toxic compressed gases are stored or used. Activation of the detection system shall sound a local alarm. The fire detection system shall comply with the requirements of the Building Code.

**3704.2.2.10 Gas detection system.** A gas detection system shall be provided to detect the presence of gas at or below the permissible exposure limit (PEL) or ceiling limit of the gas for which detection is provided. The system shall be capable of monitoring the discharge from the treatment system at or below one-half the IDLH limit.

**Exception:** A gas detection system is not required for toxic gases when the physiological warning properties for the gas are at a level below the accepted PEL for the gas.

**3704.2.2.10.1 Alarms.** The gas detection system shall initiate a local alarm and transmit a signal to a continuously attended control station on the premises whenever it detects the presence of the gas in the atmosphere. The alarm shall be both visual and audible and shall provide warning both inside and outside the area where gas is detected.

**Exception:** Signal transmission to a continuously attended control station is not required where not more than one container of highly toxic or toxic gas is stored.

**3704.2.2.10.2 [Shut off] <u>Shutoff</u> of gas supply.** The gas-detection system shall automatically close the shutoff valve at the source on gas supply piping and tubing related to the system being monitored for whichever gas is detected.

**Exception:** Automatic shutdown is not required for reactors utilized for the production of highly toxic or toxic compressed gases where such reactors are:

1. Operated at pressures less than 15 pounds per square inch gauge (psig) (103.4 kPa).

2. Continuously attended.

3. Provided with readily accessible emergency shutoff valves.

**3704.2.2.10.3 Valve closure.** When the gas-detection sampling point initiating the gas-detection system alarm is at a use location or within a gas valve enclosure of a branch line downstream of a piping distribution manifold, the shutoff valve in the gas valve enclosure for the branch line located in the piping distribution manifold enclosure shall automatically close. Under all other circumstances, shutoff valves shall comply with the following automatic closure requirements:

1. When the gas-detection sampling point initiating the gas detection system alarm is within a gas cabinet or exhausted enclosure, the shutoff valve in the gas cabinet or exhausted enclosure for the specific gas detected shall automatically close.

2. Where the gas-detection sampling point initiating the gas detection system alarm is within a gas room and compressed gas containers are not in gas cabinets or exhausted enclosures, the shutoff valves on all gas lines for the specific gas detected shall automatically close.

3. Where the gas-detection sampling point initiating the gas detection system alarm is within a piping distribution manifold enclosure, the shutoff valve for the container of specific gas detected supplying the manifold shall automatically close.

**3704.3 Outdoor storage, handling and use.** The outdoor storage, handling and use of highly toxic and toxic compressed gases shall be in accordance with [Sections] FC 3704.3.1 through [3704.3.9] 3704.3.4.

**3704.3.1 Applicability.** The outdoor storage, handling and use of highly toxic and toxic compressed gases shall be in accordance with [Sections] FC 3704.3.1.1 through 3704.3.1.3.

**3704.3.1.1 Quantities not exceeding the maximum allowable quantity per control area.** The outdoor storage, handling or use of highly toxic and toxic gases in amounts not exceeding the maximum allowable quantity per control area set forth in FC Table 2703.1.1(4) shall be in accordance with [Sections] FC 2701, 2703 and 3701.

**3704.3.1.2 Quantities exceeding the maximum allowable quantity per control area.** The outdoor storage, handling or use of highly toxic and toxic gases in amounts exceeding the maximum allowable quantity per control area set forth in FC Table 2703.1.1(4) shall be in accordance with [Sections] FC 3701 and 3704.3 and FC Chapter 27.

**3704.3.1.3 Ozone gas generators.** The outdoor use of ozone gas-generating equipment shall be in accordance with [Section 3705] FC3705.

**3704.3.2 General outdoor requirements.** The outdoor storage, handling and use of highly toxic and toxic compressed gases shall be in accordance with [Sections] FC 3704.3.2.1 through 3704.3.2.7.

**3704.3.2.1 Location.** Outdoor storage, handling or use of highly toxic or toxic compressed gases shall be located in accordance with [Sections] FC 3704.3.2.1.1 through 3704.3.2.1.3.

**Exception:** Compressed gases located in gas cabinets complying with the requirements of [Sections 2703.8.5] FC 2703.8.6 and 3704.1.2 and located 5 feet (1524 mm) or more from buildings and 25 feet (7620 mm) or more from an exit discharge.

**3704.3.2.1.1 Distance limitation to exposures.** Outdoor storage, handling or use of highly toxic or toxic compressed gases shall not be located within 75 feet (22 860 mm) of a lot line, public street, private road, exit discharge or building not associated with the manufacture or distribution of such gases, unless all of the following conditions are met:

1. Storage is shielded by a 2-hour fire-resistant barrier which interrupts the line of sight between the storage and the exposure.

2. The 2-hour fire-resistant barrier shall be located at least 5 feet (1524 mm) from any exposure.

3. The 2-hour fire-resistant barrier shall not have more than two sides at approximately 90-degree (1.57 rad) directions, or three sides with connecting angles of approximately 135 degrees (2.36 rad).

**3704.3.2.1.2 Openings in exposed buildings.** Where the storage, handling or use area is located [closer than] within 75 feet (22 860 mm) [to] of a building not associated with the manufacture or distribution of highly toxic or toxic compressed gases, openings into [a] such building other than for piping are not allowed above the height of the top of the 2-hour fire-resistant barrier or within 50 feet ([15 240mm] 15 240 mm) horizontally from the storage area whether or not shielded by a fire barrier.

**3704.3.2.1.3 Air intakes.** Any area used for storage, handling or use shall not be located within 75 feet (22 860 mm) of air intakes.

**3704.3.2.2 Leaking containers.** The requirements of [Section 3704.2.2.3] FC3704.2.2.3 shall apply to outdoor containers. Gas cabinets and exhausted enclosures shall be located within or immediately adjacent to outdoor storage, handling or use areas.

**3704.3.2.3 Local exhaust for portable containers.** Local exhaust for outdoor portable containers shall be provided in accordance with [Section 3704.2.2.4] FC3704.2.2.4.

**3704.3.2.4 Piping and controls—stationary containers.** Piping and controls for outdoor stationary containers shall be in accordance with [Section 3704.2.2.5] FC3704.2.2.5.

**3704.3.2.5 Treatment systems.** The treatment system requirements set forth in [Section 3704.2.2.7] FC3704.2.2.7 shall apply to highly toxic or toxic gases located outdoors.

**3704.3.2.6 Emergency power.** The requirements for emergency power set forth in [Section 3704.2.2.8] FC3704.2.2.8 shall apply to highly toxic or toxic gases located outdoors.

**3704.3.2.7 Gas detection system.** The gas detection system requirements set forth in [Section 3704.2.2.10] FC3704.2.2.10 shall apply to highly toxic or toxic gases located outdoors.

**3704.3.3 Outdoor storage weather protection for portable containers.** Weather protection in accordance with [Section 2704.13] FC2704.13 shall be provided for portable containers located outdoors and not within gas cabinets or exhausted enclosures. The storage area shall be protected throughout by a sprinkler system.

**Exception:** A sprinkler system is not required when:

1. [All] all materials under the weather protection structure, including hazardous materials and the containers in which they are stored, are noncombustible.

2. [The] the weather protection structure is located not less than 30 feet (9144 mm) from combustible materials or structures or is separated from such materials or structures using a fire barrier complying with the requirements of [Section 3704.3.2.1.1] FC3704.3.2.1.1.

**3704.3.4 Outdoor use of portable containers.** Portable containers in outdoor use shall be located in gas cabinets or exhausted enclosures.

## SECTION FC 3705
## OZONE GAS GENERATORS

**3705.1 Scope.** This section shall govern the design, installation, operation and maintenance of ozone gas generators with a maximum ozone-generating capacity of [0.5] ½ pound (0.23 kg) or more over a 24-hour period[, except ozone-generating equipment used in Group R-3 occupancies].

**Exceptions:**

1. Ozone-generating equipment used in Group R-3 occupancies.

2. Ozone-generating equipment used in Group H-5 occupancies in compliance with FC Chapters 18 and 27 and the provisions of FC Chapter 37 governing highly toxic gases.

**3705.2 Design.** Ozone gas generators shall be designed, manufactured and tested in accordance with NEMA 250.

**3705.3 Location.** Ozone gas generators shall be located in approved cabinets or ozone generator rooms in accordance with [Section] FC 3705.3.1 or 3705.3.2.

**3705.3.1 Cabinets.** Ozone cabinets shall be constructed of approved materials and compatible with ozone. Cabinets shall display an approved sign [stating] that reads: OZONE GAS GENERATOR—HIGHLY TOXIC—OXIDIZER.

**3705.3.1.1 Seismic design.** Cabinets shall be braced for seismic activity in accordance with the Building Code.

**3705.3.1.2 Ventilation.** Cabinets shall be mechanically ventilated in accordance with the Mechanical Code.

**3705.3.2 Ozone gas generator rooms.** Ozone [gas/generator] gas-generator rooms shall be mechanically ventilated in accordance with the Mechanical Code. Ozone gas generator rooms shall be equipped with a continuous gas detection system which will shut off the generator and sound a local audible and visible alarm when concentrations above the permissible exposure limit occur.

**3705.3.2.1 [Warning sign] Signage.** Ozone gas-generator rooms shall not be normally occupied, and such rooms shall be kept free of combustible and hazardous material storage. [Room access doors shall display an] An approved sign [stating:] that reads, "OZONE GAS GENERATOR—HIGHLY TOXIC—OXIDIZER," shall be posted on or near each entrance door to an ozone gas-generator room.

**3705.4 Piping, valves and fittings.** Piping, valves, fittings and related components used to convey ozone shall be in accordance with [Sections] FC 3705.4.1 through 3705.4.3.

**3705.4.1 Piping.** [Piping shall be] Only welded stainless steel piping or tubing shall be used.

**Exceptions:**

1. Double-walled piping.

2. Piping, valves, fittings and related components located in exhausted enclosures.

**3705.4.2 Materials.** Materials shall be compatible with ozone and shall be rated for the design operating pressures.

**3705.4.3 [Identification] Signage or marking.** Piping shall be marked, or identified [with the following:] by a durable sign posted on or near the piping that reads, as follows: "OZONE GAS—HIGHLY TOXIC—OXIDIZER."

**3705.5 Automatic shutdown.** Ozone gas generators shall be designed to shut down automatically under the following conditions:

1. When the dissolved ozone concentration in the water being treated is above saturation when measured at the point where the water is exposed to the atmosphere.

2. When the process using generated ozone is shut down.

3. When the gas detection system detects ozone.

4. Failure of the ventilation system for the cabinet or ozone-generator room.

5. Failure of the gas-detection system.

**3705.6 Manual shutdown.** Manual shutdown controls shall be provided at the ozone gas generator and, when the generator is in a room, within 10 feet (3048 mm) of the main exit or exit access door.

# CHAPTER 38
# LIQUEFIED PETROLEUM GASES

## SECTION FC 3801
## GENERAL

**3801.1 Scope.** This chapter shall govern the manufacture, storage, handling and use of LPG and the installation and operation of LPG equipment relating to such systems.

**Exceptions:**

1. Use of LPG or LPG mixtures as a refrigerant in a refrigerating system regulated by the construction codes, including the Mechanical Code, and [Section FC 606 of this code] FC606.

2. Storage and use of LPG in connection with special effects.

3. Outdoor storage and use for private, [non-commercial] noncommercial barbecues within the lot line of a Group R-3 occupancy, as set forth in [Section 307] FC307.

**3801.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**3801.2.1 Deliveries.** Distributors shall not deliver LPG containers to any location in quantities requiring a permit unless a permit for such installation, storage or use has been issued for that location [by the commissioner].

**3801.3 Design and installation documents.** Design and installation documents for LPG storage facilities and stationary installations shall be submitted to and approved by the [commissioner] department in accordance with [Section 105.4] FC105.4.

**3801.4 General.** LPG shall be stored, handled and used, and devices, equipment and systems utilizing LPG shall be designed, installed, operated and maintained, in accordance with this chapter, the rules and NFPA 58.

**3801.5 Supervision.** The storage, handling and use of LPG shall be supervised in accordance with [Sections] FC 3801.5.1 through 3801.5.8.

**3801.5.1 Connecting and disconnecting of LPG containers.** The connecting and disconnecting of LPG containers with a capacity greater than 16.4 ounces (0.465 kg) shall be conducted by a person holding a certificate of fitness.

**3801.5.2 Tar kettles.** The storage, handling and use of a tar kettle that requires a permit shall be under the personal supervision of a person holding a certificate of fitness.

**3801.5.3 Torch operations.** Torch operations using LPG containers with a capacity greater than 16.4 ounces (0.465 kg) LPG shall be performed by a person holding a certificate of fitness.

**3801.5.4 Curing concrete, drying plaster and similar applications.** The use of LPG for curing concrete, drying plaster and similar applications shall be under the personal supervision of a person holding a certificate of fitness.

**3801.5.5 Manhole operations.** The storage, handling and use of LPG at manhole operations shall be under the personal supervision of a person holding a certificate of fitness.

**3801.5.6 Street [festivals, fairs, bazaars, carnivals] fairs and similar outdoor [events] gatherings.** The storage, handling and use of LPG at street [festivals, fairs, bazaars, carnivals] fairs and similar outdoor [events, including public] gatherings[,] shall be under the personal supervision of a person holding a certificate of fitness.

**3801.5.7 Hot air balloon tethering operation.** The storage, handling and use of LPG for hot air balloon tethering operations shall be under the personal supervision of a person holding a certificate of fitness and a United States Federal Aviation Administration license, except as may otherwise be provided in the rules.

**3801.5.8 General supervision.** Except as otherwise provided in [Sections] FC 3801.5.1 through 3801.5.7, the storage and use of LPG in quantities requiring a permit shall be under the general supervision of a person holding a certificate of fitness.

## SECTION FC 3802
## DEFINITIONS

**3802.1 Definition.** The following term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

**LIQUEFIED PETROLEUM GAS (LPG).** A material which is composed predominantly of the following hydrocarbons or mixtures of them: propane, propylene, butane (normal butane or isobutane) and butylenes. Methylacetylene-propadiene mixtures (MAPP-gas) shall be deemed to be an LPG.

## SECTION FC 3803
## INSTALLATION OF EQUIPMENT

**3803.1 General.** LPG equipment shall be installed in accordance with the construction codes, including the Fuel Gas Code, the rules and NFPA 58, except as otherwise provided in this chapter.

**3803.2 [Use] Indoor storage, handling and use of LPG containers [in buildings].** The storage, handling and use of LPG containers [in buildings] indoors shall be in accordance with [Sections] FC 3803.2.1 and 3803.2.2.

**3803.2.1 Portable containers.** Portable LPG containers, as defined in NFPA 58, shall not be stored, handled or used [in buildings] indoors except as authorized by the commissioner, NFPA 58 and [Sections] FC 3803.2.1.1 through [3803.2.1.7] 3803.2.1.8.

**3803.2.1.1 Use in basement, pit or other area below grade.** LPG containers shall not be used in a cellar, basement, pit or other area below grade where heavier-than-air gas might collect. LPG containers shall not be used in an above-grade underfloor space or basement unless such location is provided with an approved means of ventilation.

**Exceptions:**

1. Use with self-contained torch assemblies in accordance with [Section 3803.2.1.6] FC3803.2.1.6 and the rules.

2. Manhole operations in accordance with the rules.

**3803.2.1.2 Construction site heating.** Portable containers [are allowed to] may be used in buildings, or [areas of buildings] parts thereof, undergoing construction, [as set forth in Section 3.4.3 of] in accordance with NFPA 58, [Sections] FC 313.5 and 1403, and the rules.

**3803.2.1.3 Group F occupancies.** Portable LPG containers shall not be stored, handled or used indoors in Group F occupancies, except as the commissioner may authorize by rule.

**3803.2.1.4 Group E and I occupancies.** Portable LPG containers shall not be [permitted inside] allowed in Group E and I occupancies, except as [allowed] set forth in this section and the rules. In Group E and I occupancies, portable LPG containers are allowed to be used for research purposes. Such containers shall not be used in classrooms. Such containers shall not exceed 16.4 ounces (0.465 kg) of LPG. Where more than one such container is present in the same room, each container shall be separated from other containers by a distance of not less than 20 feet (6096 mm).

**3803.2.1.5 [Demonstration uses] Group A occupancies.** Portable LPG containers [are allowed to be used temporarily for demonstrations and public exhibitions] may be brought into a building on a temporary basis for use in conducting a demonstration, or in connection with a trade show or other public exhibition. [Except as otherwise authorized by the commissioner in connection with exhibitions and trade shows, such containers shall not exceed 16.4 ounces (0.465 kg) of LPG.] Such use, and incidental storage and handling, shall be in accordance with the rules, and the containers shall be promptly removed from the premises upon completion of the demonstration or exhibition. Where more than one [such] LPG container is [present] in use in the same room, and are fueling different devices or equipment, [each container] the containers shall be separated from each other [containers] by a distance of not less than 20 feet (6096 mm). [Storage and use of portable LPG containers shall be in accordance with the rules.]

**3803.2.1.6 Use with self-contained torch assemblies.** Portable LPG containers are allowed to be used to supply approved self-contained torch assemblies. Such containers shall not exceed 16.4 ounces (0.465 kg) of LPG.

**3803.2.1.7 Use for food preparation.** [Commercial food service appliances using LPG may be used] Use of LPG for commercial cooking is allowed only when authorized by this code or the rules.

**3803.2.1.8 Residential storage.** LPG container storage in Group R-2 and R-3 occupancies shall not exceed four containers per dwelling unit, each container having a capacity not exceeding 16.4 ounces (0.465 kg) of LPG. Storage of such LPG containers in a basement, cellar or other area below grade is prohibited.

**3803.2.2 Industrial vehicles.** Containers on industrial vehicles shall comply with the requirements of [Section FC 309, Sections 8.3 and 8.4 of] FC309, NFPA 58, and the rules.

**3803.3 Location of equipment and piping.** Equipment and piping shall not be installed in locations where such equipment and piping is prohibited by the construction codes, including the Fuel Gas Code, or the rules.

## SECTION FC 3804

## RESERVED

## SECTION FC 3805
## PROHIBITED STORAGE, HANDLING AND USE OF LPG

**3805.1 Unapproved equipment.** LPG shall not be used for the purpose of operating any device, equipment or system unless such device, equipment or system is approved for use with LPG.

**3805.2 Release to the atmosphere.** LPG shall not be released to the atmosphere except as authorized by the commissioner.

**3805.3 General prohibitions.** It shall be unlawful to:

1. [Store] store, handle or use LPG in any container with a capacity greater than 100 pounds (45.4 kg) of LPG.

2. [Store] store, handle or use LPG in a basement, cellar or other area below grade[ area], except as authorized by the commissioner.

3. [Store] store LPG in any outdoor or indoor storage facility, or store, handle or use LPG for a stationary LPG installation that has not been approved.

4. [Store] store, handle or use LPG without a permit when such storage, handling or use exceeds the quantities set forth in [Section 105.6] FC105.6.

5. [Store] store, handle or use in, or bring or allow into, any residential occupancy, or on any lot containing a building used for a residential occupancy, any LPG container with a capacity greater than 16.4 ounces (0.465 kg), except as authorized by the commissioner.

6. [Store] store, handle or use in, or bring or allow into, any [non-residential] nonresidential building, any LPG container with a capacity greater than 16.4 ounces (0.465 kg) LPG, except as authorized by the commissioner.

7. [Store] store LPG containers on the roof of any building.

8. [Handle] handle or use on the roof of any building LPG containers with a capacity greater than 16.4 ounces (0.465 kg), except as authorized by the commissioner.

9. [Store] store, handle or use LPG in or on motor vehicles, except as temporary storage incidental to transportation, or as a fuel for generating motive power for a motor vehicle, or as otherwise authorized by the commissioner.

10. [Store] store, handle or use LPG for a stationary LPG installation in any area where access to piped natural gas from a public utility is available, except as authorized by the commissioner.

11. [Store] store, handle or use LPG in any equipment used or previously used for natural gas, except as may be authorized by the commissioner on an emergency basis.

12. [Store] store, handle or use LPG for space heating or water heating, except as authorized by the commissioner.

13. [Store] store, handle or use LPG in or for any appliance that withdraws or utilizes LPG in a liquid form except as authorized by the commissioner.

14. [Use non-metallic] use nonmetallic pipe, tubing and components for any installation, appliance or equipment using LPG, except as authorized by the commissioner.

15. [Store] store LPG containers with a capacity greater than 16.4 ounces (0.465 kg) LPG indoors in any residential occupancy and in any building where an [outside storage] outdoor location for such LPG container storage is available.

16. [Store] store or operate a floor maintenance machine utilizing LPG indoors.

17. [Manufacture] manufacture LPG.

18. [Dispense] dispense LPG and fill LPG containers as set forth in [Section FC 3806] FC3806.

## SECTION FC 3806
## DISPENSING AND FILLING

**3806.1 Dispensing and filling.** It shall be unlawful to dispense LPG, fill a container with LPG, or transfer LPG in any state from one container to another.

## SECTION FC 3807
## SAFETY PRECAUTIONS AND DEVICES

**3807.1 Safety devices.** Safety devices on LPG containers, equipment and systems shall not be tampered with or otherwise rendered [ineffective] inoperable and the service unsafe.

**3807.2 Smoking and other sources of ignition.** "No Smoking" signs complying with the requirements of [Section 310] FC310 shall be posted when required by the commissioner. Smoking is prohibited in accordance with FC Chapter 3. Control of other sources of ignition shall comply with the requirements of FC Chapter 3[,] and [Section 3.7 of] NFPA 58.

**3807.3 Clearance to combustibles.** LPG containers shall be kept a minimum of 10 feet (3048 mm) from vegetation, rubbish and other combustible waste and combustible materials.

**3807.4 Protecting containers from vehicles.** Where exposed to vehicular damage due to proximity to alleys, driveways or parking areas or when required by the commissioner, LPG containers, regulators and piping shall be protected in accordance with [Section 312] FC312.

## SECTION FC 3808
## PORTABLE FIRE EXTINGUISHERS

**3808.1** Reserved.

**3808.2 Portable fire extinguishers.** Portable fire extinguishers complying with the requirements of [Section 906] FC906 shall be provided as specified in NFPA 58 and the rules.

## SECTION FC 3809
## STORAGE OF PORTABLE LPG CONTAINERS

**3809.1 General.** Storage of portable LPG containers shall comply with the requirements of [Sections] FC 3809.2 through 3809.14, and shall be approved by the commissioner.

**Exceptions:**

1. Containers that have not previously [been filled with] contained LPG.

2. Containers stored for use at construction sites.

**3809.2 Exposure hazards.** Containers in storage shall be [located in a manner which minimizes] stored in locations that minimize exposure to physical damage, tampering or excessive temperature rise.

**3809.3 Position.** Containers in storage having individual capacity greater than 1 pound (0.454 kg) of LPG shall be positioned with the pressure relief valve in direct communication with the vapor space of the container.

**3809.4 Separation from means of egress.** Containers shall not be stored or left unattended near exit access doors, exits, stairways, exit discharge areas, or other areas designed or used as a means of egress.

**3809.5 Quantity.** Empty containers that have been in LPG service shall be considered as full containers for the purpose of determining the maximum quantities of LPG allowed in [Sections] FC 3809.9 and 3809.11.

**3809.6 Storage on roofs.** Containers shall not be stored, or connected for use in a stationary LPG installation, on the roof of any building or structure.

**3809.7 Storage in basement, pit or other area below grade.** LPG containers shall not be stored in a cellar, basement, pit or other area below grade.

**3809.8 Protection of valves on containers in storage.** Container valves shall be protected by screw-on-type caps or collars which shall be securely in place on all containers stored regardless of whether they are full, partially full or empty. Container outlet valves shall be closed. [LPG

containers with a capacity of 20 pounds (9 kg) of LPG shall also be provided with transportation plugs that secure gas tight the container's outlet valve connection.]

**3809.9 Storage within buildings accessible to the public.** LPG containers constructed in accordance with the United States Department of Transportation (DOTn) specifications with a maximum capacity of 16.4 ounces (0.465 kg) of LPG used in completely self-contained hand torches and similar devices are allowed to be stored for sale or displayed in a building accessible to the public. Buildings shall be protected by a sprinkler system in storage and display areas when quantities exceed permit amounts. The quantity of LPG shall not exceed 200 pounds (91 kg).

**3809.10 Storage within buildings not accessible to the public.** The quantity of LPG containers allowed in one storage location in [buildings] <u>a building</u> not accessible to the public, such as <u>an</u> industrial [buildings] <u>building</u>, shall not exceed a maximum capacity of 300 pounds (136 kg) of LPG. Where [additional storage locations are required] <u>LPG containers are stored in more than one location</u> on the same floor [within the same building, they] <u>of a building, the storage areas</u> shall be separated by a minimum of 300 feet (91 440 mm).

**Exception:** Storage of LPG at construction sites shall be in accordance with the rules.

**3809.11.** Reserved.

**3809.12 Location of outdoor storage.** Outdoor storage, including storage of containers for sale and containers connected for use, shall be located not less than 20 feet (6096 mm) from building openings, 20 feet (6096 mm) from any motor vehicle fuel dispenser and 10 feet (3048 mm) from any combustible material and, as applicable, in accordance with [the] <u>FC</u> Table 3809.12. Outdoor storage of LPG shall be limited to not more than 400 pounds (181.6 kg) of LPG and shall be located at or above grade level.

**Exception:** Storage of LPG at construction sites shall be in accordance with the rules.

**3809.12.1 Proximity to hazards.** Storage shall not be located where the stored LPG would be exposed to the following hazards in the event of the failure of their structure or containment systems:

1. Electric power lines.

2. Piping containing flammable or combustible liquids.

3. Piping containing flammable gases.

4. Piping containing oxidizing materials.

**<u>FC</u> TABLE 3809.12**
**DISTANCES FROM OUTDOOR LPG STORAGE AREA TO EXPOSURES**

| TYPE OF OUTDOOR EXPOSURE | LPG STORAGE AREA MORE THAN 100 POUNDS LPG UP TO MAXIMUM 400 POUNDS LPG MINIMUM DISTANCE TO EXPOSURE (FEET) |
|---|---|
| Building or structure of combustible construction | 10 |
| Subway entrance, exit or other opening | 25 |
| Flammable and combustible liquids Aboveground – 1,000 gallons or less | 10 [a] |
| Flammable and combustible liquids Aboveground – in excess of 1,000 gallons | 20 [a] |
| Flammable and combustible liquids Below ground tank – 1,000 gallons or less | 10 [a] |
| Flammable and combustible liquids Below ground tank – 1,000 gallons or less Vent or fill opening of tank | 15 [a] |
| Flammable and combustible liquids Below ground tank – in excess of 1,000 gallons | 15 [a] |
| Flammable and combustible liquids Below ground tank – in excess of 1,000 gallons Vent or fill opening of tank | 15 [a] |
| Flammable gas storage area, 1,500 SCF or less | 10 [a] |
| Flammable gas storage area, More than 1,500 SCF up to maximum 3,500 SCF | 20 [a] |
| Oxygen storage – 20,000 [scf] SCF or less | In accordance with NFPA 51 [a] |
| Oxygen storage – in excess of 20,000 [scf] SCF | In accordance with NFPA [50] 55 [a] |
| Fast-burning solids, such as ordinary lumber, excelsior or paper | 10 [a] |
| Slow-burning solids, such as heavy timber or coal | 10 [a] |
| Air compressor intakes or inlets to heating, ventilating or air-conditioning equipment | 5 |
| Group A occupancies and public gathering places | 25 |
| Public sidewalks and parked motor vehicles | 10 |
| Public streets, private roads and lot lines | 10[a] |

For SI: 1 foot = 304.8 mm, 1 cubic foot = 0.02832 $m^3$, 1 gallon = 3.785 L.

a. The minimum required distances may be reduced to 5 feet when protective structures having a minimum fire-resistance rating of 2 hours interrupt the line of sight between the container and the exposure. The protective structure shall be at least 5 feet from the exposure. The configuration of the protective structure shall be designed to allow natural ventilation to prevent the accumulation of hazardous gas concentrations.

**3809.13 Protection of containers.** Containers shall be stored within a suitable enclosure or otherwise protected against tampering. Vehicular protection shall be provided as required by the commissioner.

**[3809.14 Separation from means of egress for containers located outside of buildings.** Containers located outdoors shall not be located within 20 feet (6096 mm) of any exit access doors, exits, stairways or in areas normally designed or used as a means of egress.]

**[3809.15] 3809.14 Electrical equipment.** Except as otherwise provided in NFPA 58, electrical equipment within 3 feet (914 mm) in any direction of an outdoor LPG [storage area] facility shall comply with the Class I, Division 2 wiring requirements of the Electrical Code for hazardous locations, unless electrical equipment is separated from such area by a wall or other solid partition having no openings.

## CHAPTER 39

# ORGANIC PEROXIDES

## SECTION FC 3901
## GENERAL

**3901.1 Scope.** This chapter shall govern the manufacture, storage, handling and use of organic peroxides.

**3901.2 Permits.** Permits shall be required for organic peroxides as set forth in [Section 105.6] FC105.6.

**3901.3 General.** Organic peroxides shall be manufactured, stored, handled and used in accordance with this chapter and FC Chapter 27.

**3901.4 Prohibited manufacture, storage, handling and use.** It shall be unlawful to manufacture, store, handle and/or use unclassified detonable organic peroxides except as specifically authorized by FC Chapter 33.

**3901.5 Supervision.** The handling and use of organic peroxides in quantities requiring a permit shall be under the personal supervision of a certificate of fitness holder. The storage of organic peroxides in quantities requiring a permit shall be under the general supervision of a certificate of fitness holder.

## SECTION FC 3902
## DEFINITIONS

**3902.1 Definition.** The following term shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**ORGANIC PEROXIDE.** An organic compound having a double oxygen or peroxy (-O-O-) in its chemical structure. Organic peroxides can present an explosion hazard (detonation or deflagration), can be shock sensitive, can be susceptible to decomposition into various unstable compounds over an extended period of time and are classified as follows based upon their hazardous properties:

**Class I.** Organic peroxides that are capable of deflagration but not detonation.

**Class II.** Organic peroxides that burn very rapidly and that pose a moderate reactivity hazard.

**Class III.** Organic peroxides that burn rapidly and that pose a moderate reactivity hazard.

**Class IV.** Organic peroxides that burn in the same manner as ordinary combustibles and that pose a minimal reactivity hazard.

**Class V.** Organic peroxides that burn with less intensity than ordinary combustibles or do not sustain combustion and that pose no reactivity hazard.

**Unclassified detonable.** Organic peroxides that are capable of detonation and pose an extremely high-explosion hazard through rapid explosive decomposition.

## SECTION FC 3903
## GENERAL REQUIREMENTS

**3903.1 Quantities not exceeding the maximum allowable quantity per control area.** The storage, handling and use of organic peroxides in amounts not exceeding the maximum allowable quantity per control area indicated in [Section 2703.1] FC2703.1 shall be in accordance with [Sections] FC 2701, 2703, 3901, 3903 and 3906.

**3903.1.1 Prohibited indoor storage, handling and use by occupancy.** It shall be unlawful to store, handle or use Class I organic peroxides:

1. [In] in Group A, E, I, R or U occupancies.

2. [In] in offices in Group B, F, M or S occupancies, [or] and any [other] areas of such occupancies that are accessible to the public.

**3903.2 Quantities exceeding the maximum allowable quantity per control area.** The storage, handling and use of organic peroxides in amounts exceeding the maximum allowable quantity per control area indicated in [Section 2703.1] FC2703.1 shall be in accordance with FC Chapter 27 and this chapter.

**3903.3 Multiple hazard sign.** Where more than one class of organic peroxide formulations is stored in immediate proximity to one another, such area shall be provided with hazard identification signs pursuant to FC Chapter 27 for the most severe class present.

**3903.4 Multiple class storage.** Except as otherwise specifically provided in this code, where more than one class of organic peroxide is stored in the same control area, the maximum quantity allowed of each organic peroxide shall be limited as follows: the maximum quantity shall be reduced by multiplying the maximum allowable quantity for each such material by the proportional amount that such material bears to the total quantity of organic peroxide stored in the control area. The total of the proportional amounts shall not exceed 100 percent.

**3903.5 [Temperature sensitive] Temperature-sensitive material.** Where the required storage temperature range, as specified by the manufacturer, extends beyond normal ambient temperatures, high or low temperature limit switches, as applicable, shall be provided in addition to normal temperature controls. These limit switches shall actuate an alarm in a supervised area to ensure reporting to the fire department.

## SECTION FC 3904
## STORAGE

**3904.1 Indoor storage.** Indoor storage of organic peroxides in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1) shall be in accordance with [Sections] FC 2701, 2703, 2704 and this chapter.

**3904.1.1 Detached storage.** Storage of organic peroxides shall be in a detached building when required by [Section 2703.8.2] FC2703.8.2.

**3904.1.2 Distance from detached storage buildings to exposures.** In addition to the requirements of the Building Code, detached storage buildings shall be located in accordance with FC Table 3904.1.2.

**FC TABLE 3904.1.2**
**ORGANIC PEROXIDES—DISTANCE FROM DETACHED STORAGE BUILDINGS OR OUTDOOR STORAGE AREAS TO EXPOSURES**

| ORGANIC PEROXIDE CLASS | MAXIMUM STORAGE QUANTITY (POUNDS) AT MINIMUM SEPARATION DISTANCE | | | | | |
|---|---|---|---|---|---|---|
| | Distance to buildings, lot lines, public streets, private roads or means of egress | | | Distance between individual detached storage buildings or individual outdoor storage areas | | |
| | 50 feet | 100 feet | 150 feet | 20 feet | 75 feet | 100 feet |
| I | 2,000 | 20,000 | 175,000 | 2,000 | 20,000 | 175,000 |
| II | 100,000 | 200,000 | No Limit | 100,000[a] | No Limit | No Limit |
| III | 200,000 | No Limit | No Limit | 200,000[a] | No Limit | No Limit |
| IV | No Limit | No Limit | No Limit | No Limit | No Limit | No Limit |
| V | No Limit | No Limit | No Limit | No Limit | No Limit | No Limit |

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg.
a. When the amount of organic peroxide stored exceeds this amount, the minimum separation shall be 50 feet.

**3904.1.3 Liquid-tight floor.** In addition to the requirements of [Section 2704.12] FC2704.12, floors of storage areas shall be of liquid-tight construction.

**3904.1.4 Electrical wiring and equipment.** In addition to the requirements of [Section 2703.9.4] FC2703.9.4, electrical wiring and equipment in storage areas for Class I or II organic peroxides shall comply with the requirements of the Electrical Code for electrical Class I, Division 2 locations.

**3904.1.5 Smoke detection.** An approved supervised smoke detection system in accordance with the construction codes, including the Building Code, shall be provided in rooms or areas where Class I, II or III organic peroxides are stored. Activation of the smoke detection system shall sound a local alarm.

**Exception:** A smoke detection system shall not be required in detached storage buildings equipped throughout with a fire extinguishing system.

**3904.1.6 Maximum quantities.** Maximum allowable quantities per building in a mixed occupancy building shall not exceed the amounts set forth in FC Table 2703.8.2. Maximum allowable quantities per building in a detached storage building shall not exceed the amounts specified in FC Table 3904.1.2.

**3904.1.7 Storage arrangement.** Storage arrangements for organic peroxides shall be in accordance with FC Table 3904.2.4 and shall comply with the following requirements:

1. Containers and packages in storage areas shall be closed.

2. Bulk storage shall not be in piles or bins.

3. A minimum 2-foot (610 mm) clear space shall be maintained between storage and uninsulated metal walls.

4. Fifty-five-gallon (208 L) drums shall not be stored more than one drum high.

**3904.1.8 Location in building. [**The storage of**]** Class I or II organic peroxides shall be stored on the ground floor. Class III organic peroxides shall not be stored in basements or other areas below grade[ areas].

**3904.1.9 Contamination.** Organic peroxides shall be stored in their original DOTn shipping containers. Organic peroxides shall be stored in a manner to prevent contamination.

**3904.1.10 Explosion control.** Indoor storage rooms, areas and buildings containing Class I organic peroxides shall be provided with explosion control in accordance with [Section 911] FC911 and the construction codes, including the Building Code.

**3904.1.11 Emergency power.** Emergency power in accordance with the construction codes, including the Building Code and Electrical Code, shall be provided for storage areas of Class I organic peroxides.

**3904.1.12 Smoke and heat venting**. Storage areas for Class I organic peroxides shall be provided with smoke and heat venting in accordance with [Section 910] FC910 and the construction codes, including the Building Code.

**3904.2 Outdoor storage.** Outdoor storage of organic peroxides in amounts exceeding the maximum allowable quantities per control area indicated in FC Table 2703.1.1(3) shall be in accordance with [Sections] FC 2701, 2703, 2704 and this chapter.

**3904.2.1 Distance from storage to exposures.** Outdoor storage areas for organic peroxides shall be located in accordance with FC Table 3904.1.2.

**3904.2.2 Electrical wiring and equipment.** In addition to the requirements of [Section 2703.9.4] FC2703.9.4, electrical wiring and equipment in outdoor storage areas containing Class I or II organic peroxides shall comply with the requirements of the Electrical Code for electrical Class I, Division 2 locations.

**3904.2.3 Maximum quantities.** Maximum allowable quantities of organic peroxides in outdoor storage shall be in accordance with FC Table 3904.1.2.

**3904.2.4 Storage arrangement.** Storage arrangements shall be in accordance with FC Table 3904.2.4.

**3904.2.5 Separation.** In addition to the requirements of [Section 2703.9.8] FC2703.9.8, outdoor storage areas for organic peroxides in amounts exceeding those specified in FC Table 2703.8.2 shall be located a minimum distance of 50 feet (15 240 mm) from other hazardous material storage.

**FC TABLE 3904.2.4**
**STORAGE REQUIREMENTS FOR ORGANIC PEROXIDES**

| ORGANIC PEROXIDE CLASS | PILE CONFIGURATION | | | | MAXIMUM QUANTITY PER BUILDING |
|---|---|---|---|---|---|
| | Maximum width (feet) | Maximum height (feet) | Minimum distance to next pile (feet) | Minimum distance to walls (feet) | |
| I | 6 | 8 | 4[a] | 4[b] | Note c |
| II | 10 | 8 | 4[a] | 4[b] | Note c |
| III | 10 | 8 | 4[a] | 4[b] | Note c |
| IV | 16 | 10 | 3[a,d] | 4[b] | No Requirement |
| V | No Requirement | No Requirement | No Requirement | No Requirement | No Requirement |

For SI: 1 foot = 304.8 mm.
a. At least one main aisle with a minimum width of 8 feet shall divide the storage area.
b. Distance to noncombustible walls is allowed to be reduced to 2 feet.
c. For detached storage buildings or outdoor storage areas, see FC Table 3904.1.2 for maximum quantities. For indoor storage, see FC Table 2703.8.2 for maximum quantities.
d. The distance shall not be less than one-half the pile height.

## SECTION FC 3905
## HANDLING AND USE

**3905.1 General.** Organic peroxides in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1) or 2703.1.1(3) shall be handled and used in accordance with [Sections] FC 2701, 2703, 2705 and this chapter.

## SECTION FC 3906
## MANUFACTURING RESTRICTIONS

**3906.1 Organic peroxides classified as a Class IV material.** Organic peroxides classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution may be utilized in manufacturing processes or other production in manufacturing districts only when authorized by a special permit pursuant to Section 42-276 of the Zoning Resolution.

**3906.1.1 Manufacture of organic peroxides classified as a Class IV material.** It shall be unlawful to manufacture organic peroxides classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution.

**3906.1.2 Storage of organic peroxides classified as a Class IV material.** It shall be unlawful to store organic peroxides classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution, except that accessory storage authorized by a special permit pursuant to Section 42-276 of the Zoning Resolution shall be allowed.

# CHAPTER 40
# OXIDIZERS, OXIDIZING GASES AND OXIDIZING CRYOGENIC FLUIDS

## SECTION FC 4001

## GENERAL

**4001.1 Scope.** This chapter shall govern the manufacture, storage, handling and use of [oxidizers, except for the display and storage of oxidizers in Group M and storage of oxidizers in Group S occupancies complying with the requirements of Section 2703.11] solid and liquid oxidizers, oxidizing gases and oxidizing cryogenic fluids.

**Exceptions:**

1. Display and storage in Group M and storage in Group S occupancies in accordance with FC2703.11.

2. Storage, handling and use of liquid oxygen in a residential or residential health care setting in a Group I-1, I-4 or R occupancy in accordance with FC4006.

**4001.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**4001.3 General.** Oxidizers shall be manufactured, stored, handled and used in accordance with this chapter and FC Chapter 27.

**4001.3.1 Oxidizing gases.** [Oxidizers that are compressed] Oxidizing gases shall additionally comply with the requirements of FC Chapter 30.

**4001.3.2 Ammonium nitrate.** Oxidizers containing ammonium nitrate shall additionally comply with the requirements of NFPA 490.

**4001.3.3 Bulk oxygen systems.** Bulk oxygen systems at industrial and institutional consumer sites shall additionally comply with the requirements of NFPA [50] 55.

**4001.3.4 Bulk nitrous oxide systems.** Bulk nitrous oxide systems at industrial and institutional consumer sites shall additionally comply with the requirements of CGA G-8.1.

**4001.3.5 Oxidizing cryogenic fluids.** Oxidizing cryogenic fluids shall additionally comply with the requirements of FC Chapter 32.

**4001.4 Supervision.** The handling and use of oxidizers in quantities requiring a permit shall be under the personal supervision of a certificate of fitness holder. The storage of oxidizers in quantities requiring a permit shall be under the general supervision of a certificate of fitness holder.

## SECTION FC 4002
## DEFINITIONS

**4002.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**BULK NITROUS OXIDE SYSTEM.** A system comprised of stationary or portable nitrous oxide storage containers, pressure regulators, safety devices, vaporizers, manifolds, interconnecting piping and/or other devices or equipment, up to the point where nitrous oxide at service pressure first enters the supply line, that has a storage capacity of more than 28,000 SCF (793 $m^3$) of nitrous oxide in liquid or gaseous state, including unconnected reserves in or at the same building, structure or premises.

**BULK OXYGEN SYSTEM.** A system comprised of stationary or portable oxygen storage containers, pressure regulators, safety devices, vaporizers, manifolds, interconnecting piping and/or other devices or equipment, up to the point where oxygen at service pressure first enters the supply line, that has a storage capacity of more than 20,000 SCF (566 $m^3$) of oxygen in liquid or gaseous state, including unconnected reserves in or at the same building, structure or premises.

**LIQUID OXYGEN AMBULATORY CONTAINER.** A liquid oxygen container with a capacity not exceeding 0.396 gallons (1.5 liters) that constitutes a medical device, as that term is defined in Chapter 9 of Title 21 of the United States Code § 321, that is designed to be filled from a liquid oxygen home care container, and that is designed for portable use to supply oxygen for medical purposes, and that is used for such purpose.

**LIQUID OXYGEN HOME CARE CONTAINER.** A liquid oxygen container with a capacity not exceeding 15.8 gallons (60 liters) that constitutes a medical device, as that term is defined in Chapter 9 of Title 21 of the United States Code § 321, and that is designed and used for medical purposes in a residential or resident health care setting in a Group I-1, I-4 or R occupancy.

**OXIDIZER.** A material that readily yields oxygen or other oxidizing gas, [such as bromine, chlorine and fluorine,] or that readily reacts to promote or initiate combustion of combustible materials and, if heated or contaminated, can result in vigorous self-sustained decomposition, classified as follows:

**Class 1.** An oxidizer [whose primary hazard is that it slightly increases] that causes a readily measurable increase in the burning rate [but which does not cause spontaneous ignition when it comes in contact with] of combustible materials with which it comes in contact, but less than a moderate increase.

**Class 2.** An oxidizer that [will cause] causes a moderate increase in the burning rate [or that causes spontaneous ignition] of combustible materials with which it comes in contact.

**Class 3.** An oxidizer that [will cause] causes a severe increase in the burning rate of combustible materials with which it comes in contact [or that will undergo vigorous self-sustained decomposition caused by contamination or exposure to heat].

**Class 4.** An oxidizer that can undergo an explosive reaction due to contamination or exposure to thermal or physical shock and [can cause spontaneous ignition of combustibles] causes a severe increase in the burning rate of combustible materials with which it comes in contact.

**OXIDIZING CRYOGENIC FLUID.** An oxidizing gas in the cryogenic state.

**OXIDIZING GAS.** A gas that can support and accelerate combustion of other materials more than air does.

## SECTION FC 4003
## GENERAL REQUIREMENTS

**4003.1 Quantities not exceeding the maximum allowable quantity per control area.** The storage, handling and use of oxidizers in amounts not exceeding the maximum allowable quantity per control area indicated in [Section 2703.1] FC2703.1 shall be in accordance with [Sections] FC 2701, 2703, 4001, 4003, and [4006] 4007 and with [Chapter 30] FC Chapters 30 and 32, as applicable.

**4003.1.1 Prohibited indoor storage, handling and use by occupancy.** It shall be unlawful to store, handle or use:

1. Class 4 oxidizers in Group A, E, I, R or U occupancies.

2. Class 4 liquid and solid oxidizers in offices [or retail sales areas of] in Group B, F, M or S occupancies, and any areas of such occupancies that are accessible to the public.

3. Oxidizing gases in portable containers exceeding an individual capacity of 250 SCF (7 $m^3$) for maintenance purposes, patient care or operation of equipment in Group A[,] and [B,] E[, I, or R] occupancies; Group B occupancy offices; and Group I and R occupancies, except as authorized by FC4006.

**4003.1.2 Emergency shutoff.** [Compressed gas] Oxidizing gas piping systems [conveying oxidizer gases] shall be provided with approved manual or automatic emergency shutoff valves that can be activated at each point of use and each source.

**4003.1.2.1 Shutoff at source.** A manual or automatic fail-safe emergency shutoff valve shall be installed on supply piping at the container or other source of supply. Manual or automatic valves on the containers supplying the oxidizing gas may serve as the emergency shutoff valve when the containers are the sole source of supply and are not manifolded.

**4003.1.2.2 Shutoff at point of use.** A manual or automatic emergency shutoff valve shall be installed on the supply piping at the point of use or at a point where the equipment using the gas is connected to the supply system.

**4003.1.3 Ignition source control.** Ignition sources in areas containing oxidizing gases shall be controlled in accordance with [Section 2703.7] FC2703.7.

**4003.2 Quantities exceeding the maximum allowable quantity per control area.** The storage, handling and use of oxidizers in amounts exceeding the maximum allowable quantity per control area indicated in [Section 2703.1] FC2703.1 shall be in accordance with FC Chapter 27 and this chapter.

**4003.3 Multiple hazard sign.** Where more than one class of oxidizer is stored in immediate proximity to one another, such area shall be provided with hazard identification signs pursuant to FC Chapter 27 for the most severe class present.

**4003.4 Multiple class storage.** Except as otherwise specifically provided in this code, where more than one class of oxidizer is stored in the same control area, the maximum quantity allowed of each oxidizer shall be limited as follows: the maximum quantity shall be reduced by multiplying the maximum allowable quantity for each such material by the proportional amount that such material bears to the total quantity of oxidizer stored in the control area. The total of the proportional amounts shall not exceed 100 percent.

**4003.5 Filling of portable containers.** Portable containers of oxidizing gases shall be filled at a compressed gas dispensing facility, except that:

1. liquid oxygen home care containers alternatively may be filled outdoors from a cargo tank designed to supply such containers. When a liquid oxygen home care container is filled from a cargo tank on an asphalt or combustible surface, a drip pan compatible with liquid oxygen shall be provided under home care container fill and vent connections during the filling process to minimize the risk of ignition of the combustible surface; and

2. liquid oxygen ambulatory containers alternatively may be filled in the residence or residential health care setting from the liquid oxygen home care container designed for such purpose, in accordance with the manufacturer's instructions.

**4003.5.1 Smoking prohibited.** Smoking shall be prohibited in rooms or areas where liquid oxygen containers are filled.

## SECTION FC 4004
## STORAGE

**4004.1 Indoor storage.** Indoor storage of oxidizers in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1) shall be in accordance with [Sections] FC 2701, 2703, 2704 and this chapter.

**4004.1.1 Detached storage.** Storage of liquid and solid oxidizers shall be in a detached building when required by [Section 2703.8.2] FC2703.8.2.

**4004.1.2 Distance from detached storage buildings to exposures.** In addition to the requirements of the construction codes, including the Building Code, detached storage buildings shall be located in accordance with FC Table 4004.1.2.

**FC TABLE 4004.1.2**
**OXIDIZER (LIQUIDS AND SOLIDS)—DISTANCE FROM DETACHED STORAGE BUILDINGS AND OUTDOOR STORAGE AREAS TO EXPOSURES**

| OXIDIZER CLASS | WEIGHT (pounds) | MINIMUM DISTANCE TO BUILDINGS, LOT LINES, PUBLIC STREETS, PRIVATE ROADS OR BUILDING EXITS (feet) |
|---|---|---|
| 1 | Note a | Not Required |
| 2 | Note a | 35 |
| 3 | Note a | 50 |
| 4 | Up to 10 | 50 |
| | greater than 10 up to 100 | 75 |
| | greater than 100 up to 500 | 100 |
| | greater than 500 up to 1,000 | 125 |
| | greater than 1,000 up to 3,000 | 200 |
| | greater than 3,000 up to 5,000 | 300 |
| | greater than 5,000 up to 10,000 | 400 |
| | over 10,000 | As required by the commissioner |

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg.
a. Any quantity over the amount required for detached storage in accordance with [Section 2703.8.2] FC2703.8.2, or over the outdoor maximum allowable quantity for outdoor control areas.

**4004.1.3 Explosion control.** Any room or other area in which Class 4 liquid or solid oxidizers are stored shall be provided with explosion control in accordance with [Section 911] FC911 and the construction codes, including the Building Code.

**4004.1.4 Sprinkler system.** Solid and liquid oxidizer storage areas shall be protected by a sprinkler system in accordance with NFPA 430.

**4004.1.5 Liquid-tight floor.** In addition to [Section 2704.12] FC2704.12, floors of storage areas for liquid and solid oxidizers shall be of liquid-tight construction.

**4004.1.6 Smoke detection.** An approved supervised smoke detection system in accordance with the construction codes, including the Building Code shall be installed in liquid and solid oxidizer storage areas. Such smoke detection system shall be monitored by an approved central station.

**Exception:** Detached storage buildings protected by a fire extinguishing system.

**4004.1.6.1 Smoke and heat venting.** Smoke and heat venting shall be provided in accordance with [Section 910] FC910 and the construction codes, including the Building Code.

**4004.1.7 Storage conditions.** The maximum quantity of oxidizers that may be stored in a detached storage buildings shall not exceed the quantities set forth in FC Tables 4004.1.7(1) through 4004.1.7(4).

**4004.1.7.1 Liquid and solid oxidizers.** The storage configuration for liquid and solid oxidizers shall be as set forth in FC Tables 4004.1.7(1) through 4004.1.7(4).

**4004.1.7.2 Class 2 oxidizers.** Class 2 oxidizers shall not be stored in basements, cellars or other [below-grade areas] areas below grade, except when such storage is in stationary tanks.

**4004.1.7.3 Class 3 and 4 oxidizers.** Class 3 and 4 oxidizers in amounts exceeding the maximum allowable quantity per control area set forth in [Section 2703.1] FC2703.1 shall be stored on the ground floor only.

**FC TABLE 4004.1.7(1)**
**STORAGE REQUIREMENTS FOR CLASS 1 OXIDIZER (LIQUIDS AND SOLIDS) IN COMBUSTIBLE CONTAINERS[a]**

| STORAGE CONFIGURATION | LIMITS (feet) |
|---|---|
| Piles | |
| Maximum length | No Limit |
| Maximum width | 50 |
| Maximum height | 20 |
| Minimum distance to next pile | 3 |
| Minimum distance to walls | 2 |
| Maximum quantity per pile | No Limit |
| Maximum quantity per building | No Limit |

For SI: 1 foot = 304.8 mm.
a. Storage in noncombustible containers or in bulk in detached storage buildings is not limited as to quantity or arrangement.

**FC TABLE 4004.1.7(2)**
**STORAGE REQUIREMENTS FOR CLASS 2 OXIDIZER (LIQUIDS AND SOLIDS)[a,b]**

| STORAGE CONFIGURATION | LIMITS | | |
|---|---|---|---|
| | Segregated storage | Cutoff storage rooms[c] | Detached building |
| Piles | | | |
| Maximum width | 16 feet | 25 feet | 25 feet |
| Maximum height | 10 feet | 12 feet | 12 feet |
| Minimum distance to next pile | Note d | Note d | Note d |
| Minimum distance to walls | 2 feet | 2 feet | 2 feet |
| Maximum quantity per pile | 20 tons | 50 tons | 200 tons |
| Maximum quantity per building | 200 tons | 500 tons | No Limit |

For SI: 1 foot = 204.8 mm, 1 ton = 0.907185 metric ton.
a. Storage in noncombustible containers is not limited as to quantity or arrangement, except that piles shall be at least 2 feet from walls in buildings protected throughout by a sprinkler system and 4 feet from walls in buildings not protected throughout by a sprinkler system; the distance between piles shall not be less than the pile height.
b. Quantity limits shall be reduced by 50 percent in buildings or portions of buildings used for retail sales.
c. Cutoff storage rooms shall be separated from the remainder of the building by 2-hour fire barriers.
d. Aisle width shall not be less than the pile height.

**FC TABLE 4004.1.7(3)**
**STORAGE REQUIREMENTS FOR CLASS 3 OXIDIZER (LIQUIDS AND SOLIDS)[a,b]**

| STORAGE CONFIGURATION | LIMITS | | |
|---|---|---|---|
| | Segregated storage | Cutoff storage rooms[c] | Detached building |
| Piles | | | |
| Maximum width | 12 feet | 16 feet | 20 feet |
| Maximum height | 8 feet | 10 feet | 10 feet |
| Minimum distance to next pile | Note d | Note d | Note d |
| Minimum distance to walls | 4 feet | 4 feet | 4 feet |
| Maximum quantity per pile | 20 tons | 30 tons | 150 tons |
| Maximum quantity per building | 100 tons | 500 tons | No Limit |

For SI: 1 foot = 204.8 mm, 1 ton = 0.907185 metric ton.
a. Storage in noncombustible containers is not limited as to quantity or arrangement, except that piles shall be at least 2 feet from walls in sprinklered buildings and 4 feet from walls in nonsprinklered buildings; the distance between piles shall not be less than the pile height.
b. Quantity limits shall be reduced by 50 percent in buildings or portions of buildings used for retail sales.
c. Cutoff storage rooms shall be separated from the remainder of the building by 2-hour fire barriers.
d. Aisle width shall not be less than the pile height.

**FC TABLE 4004.1.7(4)**
**STORAGE REQUIREMENTS FOR CLASS 4 OXIDIZER (LIQUIDS AND SOLIDS)**

| STORAGE CONFIGURATION | LIMITS (feet) |
|---|---|
| Piles | |
| Maximum length | 10 |

| | |
|---|---|
| Maximum width<br>Maximum height<br>Minimum distance to next pile | 4<br>8<br>8 |
| Maximum quantity per building | No Limit |

For SI: 1 foot = 304.8 mm.

**4004.1.8 Separation of Class 4 oxidizers from other materials.** In addition to the requirements in [Section 2703.9.8] FC2703.9.8, Class 4 oxidizer liquids and solids shall be separated from other hazardous materials by not less than a 1-hour fire barrier or stored in hazardous materials storage cabinets. Detached storage buildings for Class 4 oxidizer liquids and solids shall be located a minimum of 50 feet (15 240 mm) from other hazardous materials storage.

**4004.1.9 Contamination.** Liquid and solid oxidizers shall not be stored on or against combustible surfaces. Liquid and solid oxidizers shall be stored in a manner to prevent contamination.

**4004.2 Outdoor storage.** Outdoor storage of oxidizers in amounts exceeding the maximum allowable quantities per control area set forth in FC Table 2703.1.1(3) shall be in accordance with [Sections] FC 2701, 2703, 2704 and this chapter.

**4004.2.1 Distance from storage to exposures for liquid and solid oxidizers.** Outdoor storage areas for liquid and solid oxidizers shall be located in accordance with FC Table 4004.1.2.

**4004.2.2 Distance from storage to exposures for oxidizing gases.** Outdoor storage areas for oxidizing gases shall be located in accordance with FC Table 4004.2.2.

**4004.2.2.1 Oxidizing cryogenic fluids.** Outdoor storage areas for oxidizing cryogenic fluids shall be located in accordance with FC Chapter 32.

**FC TABLE 4004.2.2**
**OXIDIZING GASES—DISTANCE FROM STORAGE TO EXPOSURES[a]**

| QUANTITY OF GAS STORED SCF | DISTANCE TO A BUILDING NOT ASSOCIATED WITH THE MANUFACTURE OR DISTRIBUTION OF OXIDIZING GASES OR PUBLIC STREET, PRIVATE ROAD OR LOT LINE (feet) | DISTANCE BETWEEN STORAGE AREAS (feet) |
|---|---|---|
| greater than 3,000 up to 50,000 | 5 | 5 |
| greater than 50,000 up to 100,000 | 10 | 10 |
| greater than 100,000 | 15 | 15 |

For SI: 1 foot = 304.8 mm, 1 cubic foot = 0.02832 $m^3$.

a. The distances do not apply when protective structures having a minimum fire-resistance rating of 2 hours interrupt the line of sight between the storage container and the exposure. The protective structure shall be at least 5 feet from the exposure. The configuration of the protective structure shall be designed to allow natural ventilation to prevent the accumulation of hazardous gas concentrations.

**4004.2.3 Storage configuration for liquid and solid oxidizers.** Storage configuration for liquid and solid oxidizers shall be in accordance with FC Tables 4004.1.7(1) through 4004.1.7(4).

**4004.2.4 Storage configuration for oxidizing gases.** Storage configuration for oxidizing gases shall be in accordance with FC Table 4004.2.2.

## SECTION FC 4005
## HANDLING AND USE

**4005.1 Scope.** Oxidizers in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1) or 2703.1.1(3) shall be handled and used in accordance with [Sections] FC 2701, 2703, 2705 and this chapter.

## SECTION FC 4006
## LIQUID OXYGEN FOR RESIDENTIAL HEALTH CARE USE

**4006.1 General.** Liquid oxygen home care containers and liquid oxygen ambulatory containers used for medical purposes in residential health care settings in Group I-1, I-4 and R occupancies shall be stored, handled and used in accordance with the manufacturer's instructions and labeling and in compliance with the requirements of this section. Storage, handling and use of liquid oxygen, including liquid oxygen home care containers and liquid oxygen ambulatory containers, in Group I-1, I-4 and R occupancies, other than in dwelling units and sleeping rooms, shall be in accordance with FC 4001 through 4005 and FC Chapter 27.

**4006.2 Supplier requirements.** Persons engaged in the business of supplying liquid oxygen home care containers and liquid oxygen ambulatory containers shall provide to the person who will be using the liquid oxygen:

1. the manufacturer's instructions, and informational materials detailing the safe storage, handling and use of the containers in accordance with this section, including the prohibition set forth in FC4006.3.4 relating to LPG storage, handling and use;

2. unless the person who will be using the liquid oxygen is already in possession of such a device suitable for the container being supplied, a base, hand truck or other device or devices designed to support the container in an upright or other approved position, to secure the container from movement, and to enable the container to be safely handled; and

3. two signs that read, "OXYGEN — NO SMOKING," and instruct the person who will be using the liquid oxygen to conspicuously post one sign in the living area of the dwelling unit and one in the person's sleeping room, to remind all occupants of the dwelling unit and all visitors of the danger of fire associated with smoking near an oxygen supply.

**4006.3 Storage, handling and use requirements.** Liquid oxygen home care containers and liquid oxygen ambulatory containers shall be stored, handled and used in residential

dwelling units and residential health care dwelling units or sleeping rooms in Group I-1, I-4 and R occupancies in compliance with the requirements of FC 4006.3.1 through 4006.3.4.

**4006.3.1 Quantity limits.** The maximum aggregate quantity of liquid oxygen that may be stored, handled and used in a residential dwelling unit or residential health care dwelling unit or sleeping room shall be limited to 31.6 gallons (120 L).

**4006.3.2 Storage and use locations.** Containers shall not be stored or used in any location in the dwelling unit or sleeping room where they obstruct egress from the room; can be struck by a door or falling object; are exposed to a heat source, including a radiator, baseboard heater, steam pipe, portable electric heater, or halogen lamp; or are exposed to any open flame or other ignition source, including a stove or torch.

**4006.3.3 Securing and handling containers.** Liquid oxygen home care containers and liquid oxygen ambulatory containers shall be kept in an upright or other approved position, secured from movement, and handled in accordance with the manufacturer's instructions, using the base, hand truck or other device or devices supplied for such purpose or other suitable device. Liquid oxygen ambulatory containers may be hand carried.

**4006.3.4 Prohibition.** LPG containers shall not be stored, handled or used in any room in the dwelling unit or sleeping room in which liquid oxygen home care containers and liquid oxygen ambulatory containers are being stored or are in use.

**4006.4 Filling of containers.** Liquid oxygen home care containers and liquid oxygen ambulatory containers shall be filled in accordance with FC4003.5.

**4006.5 Smoking prohibited.** Smoking shall be prohibited in rooms or areas where liquid oxygen is in use.

**4006.6 Signage**. Where required by the department, an approved sign shall be affixed to a lower quadrant of the door, within 12 inches (305 mm) from the bottom of the door, indicating the presence of liquid oxygen home care containers within the dwelling unit or sleeping room.

## SECTION FC [4006] 4007
## MANUFACTURING RESTRICTIONS

**[4006.1] 4007.1 Oxidizers classified as a Class IV material.** Oxidizers classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution may be utilized in manufacturing processes or other production in manufacturing districts only when authorized by a special permit pursuant to Section 42-276 of the Zoning Resolution.

**[4006.1.1] 4007.1.1 Manufacture of oxidizers classified as a Class IV material.** It shall be unlawful to manufacture oxidizers classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution.

**[4006.1.2] 4007.1.2 Storage of oxidizers classified as a Class IV material.** It shall be unlawful to store oxidizers classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution, except that accessory storage authorized by a special permit pursuant to Section 42-276 of the Zoning Resolution shall be allowed.

# CHAPTER 41
# PYROPHORIC MATERIALS

## SECTION FC 4101
## GENERAL

**4101.1 Scope.** This chapter shall govern the manufacture, storage, handling and use of pyrophoric materials.

**4101.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**4101.3 General.** Pyrophoric materials shall be manufactured, stored, handled and used in accordance with this chapter. Pyrophoric materials that are compressed gases shall additionally comply with the requirements of FC Chapter 30.

**4101.4 Prohibitions.** It shall be unlawful to:

1. Manufacture, store, handle and/or use detonable pyrophoric materials, except as specifically authorized in compliance with the requirements of FC Chapter 33.

2. Compress any pyrophoric material that is a gas.

**4101.5 Supervision.** The handling and use of pyrophoric materials in quantities requiring a permit shall be under the personal supervision of a certificate of fitness holder. The storage of pyrophoric materials in quantities requiring a permit shall be under the general supervision of a certificate of fitness holder.

## SECTION FC 4102
## DEFINITIONS

**4102.1 Definition.** The following term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

**PYROPHORIC MATERIAL.** A material with an autoignition temperature in air, at or below a temperature of 130°F (54°C).

## SECTION FC 4103
## GENERAL REQUIREMENTS

**4103.1 Quantities not exceeding the maximum allowable quantity per control area.** The storage, handling and use of pyrophoric materials in amounts not exceeding the maximum allowable quantity per control area indicated in [Section 2703.1] FC2703.1 shall be in accordance with [Sections] FC 2701, 2703, 4101, 4103 and [4107] 4106.

**4103.1.1 Emergency shutoff.** Compressed gas systems conveying pyrophoric gases shall be provided with approved manual or automatic emergency shutoff valves that can be activated at each point of use and each source.

**4103.1.1.1 Shutoff at source.** An manual or automatic fail-safe emergency shutoff valve shall be installed on supply piping at the container or other source of supply. The shutoff valve shall be operated by a remotely located manually activated shutdown control located not less than 15 feet (4572 mm) from the source of supply. Manual or automatic container valves on the containers supplying the pyrophoric material may serve as the emergency shutoff valve when the containers are the sole source of supply and are not manifolded.

**4103.1.1.2 Shutoff at point of use.** A manual or automatic emergency shutoff valve shall be installed on the supply piping at the point of use or at a point where the equipment using the gas is connected to the supply system.

**4103.2 Quantities exceeding the maximum allowable quantity per control area.** The storage, handling and use of pyrophoric materials in amounts exceeding the maximum allowable quantity per control area indicated in [Section 2703.1] FC2703.1 shall be in accordance with FC Chapter 27 and this chapter.

## SECTION FC 4104
## STORAGE

**4104.1 Indoor storage.** Indoor storage of pyrophoric materials in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1), shall be in accordance with [Sections] FC 2701, 2703, 2704 and this chapter. The storage of silane gas and gas mixtures with a silane gas concentration of [2] 1.37 percent or more by volume, shall be in accordance with [Section 4106] CGA G-13.

**4104.1.1 Liquid-tight floor.** In addition to the requirements of [Section 2704.12] FC2704.12, floors of storage areas containing pyrophoric liquids shall be of liquid-tight construction.

**4104.1.2 Pyrophoric solids and liquids.** Storage of pyrophoric solids and liquids shall be limited to a maximum area of 100 square feet (9.3 $m^2$) per pile. Storage shall not exceed 5 feet (1524 mm) in height. Individual containers shall not be stacked. Aisles between storage piles shall be a minimum of 10 feet (3048 mm) in width. Individual tanks or containers shall not exceed 500 gallons (1893 L) in capacity.

**4104.1.3 Pyrophoric gases.** Storage of pyrophoric gases shall be in detached buildings where required by [Section 2703.8.2] FC2703.8.2.

**4104.1.4 Separation from incompatible materials.** In addition to the requirements of [Section 2703.9.8] FC2703.9.8, indoor storage of pyrophoric materials shall be isolated from incompatible hazardous materials by 1-hour fire barriers with openings protected in accordance with the construction codes, including the Building Code.

**Exception:** Storage in approved hazardous materials storage cabinets constructed in accordance with [Section 2703.8.7] FC2703.8.7.

**4104.2 Outdoor storage.** Outdoor storage of pyrophoric materials in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(3) shall be in accordance with [Sections] FC 2701, 2703, 2704 and this chapter. The storage of silane gas, and gas mixtures with a silane gas concentration of [2] 1.37 percent or more by volume, shall be in accordance with [Section 4106] CGA G-13.

**4104.2.1 Distance from storage to exposures.** The separation of pyrophoric solids, liquids and gases from buildings, lot lines, public streets, private roads or means of egress shall be in accordance with the following:

1. Solids and liquids. Two times the separation required by FC Chapter 34 for Class IB flammable liquids.

2. Gases. The location and maximum amount of pyrophoric gas per storage area shall be in accordance with FC Table 4104.2.1.

**FC TABLE 4104.2.1**
**PYROPHORIC GASES—DISTANCE FROM STORAGE TO EXPOSURES[a]**

| MAXIMUM AMOUNT PER STORAGE AREA (cubic feet) | MINIMUM DISTANCE BETWEEN STORAGE AREAS (feet) | MINIMUM DISTANCE TO LOT LINES (feet) | MINIMUM DISTANCE TO PUBLIC STREETS AND PRIVATE ROADS (feet) | MINIMUM DISTANCE TO BUILDINGS ON THE SAME PROPERTY | | |
|---|---|---|---|---|---|---|
| | | | | Nonrated construction or openings within 25 feet | Two-hour construction and no openings within 25 feet | Four-hour construction and no openings within 25 feet |
| 250 | 5 | 25 | 5 | 5 | 0 | 0 |
| 2,500 | 10 | 50 | 10 | 10 | 5 | 0 |
| 7,500 | 20 | 100 | 20 | 20 | 10 | 0 |

For SI: 1 foot = 304.8 mm, 1 cubic foot = 0.02832 $m^3$.

a. The minimum required distances shall be reduced to 5 feet when protective structures having a minimum fire resistance of 2 hours interrupt the line of sight between the container and the exposure. The protective structure shall be at least 5 feet from the exposure. The configuration of the protective structure shall allow natural ventilation to prevent the accumulation of hazardous gas concentrations.

**4104.2.2 Fire protection.** When overhead construction is provided for sheltering outdoor storage areas of pyrophoric materials, the storage areas shall be protected throughout by a fire extinguishing system.

## SECTION FC 4105
## HANDLING AND USE

**4105.1 General.** Pyrophoric materials in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1) or 2703.1.1(3) shall be handled and used in accordance with [Sections] FC 2701, 2703, 2705 and this chapter.

**4105.2 Fire protection.** When overhead construction is provided for sheltering of outdoor use areas of pyrophoric materials, the use areas shall be protected throughout by a fire extinguishing system.

**4105.3 Silane gas.** The handling and use of silane gas, and gas mixtures with a silane gas concentration of [2] 1.37 percent or more by volume, shall be in accordance with [Section 4106] CGA G-13.

## [SECTION FC 4106
## SILANE GAS

**4106.1 General requirements.** The storage, handling and use of silane gas and gas mixtures with a silane gas concentration of 2 percent or more by volume, in amounts exceeding the maximum allowable quantity per control area indicated in Table 2703.1.1(1) or 2703.1.1(3), shall be in accordance with this section.

**4106.1.1 Building construction.** Indoor storage, handling and use of silane gas shall be within a room or building conforming to the construction codes, including the Building Code.

**4106.1.2 Flow control.** Compressed gas containers, cylinders and tanks containing silane gas, and gas mixtures with a silane gas concentration of 2 percent or more by volume, shall be equipped with reduced flow valves equipped with restrictive flow orifices not exceeding 0.010 inch (0.254 mm) in diameter. The presence of the restrictive flow orifice shall be indicated on the valve and on the container, cylinder or tank by means of a label placed by the manufacturer at a prominent location.

**Exceptions:**

1. Manufacturing and filling facilities where silane gas is produced or mixed and stored prior to sale.

2. Outdoor installations consisting of permanently mounted cylinders connected to a manifold, provided that the outlet connection from the manifold is equipped with a restrictive flow orifice not exceeding 0.125 inch (3.175 mm) in diameter and the setback distance to exposures is not less than 40 feet (12 192 mm). Footnote a of Table 4104.2.1 shall not apply.

**4106.1.3 Valves.** Container, cylinder and tank valves shall be constructed of stainless steel or other approved materials. Valves shall be equipped with outlet fittings in accordance with CGA V-1.

**4106.2 Indoor storage.** Indoor storage of silane gas, and gas mixtures with a silane gas concentration of 2 percent or more by volume, shall be in accordance with Section 4104.1 and Sections 4106.2.1 through 4106.2.3.

**4106.2.1 Fire protection.** Whenever a fire extinguishing system is required, a sprinkler system shall be provided.

**4106.2.2 Exhausted enclosures or gas cabinets.** When provided, exhausted enclosures and gas cabinets shall be constructed as follows:

1. Exhausted enclosures and gas cabinets shall be in accordance with Sections 2703.8.5 and 2703.8.6.

2. Exhausted enclosures and gas cabinets shall be internally protected by a sprinkler system.

3. The velocity of ventilation across unwelded fittings and connections on the piping system shall not be less than 200 linear feet per minute (102 m/s).

4. The average velocity at the face of the access ports or windows in the gas cabinet shall not be less than 200 linear feet per minute (102 m/s) with a minimum velocity of 150 linear feet per minute (76 m/s) at any point of the access port or window.

**4106.2.3 Emergency power.** The ventilation system shall be provided with an automatic emergency power source in accordance with Section 604 and designed to operate at full capacity.

**4106.3 Outdoor storage.** Outdoor storage of silane gas, and gas mixtures with a silane gas concentration of 2 percent or more by volume, shall be in accordance with Section 4104.2 and Sections 4106.3.1 through 4106.3.3.

**4106.3.1 Volume.** The maximum volume for each nest shall not exceed 10,000 cubic feet (283.2 $m^3$) of gas.

**4106.3.2 Aisles.** Storage nests shall be separated by aisles a minimum of 6 feet (1829 mm) in width.

**4106.3.3 Separation.** Storage shall be located a minimum of 25 feet (7620 mm) from lot lines, public streets, private roads, means of egress and buildings.

**4106.3.4 Weather protection.** The clear height of overhead construction provided for sheltering of outdoor storage shall not be less than 12 feet (3658 mm).

**4106.4 Indoor handling and use.** The indoor handling and use, including dispensing, of silane gas and gas mixtures with a silane gas concentration of 2 percent or more by volume, in amounts

exceeding the maximum allowable quantity per control area indicated in Table 2703.1.1(1) shall be in accordance with Sections 4105 and this section.

**4106.4.1 Exhausted enclosures or gas cabinets.** When provided, exhausted enclosures and gas cabinets shall be installed in accordance with Section 4106.2.2.

**4106.4.2 Remote manual shutdown.** Remote manual shutdown of process gas flow shall be provided outside each gas cabinet.

**4106.4.3 Emergency power.** The ventilation system shall be provided with an approved automatic emergency power source in accordance with Section 604 and designed to operate at full capacity.

**4106.4.4 Purge panels.** Automated purge panels shall be provided.

**4106.4.4.1 Purge gases.** Purging of piping and controls located in gas cabinets or exhausted enclosures shall only be performed using a dedicated inert gas supply that is designed to prevent silane gas from entering the inert gas supply. The use of nondedicated systems or portions of piping systems is allowed on portions of the venting system that are continuously vented to atmosphere. Devices that could interrupt the continuous flow of purge gas to the atmosphere shall be prohibited.

**Exception:** Manufacturing and filling facilities where silane gas is produced or mixed.

**4106.4.4.2 Venting.** Gas vent headers or individual purge panel vent lines shall have a continuous flow of inert gas. The inert gas shall be introduced upstream of the first vent or exhaust connection to the header.

**4106.4.4.3 Purging operations.** Purging operations shall be performed by means ensuring complete purging of the piping and control system before the system is opened to the atmosphere.

**4106.5 Outdoor handling and use.** The outdoor handling and use, including dispensing, of silane gas, and gas mixtures with a silane gas concentration of 2 percent or more by volume, exceeding the maximum allowable quantity per control area indicated in Table 2703.1.1(3) shall be in accordance with Sections 4105, 4106.4 and 4106.5.1.

**4106.5.1 Fire protection.** When overhead construction is provided for sheltering outdoor use areas containing silane gas, or gas mixtures with a silane gas concentration of 2 percent or more by volume, the use areas shall be protected throughout by a fire extinguishing system.]

## SECTION FC [4107] 4106
## MANUFACTURING RESTRICTIONS

**[4107.1] 4106.1 Pyrophoric materials classified as a Class IV material.** Pyrophoric materials classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution may be utilized in manufacturing processes or other production in manufacturing districts only when authorized by a special permit pursuant to Section 42-276 of the Zoning Resolution.

**[4107.1.1] 4106.1.1 Manufacture of pyrophoric materials classified as a Class IV material.** It shall be unlawful to manufacture pyrophoric materials classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution.

**[4107.1.2] 4106.1.2 Storage of pyrophoric materials classified as a Class IV material.** It shall be unlawful to store pyrophoric materials classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution, except accessory storage authorized by a special permit pursuant to Section 42-276 of the Zoning Resolution.

# CHAPTER 42
# PYROXYLIN PLASTICS

## SECTION FC 4201
## GENERAL

**4201.1 Scope.** This chapter shall govern the manufacture, storage, handling and use of pyroxylin plastic, except cellulose nitrate motion picture film, which shall comply with the requirements of [Section 306] FC306.

**4201.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**4201.3 General.** Pyroxylin plastics shall be manufactured, stored, handled and used in accordance with this chapter.

**4201.4 Prohibitions.** It shall be unlawful to:

1. Manufacture raw pyroxylin plastics.

2. Store raw pyroxylin plastics, except accessory storage authorized by a special permit pursuant to Section 42-276 of the Zoning Resolution.

**4201.5 Supervision.** The handling and use of raw pyroxylin plastics in quantities requiring a permit shall be under the personal supervision of a certificate of fitness holder. The storage of raw pyroxylin plastics in quantities requiring a permit shall be under the general supervision of a certificate of fitness holder.

## SECTION FC 4202
## DEFINITIONS

**4202.1 Definitions.** The following terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**FINISHED PYROXYLIN PLASTIC PRODUCTS.** Any product to which a pyroxylin plastic has been applied that does not require further manufacturing with respect to the application of such pyroxylin plastic or any further application of pyroxylin plastic.

**PYROXYLIN PLASTIC.** Any plastic substance, material or compound, other than cellulose nitrate film, that has soluble cotton or similar cellulose nitrate as a base, by whatever name known, in the form of blocks, sheets, tubes or other fabricated shapes, including raw pyroxylin plastics and finished pyroxylin plastic products.

**RAW PYROXYLIN PLASTIC.** Any pyroxylin plastic in the form of blocks, slabs, rods tubes or other shapes, that is to be used in a manufacturing process.

## SECTION FC 4203
## GENERAL REQUIREMENTS

**4203.1 Displays.** Finished pyroxylin plastic products displayed in areas to which the public has access shall be placed on tables not more than 3 feet (914 mm) wide and 10 feet (3048 mm) long. Tables shall be spaced at least 3 feet (914 mm) apart. Where articles are displayed on counters, they shall be arranged in a like manner.

**4203.2 Space under tables.** Spaces underneath tables on which finished pyroxylin plastic products are displayed shall be kept free from storage of any kind and accumulation of rubbish or other combustible waste or any other combustible material.

**4203.3 Location.** Tables on which finished pyroxylin plastic products are displayed shall be so located that in the event of a fire at the table, the table will not interfere with any means of egress.

**4203.4 Lighting.** Lighting shall not be located directly above pyroxylin plastics, unless provided with a suitable guard to prevent heated particles or broken bulb elements from falling.

## SECTION FC 4204
## STORAGE, HANDLING AND USE

**4204.1 Pyroxylin plastics in Group F buildings.** Pyroxylin plastics in a Group F building shall be stored, handled and used in accordance with [Sections] FC 4204.1.1 through 4204.1.7.

**4204.1.1 Storage of incoming material.** Where raw pyroxylin plastics in excess of 25 pounds (11 kg) are received in a building or fire area, an approved vented cabinet or approved vented vault protected by a sprinkler system shall be provided for the storage of material.

**4204.1.2 Capacity limitations.** Storage in any one workroom shall not exceed 1,000 pounds (454 kg) of raw pyroxylin plastics. A storage cabinet shall not contain more than 500 pounds (227 kg). Each compartment shall not contain more than 250 pounds (114 kg).

**4204.1.3 Storage of additional material.** Raw pyroxylin plastics in excess of that allowed by [Section 4204.1.2] FC4204.1.2 shall be kept in vented vaults not exceeding 1,500-cubic-foot capacity (43 $m^3$) of total vault space, and with construction, venting and sprinkler system protection approved by the commissioner.

**4204.1.4 Heat sources.** Pyroxylin plastics shall not be stored within 2 feet (610 mm) of heat-producing appliances, steam pipes, radiators or chimneys.

**4204.1.5 Accumulation of material.** In factories manufacturing pyroxylin plastic products, approved vented cabinets, vaults or storage rooms protected by a sprinkler system shall be provided to prevent the accumulation in workrooms of raw pyroxylin plastics in process and finished pyroxylin plastic products.

**4204.1.6 Operators.** In workrooms of factories manufacturing finished pyroxylin plastic products, operators shall not be stationed closer together than 3 feet (914 mm), and the amount of material per operator shall not exceed one-shift's supply and shall be limited to the capacity of three tote boxes, including material awaiting removal or use.

**4204.1.7 Waste material.** Waste pyroxylin plastics, such as shavings, chips, turnings, sawdust, edgings and trimmings, shall be kept under water in metal receptacles until removed from the premises.

**4204.2 Fire protection.** The storage, handling or use of pyroxylin plastic in quantities exceeding 100 pounds (45 kg) shall be located in a building or part thereof protected throughout by a sprinkler system, except for storage exclusively of finished pyroxylin plastic products in a quantity not exceeding 6,000 pounds (2724 kg).

**4204.3 Sources of ignition.** Sources of ignition shall not be [located] allowed in rooms in which pyroxylin plastics in excess of 25 pounds (11 kg) are stored, handled or used.

**4204.4 Heating.** Rooms in which pyroxylin plastics are handled or stored shall be heated by low-pressure steam or hot water radiators. Radiators shall be not less than 4 inches (102 mm) above the floor. All steam pipes and risers within 6 feet ([1828] 1829 mm) of the floor shall be protected with [non-combustible] noncombustible pipe covering. All heating radiators, coils, boilers, pipes and other heating apparatus situated so as to come in contact with any combustible material, including the tops of radiators, shall be protected with ¼-inch ([6 mm] 6-mm) mesh galvanized steel of No. 20 U.S. gauge or equivalent. The tops of such guards shall slope so as to prevent their use as a shelf.

**4204.5 Prohibitions.** It shall be unlawful to store, handle or use raw pyroxylin plastics as follows:

1. In any building situated within 50 feet (15 240 mm) of the nearest wall of a building occupied as a school, hospital, or Group A occupancy.

2. In any Group R occupancy.

3. In any building of combustible construction as defined in Section 602 of the Building Code.

## SECTION FC 4205
## MANUFACTURING RESTRICTIONS

**4205.1 Raw pyroxylin plastics.** Raw pyroxylin plastics shall be treated as a Class IV material as defined in Section 42-272 of the Zoning Resolution. Raw pyroxylin plastics may be utilized in manufacturing processes or other production in manufacturing districts only when authorized by a special permit pursuant to Section 42-276 of the Zoning Resolution.

# CHAPTER 43
# UNSTABLE (REACTIVE) MATERIALS

## SECTION FC 4301
## GENERAL

**4301.1 Scope.** This chapter shall govern the manufacture, storage, handling and use of unstable (reactive) materials, except for the display and storage of unstable (reactive) materials in Group M and storage of unstable (reactive) materials in Group S occupancies complying with the requirements of [Section 2703.11] FC2703.11.

**4301.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**4301.3 General.** Unstable (reactive) materials shall be manufactured, stored, handled and used in accordance with this chapter. Unstable (reactive) materials that are compressed gases shall additionally comply with the requirements of FC Chapter 30.

**4301.4 Prohibited manufacture, storage, handling and use.** It shall be unlawful to manufacture, store, handle and/or use detonable unstable (reactive) materials except as specifically authorized by FC Chapter 33.

**4301.5 Supervision.** The handling and use of unstable (reactive) materials in quantities requiring a permit shall be under the personal supervision of a certificate of fitness holder. The storage of unstable (reactive) materials in quantities requiring a permit shall be under the general supervision of a certificate of fitness holder.

## SECTION FC 4302
## DEFINITIONS

**4302.1 Definition.** The following term shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**UNSTABLE (REACTIVE) MATERIAL.** A material, other than an explosive, which in the pure state or as commercially produced, will vigorously polymerize, decompose, condense or become self-reactive and undergo other violent chemical changes, including explosion, when exposed to heat, friction or shock, or in the absence of an inhibitor, or in the presence of contaminants, or in contact with incompatible materials. Unstable (reactive) materials [shall be] are classified as follows:

**Class 1.** Materials that in themselves are normally stable but which can become unstable at elevated temperatures and [pressure] pressures.

**Class 2.** Materials that in themselves are normally unstable and readily undergo violent chemical change but do not detonate. This class includes materials that can undergo chemical change with rapid release of energy at normal temperatures and pressures, and that can undergo violent chemical change at elevated temperatures and pressures.

**Class 3.** Materials that in themselves are capable of detonation or of explosive decomposition or explosive reaction but which require a strong initiating source or which must be heated under confinement before initiation. This class includes materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures.

**Class 4.** Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures. This class includes materials that are sensitive to mechanical or localized thermal shock at normal temperatures and pressures.

## SECTION FC 4303
## GENERAL REQUIREMENTS

**4303.1 Quantities not exceeding the maximum allowable quantity per control area.** The storage, handling and use of unstable (reactive) materials in amounts not exceeding the maximum allowable quantity per control area indicated in [Section 2703.1] FC2703.1 shall be in accordance with [Sections] FC 2701, 2703, 4301, 4303 and 4306.

**4303.1.1 Prohibited indoor storage, handling and use by occupancy.** It shall be unlawful to store, handle or use:

1. Class 3 and 4 unstable (reactive) materials in Group A, E, I, R or U occupancies.

2. Class 3 and 4 unstable (reactive) materials in offices in Group B, F, M or S occupancies, or any other areas of such occupancies that are accessible to the public.

**4303.2 Quantities exceeding the maximum allowable quantity per control area.** The storage, handling and use of unstable (reactive) materials in amounts exceeding the maximum allowable

quantity per control area indicated in [Section 2703.1] FC2703.1 shall be in accordance with FC Chapter 27 and this chapter.

**4303.3 Multiple hazard sign.** Where two or more classes of unstable (reactive) materials are stored in immediate proximity to one another, such area shall be provided with hazard identification signs pursuant to FC Chapter 27 for the most severe class present.

**4303.4 Multiple class storage.** Except as otherwise specifically provided in this code, where more than one class of unstable (reactive) materials is stored in the same control area, the maximum quantity allowed of each unstable (reactive) material shall be limited as follows: the maximum quantity shall be reduced by multiplying the maximum allowable quantity for each such material by the proportion that such material bears to the total quantity of unstable (reactive) material stored in the control area. The total of the proportional amounts shall not exceed 100 percent.

**4303.5 [Temperature sensitive] Temperature-sensitive material.** Where the required storage temperature range, as specified by the manufacturer, extends beyond normal ambient temperatures, high or low temperature limit switches, as applicable, shall be provided in addition to normal temperature controls. These limit switches shall activate an alarm in a supervised area to ensure reporting to the fire department.

## SECTION FC 4304
## STORAGE

**4304.1 Indoor storage.** Indoor storage of unstable (reactive) materials in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1) shall be in accordance with [Sections] FC 2701, 2703, 2704 and this chapter.

**4304.1.1 Detached storage.** Storage of unstable (reactive) materials shall be in a detached building when required in [Section 2703.8.2] FC2703.8.2.

**4304.1.2 Explosion control.** Indoor storage rooms, areas and buildings containing Class 3 or 4 unstable (reactive) materials shall be provided with explosion control in accordance with [Section 911] FC911 and the construction codes, including the Building Code.

**4304.1.3 Liquid-tight floor.** In addition to [Section 2704.12] FC2704.12, floors of storage areas for liquids and solids shall be of liquid-tight construction.

**4304.1.4 Storage configuration.** Unstable (reactive) materials stored in quantities greater than 500 cubic feet (14 $m^3$) shall be separated into piles, each not larger than 500 cubic feet (14 $m^3$). Aisle width shall not be less than the height of the piles or 4 feet (1219 mm), whichever is greater.

**Exception:** Materials stored in tanks.

**4304.1.5 Location.** Unstable (reactive) materials shall not be stored in basements or other areas below grade[ areas].

**4304.1.6 Smoke and heat venting.** Smoke and heat venting shall be provided in accordance with [Section 910] FC910 and the construction codes, including the Building Code.

**4304.2 Outdoor storage.** Outdoor storage of unstable (reactive) materials in amounts exceeding the maximum allowable quantities per control area indicated in FC Table 2703.1.1(3) shall be in accordance with [Sections] FC 2701, 2703, 2704 and this chapter.

**4304.2.1 Distance [from storage] to exposures from Class 3 and 4 (detonable) material outdoor storage areas.** Outdoor storage of Class 3 (detonable) or 4 unstable (reactive) material shall be in accordance with FC Table 3304.5.2(3). The number of pounds of material listed in the table shall be the net weight of the material present. Alternatively, the number of pounds of material shall be based on a trinitrotoluene (TNT) equivalent weight.

**4304.2.2 Distance to exposures from Class 3 (deflagratable) material outdoor storage areas.** Outdoor storage of deflagratable Class 3 unstable (reactive) [material that can deflagrate] materials shall [not be within 75 feet (22 860 mm) of buildings, lot lines, public streets, private roads or means of egress] be in accordance with FC Table 3304.5.2(4). The number of pounds of material listed shall be the net weight of the material present.

**4304.2.3 Distance to exposures from Class 1 and 2 material outdoor storage areas.** Outdoor storage of [nondeflagrating] Class 1 or 2 unstable (reactive) materials shall not be within 20 feet (6096 mm) of buildings not associated with the manufacture or distribution of such materials, lot lines, public streets, private roads or means of egress. [A 2-hour fire barrier wall without openings or penetrations extending not less than 30 inches (762 mm) above and to the sides of the storage is allowed in lieu of such distance.] The minimum required distance shall not apply when fire barriers that have no openings or penetrations and have a minimum fire-resistance rating of 2 hours interrupt the line of sight between the storage and the exposure. The [wall] fire barrier shall either be an independent structure, or the exterior wall of the building adjacent to the storage area.

**[4304.2.2] 4304.2.4 Storage configuration.** Piles of unstable (reactive) materials shall not exceed 1,000 cubic feet (28 $m^3$).

**[4304.2.3] 4304.2.5 Aisle widths.** Aisle widths between piles shall not be less than one-half the height of the pile or 10 feet (3048 mm), whichever is greater.

## SECTION FC 4305
## HANDLING AND USE

**4305.1 General.** Unstable (reactive) materials in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1) or 2703.1.1(3) shall be handled and used in accordance with [Sections] FC 2701, 2703, 2705 and this chapter.

## SECTION FC 4306
## MANUFACTURING RESTRICTIONS

**4306.1 Unstable (reactive) material classified as a Class IV material.** Unstable (reactive) material classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution may be utilized in manufacturing processes or other production in manufacturing districts only when authorized by a special permit pursuant to Section 42-276 of the Zoning Resolution.

**4306.1.1 Manufacture of unstable (reactive) material classified as a Class IV material.** It is unlawful to manufacture unstable (reactive) material classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution.

**4306.1.2 Storage of unstable (reactive) materials classified as a Class IV material.** It shall be unlawful to store unstable (reactive) material classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution, except that accessory storage authorized by a special permit pursuant to Section 42-276 of the Zoning Resolution shall be allowed.

# CHAPTER 44
# WATER-REACTIVE SOLIDS AND LIQUIDS

## SECTION FC 4401
## GENERAL

**4401.1 Scope.** This chapter shall govern the manufacture, storage, handling and use of water-reactive solids and liquids, except for the display and storage of water-reactive solids and liquids in Group M occupancies complying with the requirements of [Section 2703.11] FC2703.11, and storage of water-reactive solids and liquids in Group S occupancies complying with the requirements of [Section 2703.11] FC2703.11.

**4401.2 Permits.** Permits shall be required as set forth in [Section 105.6] FC105.6.

**4401.3 General.** Water-reactive solids and liquids shall be manufactured, stored, handled and used in accordance with this chapter.

**4401.4 Prohibited manufacture, storage, handling and use.** It shall be unlawful to manufacture, store, handle or use detonable water-reactive solids and liquids, except as specifically authorized by FC Chapter 33.

**4401.5 Supervision.** The handling and use of water-reactive solids and liquids in quantities requiring a permit shall be under the personal supervision of a certificate of fitness holder. The storage of water-reactive solids and liquids in quantities requiring a permit shall be under the general supervision of a certificate of fitness holder.

## SECTION FC 4402
## DEFINITIONS

**4402.1 Definition.** The following term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

**WATER-REACTIVE MATERIAL.** A material that explodes, violently reacts, produces flammable, toxic or other hazardous gases, and/or generates enough heat to cause [self-ignition] autoignition or ignition of [nearby combustibles] combustible materials upon exposure to water or moisture. Water-reactive materials are classified as follows:

**Class 1.** Materials that [may] react with water with some release of energy, but not violently.

**Class 2.** Materials that [may form potentially explosive mixtures with water] react violently with water or cause water to boil upon contact; produce flammable, toxic or other hazardous gases upon contact with water; or upon contact with water generate sufficient heat to cause autoignition or ignition of adjoining combustible materials.

**Class 3.** Materials that react explosively with water without requiring heat or confinement.

## SECTION FC 4403
## GENERAL REQUIREMENTS

**4403.1 Quantities not exceeding the maximum allowable quantity per control area.** The storage, handling and use of water-reactive solids and liquids in amounts not exceeding the maximum allowable quantity per control area indicated in [Section 2703.1] FC2703.1 shall be in accordance with [Sections] FC 2701, 2703, 4401, 4403 and 4406.

**4403.1.1 Prohibited indoor storage, handling and use by occupancy.** It shall be unlawful to store, handle or use:

1. Class 3 water-reactive solids and liquids in Group A, E, I, R or U occupancies.

2. Class 3 water-reactive solids and liquids in offices [or in retail sales portions of] in Group B, F, M or S occupancies, or any other areas of such occupancy accessible to the public.

**4403.2 Quantities exceeding the maximum allowable quantity per control area.** The storage, handling and use of water-reactive solids and liquids in amounts exceeding the maximum allowable quantity per control area indicated in [Section 2703.1] FC2703.1 shall be in accordance with FC Chapter 27 and this chapter.

**4403.3 Multiple hazard sign.** Where more than one class of water-reactive solids and liquids is stored in immediate proximity to one another, such area shall be provided with hazard identification signs pursuant to FC Chapter 27 for the most severe class present.

**4403.4 Multiple class storage.** Except as otherwise specifically provided in this code, where more than one class of water-reactive solids and liquids is stored in the same control area, the maximum quantity allowed of each water-reactive solid or liquid shall be limited as follows: the maximum quantity shall be reduced by the maximum allowable quantity for each such solid or liquid by the proportion that such solid or liquid bears to the total quantity of water-reactive solid and liquid stored in the control area. The total of the proportional amounts shall not exceed 100 percent.

## SECTION FC 4404
## STORAGE

**4404.1 Indoor storage.** Indoor storage of water-reactive solids and liquids in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1), shall be in accordance with [Sections] FC 2701, 2703, 2704 and this chapter.

**4404.1.1 Detached storage.** Storage of water-reactive solids and liquids shall be in a detached building when required by [Section 2703.8.2] FC2703.8.2.

**4404.1.2 Liquid-tight floor.** In addition to the provisions of [Section 2704.12] FC2704.12, floors in storage areas for water-reactive solids and liquids shall be of liquid-tight construction.

**4404.1.3 Waterproof room.** Rooms or areas used for the storage of water-reactive solids and liquids shall be constructed in a manner which resists the penetration of water through the use of waterproof materials. Piping carrying water for other than sprinkler systems shall not be within such rooms or areas.

**4404.1.4 Water-tight containers.** When Class 2 and/or Class 3 water-reactive solids and liquids are stored in areas protected by a sprinkler system, the materials shall be stored in closed water-tight containers.

**4404.1.5 Storage configuration.** Water-reactive solids and liquids stored in quantities greater than 500 cubic feet (14 $m^3$) shall be separated into piles, each not larger than 500 cubic feet (14 $m^3$). Aisle widths between piles shall not be less than the height of the pile or 4 feet (1219 mm), whichever is greater.

**Exception:** Water-reactive solids and liquids stored in tanks.

**4404.1.5.1 Class 2 storage in basements or other areas below grade.** Class 2 water-reactive solids and liquids shall not be stored in basements or other areas below grade unless such materials are stored in closed water-tight containers or tanks.

**4404.1.5.2 Class 3 storage in basements or other areas below grade.** Class 3 water-reactive solids and liquids shall not be stored in basements or other areas below grade.

**4404.1.5.3 [Storage of flammable] Flammable liquids.** Class 2 or Class 3 water-reactive solids and liquids shall not be stored with flammable liquids.

**4404.1.6 Explosion control.** Indoor storage rooms, areas and buildings containing Class 2 or Class 3 water-reactive solids and liquids shall be provided with explosion control in accordance with [Section 911] FC911 and the construction codes, including the Building Code.

**4404.1.7 Smoke and heat venting.** Rooms or areas for the storage of water-reactive solids and liquids shall be provided with smoke and heat venting in accordance with [Section 910] FC910 and the construction codes, including the Building Code.

**4404.2 Outdoor storage.** Outdoor storage of water-reactive solids and liquids in quantities exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(3) shall be in accordance with [Sections] FC 2701, 2703, 2704 and this chapter.

**4404.2.1 General.** Outdoor storage of water-reactive solids and liquids shall be within tanks or closed water-tight containers and shall be in accordance with [Sections] FC 4404.2.2 through 4404.2.5.

**4404.2.2 [Class 3 distance to exposures.** Outdoor storage of**] Distance to exposures from Class 3 material outdoor storage areas.** Class 3 water-reactive solids and liquids shall not be stored within 75 feet (22 860 mm) of buildings, lot lines, public streets, private roads or means of egress.

**4404.2.3 [Class 1 and Class 2 distance to exposures] Distance to exposures from Class 1 and Class 2 material outdoor storage areas.** Outdoor storage of Class 1 and Class 2 water-reactive solids and liquids shall not be within 20 feet (6096 mm) of buildings, lot lines, public streets, private roads or means of egress. A 2-hour fire barrier wall without openings or penetrations, and extending not less than 30 inches (762 mm) above and to the sides of the storage area, is allowed in lieu of such distance. The wall shall either be an independent structure, or the exterior wall of the building adjacent to the storage area.

**4404.2.4 Storage conditions.** Class 3 water-reactive solids and liquids shall be limited to piles not greater than 500 cubic feet (14 $m^3$).

**4404.2.4.1 Class 1 and Class 2 piles.** Class 1 and Class 2 water-reactive solids and liquids shall be limited to piles not greater than 1,000 cubic feet (28 $m^3$).

**4404.2.4.2 Aisle widths.** Aisle widths between piles shall not be less than one-half the height of the pile or 10 feet (3048 mm), whichever is greater.

**4404.2.5 Containment.** Secondary containment shall be provided in accordance with [Section 2704.2.2] FC2704.2.2.

## SECTION FC 4405

## HANDLING AND USE

**4405.1 General.** Water-reactive solids and liquids in amounts exceeding the maximum allowable quantity per control area indicated in FC Table 2703.1.1(1) or 2703.1.1(3) shall be handled and used in accordance with [Sections] FC 2701, 2703, 2705 and this chapter.

## SECTION FC 4406
## MANUFACTURING RESTRICTIONS

**4406.1 Water-reactive solids and liquids classified as a Class IV material.** Water-reactive solids and liquids classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution may be utilized in manufacturing processes or other production in manufacturing districts only when authorized by a special permit pursuant to Section 42-276 of the Zoning Resolution.

**4406.1.1 Manufacture of water-reactive solids and liquids classified as a Class IV material.** It shall be unlawful to manufacture water-reactive solids and liquids classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution.

**4406.1.2 Storage of water-reactive solids and liquids classified as a Class IV material.** It shall be unlawful to store water-reactive solids and liquids classified as a Class IV material as defined in Section 42-272 of the Zoning Resolution, except that accessory storage authorized by a special permit pursuant to Section 42-276 of the Zoning Resolution shall be allowed.

# CHAPTER 45
# REFERENCED STANDARDS

## SECTION FC 4501
## GENERAL

**4501.1 Scope.** This chapter lists the standards that are referenced in this code.

**4501.2 Edition.** The edition of each standard referenced in this code shall be as indicated by the standard reference number.

**4501.3 Relationship with code and rules.** The application of the referenced standards and their relationship with the provisions of this code and the rules shall be as set forth in [Section 102.6] FC102.6.

## SECTION FC 4502
## LIST OF REFERENCED STANDARDS

**ANSI** American National Standards Institute
25 West 43rd Street, Fourth Floor
New York, NY 10036

| Standard Reference | Title | [Referenced in code |
|---|---|---|

| Number | | section number] |
|---|---|---|
| [A13.1—96 | Scheme for the Identification of Piping Systems | 2609.3, 2703.2.2.1, 3003.2.3, 3403.5.2] |
| [B31.3—99 | Process Piping, including addendum | 2703.2.2.2] |
| [B31.9—96 | Building Services Piping Code for Pressure Piping | 3403.6.2.1, 3403.6.3, 3403.6.11] |
| Reserved. | | |

# API

American Petroleum Institute
1220 L Street, Northwest
Washington, DC 20005-4070

| Standard Reference Number | Title | [Referenced in code section number] |
|---|---|---|
| Std 650—[1998]2007 | Welded Steel Tanks for Oil Storage, 11th edition, including Addendum 1 (2008), Addendum 2 (2009) and Addendum 3 (2011) | [3406.8.3] |
| Std 653—2009 | Tank Inspection, Repair, Alteration, and Reconstruction, 4th edition, including Addendum 1 (2010) and Addendum 2 (2012) | |
| RP 1604—1996 Reaffirmed 2001 | Closure of Underground Petroleum Storage Tanks | [3404.2.13] |
| Std 2000—[1998]2009 | Venting Atmosphere and Low Pressure Storage Tanks: Nonrefrigerated and Refrigerated | [3404.2.7.3.6] |
| [Publ]RP 2028—[1991]2002 | Flame Arrestors in Piping Systems | [3404.2.7.3.2] |
| RP 2350—[1996]2005 | Overfill Protection for Storage Tanks in Petroleum Facilities, 3rd edition | [3406.4.6] |

# ASME

The American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

| Standard Reference Number | Title | [Referenced in code section number] |
|---|---|---|
| [A17.1—2000 | Safety Code for Elevators and Escalators | 607.1] |
| [A17.3—1996 | Safety Code for Existing Elevators and Escalators with A17.3a-2000 Addenda | 607.1] |
| A13.1—07 | Scheme for the Identification of Piping Systems | |
| B31.1—07 | Power Piping, including Addendum A (2008) and Addendum B (2009) | |
| B31.3—08 | Process Piping | |
| B31.4—06 | Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids | |
| B31.9—08 | Building Services Piping Code for Pressure Piping | |
| BPVC—[2001] 2010 | ASME Boiler and Pressure Vessel Code, [2001 Edition of] (Sections I, II, IV, V, VI and VIII) | [3003.1, 3003.9, 3203.1, 3203.4.3, 3203.8, 3406.8.1, 3406.8.3] |

# ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

| Standard Reference Number | Title | [Referenced in code section number] |
|---|---|---|
| D 56—[01]05 | Test Method for Flash Point by Tag Closed Tester | [3402.1] |
| D 86—[01e01]10a | Test Method for Distillation of Petroleum Products at Atmospheric Pressure | [2702.1] |
| D 92—[01]05a | Test Method for Flash and Fire Points by Cleveland Open Cup | [3401.1, 3402.1] |
| D 93—[00]10a | Test Method for Flash Point by Pensky-Martens Closed Up Tester | [3402.1] |
| D 323—[99a]08 | Test Method for Vapor Pressure of Petroleum Products (Reid Method) | [2702.1] |
| D 3278—[96e01]96(2004)e1 | Test Methods for Flash Point of Liquids by Small Scale [Closed-Cup] Closed-cup Apparatus | [3402.1] |
| E 681—[01]09 | Test Method for Concentration Limits of Flammability of Chemicals (Vapors and Gases) | [3502.1] |
| E 1354—04a | Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter | |
| E 1529—[00]10 | Test Method for Determining Effects of Large Hydrocarbon Pool Fires on Structural Members and Assemblies | [3404.2.9.1.3] |
| E 1537—[01]07 | Test Method for Fire Testing of Upholstered Furniture | [803.5.2] |
| E 1590—[01]07 | Test Method for Fire Testing of Mattresses | [803.5.3, 803.6.3, 803.7.4] |
| F 2200—05 | Standard Specification for Automated Vehicular Gate Construction | |

# CA

State of California Department of Consumer Affairs
Bureau of Home Furnishings and Thermal Insulation
3485 Orange Grove Avenue
North Highlands, CA 95660-5595

| Standard Reference Number | Title |
|---|---|
| California Technical Bulletin 129—1992 | Flammability Test Procedure for Mattresses for Use in Public Buildings |
| California Technical Bulletin 133—1991 | Flammability Test Procedure for Seating Furniture for Use in Public Occupancies |

# CGA

Compressed Gas Association
[1725 Jefferson Davis Highway] 4221 Walney Road, 5th Floor
[Arlington, VA 22202-4102] Chantilly, VA 20151

| Standard Reference Number | Title | [Referenced in code section number] |
|---|---|---|
| C-7—([2000]2004) | Guide to the Preparation of Precautionary Labeling and Marking of Compressed Gas Containers. | [3003.2.2, 3203.4.2] |
| G-8.1—([1990]2007) | Nitrous Oxide Systems at Consumer Sites | [4001.1.4] |
| G-13—(2006) | Storage and Handling of Silane and Silane Mixtures | |
| P-1—([2000]2008) | Safe Handling of Compressed Gases in Containers | [3005.7] |
| P-18—([1992]2006) | Standard for Bulk Inert Gas Systems at Consumer Sites | [3201.1.3] |
| S-1.1—([1994]2005) | Pressure Relief Device Standards—Part 1—Cylinders for Compressed Gases | [3203.2] |
| S-1.2—([1995]2005) | Pressure Relief Device Standards—Part 2—Cargo and Portable Tanks for Compressed Gases | [3203.2] |
| S-1.3—([1995]2005) | Pressure Relief Device Standards—Part 3—Stationary Storage Containers for Compressed Gases | [3203.2] |
| V-1—([2001]2005) | [Compressed Gas Association] Standard [Compressed] for Gas Cylinder Valve Outlet and Inlet Connections | [4106.1.3] |

# CGR

Coast Guard Regulations
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402-9325

| Standard Reference Number | Title | [Referenced in code section number] |
|---|---|---|
| Reserved. | | |

# CPSC

Consumer Product Safety Commission
4330 East West Highway
Bethesda, MD 20814

| Standard Reference Number | Title | [Referenced in code section number] |
|---|---|---|
| 16 CFR Section 1500.41 | Method for Testing Primary Irritant Substances | [202] |
| 16 CFR Section 1500.42 | Test for Eye Irritants | [202] |
| 16 CFR Section 1500.44 | Method for Testing Extremely Flammable and Flammable Solids | [3602.1] |

# DOC

U.S. Department of Commerce
100 Bureau Drive, Stop 3460
Gaithersburg, MD 20899

| Standard Reference Number | Title | [Referenced in code section number] |
|---|---|---|
| 16 CFR Part 1632 | Standard for the Flammability of Mattress and Mattress Pads (FF 4—72, Amended) | [803.6.2, 803.7.3] |

# DOJ

U.S. Department of Justice
Bureau of Alcohol, Tobacco, Firearms and Explosives
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402-9325

| Standard Reference Number | Title | [Referenced in code section number] |
|---|---|---|
| 27 CFR Part 555 | Commerce in Explosives | [3302.1, Table 3304.5.2(1), 3304.6.5.3] |

# DOL

U.S. Department of Labor
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402-9325

| Standard Reference Number | Title | [Referenced in code section number] |
|---|---|---|
| 29 CFR Section 1910.1000 | Air Contaminants | [1204.2.1, 2702.1] |
| 29 CFR Section 1910.1200 | Hazard Communication | [2702.1, 3303.6] |

# DOTn

U.S. Department of Transportation
Office of Hazardous Material Standards
400 7th Street, Southwest
Washington, DC 20590

| Standard Reference Number | Title | [Referenced in code section number] |
|---|---|---|
| 49 CFR | Transportation | [2605.4] |
| 49 CFR Section 173.52 | Transportation | [3302.1] |
| 49 CFR Part 178 | Transportation | [3203.4.3, 3203.8] |
| 49 CFR Part 172 | Hazardous Materials Tables, Special Provisions, Hazardous Materials Communications, Emergency Response Information and Training Requirements | [3304.6.5.3] |
| 49 CFR Sections 173.136 & 137 | Shippers — General Requirements for Shipments and Packagings: Class 8[ — ]—Assignment of Packing Group | [3102.1] |
| 49 CFR Parts 100-178 | Hazardous Materials Regulations | [3301.3, 3406.5.1.15] |

# EN

European Committee for Standardization (EN)
Central Secretariat
Rue de Stassart 36
B-10 50 Brussels

| Standard Reference Number | Title |
|---|---|
| European Standard EN 1081: 1998 | Resilient Floor Coverings—Determination of the Electrical Resistance |

# EPA

Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460

| Standard Reference Number | Title |
|---|---|
| 40 CFR Part 112 | Oil Pollution Prevention |
| 40 CFR Part 280 | Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST) |

**ISO**

International Organization for Standardization (ISO)
ISO Central Secretariat
1 ch, de la Voie-Creuse, Case postale 56
CH-1211 Geneva 20, Switzerland

| Standard Reference Number | Title |
|---|---|
| ISO 8115—86 | Cotton Bales—Dimensions and Density |

**NEMA**

National Electrical Manufacturer's Association
1300 N. 17th Street
Suite 1847
Rosslyn, VA 22209

| Standard Reference [n]Number | Title | [Referenced in code section number] |
|---|---|---|
| 250—[1997]2003 | Enclosures for Electrical Equipment (1,000 Volt Maximum)……..…… | [3705.2] |

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# NFPA

National Fire Protection Association
Batterymarch Park
Quincy, MA 02269

| Standard Reference Number | Title | [Referenced in code section number] |
|---|---|---|
| 1—09 | Fire Code | |
| 10—07 | Portable Fire Extinguishers | [Table 901.6.1, 906.2, 906.2.1.2, 906.2.1.3, 906.3, Table 906.3(1), Table 906.3(2), 2106.3] |
| 11—[02]05 | Low-, Medium- and High-Expansion Foam | [904.7, Table 901.6.1, 3404.2.9.1.2] |
| [11A—99 | Medium- and High-Expansion Foam Systems | 904.7, 3404.2.9.1.2] |
| 12—[02] 08 | Carbon Dioxide Extinguishing Systems | [Table 901.6.1, 904.8] |
| 12A—[97]04 | Halon 1301 Fire Extinguishing Systems | [Table 901.6.1, 904.9] |
| 13—[02]07 | Installation of Sprinkler Systems | [314.5.1, 2301.1, 2304.2, Table 2306.2, 2306.9, 2307.2, 2307.2.1, 2308.2, 2308.2.2, 2308.2.2.1, 2308.4, 2310.1, 2804.1, 3404.3.3.9, Table 3404.3.6.3(7), 3404.3.7.5.1, 3404.3.8.4] |
| 13R—[02]07 | Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height | [903.4, 903.6] |
| 16—[03]07 | Installation of Foam-Water Sprinkler and Foam-Water Spray Systems | [904.7] |
| 17—02 | Dry Chemical Extinguishing Systems | [Table 901.6.1, 904.6] |
| 17A—02 | Wet Chemical Extinguishing Systems | [Table 901.6.1, 904.5] |
| 20—[99]07 | Installation of Stationary Pumps for Fire Protection | [913.1, 913.2, 913.5.1] |
| 22—[98]08 | Water Tanks for Private Fire Protection | [508.2.2] |
| 24—[07]10 | Installation of Private Fire Service Mains and their Appurtenances | [508.2.1] |
| 25—[02]11 | Inspection, Testing and Maintenance of Water-Based Fire Protection Systems | [508.5.3, Table 901.6.1, 901.6.2.1, 905.12, 912.6, 913.5, 914.2] |
| 30—[00]08 | Flammable and Combustible Liquids Code | [3403.6.2, 3404.2.7, 3404.2.7.1 3404.2.7.2, 3404.2.7.3.6, 3404.2.7.4, 3404.2.7.6, 3404.2.7.7, 3404.2.7.8, 3404.2.7.9, 3404.2.9.2, 3404.2.9.3, 3404.2.9.5.1.1, 3404.2.9.5.1.2, 3404.2.9.5.1.3, 3404.2.9.5.1.4, 3404.2.9.5.1.5, 3404.2.9.5.2, 3404.2.9.6.4, 3404.2.10.2, 3404.2.11.4, 3404.2.11.5.2, 3404.2.12.1, 3404.3.1, 3404.3.6, 3404.3.8.4, 3406.8.1] |
| 30A—[00]08 | Code for Motor Fuel-Dispensing Facilities and Repair Garages | [2201.4, 2201.5, 2201.6, 2206.6.3, 2210.1] |
| 30B—[02]07 | Manufacture and Storage of Aerosol Products | [2801.4, 2804.1, 2804.3, Table 2804.3.1, Table 2804.3.2, Table 2804.3.2.2, 2804.4.1, 2804.5.2, 2804.6, Table 2806.2, Table 2806.3, 2806.5, 2806.8, Table 2804.3.2, Table 2804.3.2.2, 2804.4.1, 2804.5.2, 2804.6, Table 2806.2, Table 2806.3] |
| 32—[00]07 | Drycleaning Plants | [1207.1] |
| 33—[00]07 | Spray Application Using Flammable or Combustible Materials | [1504.1.2] |
| 34—[00]07 | Dipping and Coating Processes Using Flammable or Combustible Liquids | [1505.3, 1505.6.1] |
| 35—[99]05 | Manufacture of Organic Coatings | [2001.3, 2005.4] |
| 40—[01]07 | Storage and Handling of Cellulose Nitrate [[](Motion Picture)[]]Film | [306.2] |
| 45—04 | Fire Protection for Laboratories Using Chemicals | [2706.2, 2706.6.1] |
| [50—01 | Bulk Oxygen Systems at Consumer Sites | 1406.2.2.5, 3201.1.1, Table 3504.2.1, Table 3809.12, 4001.1.4] |
| [50A—99 | Gaseous Hydrogen Systems at Consumer Sites | 2209.2.1, 3501.1.2] |
| [50B—99 | Liquefied Hydrogen Systems at Consumer Sites | 2209.2.1, 3201.1.2] |
| 51—[02]07 | Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting, and Allied Processes | [601.5, 2609.1, Table 3504.2.1, Table 3809.12] |
| 52—[98]06 | Compressed Natural Gas (CNG) Vehicular Fuel Systems | [3001.1] |
| 55—10 | Compressed Gases and Cryogenic Fluids Code | |
| 58—[01]08 | Liquefied Petroleum Gas Code | [3801.1.1, 3803.1, 3803.2.1, 3803.2.1.2 3803.2.2, 3807.2, 3808.2] |
| 61—[99]08 | Prevention of Fires and Dust Explosions in Agricultural and Food [Products] Processing Facilities | [Table 1304.1] |
| 69—[97]08 | Explosion Prevention Systems | [911.1, 911.3, Table 1304.1] |
| 72—[02]10 | National Fire Alarm and Signaling Code | [509.1, Table 901.6.1, 907.2, 907.15, 907.17, 907.18, 907.20, 907.20.2, 907.20.3, 907.20.5, 908.10, 908.10.1] |
| 77—[00] 07 | Recommended Practice on Static Electricity | [3406.8.1] |
| 80—[99]07 | Fire Doors and [Fire Windows] and Other Opening Protectives | [703.2] |
| 85—[01]07 | Boiler and Combustion System Hazards Code [(Note: NFPA 8503 has been incorporated into NFPA 85)] | [Table 1304.1] |
| 86—[99]07 | Ovens and Furnaces | [2101.3] |
| 99—05 | Health Care Facilities | [3005.7, 3006.4] |
| 105—07 | Installation of Smoke Door Assemblies and Other Opening Protectives | |
| 110—[99]05 | Emergency and Standby Power Systems | [604.4] |
| 111—[01]05 | Stored Electrical Energy Emergency and Standby Power Systems | [604.4] |
| 120—[99]04 | [Coal Preparation Plants] Fire Prevention and Control in Coal Mines | [Table 1304.1] |
| 130—10 | Fixed Guideway Transit and Passenger Rail Systems | |
| 160—[01]06 | Use of Flame Effects Before an Audience | [308.3.6, 3309.17] |
| [231D—98 | Storage of Rubber Tires | 2501.1.1, 2505.3] |
| 241—[00]04 | Safeguarding Construction, Alteration, and Demolition Operations | [1401.1] |

| | |
|---|---|
| 260—[98]03 | Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture……[803.6.1, 803.7.1] |
| 261—[98]03 | Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes……[803.5.1] |
| [266—98 | Method of Test for Fire Characteristics of Upholstered Furniture Exposed to Flaming Ignition Source…….803.5.2] |
| [267—98 | Method of Test for Fire Characteristics of Mattresses and Bedding Assemblies Exposed to Flaming Ignition Source……..803.5.3, 803.6.3, 803.7.4] |
| 289—09 | Method of Fire Test for Individual Fuel Packages |
| 303—06 | Fire Protection Standard for Marinas and Boatyards |
| 407—[96]07 | Aircraft Fuel Servicing……...[1106.2, 1106.3] |
| 430—[00] 04 | Storage of Liquid and Solid Oxidizers……[4004.1.4] |
| 484—[02]06 | Combustible Metals[, Metal Powders, and Metal Dusts……Table 1304.1, 3603.2, 3604.1, 3604.2, 3605.1] |
| 490—[98]02 | Storage of Ammonium Nitrate……..[4001.1.3, 3301.1.5] |
| 495—[96]06 | Explosive Materials Code……[911.1, 911.4, 3302.1, 3304.3, 3304.6.2, 3304.6.3, 3304.7.1, 3306.1, 3307.1, 3307.11] |
| 498—[96]06 | Safe Havens and Interchange Lots for Vehicles Transporting Explosives……[3301.3.1] |
| 502—11 | Road Tunnels, Bridges and Other Limited Access Highways |
| 505—[99]06 | Fire Safety Standard for Powered Industrial Trucks[,] Including Type Designations, Areas of Use, Conversions, Maintenance, and [Operation] Operations……[309.1.1, 2703.7.3] |
| 654—[00]06 | Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids……[Table 1304.1] |
| 655—[93]07 | Prevention of Sulfur Fires and Explosions……[Table 1304.1] |
| 701—[99]10 | Standard Methods of Fire Tests for Flame-Propagation of Textiles and Films……[202, 306.3, 802.1,.803.2.2, 805.1, 805.1.3, 2404.2] |
| 704—[96]07 | Identification of the Hazards of Materials for Emergency Response……[606.9.3.4, 1802.1, 2702.1, 2703.2.2.1, 2703.2.2.2, 2703.5, 2703.10.2, 2703.10.4, 2705.1.10, 2705.2.1.1, 3203.4.1, 3404.2.3.2] |
| 720—09 | Installation of Carbon Monoxide (CO) Detection and Warning Equipment |
| 750—[00]06 | Standard on Water Mist Fire Protection Systems……[Table 901.6.1, 904.12] |
| 780—[00]08 | Standard for the Installation of Lightning Protection Systems……[3406.8.1] |
| 820—08 | Fire Protection in Wastewater Treatment and Collection Facilities |
| 850—10 | Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations |
| 1122—[97]08 | Model Rocketry……[3301.3.6] |
| 1123—[00]06 | Fireworks Display……[3302.1, 3308.1, 3308.5, 3308.6.1] |
| 1124—[98]06 | Code for the Manufacture, Transportation, [and] Storage, and Retail Sales of Fireworks and Pyrotechnic Articles……[3302.1, 3304.3] |
| 1125—[95]07 | Manufacture of Model Rocket and High Power Rocket Motors……..[3301.1.4] |
| 1126—[01]06 | Use of Pyrotechnics Before a Proximate Audience……[3309.1] |
| 1127—[98]08 | High Power Rocketry……[3301.1.4] |
| 2001—[04]08 | Clean Agent Fire Extinguishing Systems……[Table 901.6.1, 904.10, 904.10.7] |
| 2010—10 | Fixed Aerosol Fire Extinguishing Systems |

**UL**

Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062

| Standard Reference [n]Number | Title | [Referenced in code section number] |
|---|---|---|
| 30—95 | Metal Safety Cans—with Revisions through [2000] December 2004…… | [2[03.8.7.1, 2705.1.10, 3405.2.4] |
| 300—[96]05 | Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking [Areas —with Revisions through December 1998] Equipment…… | [904.11] |
| 325—02 | Door, Drapery, Gate, Louver, and Window Operators and Systems—with Revisions through February 2006 | |
| 900—[94]04 | Air Filter Units[—with Revisions through October 1999]…… | [1504.3] |
| 1275—[94]05 | Flammable Liquid Storage Cabinets—with Revisions through [March 1997] May 2006…… | [805.2.1, 2703.8.7.1, 3404.3.2.1.1] |
| 1313—93 | Standard for Nonmetallic Safety Cans for Petroleum Products—with Revisions through May 2003 | |
| 1315—95 | Standard for Safety for Metal Waste Paper Containers—with Revisions through December 2003 | |
| 1975—[96]06 | Fire Tests for Foamed Plastics Used for Decorative Purpose…… | [803.2.1, 805.2.1] |
| 2085—97 | Protected Aboveground Tanks for Flammable and Combustible Liquids— with Revisions through December 1999……... | [2202.1, 3402.1, 3404.2.9.1.3, 3404.2.9.6.5, 3405.3.8.2] |
| 2208—[96]05 | Solvent Distillation Units[—with Revisions through March 1999] …… | [3405.4.1] |
| 2335—01 | Fire Tests of Storage Pallets—with Revisions through September 2004 | |

# APPENDIX A
# FEES

## SECTION FC A01
## CERTIFICATES

**A01.1 Certificate fees.** Applicants for certificates required pursuant to the provisions of this code or the rules shall pay the fees specified in this section. Fees for certificates shall be per year, except as otherwise indicated. Fees for written and practical examinations shall be per examination.

| | **Fee** |
|---|---|
| **1. Blasting contractor certificate** | |
| Original application | $105.00 |
| Renewal application | $50.00 |
| **2. Certificate of approval** (per application) | |
| Original application | $625.00 |
| Amended application | $625.00 |
| Change of ownership | $625.00 |
| Change in manufacturing process, chemical composition or design | $625.00 |
| Renewal application | $50.00 |
| Change of identification, including change in name of article, model number or name of manufacturer | $210.00 |
| **3. Certificate of fitness** | |
| Original application (including written examination) (for 3 years) | $25.00 |
| Practical (on-site) examination for fire safety director | $445.00 |
| Practical (on-site) examination for fire safety/EAP director | $305.00 |
| Renewal application (without examination) | $5.00 |
| **4. Certificate of license for flammable and combustible liquid storage systems** | |
| Original application (including written examination) | $145.00 |
| Renewal application (without examination) | $15.00 |
| **5. Certificate of license for <u>liquid</u> motor fuel storage and dispensing systems** | |
| Original application (including written examination) | $145.00 |
| Renewal application (without examination) | $15.00 |
| **6. Certificate of operation** | |
| Original application | $3500.00 |
| Renewal application | $2500.00 |
| **7. Certificate of qualification for refrigerating system operating engineer** | |
| Original application (including written examination) (for 3 years) | $60.00 |
| Practical examination | $225.00 |

| | |
|---|---|
| Renewal application (without examination) | $5.00 |

**8. Commercial cooking exhaust system servicing company certificate**

| | |
|---|---|
| Original application | $105.00 |
| Renewal application | $50.00 |

**9. Fireworks contractor certificate**

| | |
|---|---|
| Original application | $110.00 |
| Renewal application | $110.00 |

**10. Fumigation and [thermal] insecticidal fogging operation company certificate**

| | |
|---|---|
| Original application | $105.00 |
| Renewal application | $50.00 |

**11. Portable fire extinguisher sales company certificate**

| | |
|---|---|
| Original application | $105.00 |
| Renewal application | $50.00 |

**12. Portable fire extinguisher servicing company certificate**

| | |
|---|---|
| Original application | $100.00 |
| Renewal application | $50.00 |

**13. Pyrotechnic supplier certificate**

| | |
|---|---|
| Original application | $105.00 |
| Renewal application | $50.00 |

**14. Registration of expeditors**

| | |
|---|---|
| Original registration application | $105.00 |
| Renewal registration application | $50.00 |

**15. Smoke detector maintenance company certificate**

| | |
|---|---|
| Original application | $105.00 |
| Renewal application | $50.00 |

## SECTION FC A02
## TRAINING SCHOOLS

**A02.1 Training school accreditation fees.** Applicants for training school accreditation required pursuant to the provisions of this code or the rules shall pay the fees specified in this section. All accreditation fees are per year, unless otherwise indicated.

| | **Fee** |
|---|---|
| **1. Fire safety director training school** | |
| Original application | $2,940.00 |
| Renewal application | $420.00 |

**2. Fire safety/EAP director training school**

| | |
|---|---|
| Original application | $2,940.00 |
| Renewal application | $420.00 |

**3. Refrigeration and related technology training school**

| | |
|---|---|
| Original application | $2,940.00 |
| Renewal application | $420.00 |

**4. Construction site fire safety manager training schools**

| | |
|---|---|
| Original application | $2,940.00 |
| Renewal application | $420.00 |

**5. Building operation, maintenance and recordkeeping training schools**

| | |
|---|---|
| Original application | $2,940.00 |
| Renewal application | $420.00 |

## SECTION FC A03
## PERMITS, [AND] INSPECTIONS AND PLAN EXAMINATIONS

**A03.1 Permit, [and] inspection and plan examination fees.** The owner or applicant shall pay the following fees for permits, inspections, witnessing of tests, and other services. All such fees are per year, except when based on frequency of inspection or hourly rate, as indicated. Hourly rates are per inspector.

| | **Fee** |
|---|---|
| **1. Aerosol products** | |
| Store, handle or use up to and including 2,500 pounds (1135 kg) | $105.00 |
| Store, handle or use more than 2,500 pounds (1135 kg) | $210.00 |
| **2. Asphalt melters** | |
| Store, handle or use an asphalt melter | $105.00 |
| **[2] 3. Assembly occupancies (places of assembly)** | |
| Fire safety inspection/permit (frequency of inspection as required by code or rule) | |
| Occupancy 75 to 149 | $415.00 |
| Occupancy 150 to 499 | $520.00 |
| Occupancy 500 to 999 | $625.00 |
| Occupancy 1,000 to 2,499 | $725.00 |
| Occupancy 2,500 to 9,999 | $830.00 |
| Occupancy 10,000 or greater, and arenas and stadiums (per hour) | $210.00 |
| **[3] 4. Automotive liquid motor fuel-dispensing facilities** | |
| Maintain or operate an automotive liquid motor fuel-dispensing facility | $105.00 |
| Precision test of underground tank and piping (frequency of inspection as | |

| | |
|---|---|
| required by code or rule) (per hour) | $210.00 |
| Leak detection functionality test (per hour) (frequency of test as required by code or rule) | $210.00 |
| Tank test (per site) (frequency of test as required by code or rule) | $355.00 |
| Tank reopening and repair (frequency of inspection as required by code or rule) | $320.00 |
| Installation and alteration (frequency of inspection as required by code or rule) | |
| With discharge lines | |
| For tank with capacity of 4,000 gallons (15 140 L) or less | $980.00 |
| Each additional tank | $210.00 |
| For tank with a capacity greater than 4,000 gallons (15 140 L) | $1,210.00 |
| Each additional tank | $420.00 |
| Without discharge lines | |
| For tank with capacity of 4,000 gallons (15 140 L) or less | $665.00 |
| Each additional tank | $195.00 |
| For tank with a capacity greater than 4,000 gallons (15 140 L) | $840.00 |
| Each additional tank | $385.00 |
| Fire extinguishing system test | |
| Initial installation acceptance test (per system) (per hour) | $210.00 |
| Periodic test (frequency of test as required by code or rule) (per system) (per hour) | $210.00 |

**[4] 5. Aviation facilities and operations**

| | |
|---|---|
| Maintain or operate an aircraft-fueling vehicle | $105.00 |
| [Maintain or operate a seaplane base] | [$315.00] |
| Conduct a helicopter landing at other than an approved heliport, helistop or airport | $315.00 |
| Conduct a helicopter lift operation | $315.00 |
| Conduct a hot air balloon operation | $315.00 |

**[5] 6. Bulk plants and terminals and bulk transfer facilities**

| | |
|---|---|
| Store and/or use flammable and combustible liquids in stationary tanks (per equivalent unit of storage) | $70.00 |
| Use following algorithm to determine "equivalent unit of storage": | |
| Equivalent unit of storage = (number of millions of gallons of tank capacity at facility) + (3 x number of tanks at facility) | |
| Fire protection system inspection (frequency of inspection as required by code or rule)(per hour) | $210.00 |
| Fire department connection inspection (frequency of inspection as required by code or rule) (per hour) | $210.00 |
| Periodic inspection and/or test (frequency of inspection as required by code or rule) (per hour) | $210.00 |
| Installation of devices, equipment and systems (new or altered), including fire protection systems (frequency of inspection as required by code or rule) (per hour) | $210.00 |

**[6] 7. CNG motor fuel-dispensing facilities**

| | |
|---|---|
| Maintain or operate a CNG motor fuel-dispensing facility | $625.00 |
| Installation of devices, equipment and systems (new or altered), including fire protection systems (frequency of inspection as required by code or rule) (per hour) | $210.00 |

**[7] 8. Cellulose nitrate film**

| | |
|---|---|
| Store | |
| Up to and including 100,000 feet (30 480 000 mm) | $105.00 |
| More than 100,000 feet (30 480 000 mm) | $210.00 |
| Handle and use | $105.00 |

**9. Coke-fueled salamanders**

| | |
|---|---|
| Store, handle or use coke-fueled salamanders at a construction site | $105.00 |

**[8] 10. Combustible dust-producing operations**

| | |
|---|---|
| Conduct a combustible dust-producing operation | $105.00 |

**[9] 11. Combustible fibers**

| | |
|---|---|
| Store less than [10 tons] 20,000 pounds (9080 kg) | $105.00 |
| Store [10 tons] 20,000 pounds (9080 kg) or more | $210.00 |

**[10] 12. Combustible liquids** (excluding paints, varnishes and lacquers)

| | |
|---|---|
| Store, handle or use liquids with a flash point of 300°F (149°C) or less | |
| In containers each equal to or less than 55 gallons (208 L): | |
| Up to and including 550 gallons (2082 L) | $105.00 |
| More than 550 gallons (2082 L) up to and including 2,500 gallons (9463 L) | $210.00 |
| Each additional 2,500 gallons (9463 L) or portion thereof | $105.00 |
| In tanks each larger than 55 gallons (208 L) | |
| Up to and including [20] twenty tanks | $125.00 |
| More than [20] twenty tanks | $415.00 |
| Store, handle or use fuel oil in tanks each larger than 55 gallons (208 L) | |
| [1 or 2 family dwellings, or schools where tuition is charged (frequency of inspection as required by code or rule)] | [$50.00] |
| In buildings where no oil burner certificate of fitness is required | $90.00 |
| In buildings where an oil burner certificate of fitness is required, or for any other purpose | |
| Up to and including [20] twenty tanks | $105.00 |
| More than [20] twenty tanks | $210.00 |
| Store kerosene | |
| Store for retail sale | $105.00 |
| Store for wholesale | $210.00 |
| Store for use | $105.00 |
| Store or handle essential oils | |

| | |
|---|---|
| Less than 500 pounds (227 kg) | $50.00 |
| 500 pounds (227 kg) or more | $105.00 |
| Store, handle or use petroleum products with a flash point exceeding 300°F (149°C) | |
| In containers each equal to or less than 55 gallons (208 L) | |
| Up to and including 550 gallons (2082 L) | $105.00 |
| More than 550 gallons (2082 L) up to and including 2,500 gallons (9463 L) | $210.00 |
| Each additional 2,500 gallons (9463 L) or portion thereof | $105.00 |
| In tanks each larger than 55 gallons (208 L) | |
| Up to and including [20] twenty tanks | $125.00 |
| More than [20] twenty tanks | $415.00 |
| Store, handle or use waxes, oils and fats (animal, vegetable or mineral) | |
| More than 400 pounds (182 kg) of wax | $105.00 |
| More than 250 gallons (946 L) of oils and/or fats | $105.00 |
| Manufacture combustible liquid | $210.00 |
| Manufacture or distill liquor, spirits or alcohol | $210.00 |
| Store liquors, spirits or alcohol (except retail liquor stores and premises where alcohol is sold for consumption on the premises) | |
| In containers, each equal to or less than 55 gallons (208 L) | |
| More than 500 gallons (1893 L) up to and including 1,000 gallons (3785 L) | $105.00 |
| More than 1,000 gallons (3875 L) up to and including 5,000 gallons (18 925 L) | $210.00 |
| Each additional 5,000 gallons (18 925 L) or portion thereof | $105.00 |
| In tanks each larger than 55 gallons (208 L) | |
| Up to and including [10] ten tanks | $105.00 |
| More than [10] ten tanks | $210.00 |
| Store and/or use fuel oil stored on a marine vessel or watercraft moored to or anchored at [privately owned] privately-owned waterfront property | Included in fees set forth in FC A03.1([5] 6); tank on the vessel is treated as a stationary tank |
| Store and use fuel oil on a mobile heating and power generation trailer (citywide) | $105.00 |

**[11] 13. Combustible materials**

| | |
|---|---|
| Store more than 2,000 cubic feet (57 $m^3$) | $105.00 |
| Store flammable plastic foam | |
| Up to and including [3 tons] 6,000 pounds (2724 kg) | $105.00 |

| | |
|---|---|
| More than [3 tons] 6,000 pounds (2724 kg) | $210.00 |

**[12] 14. Commercial cooking systems**

| | |
|---|---|
| Maintain or operate a commercial cooking system | $70.00 |
| Acceptance test of fire extinguishing system | As set forth in FC A03.1([20] 25) |

**[13] 15. Compressed gases**

| | |
|---|---|
| Store, handle or use corrosive | $210.00 |
| Store, handle or use flammable ([non-liquefied] nonliquefied) | $210.00 |
| Store, handle or use flammable (liquefied, [non-cryogenic] noncryogenic, except LPG) | $210.00 |
| Store, handle or use [non-flammable] nonflammable ([non-liquefied] nonliquefied) | $210.00 |
| Store, handle or use [non-flammable] nonflammable (liquefied, [non-cryogenic] noncryogenic) | $210.00 |
| Store, handle or use anhydrous liquid ammonia | $210.00 |
| Store, handle or use carbon dioxide | $210.00 |
| Store, handle or use acetylene | $210.00 |
| Store, handle or use highly toxic | $210.00 |
| Store, handle or use liquefied chlorine | $105.00 |
| Store, handle or use toxic | $210.00 |
| Store, handle or use unstable (reactive) | $210.00 |
| Store, handle or use water reactive | $210.00 |
| Store, handle or use pyrophoric | $210.00 |

**[14] 16. Compressing gases**

| | |
|---|---|
| Maintain or operate a device, equipment or system to compress flammable gas | |
| Compress to a pressure up to and including 15 psig (103.4 kPa) | $210.00 |
| Compress to a pressure more than 15 psig (103.4 kPa) | $415.00 |
| Maintain or operate a device, equipment or system to compress [non-flammable] nonflammable gas | $210.00 |
| Maintain or operate a device, equipment or system to compress atmospheric air | |
| Up to and including three compressors | $105.00 |
| Each additional six compressors or portion thereof | $105.00 |

**17. Construction sites**

| | |
|---|---|
| Fire safety inspection (annual fee) | $315.00 |

**[15] 18. Corrosive materials**

| | |
|---|---|
| Store, handle or use solid | $50.00 |
| Store, handle or use liquid | |
| In portable containers | $50.00 |
| In tanks (each unit of 1,000 gallons (3785 L) or portion thereof) | $50.00 |

**[16] 19. Cryogenic fluids**

| | |
|---|---|
| Store, handle or use flammable | $210.00 |
| Store, handle or use nonflammable | |
| Up to and including 1,300 gallons (4921 L) | $210.00 |
| Each additional 3,900 gallons (14 762 L) or portion thereof | $105.00 |

**[17] 20. Dry cleaning facilities**

| | |
|---|---|
| Maintain or operate a dry cleaning facility | $125.00 |

**[18] 21. Decorations**

| | |
|---|---|
| Fire safety inspection of combustible decorations and scenery in: | |
| An assembly occupancy | Included in fee set forth in FC A03.1([2] 3) |
| Other public gathering places | Included in fee set forth in FC A03.1([56] 61) |

**[19] 22. Explosives**

| | |
|---|---|
| Store, handle and sell explosives at vendor's facility (frequency of inspection as required by code or rule) | |
| Initial inspection | $210.00 |
| Subsequent inspection (per hour) | $210.00 |
| Store, handle and use explosives at a job site (frequency of inspection as required by code or rule) (per hour) | $210.00 |
| Store small arms ammunition for sale | |
| Up to and including 25 percent of the maximum allowable code quantities | $105.00 |
| More than 25 percent of the maximum allowable code quantities | $210.00 |
| Store black powder or smokeless propellant | |
| Less than 14 pounds (6.4 kg) | $50.00 |
| 14 pounds (6.4 kg) or more | $105.00 |
| Store, sell or offer for sale low explosives at a location other than a vendor's facility or job site (frequency of inspection as required by code) (per hour) | $210.00 |

**23. Fire apparatus services** (as required by code, rule, permit or hazardous

| | |
|---|---|
| materials release) | |
| Firefighting apparatus (per hour) (per apparatus) | $525.00 |
| Other services | Hourly fee based on cost of services, including travel time, overtime, expenses and overhead |
| **24. Fire department in-building auxiliary radio communication systems** | $105.00 |
| **[20] 25. Fire protection systems** | |
| Acceptance tests | |
| Commercial cooking fire extinguishing system (per system) | |
| Mechanical only | $285.00 |
| Mechanical and electrical | $580.00 |
| Fire and carbon monoxide alarm and communication systems (per system) (per hour) | $210.00 |
| Fire extinguishing systems, mechanical and electrical, (per system) (per hour) | |
| Aerosol | $210.00 |
| Carbon dioxide | $210.00 |
| Clean agent | $210.00 |
| Dry chemical | $210.00 |
| Foam | $210.00 |
| [Halon] | [$210.00] |
| Water mist | $210.00 |
| Wet chemical | $210.00 |
| Fire and booster pumps (per pump) (per hour) | |
| Electric driven, mechanical and electrical | $210.00 |
| Engine driven | $210.00 |
| Periodic tests (frequency of inspection as required by code or rule) | |
| Sprinkler system | |
| One fire department connection | $320.00 |
| Each additional fire department connection | $275.00 |
| Trip test (per valve) (per hour) | $210.00 |
| Flow test | $105.00 |
| Standpipe system | |
| One fire department connection | $365.00 |
| Each additional fire department connection | $210.00 |
| Combination sprinkler/standpipe system | |
| One fire department connection | $365.00 |

| | |
|---|---|
| Each additional fire department connection | $210.00 |

**[21] 26. Fireworks displays**

| | |
|---|---|
| Permit application | $210.00 |
| Site inspection (per hour) | $210.00 |
| Monitoring of fireworks display (including pre-display operations and post-display safety measures) (per hour) | $210.00 |

**[22] 27. Flammable liquids (excluding paint, varnish and lacquer)**

| | |
|---|---|
| Store, handle or use in containers, each equal to or less than 55 gallons (208 L) | |
| Up to and including 550 gallons (2082 L) | $105.00 |
| More than 550 gallons (2082 L) up to and including 2,500 gallons (9463 L) | $210.00 |
| Each additional 2,500 gallons (9463 L) or portion thereof | $105.00 |
| Store, handle or use in tanks, each larger than 55 gallons (208 L) | |
| Up to and including [10] ten tanks | $210.00 |
| More than [10] ten tanks | $415.00 |
| Store, handle and use gasoline or other petroleum products in containers, each equal to or less than 55 gallons (208 L) | |
| Up to and including 55 gallons (208 L) | $50.00 |
| More than 55 gallons (208 L) | $105.00 |
| Store and handle for retail sale | |
| Up to and including 100 gallons (379 L) | $95.00 |
| More than 100 gallons (379 L) | $105.00 |
| Manufacture flammable liquid | $210.00 |
| Manufacture or distill liquor, spirits or alcohol | $210.00 |
| Store and handle liquors, spirits or alcohol (except retail liquor stores and premises where alcohol is sold for consumption on the premises) | |
| In containers, each equal to or less than 55 gallons (208 L) | |
| More than 500 gallons (1893 L) up to and including 1,000 gallons (3785 L) | $105.00 |
| More than 1,000 gallons (3785 L) up to and including 5,000 gallons (18 925 L) | $210.00 |
| Each additional 5,000 gallons (18 925 L) or portion thereof | $105.00 |
| In tanks each larger than 55 gallons (208 L) | |
| Up to and including [10] ten tanks | $105.00 |
| More than [10] ten tanks | $210.00 |

**[23] 28. Flammable solids**

| | |
|---|---|
| Store, handle or use | $105.00 |
| Store, handle and use nitrocellulose products in manufacture | $210.00 |

**[24] 29. Floor finishing [or surfacing] operations**

| | |
|---|---|
| Conduct a floor finishing [or surfacing] operation | $105.00 |

**[25] 30. Fruit and crop ripening**

Maintain or operate a fruit or crop ripening facility $105.00

**[26] 31. Fumigation and [thermal] insecticidal fogging**

Maintain or operate a toxic or flammable fumigation and [thermal] insecticidal fogging facility $105.00

**[27] 32. High rise office buildings, and hotels and motels**

Fire safety inspection (frequency of inspection as required by code or rule) $570.00

**[28] 33. Highly toxic materials**

Store, handle or use liquid $105.00

Store, handle or use solid $105.00

**[29] 34. Hazardous production materials (HPM)**

Store, handle or use hazardous production materials at an HPM facility $315.00

**[30] 35. High-piled combustible storage**

Maintain or operate a high-piled combustible storage facility

Up to and including 5,000 square feet (465 $m^2$) of high-piled combustible storage $105.00

More than 5,000 square feet (465 $m^2$) of high-piled combustible storage $210.00

**[31] 36. Hot work operations**

Citywide operations $105.00

Site-specific hot work program $105.00

**37. Hydrogen motor fuel-dispensing facilities**

Maintain or operate a hydrogen motor fuel-dispensing facility $105.00

**[32] 38. Industrial furnaces**

Maintain or operate an industrial furnace $105.00

**[33] 39. Inspections, [and] re-inspections and witnessed tests**

Inspections or witnessed tests required or authorized by the code or rules, the fee for which is not otherwise specified herein (per hour) $210.00

Re-inspections in connection with permit or inspection required or authorized by code or rule, to confirm correction of violation(s) (per hour) $210.00

Failure to provide access for a scheduled inspection or witnessed test $105.00

Late cancellation of a scheduled inspection or witnessed test (notice of less than [1] one business day) $105.00

**[34] 40. Laboratories, [nonproduction] non-production**

Maintain or operate a non-production laboratory

Original permit (per laboratory unit)

Up to and including 2,500 square feet (232 $m^2$) $210.00

More than 2,500 square feet (232 $m^2$) $315.00
Renewal permits (per laboratory unit)
Up to and including 2,500 square feet (232 $m^2$) $105.00
More than 2,500 square feet (232 $m^2$) $210.00

**[35] 41. Liquefied petroleum gases**
Store, handle or use $210.00

**[36] 42. Lumber yards**
Storage of lumber at lumber yards $105.00

**[37] 43. Marine liquid motor fuel-dispensing facilities**
Maintain or operate a marine liquid motor fuel-dispensing facility $105.00
Precision test of underground tank and piping (frequency of inspection as required by code or rule) (per hour) $210.00
Leak detection functionality test (frequency of test as required by code or rule) (per hour) $210.00
Tank test (per site) (frequency of test as required by code or rule) $355.00
Tank reopening and repair (frequency of inspection as required by code or rule) $320.00
Installation and alteration (frequency of inspection as required by code or rule)
With discharge lines
For tank with capacity up to and including 4,000 gallons (15 140 L) $980.00
Each additional tank $210.00
For tank with a capacity more than 4,000 gallons (15 140 L) $1,210.00
Each additional tank $420.00
Without discharge lines
For tank with capacity up to and including 4,000 gallons (15 140 L) $665.00
Each additional tank $195.00
For tank with a capacity more than 4,000 gallons (15 140 L) $840.00
Each additional tank $385.00
Fire extinguishing system test
Initial installation acceptance test (per system) $750.00
Periodic test (frequency of test as required by code or rule) (per system) $750.00

**[38] 44. Methane recovery facilities**
Maintain or operate a methane recovery facility (per hour) $210.00
Installation of devices, equipment and systems (new or altered), (frequency of inspection as required by code or rule) (per hour) $210.00
Periodic inspection/test (frequency of inspection as required by code or rule) (per hour) $210.00

**[39] 45. Natural gas liquefaction facilities**
Maintain or operate natural gas liquefaction facility (per hour) $210.00
Installation of devices, equipment and systems (new or altered), (frequency

| | |
|---|---|
| of inspection as required by code or rule) (per hour) | $210.00 |
| Periodic inspection/test (frequency of inspection as required by code or rule) (per hour) | $210.00 |

**[40] 46. Open flames**

| | |
|---|---|
| Fire safety inspection for use of an open flame in: | |
| [An assembly occupancy] A place of assembly | Included in fee set forth in FC A03.1([2] 3) |
| Other public gathering places | Included in fee set forth in FC A03.1([56] (61) |
| A covered mall (per hour) | $210.00 |

**[41] 47. Organic coatings**

| | |
|---|---|
| Manufacture organic coating | $210.00 |

**[42] 48. Organic peroxides**

| | |
|---|---|
| Store, handle or use liquid | $210.00 |
| Store, handle or use solid | $210.00 |

**[43] 49. Oxidizing materials**

| | |
|---|---|
| Store, handle or use liquid (per hour) | $210.00 |
| Store, handle or use solid (per hour) | $210.00 |
| Store, handle or use hydrogen peroxide, (concentration of [35%] 35 percent or more) | |
| Up to and including 150 gallons (568 L) in containers | $50.00 |
| More than 150 (568 L) gallons in containers | $105.00 |
| In bulk, per 1,000 gallons (3785 L) or portion thereof | $50.00 |

**[44] 50. Paints, varnishes and lacquers [(]with a flash point of 300°F (149°C) or less[)]**

| | |
|---|---|
| Store, handle or use paint, varnish and lacquer | |
| Up to and including 1,000 gallons (3785 L) | $105.00 |
| More than 1,000 gallons (3785 L) | $210.00 |
| Manufacture, mix or compound | $210.00 |

**[45] 51. Plan examinations**

| | |
|---|---|
| Review of design and installation documents, except as otherwise provided in FC A03.1(51) | [$210.00] $420.00 |
| Review of design and installation documents for commercial cooking systems | $210.00 |

| | |
|---|---|
| Review of fire safety and evacuation plan | $210.00 |
| Review of emergency action plan | |
| Original application | $525.00 |
| Amended application (per hour)(total not to exceed $525.00) | $210.00 |
| Review of combined fire safety and evacuation plan and emergency action plan | |
| Original application | $630.00 |
| Amended application (per hour)(total not to exceed $630.00) | $210.00 |
| Review of professionally certified application | $210.00 |

**[46] 52. Portable fueled space heaters**

| | |
|---|---|
| Store, handle or use | $210.00 |

**[47] 53. Pyrophoric materials**

| | |
|---|---|
| Store, handle or use liquid | $105.00 |
| Store, handle or use solid | $105.00 |

**[48] 54. Pyroxylin plastics**

| | |
|---|---|
| Store, handle or use raw pyroxylin plastics | $105.00 |
| Use of raw pyroxylin plastics in manufacture of products | $210.00 |

**[49[ 55. Refrigerating systems**

| | |
|---|---|
| Maintain or operate a refrigerating system (per compressor) | $105.00 |

**[50] 56. Repair garages**

| | |
|---|---|
| Maintain or operate a repair garage | $105.00 |

**[51] 57. Smoking rooms**

| | |
|---|---|
| Fire safety inspection in health care facilities (frequency of inspection as required by code or rule) | $105.00 |

**[52] 58. Special effects**

| | |
|---|---|
| Special effects permit application | $210.00 |
| Production company special effects permit application | $210.00 |
| Site inspection (per hour) | $210.00 |
| Central storage facility permit application | $210.00 |
| Monitoring of special effects operations (per hour) | $210.00 |

**[53] 59. Special services**

| | |
|---|---|
| Requests for an inspection, witnessing of test, or other services, at times other than regular business hours, or other special circumstances | Hourly fee based on cost of services, including travel time, |

| | |
|---|---|
| | overtime, expenses and overhead |
| **[54] 60. Spraying and dipping operations** | |
| Conduct a spraying or dipping operation | $310.00 |
| **[55. Standby of department personnel** (as required by code, rule or permit | |
| Firefighting apparatus (per hour) (per apparatus) | $525.00 |
| Other services | Hourly fee based on cost of services, including travel time, overtime, expenses and overhead] |
| **[56] 61. Street fairs and other public gatherings or gathering places** | |
| Review of site plan (per hour) | $210.00 |
| Fire safety inspection (per hour) | $210.00 |
| **[57] 62. Sulfur** | |
| Store, handle or use up to and including 1,500 pounds (681 kg) | $50.00 |
| Store, handle or use more than 1,500 pounds (681 kg) | $105.00 |
| **[58] 63. Tar kettles** | |
| Store, handle or use a tar kettle | $105.00 |
| **[59] 64. Tire-rebuilding plants** | |
| Maintain or operate a tire-rebuilding plant | $210.00 |
| **[60] 65. Tires, scrap tires and tire byproducts** | |
| Store tires, scrap tires and tire byproducts | $70.00 |
| **[61] 66. Toxic materials** | |
| Store, handle or use liquid | $105.00 |
| Store, handle or use solid | $105.00 |
| **[62] 67. Transportation of hazardous materials** | |
| Combustible liquid by motor vehicle | $105.00 |
| Compressed gas by motor vehicle | $105.00 |
| Explosives by marine vessel or watercraft (per hour) | $210.00 |

| | |
|---|---|
| Explosives by motor vehicle (per hour) | $210.00 |
| Firefighting apparatus escort (as required by code or rule) (per hour) (per apparatus) | $525.00 |
| Flammable liquid by motor vehicle | $105.00 |

**[63] 68. Unstable (reactive) materials**

| | |
|---|---|
| Store, handle or use liquid | $105.00 |
| Store, handle or use solid | $105.00 |

**[64] 69. Water-reactive materials**

| | |
|---|---|
| Store, handle or use liquid | $105.00 |
| Store, handle or use solid | $105.00 |
| Store calcium carbide | |
| Up to and including 600 pounds (272 kg) | $105.00 |
| More than 600 pounds (272 kg) | $210.00 |

## SECTION FC A04
## ADMINISTRATIVE SERVICES

**A04.1 Fees for administrative services.** Fees for administrative services shall be as follows:

| | **Fee** |
|---|---|
| **1. Transcripts and special reports** (per transcript or special report) (per premises) | $10.00 |
| **2. Replacement of lost permit or certificate** | $5.00 |
| **3. Application for modification of certificate (except certificate of approval)** | $5.00 |
| **4. Violation dismissal notice** (per violation) | $5.00 |
| **5. Application for modification** | $200.00 |
| **6. Removal and storage of contraband material** (per [cylinder or] article, device or equipment reclaimed) | $65.00 |
| **7. Payment returned for insufficient funds** (per item) | $20.00 |
| **8. Vacate order processing (upon dismissal for compliance)** | $525.00 |

## SECTION FC A05
## LATE RENEWALS

**A05.1 Penalties for late renewals.** Penalties and fees for late renewal of certificates and permits shall be as follows:

| | |
|---|---|
| **1. Certificates and permits** | **Fee**<br>As set forth in [Section 117.3]<br>FC117.3 |

## APPENDIX B
## REFERENCED STANDARD MODIFICATIONS

## SECTION FC B01
## NATIONAL FIRE PROTECTION ASSOCIATION REFERENCED STANDARDS

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

**NFPA 11-[2002] 2005.** The provisions of NFPA 11-[2002] 2005, [Low Expansion] Low-, Medium- and High-Expansion Foam, [shall be] are modified as follows:

1. Delete the language of Section 2.2 and replace with "As required by [this code] the Fire Code."

2. Delete Chapter 9 in its entirety.

**[NFPA 11A-1999.** The provisions of NFPA 11A-1999, Medium- and High-Expansion Foam Systems, shall be modified as follows:

1. Delete the language of Section 5.1.1 and replace with "As required by this code."]

**NFPA 12-[2002.] 2008.** The provisions of NFPA 12-[2002] 2008, Carbon Dioxide Extinguishing Systems, [shall be] are modified as follows:

1. Delete Section [1-3.13] 3.3.9.

2. Delete Section [1-3.14] 3.3.10.1.

3. Delete Section [1-7.4(c)] 4.4.4.3.1 and 4.4.4.3.2.

4. Delete [exceptions 2 and 3 from Section 1-8.1.1] Sections 4.5.2(2) and 4,5,2(3).

5. In Section [1-8.3.7] 4.5.4.8.2 delete "not more than 4 ft (1.2 m)" and replace with "42 to 48 inches (1067 to 1219 mm),"[,] and add "at its center" at the end of the sentence.

6. In Section [1-8.4] 4.5.5.5, replace "NFPA 72" with "[Section 907 of the Building Code] NFPA 72, as modified by FC Appendix B."[.]

7. Delete Section [1-9.1.1] 4.6.1.1.

8. In Section [1-11.3.7] 4.8.3.2(8), replace "NFPA 72" with "[Section 907 of the Building Code] NFPA 72, as modified by FC Appendix B."[.]

9. Delete Chapter [4] 7 in its entirety.

10. Delete Chapter [5] 8 in its entirety.

11. Delete Chapter [6] 9 in its entirety.

12. In Section [7-1.1] 2.2, replace "NFPA 70, National Electrical Code, [2002 Edition] 2008 edition" with "Electrical Code;"[;] replace "NFPA 72, National Fire Alarm Code, 2007 edition" with "[Section 907 of the Building Code] NFPA 72, as modified by FC Appendix B."[.]

**NFPA 13-2007.** The provisions of NFPA 13-2007, Installation of Sprinkler Systems, with respect to the design and installation of sprinkler systems, are modified to incorporate the "Modified Standards for Automatic Sprinkler, Standpipe and Fire Alarm Systems" as set forth in Appendix Q to the Building Code.

**NFPA 13R-2007.** The provisions of NFPA 13R-2007, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height, with respect to the design and installation of sprinkler systems, are modified to incorporate the "Modified Standards for Automatic Sprinkler, Standpipe and Fire Alarm Systems" as set forth in Appendix Q to the Building Code.

**NFPA 16-[2003] 2007.** The provisions of NFPA 16-[2003] 2007, Installation of Foam-Water Sprinkler and Foam-Water Spray Systems, [shall be] are modified as follows:

1. Delete the language of Section 2.2 and replace with "As required by [this code] the Fire Code."

2. Delete the language of Section 4.4.1 and replace with "A reserve supply of foam concentrate equal to that required for operation of the system for the required duration shall be available on site."

3. [Sections 5.8.1 and 5.10 are modified to indicate the appropriate section of the Building Code.] In Section 5.8.1, replace "NFPA 13, Standard for the Installation of Sprinkler Systems" with "NFPA 13, as modified by FC Appendix B."

4. In Section 5.10, replace "NFPA 13, Standard for the Installation of Sprinkler Systems" with "NFPA 13, as modified by FC Appendix B."

[4] 5. [In Section 5.12.2, replace "NFPA 72" with "Section 907 of the Building Code".] In Section 5.13.2, replace "NFPA 72, National Fire Alarm Code" with "NFPA 72, as modified by FC Appendix B."

[5] 6. Delete items (1) through and including (10) of Section 7.3.1 and replace with "As required by this code, the Building Code and the Electrical Code, as applicable."

**NFPA 17-2002.** The provisions of NFPA 17-2002, Dry Chemical Extinguishing Systems, [shall be] are modified as follows:

1. In [section] Section 2.2, replace "NFPA 70, National Electrical Code, 2002 Edition" with "Electrical Code,"[,] and replace "NFPA 72" with "[Section 907 of the Building Code] NFPA 72, as modified by FC Appendix B."[.]

2. [Section 3.2.4 is modified to indicate the department as the governing agency.] In Section 3.2.4, replace "authority having jurisdiction" with "Fire Department."

3. Delete Section 3.4.3.

4. Delete Section 4.2.

5. [Section 5.7.1.7.1 is modified to require the location of alarm stations to be "42 to 48 inches (1067 to 1219 mm) above the floor at its center".] In Section 5.7.1.7.1, replace "no more than 48 in. (1200 mm), nor less than 42 in. (1067 mm) above the floor" with "42 to 48 inches (1067 to 1219 mm) above the floor at its center."

6. [Section 5.4.7 is modified to indicate the appropriate section of the Building Code] In Section 5.7.4, replace "NFPA 72, National Fire Alarm Code" with "NFPA 72, as modified by FC Appendix B" and add a new sentence to the end of the section to read "The fire extinguishing system shall report alarm and trouble signals."

7. Delete the language of Section 5.8.3.6 and replace with "The dry chemical container and expellant gas assemblies shall be located where they will be readily accessible for manual activation during an emergency, and for inspection, servicing and other maintenance."

[7] 8. Delete Chapter 8 in its entirety.

[8] 9. Delete Section 9.10.

[9] 10. Add a new sentence to the end of [the section,] Section 10.2, to read "10.2 Before any work is commenced the applicant shall submit plans to the Department of Buildings and the [department] Fire Department for approval."

[10] 11. Add a new section, 10.4.3.6, to read "The completed system shall be tested by the installer, at his own risk, as required by other provisions of [this code] the Fire Code before any approval shall be issued."

[11] 12. Add a new sentence to the end of Section 10.5, to read "[Clear] A durable sign setting forth clear and concise operating [instruction] instructions for the system shall be [permanently] conspicuously posted at the entrance to the [space containing the system] protected area."

**NFPA 17A-2002.** The provisions of NFPA 17A-2002, Wet Chemical Extinguishing Systems, [shall be] are modified as follows:

1. In [section] Section 2.2, replace "NFPA 70, National Electrical Code, 2002 [Edition] edition" with "Electrical Code,"[,] and replace "NFPA 72, National Fire Alarm Code, 2002 edition" with "[Section 907 of the Building Code] NFPA 72, as modified by FC Appendix B."[.]

2. [Section 3.2.3 is modified to indicate the department as the governing agency.] In Section 3.2.3, replace "authority having jurisdiction" with "Fire Department."

3. In [section] Section 4.7, replace "NFPA 70, National Electrical Code" with "Electrical Code."[.]

4. In [section] Section 5.2.1.9, replace "NFPA 72, National Fire Alarm Code" with "[Section 907 of the Building Code] NFPA 72, as modified by FC Appendix B."[.]

5. [Section 5.2.1.10 is modified to require the location of alarm stations to be "42 to 48 inches (1067 to 1219 mm) above the floor at its center".] In the second sentence of Section 5.2.1.10, replace "no more than 48 in. (1200 mm), nor less than 42 in. (1067 mm) above the floor" with "42 to 48 inches (1067 to 1219 mm) above the floor at its center."

6. [Add a new section, 6.1, to read "6.1. Before any work is commenced, the applicant shall submit plans to the New York City Department of Buildings and the department for approval."] Add a new sentence to the end of Section 6.1, to read "Before any work is commenced, the applicant shall submit plans to the Department of Buildings and the Fire Department for approval."

7. [Add a new section, 6.4.4, to read "6.4.4. Clear and concise operating instructions for the system shall be permanently posted at the entrance to the space containing the system."] Add a new sentence to the end of Section 6.4.4, to read "A durable sign setting forth clear and concise operating instructions for the system shall be conspicuously posted at the entrance to the protected area."

**NFPA 72-2010.** The provisions of NFPA 72-2010, National Fire Alarm and Signaling Code, with respect to the design and installation of fire alarm systems, are modified to incorporate

the "Modified Standards for Automatic Sprinkler, Standpipe and Fire Alarm Systems" as set forth in Appendix Q to the Building Code.

**NFPA 110-2005.** The provisions of NFPA 110-2005, Emergency and Standby Power Systems, are modified as follows:

1. Delete Section 7.13.3.

2. Add a new sentence to the end of Section 7.13.4(5), to read "Time to initial load transfer shall not exceed 10 seconds unless a longer time is allowed by the Building Code and the Electrical Code."

3. Delete Section 7.13.4.1(11) and replace with "7.13.4.1(11) The load test with building load or other loads that simulate intended load shall continue for 2 hours observing and recording load changes and the resultant effect on voltage and frequency."

4. Delete Section 7.13.10.2 and replace with "7.13.10.2 The complete crank/rest cycle shall consist of 3-15 second crank cycles with 15 second rest periods between cranks."

5. Add a new section, 7.13.13, to read "7.13.13 Transfer switches shall be tested in accordance with 8.4.6."

6. Delete Section 8.1.2.

7. Delete Section 8.2.

8. Delete from the end of Section 8.3.1 the following language: "for the type and for the time duration specified for the class."

9. Delete Section 8.3.4 and replace with "8.3.4 A written record of the EPSS inspection, tests, exercising, operation, and repairs shall be maintained in accordance with FC107.7. Records shall be inclusive of the transfer switches and storage batteries."

10. Add a new section, 8.4.4.1, to read "8.4.4.1 Inspection shall consist of observation of all EPSS components for leaks, abnormal device position and status of all alarm/trouble indicators."

11. Delete Section 8.4.5.

12. In Section 8.4.6, replace "monthly" with "semiannually."

13. In Section 8.4.6.1, replace "monthly" with "semiannually."

**NFPA 130-2010.** The provisions of NFPA 130-2010, Standard on Fixed Guideway Transit and Passenger Rail Systems, are modified as follows:

1. Add a new sentence to the end of Section 3.3.14, to read "If required by the Fire Department the analysis shall include the timed fire simulation, input data and output data of the computational fluid dynamics analysis."

2. Add a new section, 3.3.44.1.1, to read "3.3.44.1.1 Deep Tunnel Stations. Stations where the lowest track is 60 feet (18 288 mm) or more below grade."

3. Delete Section 4.2.1 and replace with "4.2.1 The goal of this standard shall be to provide an environment that, in the event of a fire or non-fire emergency, protects to the maximum extent practicable occupants of fixed guideway transit and passenger rail systems, including personnel present during the construction of such systems, and firefighters and other personnel responding to the fire or non-fire emergency. This goal includes the following objectives:

(1) protecting occupants not intimate with the initial fire development.

(2) maximizing the survivability of occupants intimate with the initial fire development.

(3) facilitating short term and long term firefighting operations."

4. Add a new section, 4.3.1.1, to read "4.3.1.1 Emergency responder protection. Systems shall be designed, constructed and maintained to protect emergency responders during the fire or fire-related emergencies."

5. Add a new section, 4.3.2.1, to read "4.3.2.1 Structural integrity. Structural integrity shall be maintained to protect emergency responders during the fire or fire-related emergencies."

6. Add a new section, 4.7, to read "4.7 Terrorist protection. Rail systems shall be designed and operated to protect against potential terrorist attacks. The design and operational criteria to protect against terrorist attacks shall be approved."

7. In Section 4.5, insert "by the Fire Department" at the end of the sentence.

8. In the first sentence of Section 5.2.2.3, insert "and in all enclosed stations and open stations greater than 10,000 square feet (929 $m^2$)" after the word "restricted."

9. Add a new item to the end of Section 5.4.11.4, to read "(5) Emergency ventilation fans."

10. In Section 5.5.2.1(3), insert "automatically upon transmission of a fire alarm signal" between the words "stopped" and "locally," and add a new sentence after Section 5.5.2.1.3(b), to read "Deceleration shall be in accordance with Section 5.5.2.1(4)(b)."

11. Delete the first sentence of Section 5.5.2.1(4) and replace with "Where provision is made to stop escalators counted as a means of egress, one of the following shall apply:"

12. Add a new sentence to the end of Section 5.5.2.2, to read "For deep tunnel stations, 5.5.6.3.2.3 shall apply."

13. At the end of Section 5.5.3.1, insert "or automatically upon transmission of a fire alarm signal.

14. Add two new subdivisions to Section 5.5.4, to read:

"(4) Devices operable by a citywide standard key shall be installed so the door can be held in the open position.

(5) Access for emergency responders from the platform side at regular intervals by use of a citywide standard key or other approved means."

15. Add two new sentences to the end of Section 5.5.6.1, to read "Calculations to determine egress time shall take into consideration the impact of products of combustion, but need not take into account delays in egress caused by potential accumulations of rubbish or individuals that are not capable of self evacuation."

16. In Section 5.5.6.3.2.1, replace "1120 mm (44 in.)" with "72 inches (1829 mm)."

17. Add a new sentence to the end of Section 5.5.6.3.2.3, to read "For deep tunnel stations, an area of rescue assistance shall be provided to accommodate persons with an infirmity, disability or other special need in the course of exiting a deep tunnel station by means of a stair or escalator, as set forth in A 5.5.6.3.2.3, A 5.5.6.3.2.3 (2) and the referenced literature."

18. Delete the introductory language in Section 5.5.6.3.2.5, and replace with: "Escalators shall not be allowed to account for more than one-half of the required means of egress capacity at any one level. Escalators shall meet the following criteria:" In Section 5.5.6.3.2.5(1), insert "being brought to a stop upon transmission of a fire alarm signal, or" between the words "of" and "being."

19. Delete Section 5.5.6.3.3.1 and replace with "5.5.6.3.3.1 Elevators shall be installed for the possible use in the evacuation of persons with infirmities, disabilities or other special need. Elevators shall not be allowed to be used in the calculation of means of egress capacity."

20. Delete Section 5.5.6.3.3.2.

21. In Section 5.5.6.3.3.3, delete "counted as contributing to the means of egress capacity," and replace "that" with "and".

22. In Section 5.5.6.3.3.4, delete "counted as contributing to the means of egress capacity," delete "means of egress or" from Section 5.5.6.3.3.4(3), and add two new subdivisions to the end of Section 5.5.6.3.3.4, to read:

"(7) Elevators shall be designed to accommodate an ambulance stretcher in accordance with Section 3002.4 of the Building Code.

(8) A Fire Department-approved city-wide standard key shall be provided for elevator control."

23. Add a new sentence to the end of Section 5.5.6.3.4.4, to read "Gate type exits shall have a Fire Department-approved key, for access by Fire Department personnel."

24. In Section 5.7.3.1, delete ", except trainways" at the end of the sentence. Add a new sentence to the end of Section 5.7.3.1, to read "Automatic sprinkler protection shall be provided in all areas of deep tunnel stations."

25. Delete Section 5.7.3.2 and replace with "5.7.3.2 Sprinkler systems shall be installed and acceptance tested in accordance with the Building Code and the Fire Code. Sprinkler systems shall be approved by the Fire Department"

26. Add a new section, 5.7.3.6, to read "5.7.3.6 A fire department connection shall be provided for all sprinkler systems, regardless of the number of sprinkler heads in such system. The design of fire department connections shall be in accordance with the Building Code and the Fire Code."

27. In Section 5.7.4.1, delete "or Class III" and insert "the Building Code, the Fire Code and" between the words "with" and "NFPA 14."

28 In Section 5.7.4.1.1(2), replace "245 m (800 ft)" with "600 feet (182 880 mm)."

29. Add a new sentence to the end of Section 5.7.4.2, to read "The location of fire department connections shall be approved by the Fire Department."

30. In Section 5.7.4.4, insert ", the Building Code and the Fire Code" at the end of the sentence.

31. Add a new section, 5.7.4.5, to read "5.7.4.5 The system shall be designed for a flow of 750 gpm (2839 L/min) (three hose streams) and with a residual pressure of not less than 100 psi (690 kPa) available at all hose outlets. Dry standpipe systems shall be capable of being completely filled with water in not more than 10 minutes at a flow rate of 750 gpm (2839 L/min)."

32. Add a new section, 5.7.4.6, to read "5.7.4.6 Standpipe hose outlets shall be installed throughout the station so that all areas within the station are within 150 feet (45 720 mm) of a hose outlet.

33. Add a new section, 5.7.4.7, to read "5.7.4.7 Standpipe systems shall be supplied by not less than two fire department connections complying with the Building Code and FC 912. Each fire department connection shall have signage indicating the type of system and a description of the area it protects. The fire department connection shall be suitable for the Fire Department operations."

34. Add a new section, 5.7.4.8, to read "5.7.4.8 Standpipe system riser diagrams shall be conspicuously posted at the fire command center, firefighting ingress locations and other Fire Department-approved locations."

35. Add a new sentence to the end of Section 5.7.5 to read "In addition, portable fire extinguishers shall be provided in each staffed fare and information booth."

36. Delete Section 5.7.6.1 and replace with "5.7.6.1 The fire command center shall be in a separate room with hardened security features in accordance with United States Department of Homeland Security standards. The location of the fire command center shall be approved by the Fire Department."

37. Delete Section 5.7.6.2 and replace with "5.7.6.2 The fire command center shall be provided with controls for the ventilation system of the station and the tunnels serving such station."

38. Add a new section 5.7.6.3, to read "The fire command center shall be provided with voice communication capability throughout the station."

39. In Section 6.2.2.2.1, replace "762 m (2500 ft)" with "1,000 feet (304 800 mm)."

40. In Section 6.2.2.2.2, replace "not be required to exceed 1120 mm (44 in.)" with "be a minimum of 44 inches (1120 mm)."

41. Add two new sentences to the end of Section 6.2.2.5.3, to read "Exit hatches shall be capable of being opened from the discharge side to permit access by authorized personnel. They shall be marked on the inside with the exit number and the tracks they provide access to."

42. Add a new section, 6.2.7.4, to read "6.2.7.4 The path of travel distance between blue light stations shall not exceed 600 feet (182 880 mm)."

43. Add a new section, 6.2.7.5, to read "6.2.7.5 No path of travel between blue light stations shall require crossing of rail tracks or a traction power rail."

44. Add a new section, 6.2.7.6, to read "6.2.7.6 Blue light stations shall not be adjacent to the traction power rail or on the same side of the track bed as the traction power rail."

45. Add a new section, 6.2.7.7, to read "6.2.7.7 Blue light stations shall be provided with a blue light and reflective signage having alternating white and blue stripes on each side of the blue light station. The signage shall be readily visible from the trainway."

46. Add a new section, 6.2.7.8, to read "6.2.7.8 A public address system with coded access shall be provided at each blue light station."

47. In Section 6.3.2, replace "Except as described in 6.3.2.1 and 6.3.2.2, emergency" with "Emergency."

48. Delete Sections 6.3.2.1 and 6.3.2.2 in their entirety.

49. Add a new item to the end of Section 6.3.3.2.11.1, to read "(5) Emergency ventilation system."

50. Add a new sentence to the end of Section 6.5.1.1, to read "Heat detectors shall be provided in underground trainways when required by the Fire Department."

51. Add a new section, 6.5.1.3, to read "6.5.1.3 An approved fire extinguishing system shall be provided in signal bungalows."

52. In Section 6.5.2.1.1, delete "or Class III," and insert "the Building Code, the Fire Code and" between the words "with" and "NFPA 14.", and add two sentences to the end, to read "Standpipe hose outlets shall be installed throughout the trainway so that all areas are within 150 feet (45 720 mm) of a hose outlet. Additionally, a hose outlet shall be located at a Fire Department-approved location accessible from each emergency exit (hatch). Hose outlet areas shall be lighted."

53. In Section 6.5.2.1.2(2), replace "244 m (800 ft)" with "600 feet (182 880 mm)."

54. Add a new section, 6.5.2.6, to read "6.5.2.6 Standpipe systems shall be installed, initially tested and maintained in accordance with the Fire Code and the Building Code."

55. Add a new section, 6.5.2.7, to read "6.5.2.7 The system shall be designed for a flow of not less than 750 gpm (2839 L/min) (three hose streams) and a pressure of not less than 100 psi (690 kPa) shall be available at the hydraulically most remote hose outlets. A durable sign conspicuously posted at the fire department connection shall read : "Do not pressurize system above_____psi"."

56. Add a new section, 6.5.2.8, to read "6.5.2.8 Standpipes shall be supplied by a minimum of two fire department connections at an approved location at street level and remote from each other. Each fire department connection shall have signage indicating the type of system and a description of the area being protected."

57. Add a new section, 6.5.2.9, to read "6.5.2.9 Dry standpipe systems shall be capable of being completely filled with water in not more than 10 minutes from either fire department pumping apparatus or a fixed pump operating at 750 gpm (2839 L/min). Design flow rate shall not be less than 750 gpm (2839 L/min) and the design pressure at the most remote hose outlet shall not be less than 100 psi (690 kPa)."

58. Add a new section, 6.5.2.10, to read "6.5.2.10 Standpipe system riser diagrams shall be conspicuously posted at all trainway fire department ingress points and at the fire command center."

59. Add a new section, 6.5.2.11, to read "6.5.2.11 The standpipe system shall be approved by the Fire Department."

60. In Section 6.5.3.1.1, replace "61 m (200 ft)" with "150 feet (45 720 mm)."

61. Add a new section, 6.5.3.1.3, to read "6.5.3.1.3 Outlet valves shall be readily visible with conspicuously posted Fire-Department approved signage."

62. Add a new section, 6.5.5, to read "6.5.5 Fire extinguishing system."

63. Add a new section, 6.5.5.1, to read "6.5.5.1 A Fire Department-approved manual or automatic fire extinguishing system shall be provided in tunnels."

64. Add a new section, 6.5.5.2, to read "6.5.5.2 A Fire Department-approved fire extinguishing system shall be provided in underground diesel locomotive yards."

65. Add a new section, 6.6.5.4, to read "6.6.5.4 Flammable liquids, combustible liquids and flammable gases shall not be stored or dispensed in trainways. Flammable liquids, combustible liquids and flammable gases shall be stored or dispensed in stations in accordance with the Fire Code and the Fire Department Rules."

66. Add a new section, 6.6.5.5, to read "6.6.5.5 Flammable liquids and combustible liquids shall not be stored or dispensed within 20 feet (6096 mm) of any tunnel vent grate or any station entrance or exit."

67. In Section 7.2.1(5), delete "for a minimum of 1 hour but not less than the required time of tenability."

68. In Section 7.2.1.1, replace "during the design incident for the duration determined as per 7.2.1(5)" with "as per the computational fluid dynamics analysis for the design incident" and add a new sentence to the end, to read "The system shall be designed to function in extreme conditions consistent with the computational fluid dynamics analysis."

69. Add a new item to the end of Section 7.2.3, to read "(8) Capability to monitor the system operation and performance during a fire or non-fire emergency."

70. Add a new section, 7.2.4.2, to read "7.2.4.2 Terrorist event, including an explosion. This analysis shall be submitted to the Fire Department."

71. In Section 7.3.2, replace "in an ambient atmosphere of 250°C (482°F) for a minimum of 1 hour but not less than the required time of tenability" with "for the temperature expected based on the computational fluid dynamics analysis ."

72. In Section 7.4.2, replace "in an ambient atmosphere of 250ºC (482°F) for a minimum of 1 hour but not less than the required time of tenability" with "for the temperature expected based on the computational fluid dynamics analysis."

73. Add a new sentence after the first sentence of Section 7.4.4, to read "The plenum shall be rated for the highest temperature expected based on the computational fluid dynamics analysis."

74. In Section 7.6.1.1, insert "and have the capability to monitor system operation and performance during fire and non-fire emergencies" at the end of the sentence.

75. Add a new sentence to the end of Section 7.7.7.2, to read "In areas where this exception applies, signs shall be conspicuously posted at entrances or other Fire Department-approved locations to warn of the electrical hazard."

76. Add a new section, 9.1.4, to read "9.1.4 It is the responsibility of the rail authority to control overcrowding in the station. A protocol shall be developed where during periods of significant delay or disruption of service, the rail authority will dispatch representatives to monitor for overcrowding within the station. When overcrowding is present, the Fire Department may assist in restricting access to the station and assist in taking action to alleviate the overcrowding situation."

77. Add a new section, 9.2.6, to read "9.2.6 Accurate system and track maps, along with station diagram showing both public and non-public spaces, shall be made available to firefighting and other emergency response personnel responding to a fire or non-fire emergency."

78. Add a new section, 9.2.7, to read "9.2.7 A system of signage or other means of measuring distance within the station and associated tunnels shall be implemented, to enable emergency response personnel to establish the location of an incident in the trainway and/or its distance from the station."

79. Add a new section, 9.7.4, to read "The listing shall include the name and contact information of the station manager or other trained and knowledgeable personnel designated to respond to the command post in the event of any fire or non-fire emergency, to act as a liaison to the incident commander."

80. Add a new section, 9.8.7, to read "9.8.7 The rail authority shall establish a procedure by which the station manager or other trained and knowledgeable personnel will immediately respond to the command post in the event of a fire or non-fire emergency to act as a liaison to the incident commander."

81. Add a new section, 9.8.8, to read "The fire command center shall be readily accessible from the command post, unless otherwise approved by the Fire Department. A fire command post, if constructed, shall be approved by the Fire Department prior to installation."

82. Add a new sentence to the end of Section 9.10.2, to read "Station staff whose duties require that they operate or be familiar with station equipment, shall be trained in the proper operation of any new equipment that is installed in the station. Training shall be provided whenever there is a change in station design or operation that would affect emergency response procedures."

83. Add a new section, 9.13, to read "9.13 Emergency Equipment."

84. Add a new section, 9.13.1, to read "9.13.1 Devices to aid in the discharge of passengers from a train to the railroad or from a train to a rescue train shall be positioned at stations and along the trainway at 800 feet (243 840 mm) intervals, preferably at blue light stations."

85. Add a new section, 9.13.2, to read "9.13.2 "Rail carts shall be provided at stations for use by emergency response personnel."

86. Add a new section, 9.13.3, to read "9.13.3 Couplers or other devices necessary to allow one train to attach to and tow a disabled train shall be positioned in sufficient quantities and at locations that provide ready access in the event of a fire or non-fire emergency."

87. Add a new sentence to the end of Section 10.1, to read "A Fire Department-approved communication system shall be provided during the construction phase of underground projects."

88. Add two new sentences before the first sentence of Section 10.3.2, to read "A separate radio network capable of two way portable radio communication shall be provided for on-scene fire personnel to communicate with other on-scene fire personnel throughout the station and associated tunnels, and on trains located therein. Such network shall be of approved design and shall cover the entire station and associated tunnels, and provide street coverage, for a reasonable distance, around stations and emergency exits."

89. Add a new sentence to the end of Section 10.4.1, to read "Such emergency telephone system shall be connected to an emergency power supply."

90. Delete Section 10.4.3, and replace with "Emergency telephones shall be installed along the trainway at locations not more than 600 feet apart, except as otherwise approved by the Fire Department."

91. Add a new section, 10.4.6, to read "10.4.6 A listing of telephone locations and phone numbers shall be kept at the fire command center and made available to emergency response personnel."

92. In Section 10.6.1, insert "and blue light stations" after the word "stations."

93. Add a new sentence at the end of Section 11.3.1, to read "Submit to the Fire Department any plan or analysis addressing the functionality, reliability, and availability of control systems and communication systems under fire conditions."

94. In Section 11.3.2, replace "single points of failure" with "multiple failure points."

**NFPA 502-2011.** The provisions of NFPA 502-2011, Road Tunnels, Bridges, and Other Limited Access Highways, are modified as follows:

1. Add two new sentences at the end of Section 4.3, to read "The goal of this standard shall be to provide an environment that, in the event of a fire or non-fire emergency, protects to the maximum extent practicable occupants of road tunnels, bridges and other limited access highways, including personnel present during the construction of such facilities, and firefighters and other personnel responding to the fire or non-fire emergency. This goal includes the following objectives:

(1) protecting occupants not intimate with the initial fire development.

(2) maximizing the survivability of occupants intimate with the initial fire development.

(3) facilitating short term and long term firefighting operations."

2. Add a new item to the end of Section 4.3.1(8), to read "(f) Sprinkler systems."

3. In Section 4.4.1, delete "carry out a complete and" and replace "prepare a Fire Department-approved."

4. Add a new sentence to the end of Section 4.4.2, to read "A written protocol shall be established with all agencies involved in an emergency response, including the Fire Department."

5. Delete in item (1) of Section 4.5 "lights or," and replace with "blue lights and."

6. In Section 5.2.1, replace "squads" with "personnel."

7. In Section 5.3, replace "(Reserved)" with "A fire hydrant shall be located not more than 300 feet (91 440 mm) from each fire department connection."

8. In Section 6.3.3, insert "and terrorism" between the words "collapse" and "scenarios."

9. Add a new section, 6.3.4, to read "6.3.4 Access shall be available for Fire Department apparatus and fire boats such that all parts of the underside of the bridge are accessible for firefighting operations."

10. Add a new section, 6.3.5, to read "6.3.5 Fireproofing of structural members, when provided, shall be periodically inspected by the bridge engineer. Fireproofing shall be maintained in good condition."

11. In Section 6.4.1.2 replace "AHJ" with "the Fire Department and other authorities having jurisdiction."

12. In Section 6.4.2.1, insert "or elevated highway and shall be linked to the Fire Department's Operations Center" at the end of the sentence.

13. Add a new section, 6.6.3, to read "6.6.3 A fire hydrant shall be located not more than 300 feet (91 440 mm) from any fire department connection."

14. In Section 6.7.1, replace "3.2 km (2 miles)" with "1.5 miles (2.4 km)."

15. Delete Table 7.2 and replace with the following:

**Table 7.2 Road Tunnel Fire Protection Summary**

| Fire Protection Systems | NFPA 502 Sections | Tunnel Categories | | | | |
|---|---|---|---|---|---|---|
| | | X | A | B | C | D |
| **Fire Detection** | | | | | | |
| Detection, identification, and location of fire in tunnel | 7.4.1 | CMR | CMR | MR | MR | MR |
| Manual fire alarm boxes | 7.4.1.3 | CMR | CMR | MR | MR | MR |
| CCTV systems | 7.4.1.1 | CMR | CMR | MR | MR | MR |
| Automatic fire detection systems | 7.4.1.4 | CMR | CMR | MR | MR | MR |
| Fire alarm control panel | 7.4.2 | CMR | CMR | MR | MR | MR |
| **Communication systems** | | | | | | |
| Radio | 7.5 | CMR | CMR | MR | MR | MR |
| Telephone | 4.5 | CMR | CMR | MR | MR | MR |
| **Traffic control** | | | | | | |
| Stop traffic approaching tunnel portal | 7.6.1 | MR | MR | MR | MR | MR |
| Stop traffic from entering tunnels direct approaches | 7.6.2 | — | — | MR | MR | MR |
| **Fire protection** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Fire apparatus[a] | 7.7 | NMR | NMR | NMR | NMR | NMR |
| Fire standpipe | 7.8 | CMR | MR | MR | MR | MR |
| Water supply | 10.2 | CMR | MR | MR | MR | MR |
| Fire department connections | 10.3 | CMR | MR | MR | MR | MR |
| Hose connections | 10.4 | CMR | MR | MR | MR | MR |
| Fire pumps[b] | 10.5 | CMR | CMR | CMR | CMR | CMR |
| Portable fire extinguishers | 7.9 | CMR | CMR | MR | MR | MR |
| Water based fire-fighting system[c] | Chapter 9 | CMR | CMR | CMR | MR | MR |
| Emergency ventilation system[d] | Chapter 11 | CMR | CMR | CMR | MR | MR |
| Tunnel drainage system[d] | 7.12 | MR | MR | MR | MR | MR |
| Hydrocarbon detector | 7.12.7 | CMR | CMR | MR | MR | MR |
| **Means of egress** | | | | | | |
| Emergency egress | 7.15.1.1 | CMR | MR | MR | MR | MR |
| Exit identification | 7.15.1.2 | CMR | MR | MR | MR | MR |
| Tenable environment | 7.15.2 | MR | MR | MR | MR | MR |
| Emergency exits (includes cross passageways)[e] | 7.15.6 / 7.15.7 | CMR | MR | MR | MR | MR |
| **Electrical systems** | | | | | | |
| General | 12.1 | CMR | CMR | MR | MR | MR |
| Emergency power | 12.4 | MR | MR | MR | MR | MR |
| Emergency lighting | 12.6 | MR | MR | MR | MR | MR |
| Exit signs | 12.6.8 | MR | MR | MR | MR | MR |
| Security plan | 12.7 | MR | MR | MR | MR | MR |
| **Emergency response plan** | | | | | | |
| Emergency response plan | 13.3 | MR | MR | MR | MR | MR |

MR: Mandatory requirement. CMR: Conditional mandatory requirement. NMR: Nonmandatory requirement.
Note: The purpose of Table 7.2 is to provide assistance in locating road tunnel fire protection requirements contained within this standard. If there is any conflict between the requirements defined in the standard text and this table, the standard text shall govern.
[a] Not mandatory to be at tunnel, however, they must be nearby to minimize response time.
[b] If required, comply with Section 10.5.
[c] If installed, comply with Chapter 9.
[d] Allows engineering analysis to determine requirements.
[e] Emergency exit spacing shall be substantiated by an egress analysis.

16. In Section 7.4.1.1, insert at the end of the sentence "and shall be linked to the Fire Department's Operations Center."

17. In Section 7.5.1, replace "to the fire department communication center" with "to communicate from person to the command center, and from person to person."

18. Add a new section, 7.5.1.1, to read "7.5.1.1 Emergency communication devices shall be installed at cross passageways and emergency exits, with spacing between devices not to exceed 150 feet (45 720 mm)."

19. Add a new section, 7.9.4, to read "7.9.4 The location of portable fire extinguishers shall be conspicuously marked."

20. Add a new sentence to the end of Section 7.15.1.1, to read "If required by the Fire Department, an engineering analysis shall be carried out to meet the requirements of Section 4.3."

21. In Section 7.15.1.2, insert at the end of the sentence ", and within 15 feet (4572 mm) of an emergency exit."

22. In Section 7.15.5.2, insert "shall be approved by the Fire Department" between the words "doors" and "shall."

23. Add a new section, 7.15.5.7, to read "7.15.5.7 If emergency exit doors are provided with locks, such locks shall be operable from both sides of the door with a citywide standard key."

24. In the first sentence of Section 7.15.6.2, replace "300 m (1000 ft)" with "500 feet (152 400 mm)."

25. In Section 8.10.1, replace "NFPA 14 or other equivalent international standards and performance specified in Chapter 10" with "the Building Code, the Fire Code and NFPA 14, as modified by the Building Code and Fire Code, including the system performance requirements specified in Chapter 11 of NFPA 14."

26. Add a new section, 8.11, to read "8.11 Inspection, testing and other maintenance of standpipe systems shall be in accordance with the Building Code and the Fire Code."

27. In Section 9.1.1, replace "permitted" with "required."

28. In Section 9.1.2, insert "the Building Code and the Fire Code, and, as applicable," between "with" and "NFPA 11", and delete "or other equivalent international standards."

29. In Section 10.1.1, replace "NFPA 14, except as modified by this standard" with "the Building Code, the Fire Code and NFPA 14 as modified by the Building Code and Fire Code."

30. In Section 10.1.2, replace "NFPA 25" with "the Fire Code and the Building Code."

31. Delete the language of Section 10.1.3 and replace with "The standpipe system shall be designed as a dry system, connected to a manual fire pump. The standpipe system shall be maintained filled with water during the summer months."

32. Add a new section, 10.1.3.1, to read "10.1.3.1 The bridge standpipe system shall be capable of flowing 3,000 gpm (11 355 L/min) through hose outlets located on the bridge with hose valves in the open position. Each hose outlet shall be designed to flow not less than 250 gpm (846 L/min) at a pressure of not less than 100 psi (690

kPa), and capable of supplying 1,000 gpm (3785 L/min) to a tower ladder through hose connections required by Section 10.1.3.4. For standpipe systems on other structures, the design parameters shall be approved by the Fire Department."

33. Add a new section, 10.1.3.2, to read "10.1.3.2 Standpipe system hose connections shall be provided on the bridge approach from the point at which the road surface becomes elevated."

34. Add a new section, 10.1.3.3, to read "10.1.3.3 Standpipe system hose connections and valves shall be readily accessible, and shall be kept unobstructed."

35. Add a new section, 10.1.3.4, to read "10.1.3.4. Fire Department hose connections shall be installed at approved locations and have a 4½-inch (114-mm) diameter and Fire Department approved threads."

36. Add a new section, 10.1.3.5, to read "10.1.3.5 Standpipe systems shall be securely braced to prevent movement under normal use conditions."

37. In Section 10.1.5, replace "10 minutes or less" with "8 minutes or less at the design flow."

38. In Section 10.2.3(3), replace "NFPA 22" with "the Building Code and the Fire Code."

39. In Section 10.3.1, delete "or shall consist of a minimum 100 mm (4 in) quick connect coupling that is accessible."

40. Add a new section, 10.3.5, to read "10.3.5 Fire department connections for use by Fire Department fire boats shall be provided when required by the Fire Department."

41. Add a new section, 10.3.6, to read "10.3.6 A durable, weather-resistant diagram of the bridge's standpipe system riser, including the location of valves, shall be kept in a Fire Department-approved emergency responder box openable by a citywide standard key. Such emergency responder box shall be located at or near the fire department connections."

42. In Section 10.4.2, replace "85 m (275 ft)" with 200 feet (45 720 mm)."

43. In Section 10.4.4, replace "external threads in accordance with NFPA 1963 and the authority having jurisdiction" with "and shall be suitable for Fire Department operations."

44. In Section 10.5, replace "NFPA 20" with "the Building Code and the Fire Code."

45. In Section 11.1, insert "to assist in evacuation and firefighting operations" at the end of the sentence, and add a new sentence to the end, to read "The emergency ventilation system shall be approved by the Fire Department."

46. In Section 11.6.1, replace "for a minimum of 1 hour in" with "for the temperature expected in the computational fluid dynamics analysis for the design fire, but not less than".

47. In Section 11.6.2, replace "considered expendable" with "designed so that temperature in the tunnel, based on the design fire, does not exceed the temperature that would cause the exhaust fans to fail."

48. In Section 11.7.1, insert "at the temperature expected in the computational fluid dynamics analysis for the design fire, but not less than" before "in an airstream temperature of 250ºC (482ºF), and delete "for at least 1 hour".

49. Delete the language of Section 11.9.1 and replace with "The exhaust fans may be designed to operate automatically and/or manually. Controls shall be provided locally and at a remote location. Each set of controls shall be capable of overriding the other and any automatic controls.

50. Add a new section, 11.10.4, to read "11.10.4 Flammable and combustible liquids shall not be stored in limited access highways, road tunnels, bridges, and other limited access highways, including roadways that are located beneath air-right structures."

51. In Section 12.2.1, replace "NFPA 70" with "the Electrical Code."

52. In Section 12.5.1, delete "in excess of 1000 m (3280 ft) in length."

53. In Section 12.6.1, replace "NFPA 70" with "the Electrical Code, NFPA 110, as modified by FC Appendix B, and NFPA 111."

54. Add a new sentence to the end of Section 12.6.8.1, to read "The exit signs shall be reflective."

55. Add a new section, 13.5.4.1, to read "13.5.4.1 Road tunnels shall have thermal imaging cameras designed to operate in heavy smoke conditions."

56. Add a new section, 13.5.9, to read "13.5.9 The OCC shall be protected from acts of terrorism and natural disasters in accordance with the United States Department of Homeland Security guidelines."

57. Add a new sentence to the end of Section 13.8.2, to read "Such personnel shall be the holder of a certificate of fitness where required by the Fire Code or the rules."

58. In Section 14.1.2, insert "and acts of terrorism" after "14.1.1."

59. In Section 15.1.2, replace "five years" with "one year."

60. In Section A.3.3.19, delete "is submitted to the authority having jurisdiction" and insert "shall be filed with and approved by the Fire Department. If required by the Department, a computational fluid dynamics analysis shall be conducted in accordance with the Fire Code."

**NFPA 750-[2000] 2006.** The provisions of NFPA 750-[2000] 2006, Standard on Water Mist Fire Protection Systems, shall be modified as follows:

1. In Section [2-10.2.1] 5.10.2.1, delete "NFPA 72, National Fire Alarm Code" and replace with "[Section 907 of the Building Code] NFPA 72, as modified by FC Appendix B" and add "and tied-in to the building fire alarm system for monitoring of alarm, trouble and supervisory signals" to the end of the section.

2. In Section [2-10.3.6] 5.10.3.6.5, [add "Manual release to be installed] replace "not more than 1.2 m (4 ft) above the floor" with "42 to 48 inches (1067 to 1219 mm) above the floor at its center and located at egress."

3. Delete Chapter 14 in its entirety.

**NFPA 2001-[2004] 2008.** The provisions of NFPA 2001-[2004] 2008, Clean Agent Fire Extinguishing Systems, shall be modified as follows:

1. In Section 1.5.2.1, delete "NFPA 70[-National Electrical Code]" and replace with "Electrical Code."[.]

2. In Section 2.2, delete "NFPA 70-National Electrical Code, 2008 edition" and replace with "Electrical Code" and delete "NFPA 72, 2007 edition" and replace with "[Section 907 of the Building Code] NFPA 72, as modified by FC Appendix B."[.]

3. In Section 4.3.3.7, replace "not more than 4 ft (1.2 m) above the floor" with "42 to 48 inches (1067 to 1219 mm) above the floor at its center."

[3] 4. Delete Chapter [7] 8 in its entirety.

**NFPA 2010-2010.** The provisions of NFPA 2010-2010, Fixed Aerosol Fire-Extinguishing Systems, shall be modified as follows:

1. In Section 2.2, delete "NFPA 70-National Electrical Code, 2008 edition" and replace with "Electrical Code" and delete "NFPA 72, 2010 edition" and replace with "NFPA 72, as modified by FC Appendix B."

2. Delete Section 3.1.

3. In Section 5.3.1.1, delete "NFPA 70" and replace with "Electrical Code."

4. In Section 6.4.3.7.2, replace "not more than 1.2 m (4 ft) above the floor" with "42 to 48 inches (1067 to 1219 mm) above the floor at its center."

5. In Section 8.1.10.1, delete "NFPA 72, National Fire Alarm and Signaling Code" and replace with "NFPA 72, as modified by FC Appendix B."

6. In Section 8.1.10.2.4, delete "NFPA 72, National Fire Alarm and Signaling Code" and replace with "NFPA 72, as modified by FC Appendix B."

7. Delete Chapter 10 in its entirety.

§7. All actions and proceedings, civil or criminal, commenced prior to the effective date of this local law in accordance with any provision repealed by this local law and pending immediately prior to the taking effect of such repeal may be prosecuted and defended to final effect in the same manner as they might if those provisions had not been repealed.

§8. Rules promulgated by the fire commissioner in accordance with the law in effect prior to the effective date of this local law shall remain in effect for the matters covered to the extent that such rules are not inconsistent with the New York city fire code, as added by this local law, unless and until such rules are amended or repealed by the fire commissioner.

§9. This local law shall take effect 90 days after the date of enactment, except that the fire commissioner may take prior to such date any administrative actions necessary for the timely implementation of this local law, including but not limited to the promulgation of rules.