

**To Be Rescinded**

1301:7-7-05 Fire protection systems.

(A) Section FM-500.0 Certification.

(1) FM-500.1 No person shall sell, offer for sale, or use any fire protection or fire fighting equipment which does not meet the minimum standards for such equipment as specified in this code.

(2) FM-500.2 Except for public and private mobile fire trucks, no person shall engage in the business of servicing, testing, repairing, or installing fire protection or fire fighting equipment for profit without first being certified by the fire marshal, as required by section 3737.65 of the Revised Code.

(3) FM-500.3 For the purposes of this rule, "company" means any individual, sole proprietorship, partnership, association, or corporation certified pursuant to paragraph (A)(4)(FM-500.4) of this rule.

(4) FM-500.4 Upon satisfactory application, the fire marshal may certify any company to engage in the business of servicing, testing, repairing, and installing fire protection and fire fighting equipment.

A company must restrict its activities to those categories in which its employees (individuals) are certified.

(5) FM-500.5 Upon satisfactory application, the fire marshal may certify any individual or provisional individual to service, test, repair or install fire protection or fire fighting equipment in the following categories:

(a) Automatic sprinkler and standpipe systems;

(b) Fire service mains;

(c) Fire pumps;

(d) Fire alarm and detection equipment;

(e) HOUSEHOLD FIRE WARNING EQUIPMENT ONLY;

(f) Portable fire extinguishers;

(g) Engineered extinguishing equipment other than water;

(h) Pre-engineered extinguishing equipment other than water; or

(i) Such other categories as deemed necessary by the fire marshal.

An individual must be a company certified pursuant to paragraph (A) (4) (FM-500.4) of this rule or must be associated with a certified company when such individual engages in the business of servicing, testing, repairing or installing fire protection or fire fighting equipment for profit. An

individual may only work in those categories for which he has been certified pursuant to paragraph (A)(5)(FM-500.5) of this rule. Individuals may only work on those particular engineered or pre-engineered systems for which they have recent experience or education to show competence and have provided documentation thereof to the fire marshal. A provisional individual must be supervised by a certified individual at all times.

(6) FM-500.6 Certification procedure.

(a) Applications for certification and renewals shall be made on forms provided by the fire marshal. All applications and renewals shall be accompanied by the appropriate fee, to be made payable to "Treasurer, State of Ohio". Applications for renewal must be received by the state fire marshal thirty days prior to the expiration date. Individual certification licenses and company certification of an individual operating alone expire in accordance with the following schedule: last name beginning with "a-g" on January second of each year; last name beginning with "h-m" on April first of each year; last name beginning with "n-s" on July first of each year and last name beginning with "t-z" on October first of each year. All other company certification licenses expire June thirtieth of each year. ORIGINAL CERTIFICATION SHALL BE VALID FOR ONE YEAR OR THE REMAINING PORTION THEREOF. Renewal shall be pursuant to standard renewal procedure.

Those seeking certification to work on a particular engineered or pre-engineered system must show at least one of the following:

(i) Proof from the manufacturer of training or approval to work on the manufacturer's engineered or pre-engineered system; or

(ii) Recent experience or education sufficient to show competence to work on a particular engineered or pre-engineered system.

(b) Original application for certification and renewal of a company shall, at a minimum, include the following:

(i) Name of applicant;

(ii) The primary business address of the company;

(iii) Names of all persons responsible for the normal operations of the company (e.g., officers of the corporation, partners, etc.);

(iv) Proof of liability insurance or bonding in an amount of at least fifty thousand dollars for completion and/or performance purposes; and

(v) If a non-resident, an irrevocable consent to legal service in Ohio (needed for original application only).

(c) Original application for certification and renewal of an individual or provisional individual shall, at a minimum, include the following:

- (i) Name of applicant;
- (ii) Categories for which applicant is seeking certification;
- (iii) If a non-resident, an irrevocable consent to legal service in Ohio (needed for original application only); and
- (iv) If for a provisional individual, a copy of the indenture agreement.

(d) Fees shall be as follows:

- (i) Original application of a company shall be two hundred dollars, except that an individual operating as a company shall not be required to pay such fee;
- (ii) Renewal of a company shall be one hundred fifty dollars, except that an individual operating as a company shall not be required to pay such fee; all renewal applications not submitted thirty days prior to the date of expiration, shall be subject to a late fee of ten per cent of the assessed renewal fee.
- (iii) Original application of an individual or provisional individual shall be fifty dollars for each category for which certification is sought;
- (iv) Renewal of an individual or provisional individual shall be forty dollars; all renewal applications not submitted thirty days prior to the date of expiration, shall be subject to a late fee of ten per cent of the assessed renewal fee.
- (v) Changes in certification status or information shall be twenty-five dollars per fiscal year.

(vi) ALL FEES SUBMITTED ARE NONREFUNDABLE.

(E) Upon expiration of certification for a period exceeding sixty days, all applications for renewal will be considered as a new application and the applicant shall be required to pass an examination prior to certification.

(7) FM-500.7 Qualifications for certification.

Any company may be certified upon proper application as provided in paragraph (A)(6) (FM-500.6) of this rule.



Except for provisional individuals, the fire marshal shall require all applicants to obtain a passing grade of at least seventy percent on an examination prior to certification.

(8) FM-500.8 A certificate issued pursuant to paragraph (A)(FM-500.0) of this rule may be suspended or revoked by the fire marshal for the following reasons:

(a) For knowingly violating any provision of the "Ohio Basic Building Code," the "Ohio Fire Code," or the Revised Code;

(b) For engaging in or permitting a person to engage in activity requiring certification, but for which activity the person is not certified;

(c) For gross negligence or gross incompetence;

(d) For knowingly making any misrepresentation or false promise, or for dishonest or illegal dealing; or

(e) For a continued course of misrepresentation or the making of false promises individually, through employees or agents, through advertising, or otherwise;

(f) In the case of a company, for failure to notify the fire marshal of change of primary business address;

(g) In the case of a provisional individual, for failure to complete the apprenticeship program.

(9) FM-500.9 The fire marshal shall comply with the provisions of Chapter 119. of the Revised Code whenever suspending or revoking a certificate pursuant to paragraph (A)(8)(FM-500.8) of this rule.

(10) FM-500.10 No person, while under suspension or revocation of certificate pursuant to paragraph (A)(8)(FM-500.8) of this rule, may be associated with any company certified pursuant to paragraph (A)(FM-500.0) of this rule.

(11) FM-500.11 If a certificate issued pursuant to paragraph (A)(FM-500.0) of this rule is suspended or revoked, the company or individual shall immediately cease engaging in the business of servicing, testing, repairing or installing fire protection or fire fighting equipment for profit. A company or individual may not reapply for certification pursuant to paragraph (A)(FM-500.0) of this rule until two years expire from the date of revocation.

(12) FM-500.12 Every certified individual shall carry the certificate issued pursuant to paragraph (A)(FM-500.0) of this rule on their person while engaging in the business of servicing, testing, repairing or installing fire protection or fire fighting equipment for profit and produce the certificate for inspection upon request by the code official.



(13) FM-500.13 Any certified individual or certified company that changes the primary mailing address as previously filed with the fire marshal, shall submit notification of such change of address to the fire marshal within thirty days of the change of address.

(B) Section FM-501.0 General

(1) FM-501.1 Scope: The provisions of this rule shall govern the installation, operation, maintenance and testing of all new and existing fire protection systems, devices, units and fire safety equipment. Such systems shall comply with the provisions of the ~~OBBC BUILDING CODE~~ and NFPA 10, 13, 14, 17, 17A, 20, 22, 24, 25, 71, 72, 92A, 231, 231C, 231D listed in rule 1301:7-7-44 of the Administrative Code, ~~where provisions of this rule do not specifically cover conditions and operations.~~

(2) F-501.2 Installations: Before any fire alarm, detection or fire suppression system is installed, enlarged, or extended, a permit shall be obtained from the building code official. Construction documents shall be reviewed by the code official prior to the issuance of the building permit.

FM-501.2.1 Design criteria: All fire protection systems shall be designed and installed in accordance with the requirements of this code and the building code listed in rule 1301:7-7-44 of the Administrative Code.

(3) FM-501.3 Acceptance test: All fire protection systems shall be tested in accordance with the requirements of this code and the building code listed in rule 1301:7-7-44 of the Administrative Code. The tests shall be conducted by the owner or an authorized representative and in the presence of the code official. All tests required by this code and the standards referenced in this code shall be conducted at the expense of the owner or the owner's representative.

(4) F-501.4 Periodic test frequency: Dedicated smoke control systems shall be inspected and operated at six-month intervals. All other fire protection systems, including emergency generators, shall be tested at not greater than twelve-month intervals.

(a) F-501.4.1 Test records: A complete written record of all tests and inspections required under this rule shall be maintained on the premises by the owner or occupant responsible for said premises. Accurate logs shall be maintained, indicating the number, location and type of device tested. Any defect, modification or repair shall be logged, and the log shall be available to the code official.

(b) F-501.4.2 Fire drills: Fire protection systems utilized for fire drill purposes shall be accepted as a test of only those parts of the system actually utilized in the drill procedure.

(c) FM-501.4.3 Test responsibility and notification: The code official shall not be held responsible for any damages incurred during any test required under the provisions of this rule. When the presence of the code official is required for a test, the code official shall be notified not less than 48 hours before said test is conducted.

(d) F-501.4.4 Alarm and supervisory service: When testing any suppression system, standpipe or fire alarm system connected through a supervisory service directly to the fire or police department, notification shall be given to the department before initiation of the tests.

(5) F-501.5 Signs: All signs required to identify fire protection equipment and equipment locations shall be constructed of durable materials, permanently installed and readily visible. Letters and numbers shall contrast with the sign background and have an appropriate width-to-height ratio to permit the sign to be read easily.

(6) F-501.6 Threads: All threads provided for fire department connections to sprinkler systems, standpipe systems, yard hydrants or any other fire hose connection shall be compatible with the connections utilized by the local fire department.

(C) Section FM-502.0 Definitions

FM-502.1 General: The following words and terms shall, for the purposes of this rule and as stated elsewhere in this code, have the meanings shown herein.

Alarm: Any audible or visible signal or intelligence indicating existence of a supposed fire or emergency requiring both response and emergency action on the part of the fire-fighting service. Additionally, the alarm device or devices by which fire and emergency signals are received.

Automatic fire suppression system: An engineered system utilizing carbon dioxide (CO<sub>2</sub>), foam, wet or dry chemical, a halogenated extinguishing agent, a clean extinguishing agent or an automatic sprinkler system to detect automatically and suppress a fire through fixed piping and nozzles.

Automatic sprinkler system: A sprinkler system, for fire protection purposes, is an integrated system of underground or overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply. The portion of the system above the ground is a network of specially sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which automatic sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the fire area.

Carbon dioxide (CO<sub>2</sub>): A colorless, odorless, electrically nonconductive inert gas.

Carbon dioxide extinguishing system (CO<sub>2</sub>): A system supplying carbon dioxide (CO<sub>2</sub>) from a pressurized vessel through fixed pipes and nozzles. The system includes an automatic detection and actuating mechanism (see ~~paragraph~~ SECTION (I)(FM-508.0) of this rule).

Clean agent: electrically nonconducting, volatile or gaseous fire extinguishant that does not leave a residue upon evaporation.

Clean agent fire extinguishing system: a system of pipes, nozzles, an actuating mechanism and a container of clean agent under pressure (see section FM-510.0).

Detector, heat: An alarm-initiating device that detects abnormally high temperature or rate of temperature rise (see paragraph SECTION ~~(N)~~ (O) ~~(FM-513.0 FM-514.0)~~ of this rule).

Detector, smoke: An alarm-initiating device that detects visible or invisible particles of combustion (see paragraph SECTION ~~(N)~~ (O) ~~(FM-513.0 FM-514.0)~~ of this rule).

Dry chemical: A powder composed of small particles, usually of sodium bicarbonate, potassium bicarbonate, urea-potassium-based bicarbonate, potassium chloride or monoammonium phosphate, with added particulate material supplemented by special treatment to provide resistance to packing, resistance to moisture absorption (caking) and the proper flow capabilities.

Dry-chemical extinguishing system: A system consisting of dry chemical and expellant gas storage tanks and fixed piping and nozzles utilized to ensure proper distribution of an approved extinguishing agent on a specific fire hazard or into a potential fire area (see paragraph SECTION ~~(K)~~ (L) ~~(FM-510.0 FM-511.0)~~ of this rule).

Engineered system: A functional unit requiring individual calculation and design to determine the flow rates, nozzle pressures, quantities of extinguishing agent and the number and types of nozzles and their placement for the protection of a specific hazard.

Fire alarm box, manual: A manually operated alarm-initiating device that activates a fire protective signaling system (see paragraph SECTION ~~(M)~~ (N) ~~(FM-512.0 FM-513.0)~~ of this rule).

Fire alarm system, central station: A central office, connected to remote alarm and supervisory signaling devices, where personnel are in attendance at all times to monitor the system activity and investigate signals. The central station personnel takes immediate and appropriate action upon receipt of an alarm signal.

Fire alarm system, proprietary: An installation of protective signaling systems serving contiguous and noncontiguous properties under one ownership from a central supervising station located at the protected property where trained, competent personnel are in constant attendance.

Fire alarm system, remote station: An installation utilizing supervised circuits to transmit alarm and supervisory and trouble signals from one or more protected premises to a remote location at which appropriate action is taken (see paragraph ~~(M)~~ (N) ~~(FM-512.0 FM-513.0)~~ of this rule).

Fire detector, automatic: An alarm-initiating device that automatically detects heat, smoke or other products of combustion (see paragraph ~~(M)~~ (O) ~~(FM-512.0 FM-514.0)~~ of this rule).

Fire protection system: Devices, equipment and systems utilized to detect a fire, activate an alarm,



suppress or control a fire, or any combination thereof.

**Fire suppression system:** A mechanical system designed and equipped to detect a fire, actuate an alarm and suppress a fire.

**Foam-extinguishing system:** A special system discharging a foam made from concentrates, either mechanically or chemically, over the area to be protected (see ~~paragraph~~ SECTION (H)(FM-507.0) of this rule).

**Halogenated extinguishing agent:** A halogenated compound is a compound containing one or more atoms of an element from the halogen chemical series: fluorine, chlorine, bromine and iodine. Halogenated extinguishing compounds shall be restricted to the following:

(1) Halon 1211, bromochlorodifluoromethane,  $\text{CBrClF}_2$ , or

(2) Halon 1301, bromotrifluoromethane,  $\text{CBrF}_3$ .

**Halogenated extinguishing system:** A system of pipes, nozzles and an actuating mechanism and a container of halogenated agent under pressure (see ~~paragraph~~ SECTION (J)(FM-509.0) of this rule).

**Portable fire extinguisher:** A portable device containing an extinguishing agent that is expelled under pressure for the purpose of suppressing or extinguishing a fire (see ~~paragraph~~ SECTION (T)(FM-519.0) of this rule).

**Smoke detector, multiple station:** Single-station smoke detectors that are capable of being interconnected such that the actuation of one causes all integral or separate audible alarms to operate (see ~~paragraph~~ SECTION (O) (P) (FM-514.0 FM-515.0) of this rule).

**Smoke detector, single station:** An assembly incorporating the detector, control equipment and alarm-sounding device in one unit, which is operated from a power supply either in the unit or obtained at the point of installation (see ~~paragraph~~ SECTION (O) (P) (FM-514.0 FM-515.0) of this rule).

**Sprinkler alarm system:** An alarm activated by waterflow from a sprinkler system.

**Standpipe system:** A standpipe system is a fire protection system consisting of an arrangement of piping, valves, hose outlets and allied equipment installed in a structure.

**Supervisory device:** An initiating device utilized to monitor the conditions that are essential for the proper operation of automatic fire suppression systems (i.e., switches utilized to monitor the position of gate valves, a low air-pressure switch on a dry pipe sprinkler system, etc.).

**Voice/alarm signaling system:** A system that provides, to the occupants of a structure, dedicated manual or automatic facilities, or both, for originating and distributing voice instructions, as well as

alert and evacuation signals that pertain to a fire emergency.

**Water-spray system:** For fire protection purposes, a special fixed-pipe system connected to a reliable source of fire protection water supply and equipped with water-spray nozzles for specific water discharge and distribution over the surface or area to be protected. The piping system is connected to the water supply through an automatically or manually actuated valve initiating the flow of water. An automatic valve is activated by the operation of automatic detection equipment installed in the same area as the water-spray nozzles or, in special cases, located in another area.

**Wet chemical:** Normally a solution of water and potassium carbonate based chemical, potassium-acetate based chemical or a combination thereof forming an extinguishing agent.

**Wet chemical extinguishing system:** A system consisting of wet chemical and expellant gas storage tanks and fixed piping and nozzles utilized to ensure proper distribution on or into the protected hazard (see paragraph SECTION (L) (M) (FM-511.0 FM-512.0) of this rule).

(D) Section FM-503.0 Existing structures

(1) FM-503.1 General: The provisions of this section are intended to provide a reasonable degree of safety to persons occupying existing structures not complying with the minimum requirements of the building code listed in rule 1301:7-7-44 of the Administrative Code by requiring the fire protection systems provided herein be installed in such existing structures.

(2) F-503.2 High-hazard occupancy: All high-hazard occupancies shall be equipped throughout with an approved automatic fire suppression system.

FM-503.2.1 Pyroxylin plastics: All structures occupied for the manufacture or storage of articles of cellulose nitrate (pyroxylin) plastic shall be equipped with an approved automatic fire suppression system as required by the building code listed in rule 1301:7-7-44 of the Administrative Code. Vaults located within buildings for the storage of raw pyroxylin shall be protected with an approved automatic sprinkler system capable of discharging 1.66 gallons per minute (gpm) per square foot ( $0.00113 \text{ m}^3/\text{sm}^2$ ) ( $68 \text{ L/min/m}^2$ ) over the area of the vault.

(3) FM-503.3 Fire standpipes: All buildings with occupied floors located more than six stories above grade shall be provided with standpipes installed in accordance with the building code listed in rule 1301:7-7-44 of the Administrative Code. The standpipes shall have an approved fire department connection with hose connections at each floor level.

(4) F-503.4 Single and multiple station smoke detectors: A minimum of one approved single station or multiple station smoke detector shall be installed in each guestroom, suite or sleeping area in occupancies in use groups R-1 and I-1 and in dwelling units in the immediate vicinity of the bedrooms in occupancies in use groups R-2 and R-3. In all residential occupancies, smoke detectors shall be required on every story of the dwelling unit, including basements. In dwelling units with split levels

and without an intervening door between the adjacent levels, a smoke detector installed on the upper level shall suffice for the adjacent lower level, provided that the lower level is less than one full story below the upper level.

(a) FM-503.4.1 Installation: All detectors shall be installed in accordance with the building code listed in rule 1301:7-7-44 of the Administrative Code. When actuated, the smoke detectors shall provide an alarm suitable to warn the occupants within the individual room or dwelling unit.

(b) F-503.4.2 Power source: The power source for smoke detectors shall either be an AC primary power source or a monitored battery primary power source.

(c) F-503.4.3 Tampering: Anyone tampering or interfering with the effectiveness of a smoke detector shall be in violation of this code.

(5) FM-503.5 Fire alarm system: All occupancies in use groups E, I-2 and I-3 shall be equipped with a fire alarm system in accordance with the building code listed in rule 1301:7-7-44 of the Administrative Code.

Exception: Existing approved systems.

(6) FM-503.6 Mechanical equipment control: Approved smoke or heat detectors shall be installed in return air ducts or plenums in each recirculating air system with a capacity of more than 2,000 CUBIC FEET PER MINUTE (cfm) ( $0.94 \text{ m}^3/\text{s}$   $\leq$   $\text{m}^3/\text{s}$ ) and serving more than one floor in buildings exceeding six stories in height in accordance with the mechanical code listed in rule 1301:7-7-44 of the Administrative Code. Actuation of the detector shall stop the fan or fans automatically and be of the manual-reset type. Automatic fan shutdown is not required where the system is part of an approved smoke control system.

(E) Section F-504.0 Protection maintenance

(1) F-504.1 General: All fire protection systems which were installed in compliance with any law, ordinance or order, shall be maintained in an operative condition at all times. An owner or occupant shall not reduce the effectiveness of the protection so required. This requirement shall not prohibit the owner or occupant from temporarily reducing or discontinuing the protection where necessary to make tests, repairs, alterations or additions. The code official shall be notified before disconnection and interruption of protection and when tests, repairs, alterations or additions are started and upon completion of such work. The code official shall be advised of the extent of and reason for such work, and the restoration of the protection shall be diligently pursued.

(2) F-504.2 Unsafe structures: When any required fire protection system or part thereof becomes inoperative and affects the fire safety of a structure or the occupants therein, the code official shall order the system to be repaired and returned to service, or the structure shall be vacated until the inoperative system is repaired and returned to service.



(3) F-504.3 Vacant structures: All required sprinkler and standpipe systems and all component parts shall be maintained in an operable condition at all times in vacant or unoccupied structures. Fire alarm systems shall be maintained in an operable condition at all times, ~~except when the structure is vacated for periods of more than one week, and the system shall be tested in the presence of the code official upon restoration to an operable condition.~~

Exception: Where the type of construction, fire separation and security of the structure does not create a fire hazard as approved by the code official.

(4) F-504.4 Nonrequired equipment: Fire protection systems that are not required to comply with other applicable code requirements shall be permitted to continue in service without alteration, provided that the systems do not constitute a hazard. The systems shall be maintained operational to the original level of protection.

F-504.4.1 Nonrequired fire equipment - discontinuance: All nonrequired fire protection systems shall be arranged and maintained in a manner consistent with the requirements at the time of installation unless discontinuation of the equipment is approved. All discontinued equipment and devices, such as pull stations, nozzles, detectors, sprinklers, sensors, panels and hose connections, shall be removed so AS not to give a false indication that the structure, area or space is protected.

(5) F-504.5 Out of service: Where a fire protection system or any portion thereof is out of service for any reason, notice shall be given to the fire department and, in the case of a sprinkler or standpipe system, a sign shall be posted on each fire department connection, indicating the portion of the system which is out of service.

(F) Section F-505.0 Cabinets and dry standpipe stations

(1) F-505.1 Cabinets: Cabinets containing fire fighting equipment, such as standpipes, fire hose, fire extinguishers, or fire department valves shall not be blocked from utilization, or obscured from view.

(2) F-505.2 Cabinet equipment identification: All cabinets shall be identified in an approved manner by a permanently attached sign with letters not less than 2 inches (51 mm) high in a color that contrasts with the background color, indicating the equipment contained therein.

Exceptions

(a) Doors not large enough to accommodate a written sign shall be marked with a permanently attached pictogram of the equipment contained therein.

(b) Doors that have either an approved visual identification clear glass panel or a complete glass door panel are not required to be marked.

(3) F-505.3 Locking cabinet doors: All cabinets shall be unlocked.

Exceptions

(a) Visual identification panels of glass or other approved transparent frangible material that is easily broken and allows access.

(b) Approved locking arrangements.

(4) F-505.4 Dry standpipe stations: Where the fire hose is connected to dry standpipe systems, a permanently attached sign with letters not less than 2 inches (51 mm) high in a color that contrasts with the background color, and reading: "Dry Hose - Fire Department Use Only" shall be mounted or painted on or near the hose connection.

(G) Section FM-506.0 Water-based fire protection systems

(1) FM-506.1 Water-based extinguishing systems: All water sprinkler and water-spray extinguishing systems and standpipe systems shall be periodically inspected, tested and maintained in accordance with the requirements of NFPA 25 listed in rule 1301:7-7-44 of the Administrative Code and with paragraphs (G)(2)(FM-506.2) through (G)(5)(FM-506.5) of this rule.

(2) FM-506.2 System test: The inspector's test connections, main drain valve and all control valves shall be operated at 12-month intervals to determine that there is water flow at adequate pressure. Dry pipe systems shall deliver water to the inspector's test pipe in not more than sixty seconds, starting at the normal operating air pressure.

Exception: Antifreeze solution systems and limited area sprinkler systems which are supplied from a domestic water source and which are not required to have an inspector's test connection.

(3) FM-506.3 Dry pipe valves: Each dry pipe valve shall be cleaned and reset at twelve-month intervals.

(4) FM-506.4 Piping: If obstructions are observed during a system test, an internal inspection shall be conducted. A dry pipe systems shall be flushed at six-year intervals.

Exception: Antifreeze solution systems and limited area sprinkler systems which are supplied from a domestic water source and which are not required to have an inspector's test connection.

(5) FM-506.5 Antifreeze solution system: Before freezing weather each year, the solution shall be tested for the approved specific gravity. Where necessary, the solution shall be brought to the approved specific gravity.

Exception: Antifreeze solution systems which are supplied from a domestic water source and which

~~are not required to provide an inspector's test connection.~~

(H) Section FM-507.0 Foam-extinguishing systems

FM-507.1 Periodic testing and inspection: All foam-extinguishing systems shall be maintained, periodically inspected and tested in accordance with NFPA 11, 11A and 16 listed in rule 1301:7-7-44 of the Administrative Code.

(I) Section FM-508.0 Carbon dioxide extinguishing systems

(1) FM-508.1 Periodic testing and inspection: All carbon dioxide extinguishing systems shall be maintained, periodically inspected and tested in accordance with NFPA 12 listed in rule 1301:7-7-44 of the Administrative Code and paragraphs (I)(2)(F-508.2) ~~to~~ THROUGH (I)(6)(F-508.6) of this rule.

(2) F-508.2 System test: All systems shall be inspected and tested for proper operation at twelve-month intervals.

(3) F-508.3 High-pressure cylinders: All high-pressure cylinders shall be weighed and the date of the last hydrostatic test shall be verified at six-month intervals. Where a container shows a loss in original content of more than ten percent, the cylinder shall be refilled or replaced.

(4) F-508.4 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 ten percent, the container shall be refilled to maintain the minimum gas requirements.

(5) F-508.5 System hoses: All system hoses shall be examined at 12 month intervals for damage. Damaged hoses shall be replaced or tested. ALL HOSES SHALL BE TESTED AT ~~At~~ five year intervals, ~~all hoses shall be tested.~~

F-508.5.1 Test procedure: All hoses shall be tested at not less than 2,500 psi (17238 kPa) for high-pressure systems and at not less than 900 psi (6206 kPa) for low-pressure systems.

(6) F-508.6 Auxiliary equipment: All auxiliary and supplementary components, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, shall be manually operated at twelve-month intervals to ensure that such components are in proper operating condition.

(J) Section FM-509.0 Halogenated extinguishing systems

(1) FM-509.1 Periodic testing and inspection: All halogenated extinguishing systems shall be maintained, periodically inspected and tested in accordance with NFPA 12A, ~~12B and 2001~~ listed in rule 1301:7-7-44 of the Administrative Code and paragraphs (J)(2)(F-509.2) through (J)(5)(F-509.5)



of this rule.

(2) F-509.2 System test: All systems shall be inspected and tested for proper operation at twelve-month intervals.

(3) F-509.3 Containers: The extinguishing agent quantity and pressure of containers shall be checked at six-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 ten 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.

(4) F-509.4 System hoses: All system hoses shall be examined at twelve month intervals for damage. Damaged hoses shall be replaced or tested. ~~At five-year intervals, all~~ ALL hoses shall be tested AT FIVE YEAR INTERVALS.

F-509.4.1 Test procedure: For halon 1301 systems all hoses shall be tested at not less than 1,500 psi (10343 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 all hoses shall be tested at 2,500 psi (17238 kPa) for high-pressure systems and 900 psi (6206 kPa) for low-pressure systems.

(5) F-509.5 Auxiliary equipment: All auxiliary and supplementary components, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, shall be manually operated at twelve month intervals to ensure such components are in proper operating condition.

(K) Section F-510.0 Clean agent fire extinguishing systems

(1) F-510.1 Periodic testing and inspection: All clean agent fire extinguishing systems shall be maintained, periodically inspected and tested in accordance with the system manufacturer's instructions.

(2) F-510.2 System test: All systems shall be inspected and tested for proper operation at twelve-month intervals.

(3) F-510.3 Containers: The extinguishing agent quantity and pressure of the containers shall be checked at six-month intervals. Where a container shows a loss in original weight of more than five percent or a loss in original pressure, adjusted for temperature, of more than ten per cent, the container shall be refilled or replaced. The weight and pressure of the container shall be recorded on a tag attached to the container.

(4) F-510.4 System hoses: All system hoses shall be examined at twelve-month intervals for damage. Damaged hoses shall be replaced or tested. All hoses shall be tested at five-year intervals.

(L) Section FM-511.0 Dry-chemical extinguishing systems

(1) FM-511.1 Periodic testing and inspection: All dry-chemical extinguishing systems shall be maintained, periodically inspected and tested in accordance with NFPA 17 listed in rule 1301:7-7-44 of the Administrative Code and paragraphs (L)(2)(F-511.2) and (L)(3)(F-511.3) of this rule.

(2) F-511.2 System test: All systems shall be inspected and tested for proper operation at six month intervals. Tests shall include a check of the detection system alarms and releasing devices, including manual stations and other associated equipment. Extinguishing system units shall be weighed, and the required amount of agent verified. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge operated units shall be weighed and replaced at intervals indicated by the manufacturer.

(3) F-511.3 Fusible link maintenance: Fixed temperature-sensing elements shall be maintained to ensure proper operation of the system.

(M) Section FM-512.0 Wet-chemical extinguishing systems

(1) FM-512.1 Periodic testing and inspection: All wet-chemical extinguishing systems shall be maintained, periodically inspected and tested in accordance with NFPA 17A listed in rule 1301:7-7-44 of the Administrative Code and paragraphs (M)(2)(F-512.2) and (M)(3)(F-512.3) of this rule.

(2) F-512.2 System test: All systems shall be inspected and tested for proper operation at six-month intervals. Tests shall include a check of the detection system alarms and releasing devices, including manual stations and other associated equipment. Extinguishing system units shall be weighed and the required amount of agent verified. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals indicated by the manufacturer.

(3) F0-512.3 Fusible link maintenance: Fixed temperature-sensing elements shall be maintained to ensure proper operation of the system.

(N) Section FM-513.0 Fire ~~protective signaling~~ ALARM systems

(1) FM-513.1 Periodic testing and inspection: All fire ~~protective signaling~~ ALARM systems shall be maintained, periodically inspected and tested in accordance with NFPA 71 and 72 listed in rule 1301:7-7-44 of the Administrative Code and paragraphs (N)(2)(FM-513.2) and (N)(3)(F-513.3) of this rule.

(2) FM-513.2 System test: Complete and satisfactory tests shall be performed on all devices in accordance with the following:

- (a) At two-month intervals: All transmitters and circuit interfaces.
- (b) At three-month intervals: Functional and operational testing of the voice/alarm signaling system and water-flow-actuated devices. For sprinkler water-flow alarm tests, an actual water flow, through the utilization of a test connection, shall be the method employed for testing the reliability of the sprinkler alarm unit as a whole.
- (c) At six-month intervals: Gate valve supervisory switches, manual fire alarm boxes, combination night guard and fire alarm boxes, tank water-level devices, building and tank water-temperature supervisory devices, and other sprinkler system supervisory devices.
- (d) At twelve-month intervals: Remote annunciators, audible and visible alarm-indicating appliances, two-way telephones for the fire service, primary and secondary power supplies and all control panel functions.
- (e) Inspection and tests of automatic fire detection devices shall be in accordance with paragraph SECTION ~~(N)~~ (O) ~~(FM-513.0)~~ FM-514 of this rule.

F-513.2.1 Central-station circuit test: tests of all circuits extending from a central station, and tests of central-station devices, shall be conducted at twenty-four-hour intervals.

(3) F-513.3 Engine-driven generator: Where an engine-driven generator provides required secondary power source, such generator shall be inspected weekly and exercised at least monthly under load by disconnecting the normal supply to the system for a minimum of ½ hour in a continuous period.

(O) Section FM-514.0 Automatic fire detection systems

(1) FM-514.1 Periodic testing and inspection: All automatic fire detection systems shall be maintained, periodically inspected and tested in accordance with NFPA 72 listed in rule 1301:7-7-44 of the Administrative Code and paragraphs (O)(2)(F-514.2) through (O)(10)~~(FM-514.9)~~ FM-514.10 of this rule.

(2) F-514.2 Visual inspection: A visual inspection shall be performed at twelve-month intervals to ensure that each detector remains in good physical condition and that there are not changes that will affect detector performance, such as building modifications, occupancy hazards and environmental effects.

(3) F-514.3 Nonrestorable spot-type heat detectors: For nonrestorable spot-type heat detectors, after the first fifteen years and at five-year intervals thereafter, at least two detectors out of every one hundred or a fraction thereof shall be removed and tested by an approved agency. The detectors that have been removed shall be replaced with new detectors. If a failure occurs on any of the detectors removed, additional detectors shall be removed and tested as a further check on the installation until there is proven to exist either a general problem involving faulty detectors or a localized problem



involving individual defective detectors.

(4) F-514.4 Restorable heat detectors: For restorable heat detectors, one or more detectors on each signal-initiating circuit shall be tested at six-month intervals, and different detectors shall be selected for each test. Within five years, each detector shall have been tested.

Exception: Pneumatic line-type heat detectors.

(5) F-514.5 Pneumatic line-type heat detectors: All pneumatic line-type heat detectors shall be tested for leaks and proper operation at six-month intervals.

(6) F-514.6 Nonrestorable line-type fixed-temperature heat detectors: Nonrestorable line-type fixed-temperature heat detectors shall be tested for alarm function at six-month intervals. The loop resistance shall be measured, recorded and compared with the loop resistance previously recorded. Any change in loop resistance shall be investigated.

(7) F-514.7 Smoke detectors: all smoke detectors shall be inspected in place at twelve-month intervals to identify missing detectors, detectors with impeded smoke entry, dirty detectors and detectors no longer properly located because of occupancy or structure changes. Additionally, a test shall be performed at twelve-month intervals to ensure that each smoke detector is in an operable condition and produces the intended response by causing the detector to initiate an alarm at the installed location with smoke or other aerosol acceptable to the manufacturer and to demonstrate that smoke will enter the chamber and initiate an alarm.

(8) FM-514.8 Smoke detector sensitivity: Detector sensitivity shall be checked within one year after installation at five year intervals thereafter. The sensitivity testing shall be conducted by random selection and the number of smoke detectors shall be as required in Table FM-514.8. The random selection for sensitivity testing shall require a minimum of one detector per zone and/or one per floor whichever is the greatest number. Detectors with abnormal sensitivities shall be replaced or cleaned and recalibrated. To determine whether each smoke detector is within proper sensitivity range, the detector shall be tested in accordance with any one of the following:

- (a) A calibrated test method,
- (b) The manufacturer's calibrated sensitivity test instrument,
- (c) Approved control equipment arranged for the purpose, or
- (d) Other approved calibrated sensitivity test method.

Table FM-514.8  
Smoke detector sensitivity

Number of total detectors in fire alarm system (lot size)	Number of detectors to be tested for sensitivity	Number of detector failures requiring 100% sensitivity testing (Rc)
1 - 13	100%	N/A
14 - 150	13	1
151 - 500	50	2
501 - 1200	80	3
1201 - 3200	125	4
3201 - greater	200	6

(9) FM-514.9 Air duct detectors: Additional tests for air duct detectors shall consist of all of the following:

(a) A visual inspection of the detector installation, including seals, abuse or modification of the device or installation and intended operation of the device.

(b) The manufacturer's specifications shall be utilized to determine that the device will respond to smoke in the airstream.

(10) FM-514.10 Flame detectors, fire-gas detectors and other fire detectors: All flame detectors, fire-gas detectors and other fire detectors shall be tested in accordance with the manufacturer's instructions at six-month intervals.

(P) Section FM-515.0 Single and multiple-station smoke detectors

(1) FM-515.1 Periodic testing and inspection: All single- and multiple-station smoke detectors shall be maintained, periodically inspected and tested in accordance with NFPA 72 listed in rule 1301:7-7-44 of the Administrative Code and paragraph (P)(2)(FM-515.2) of this rule.

(2) FM-515.2 Single station smoke detectors: Tests or inspections in accordance with the manufacturer's instructions shall be conducted at one-month intervals for other than battery-powered smoke detectors and at one-week intervals for battery-powered smoke detectors.

Exception: The written log of tests as specified in paragraph (B)(4)(a)(F-501.4.1) of this rule shall not be required in occupancies in use group R-3.

(Q) Section FM-516.0 Fire pumps

(1) FM-516.1 General: All fire pumps required by the building code listed in rule 1301:7-7-44 of the Administrative Code shall be installed in accordance with the building code and NFPA 20 listed in

rule 1301:7-7-44 of the Administrative Code.

(2) F-516.2 Acceptance test: Pumps shall furnish not less than one hundred fifty per cent of rated capacity at a total head of not less than sixty-five per cent of total-rated head. The shutoff total head for horizontal shaft pumps shall not exceed one hundred forty per cent of the total-rated head. The inlet pressure available from a water supply shall be determined on a flow basis of one hundred fifty per cent of the rated capacity of the pump as indicated by a flow test.

(3) F-516.3 Overheating: As installed at operating speed, the pump shall be capable of operating at peak load conditions without having the bearings or the prime mover overheat. The operating pump speed shall be the speed at which the pumping unit is expected to operate during a fire.

(4) F-516.4 Automatic controllers: All pumps that supply fire protection systems or devices shall be capable of self-acting operation by their own mechanisms when actuated by some impersonal influence, such as: a change in current strength, pressure, temperature or mechanical configuration. The unit shall be capable of self-starting and shutdown after the starting causes have returned to normal and the pumping unit has operated for the time fixed by the running period timer. The running period timer shall be set for One minute of running time for every ten horsepower (7.46 kW) rating of the motor, with a maximum required running period of seven minutes. All pressure-actuated control switches that respond to water pressure shall be protected from accidental changes in pressure settings by locking bars or other protective devices.

(5) FM-516.5 Violations: Where the code official finds an apparent or actual violation of the requirements for installation or acceptance, the findings shall be reported to the building code official, who shall cause a joint investigation to be performed with the code official, and appropriate action shall be taken as necessary to secure compliance with the intent of this code and the building code listed in rule 1301:7-7-44 of the Administrative Code.

(6) FM-516.6 Inspection, testing and maintenance: All fire pumps shall be inspected, tested and maintained in accordance with the requirements of NFPA 25 listed in rule 1301:7-7-44 of the Administrative Code.

(R) Section FM-517.0 Water tanks and fire service mains

(1) FM-517.1 Water tanks: All water tanks for private fire protection shall be installed in accordance with NFPA 22 listed in rule 1301:7-7-44 of the Administrative Code.

(2) FM-517.2 Fire service mains: All private fire service mains and appurtenances shall be installed in accordance with NFPA 24 listed in rule 1301:7-7-44 of the Administrative Code.

(3) FM-517.3 Inspection, testing and maintenance: Water tanks and water service mains shall be periodically inspected, tested and maintained in accordance with the requirements of NFPA 25 listed in rule 1301:7-7-44 of the Administrative Code.



(S) Section FM-518.0 Fire department connections

(1) FM-518.1 Installation: All fire department connections shall be installed in accordance with the building code listed in rule 1301:7-7-44 of the Administrative Code.

(2) FM-518.2 Inspection, testing and maintenance: All fire department connections shall be periodically inspected, tested and maintained in accordance with NFPA 25 listed in rule 1301:7-7-44 of the Administrative Code.

(3) F-518.3 Access: Immediate access to all fire department connections shall be maintained at all times and without obstruction by fences, bushes, trees, walls or any other object.

(4) F-518.4 Signs: A metal sign with raised letters at least 1 inch (25mm) in size shall be mounted on all fire department connections serving fire sprinklers, standpipes or fire pump connections. Such signs shall read: "automatic sprinklers", "standpipes" or "test connection" or a combination thereof as applicable.

(T) Section FM-519.0 Portable fire extinguishers

(1) F-519.1 Approval: Portable fire extinguishers shall bear the label of an approved agency, be of an approved type, be tested, be maintained and be installed in a visible location to which the occupants have access in accordance with NFPA 10 listed in rule 1301:7-7-44 of the Administrative Code.

(2) FM-519.2 Where required: A portable fire extinguisher shall be installed and maintained in the following locations in accordance with NFPA 10 listed in rule 1301:7-7-44 of the Administrative Code:

- (a) In all occupancies of all use group classifications.
- (b) In all areas containing commercial kitchen exhaust hood systems.
- (c) In all areas where fuel is dispensed.
- (d) In all areas where a flammable or combustible liquid is used in the operation of spraying, coating or dipping.
- (e) In all occupancies in use group I-3 at staff locations. Access to portable fire extinguishers shall be permitted to be locked.
- (f) On each floor of structures under construction, except occupancies in use group R-3.

(g) In any laboratory, shop or other room of similar purpose.

(h) Where required by the sections indicated in Table FM-519.2 for various operations, processes, structures and areas.

(3) F-519.3 Cabinets: Cabinets containing portable fire extinguishers shall conform to ~~paragraph~~ SECTION (F)(F-505.0) of this rule.

(4) F-519.4 Servicing actuated units: Actuated extinguishers shall be immediately removed and temporarily replaced with a standby or spare unit of the same type and capacity as the actuated unit.

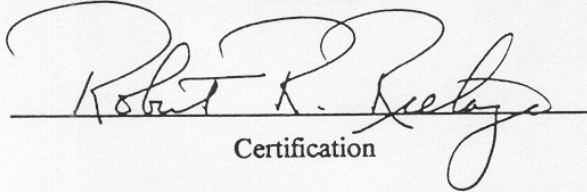
(5) F-519.5 Discontinued portable fire extinguishers: Soda acid, foam, loaded stream, antifreeze and water portable fire extinguishers of the inverting type and vaporizing liquid extinguishers containing carbon tetrachloride or bromochloromethane shall not be recharged or placed in service for fire protection purposes. Extinguishers of these types shall not be considered approved devices for fire protection purposes under the provisions of this code.

Table FM-519.2  
Additional required portable fire extinguishers

Section	Subject
F-306.5.1	Motorized parade floats
F-315.5	Construction, alterations, demolition of structures
F-403.7	Open burning
F-404.1	Open-flame paint removal
F-405.3	Asphalt (tar) kettles
F-805.2	Aircraft towing vehicle
F-805.2.1	Aircraft welding apparatus
F-805.3	Aircraft refueler
F-805.4.1	Aircraft service areas (low hose flow)
F-805.4.2	Aircraft service areas (medium hose flow)
F-805.4.3	Aircraft service areas (high hose flow)
F-1104.1	Dry cleaning plants

F-1104.2	Dry cleaning rooms
F-1304.8	Spray finishing
F-1305.8	Dip tanks
<del>F-1602.7</del> FM-1602.7	Lumber yards
F-1603.3	Woodworking machines
F-1902.3	Organic coating area
F-2002.6	Tents and air-supported structures
F-2204.3	Welding or cutting operations and portable welding carts
F-2905.3 FM-2905.3	Vehicles for cryogenic liquids
F-3005.12.1	Vehicles for explosives (small trucks)
F-3005.12.2	Vehicles for explosives (large trucks)
FM-2806.9	Service stations
FM-2809.1 F-2809.1	Interior flammable or combustible liquid storage rooms
FM-2809.2 F-2809.2	Flammable or combustible liquid storage areas
FM-2811.1.2	Vehicles for flammable or combustible liquid or asphalt

Effective date: January 3, 2000

  
 Certification

November 17, 1999  
 Date

Promulgated under: R.C. Section 119.03  
 Rule amplifies: R.C. Section 3737.22  
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 R.C. 119.032 Review Date: 1/01/03  
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WITHDRAWN ELECTRONICALLY

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Date

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