

2021 Virginia Construction Code

CHAPTER 9 FIRE PROTECTION AND LIFE SAFETY SYSTEMS

SECTION 904 ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

[F] 904.1 General.

Automatic fire-extinguishing systems, other than *automatic sprinkler systems*, shall be designed, installed, inspected, tested and maintained in accordance with the provisions of this section and the applicable referenced standards.

[F] 904.2 Where permitted.

Automatic fire-extinguishing systems installed as an alternative to the required *automatic sprinkler systems* of [Section 903](#) shall be approved by the fire code official.

[F] 904.2.1 Restriction on using automatic sprinkler system exceptions or reductions.

Automatic fire-extinguishing systems shall not be considered alternatives for the purposes of exceptions or reductions allowed for *automatic sprinkler systems* or by other requirements of this code.

[F] 904.2.2 Commercial hood and duct systems.

Each required commercial kitchen exhaust hood and duct system required by [Section 606](#) of the *International Fire Code* or [Chapter 5](#) of the *International Mechanical Code* to have a Type I hood shall be protected with an approved *automatic fire-extinguishing system* installed in accordance with this code.

[F] 904.3 Installation.

Automatic fire-extinguishing systems shall be installed in accordance with this section.

[F] 904.3.1 Electrical wiring.

Electrical wiring shall be in accordance with [NFPA 70](#).

[F] 904.3.2 Actuation.

Automatic fire-extinguishing systems shall be automatically actuated and provided with a manual means of actuation in accordance with [Section 904.11.1](#). Where more than one hazard could be simultaneously involved in fire due to their proximity, all hazards shall be protected by a single system designed to protect all hazards that could become involved.

Exception: Multiple systems shall be permitted to be installed if they are designed to operate simultaneously.

[F] 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.

[F] 904.3.4 Alarms and warning signs.

Where alarms are required to indicate the operation of automatic fire-extinguishing systems, distinctive audible and 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. Audible signals shall be in accordance with [Section 907.5.2](#).

[F] 904.3.5 Monitoring.

Where a building fire alarm system is installed, *automatic fire-extinguishing systems* shall be monitored by the building fire alarm system in accordance with [NFPA 72](#).

[F] 904.4 Inspection and testing.

Automatic fire-extinguishing systems shall be inspected and tested in accordance with the provisions of this section prior to acceptance.

[F] 904.4.1 Inspection.

Prior to conducting final acceptance tests, all of 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.

Copyright © 2024 International Code Council, Inc., or its licensors (ALL RIGHTS RESERVED).

Accessed by Venkatesh Shanmugam on 11/13/2024 pursuant to License Agreement with ICC. No further reproduction or distribution authorized. Any Unauthorized reproduction or distribution is a violation of the federal copyright, and subject to civil and criminal penalties thereunder.

[F] 904.4.2 Alarm testing.

Notification appliances, connections to fire alarm systems and connections to *approved* supervising stations shall be tested in accordance with this section and [Section 907](#) to verify proper operation.

[F] 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.

[F] 904.4.3 Monitor testing.

Connections to protected premises and supervising station fire alarm systems shall be tested to verify proper identification and retransmission of alarms from *automatic fire-extinguishing systems*.

[F] 904.5 Wet-chemical systems.

Wet-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with [NFPA 17A](#) and their listing. Records of inspections and testing shall be maintained.

[F] 904.6 Dry-chemical systems.

Dry-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with [NFPA 17](#) and their listing. Records of inspections and testing shall be maintained.

[F] 904.7 Foam systems.

Foam-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with [NFPA 11](#) and [NFPA 16](#) and their listing. Records of inspections and testing shall be maintained.

[F] 904.8 Carbon dioxide systems.

Carbon dioxide extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with [NFPA 12](#) and their listing. Records of inspections and testing shall be maintained.

[F] 904.9 Halon systems.

Halogenated extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with [NFPA 12A](#) and their listing. Records of inspections and testing shall be maintained.

[F] 904.10 Clean-agent systems.

Clean-agent fire-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with [NFPA 2001](#) and their listing. Records of inspections and testing shall be maintained.

[F] 904.11 Automatic water mist systems.

Automatic water mist systems shall be permitted in applications that are consistent with the applicable listing or approvals and shall comply with [Sections 904.11.1](#) through [904.11.3](#).

[F] 904.11.1 Design and installation requirements.

Automatic water mist systems shall be designed and installed in accordance with [Sections 904.11.1.1](#) through [904.11.1.4](#).

[F] 904.11.1.1 General.

Automatic water mist systems shall be designed and installed in accordance with [NFPA 750](#) and the manufacturer's instructions.

[F] 904.11.1.2 Actuation.

Automatic water mist systems shall be automatically actuated.

[F] 904.11.1.3 Water supply protection.

Connections to a potable water supply shall be protected against backflow in accordance with the [International Plumbing Code](#).

[F] 904.11.1.4 Secondary water supply.

Where a secondary water supply is required for an *automatic sprinkler system*, an *automatic water mist system* shall be provided with an *approved* secondary water supply.

[F] 904.11.2 Water mist system supervision and alarms.

Supervision and alarms shall be provided as required for *automatic sprinkler systems* in accordance with [Section 903.4](#).

[F] 904.11.2.1 Monitoring.

Monitoring shall be provided as required for *automatic sprinkler systems* in accordance with [Section 903.4.1](#).

[F] 904.11.2.2 Alarms.

Alarms shall be provided as required for *automatic sprinkler systems* in accordance with [Section 903.4.2](#).

[F] 904.11.2.3 Floor control valves.

Floor control valves shall be provided as required for *automatic sprinkler systems* in accordance with [Section 903.4.3](#).

Copyright © 2024 International Code Council, Inc., or its licensors (ALL RIGHTS RESERVED).

Accessed by Venkatesh Shanmugam on 11/13/2024 pursuant to License Agreement with ICC. No further reproduction or distribution authorized. Any Unauthorized reproduction or distribution is a violation of the federal copyright, and subject to civil and criminal penalties thereunder.

[F] 904.11.3 Testing and maintenance.

Automatic water mist systems shall be tested and maintained in accordance with the [International Fire Code](#).

Relocated

Relocated

[F] 904.12 Aerosol fire-extinguishing systems.

Aerosol fire-extinguishing systems shall be installed, [maintained](#), periodically inspected and [tested](#) in accordance with [NFPA 2010](#), and their listing.

Such devices and appurtenances shall be listed and installed in compliance with manufacturers' instructions.

Relocated

[F] 904.13 Commercial cooking systems.

The *automatic fire-extinguishing system* for commercial cooking systems shall be of a type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Preengineered automatic dry- and wet-chemical extinguishing systems shall be tested in accordance with [UL 300](#) and *listed* and *labeled* for the intended application. Other types of *automatic 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, NFPA 96, its listing and the manufacturer's installation instructions. *Automatic fire-extinguishing systems* of the following types shall be installed in accordance with the referenced standard indicated, as follows:

1. Carbon dioxide extinguishing systems, [NFPA 12](#).
2. *Automatic sprinkler systems*, [NFPA 13](#).
3. Automatic water mist systems, [NFPA 750](#).
4. Foam-water sprinkler system or foam-water spray systems, [NFPA 16](#).
5. Dry-chemical extinguishing systems, [NFPA 17](#).
6. Wet-chemical extinguishing systems, [NFPA 17A](#).

Exception: Factory-built commercial cooking recirculating systems that are tested in accordance with [UL 710B](#) and *listed, labeled* and installed in accordance with [Section 304.1](#) of the *International Mechanical Code*.

[F] 904.13.1 Manual system operation.

A manual actuation device shall be located at or near *a means of egress* from the cooking area not less than 10 feet (3048 mm) and not more than 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) or less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

Exception: *Automatic sprinkler systems* shall not be required to be equipped with manual actuation means.

[F] 904.13.2 System interconnection.

The actuation of the fire suppression system shall automatically shut down the fuel or electrical power supply to the cooking equipment. The fuel and electrical supply reset shall be manual.

[F] 904.13.3 Carbon dioxide systems.

Where carbon dioxide systems are used, there shall be a nozzle at the top of the ventilating duct. Additional nozzles that are symmetrically arranged to give uniform distribution shall be installed within vertical ducts exceeding 20 feet (6096 mm) and horizontal ducts exceeding 50 feet (15 240 mm). *Dampers* shall be installed at either the top or the bottom of the duct and shall be arranged to operate automatically upon activation of the fire-extinguishing system. Where the *damper* is installed at the top of the duct, the top nozzle shall be immediately below the *damper*. Automatic carbon dioxide fire-extinguishing systems shall be sufficiently sized to protect against all hazards venting through a common duct simultaneously.

[F] 904.13.3.1 Ventilation system.

Commercial-type cooking equipment protected by an automatic carbon dioxide-extinguishing system shall be arranged to shut off the ventilation system upon activation.

[F] 904.13.4 Special provisions for automatic sprinkler systems.

Automatic sprinkler systems protecting commercial-type cooking equipment shall be supplied from a separate, indicating-type control valve that is identified. Access to the control valve shall be provided.

[F] 904.13.4.1 Listed sprinklers.

Sprinklers used for the protection of fryers shall be tested in accordance with [UL 199E](#), *listed* for that application and installed in accordance with their listing.

Copyright © 2024 International Code Council, Inc., or its licensors (ALL RIGHTS RESERVED).

Accessed by Venkatesh Shanmugam on 11/13/2024 pursuant to License Agreement with ICC. No further reproduction or distribution authorized. Any Unauthorized reproduction or distribution is a violation of the federal copyright, and subject to civil and criminal penalties thereunder.

[F] 904.14 Domestic cooking facilities.

Cooktops and ranges installed in the following occupancies shall be protected in accordance with [Section 904.14.1](#):

1. In Group I-1 occupancies where domestic cooking facilities are installed in accordance with [Section 420.9](#).
2. In Group I-2 occupancies where domestic cooking facilities are installed in accordance with [Section 407.2.7](#).
3. In Group R-2 college *dormitories* where domestic cooking facilities are installed in accordance with [Section 420.11](#).

[F] 904.14.1 Protection from fire.

Cooktops and ranges shall be protected in accordance with [Section 904.14.1.1](#) or [904.14.1.2](#).

[F] 904.14.1.1 Automatic fire-extinguishing system.

The domestic recirculating or exterior vented cooking hood provided over the cooktop or range shall be equipped with an approved *automatic fire-extinguishing system* complying with the following:

1. The *automatic fire-extinguishing system* shall be of a type recognized for protection of domestic cooking equipment. Preengineered *automatic fire-extinguishing systems* shall be listed and labeled in accordance with [UL 300A](#) and installed in accordance with the manufacturer's instructions.
2. Manual actuation of the fire-extinguishing system shall be provided in accordance with [Section 904.13.1](#).
3. Interconnection of the fuel and electric power supply shall be in accordance with [Section 904.13.2](#).

[F] 904.14.1.2 Ignition prevention.

Cooktops and ranges shall include burners that have been tested and listed to prevent ignition of cooking oil with burners turned on to their maximum heat settings and allowed to operate for 30 minutes.