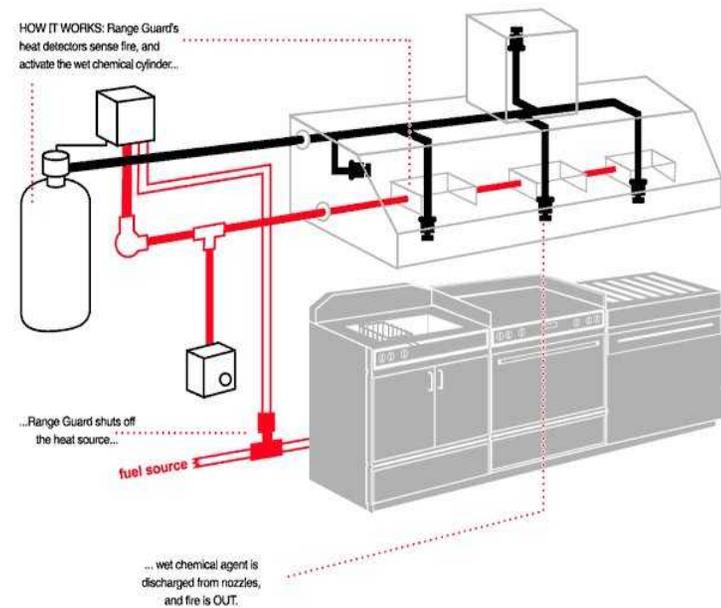
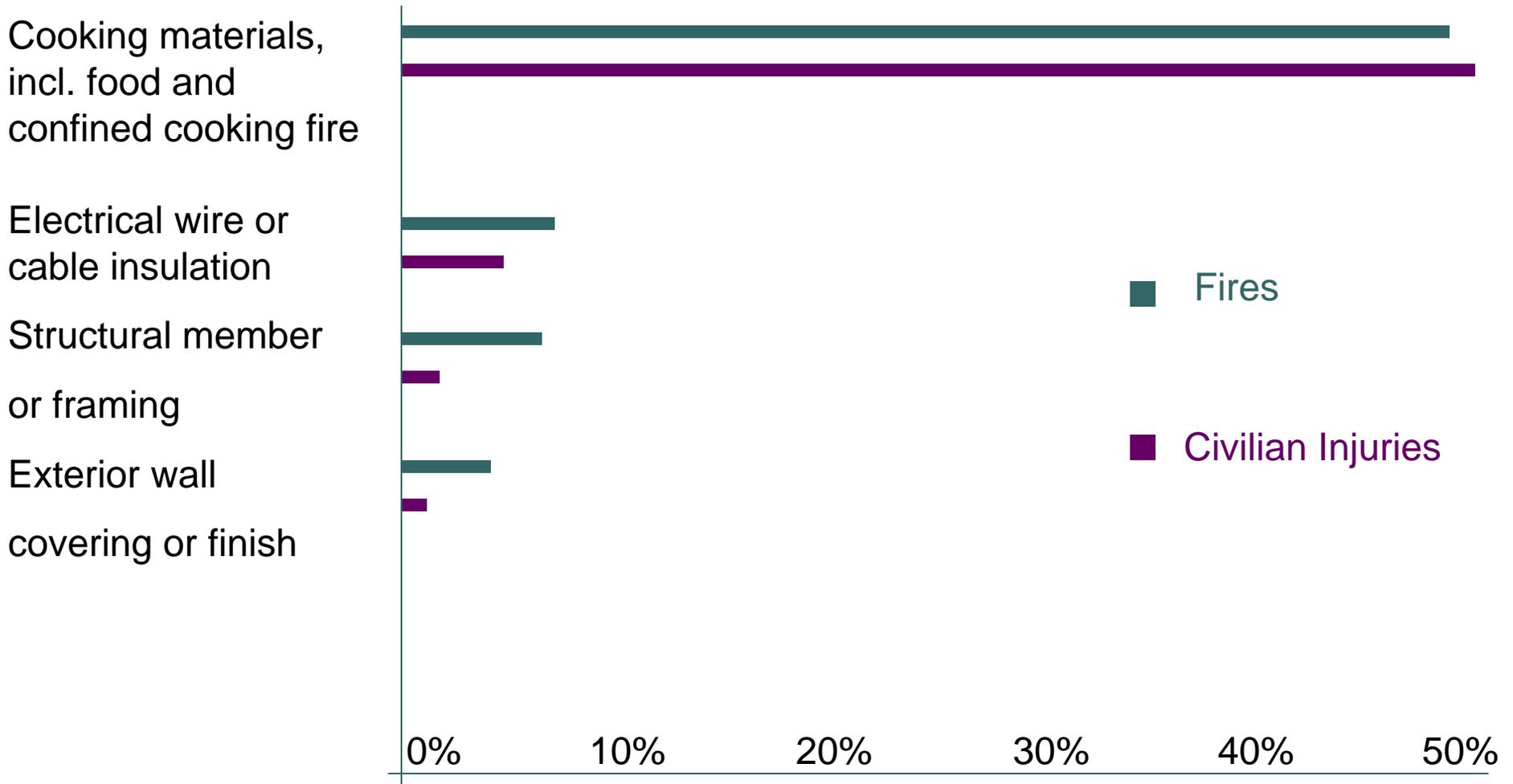


Automatic fire-extinguishing systems for commercial cooking



Leading Items First Ignited in Eating and Drinking Establishment Structure Fires, 2000-2004 Annual Averages



An average of 8,520 eating and drinking establishment structure fires were reported per year in 2000-2004.

No Fire Suppression System



Excessive Grease Buildup in Hood and Ducts



Lack of Maintenance of Fire Suppression System

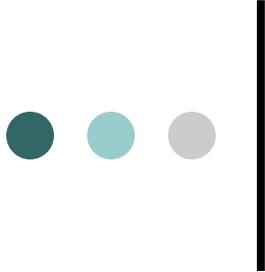




Code Flow for New Construction

2005

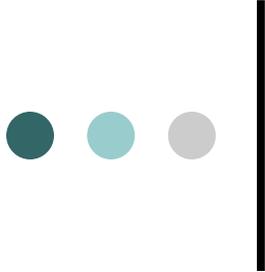
**Connecticut Fire
Safety Code
Guidebook**



2005 Connecticut Fire Safety Code Guidebook

Part III **New Construction,** Renovations & Change of Use

CHAPTER 6 BUILDING SERVICES AND SYSTEMS



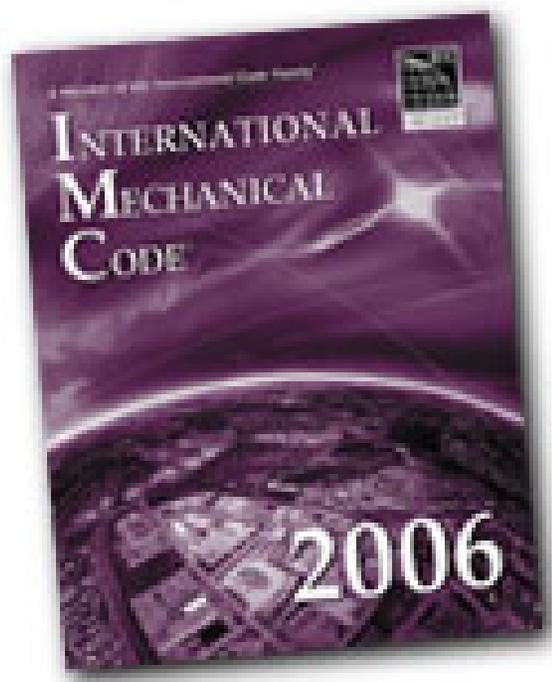
SECTION 610 COMMERCIAL KITCHEN HOODS

610.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of the *International Mechanical Code*.

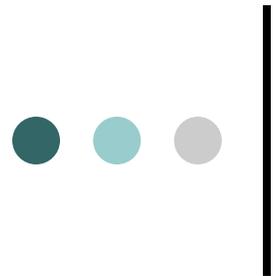
610.2 Where required. A Type I hood shall be installed at or above all commercial cooking appliances and domestic cooking appliances used for commercial purposes that produce grease vapors.



New Construction



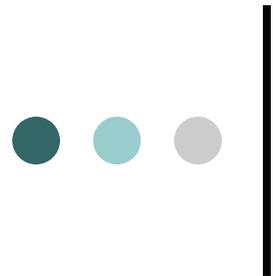
Section 509
Fire suppression systems



CHAPTER 9

FIRE PROTECTION SYSTEMS (CSFSC Part III)

904.2.1 Commercial hood and duct systems. Each required commercial kitchen exhaust hood and duct system required by Section 610 to have a Type I hood *shall be protected with an approved automatic fire-extinguishing system* installed in accordance with this code.



Automatic fire-extinguishing system for commercial cooking systems shall:

904.11

- Be of a type recognized for protection of commercial cooking
- Dry- and wet-chemical extinguishing systems shall be tested in accordance with UL 300 (CFSC Part III, 904.11)
- Other types of automatic fire-extinguishing systems shall be listed and labeled for specific use as protection for commercial cooking operations

- ● ● | 904.11 Automatic fire-extinguishing systems shall be installed in accordance:

1. Carbon dioxide extinguishing systems, NFPA 12.
2. Automatic sprinkler systems, NFPA 13.
3. Foam-water sprinkler system or foam-water spray systems, NFPA 16.
4. Dry-chemical extinguishing systems, NFPA 17.
5. Wet-chemical extinguishing systems, NFPA 17A.



UL 300

"UL 300 is a standard developed by Underwriters Laboratories, Inc. (UL) entitled 'Fire Extinguishing Systems for Protection of Restaurant Cooking Areas'

Effective date November 21,1994



UL 300

Translation:

*Old dry- chemical hood systems
won't put out fires in the new
high temperature oils.*



UL 300



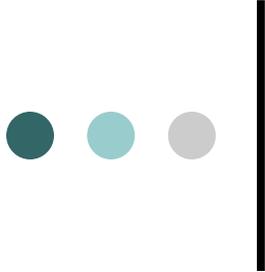
[Video](#)



Code Flow for Existing Buildings

2005

**Connecticut Fire
Safety Code
Guidebook**



2005 Connecticut Fire Safety Code Guidebook Part IV

9.2.3 Commercial Cooking Equipment.

Commercial cooking equipment shall be in accordance with NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations...*



Existing Buildings

unless such installation are approved existing installations, which shall be permitted to be continued in service.



2001 edition

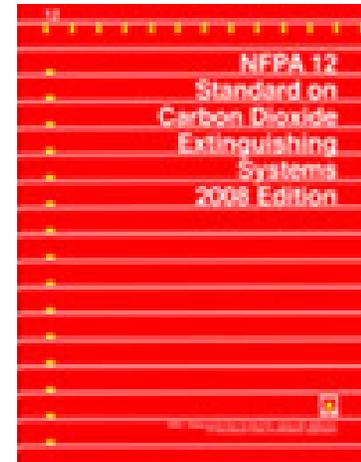


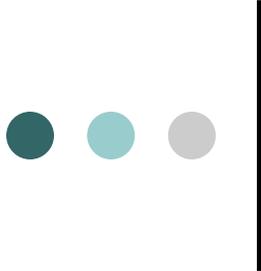
- ● ● | NFPA 96 10.2.6 Automatic fire-extinguishing systems shall be installed in accordance:

1. Carbon dioxide extinguishing systems, NFPA 12.
2. Automatic sprinkler systems, NFPA 13.
3. Dry-chemical extinguishing systems, NFPA 17.
4. Wet-chemical extinguishing systems, NFPA 17A.

Carbon dioxide extinguishing systems, NFPA 12

Protection of kitchen hoods & ducts is accomplished with a combination of total flooding & local application





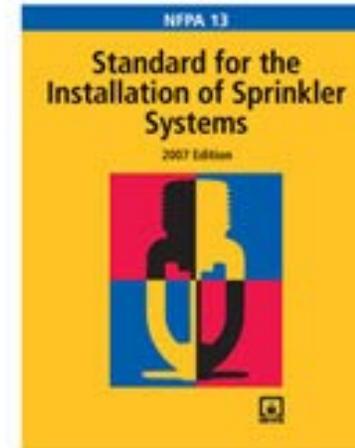
Carbon dioxide extinguishing systems, NFPA 12 2002 Edition

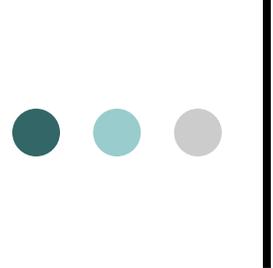
- Dampers shall be installed at top/bottom of duct
- Ventilation and shall be arranged to shut off upon system activation
- Fuel valves or power switches required to shut down
- Manual reset required

Automatic sprinkler systems, NFPA 13

7.9.2.1

Spray nozzles are required in exhaust ducts, duct collars, and plenum chambers.





Automatic sprinklers contd...

7.9.8

Cooking equipment (such as deep fat fryers, ranges, griddles and broilers) that is considered to be a source of ignition shall be protected.

- ● ● | Foam-water sprinkler system or foam-water spray systems, NFPA 16

904.7 Foam systems

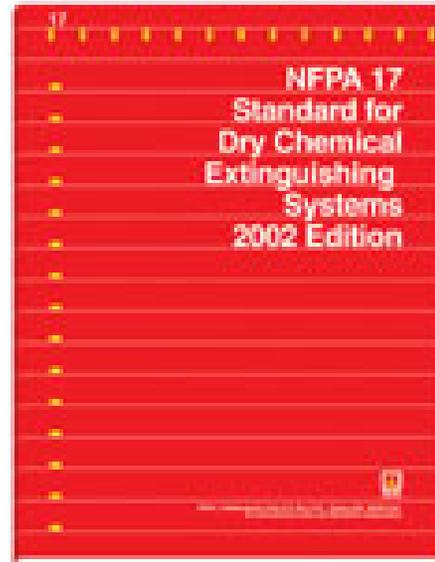
Foam-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 11, NFPA 11A and NFPA 16 and their listing.

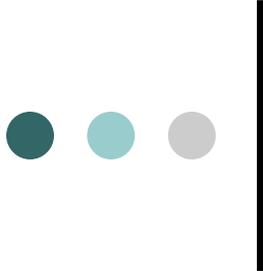


2003 Edition



Dry-chemical extinguishing systems, NFPA 17, 2002 edition





Dry-chemical extinguishing systems, NFPA 17

Part III CFSC

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.



Dry-chemical extinguishing systems, NFPA 17, 2002 edition

- Not manufactured anymore
- Most Fire Equipment Companies will not service them

● ● ● | Wet-chemical extinguishing systems, NFPA 17A, 2002 edition



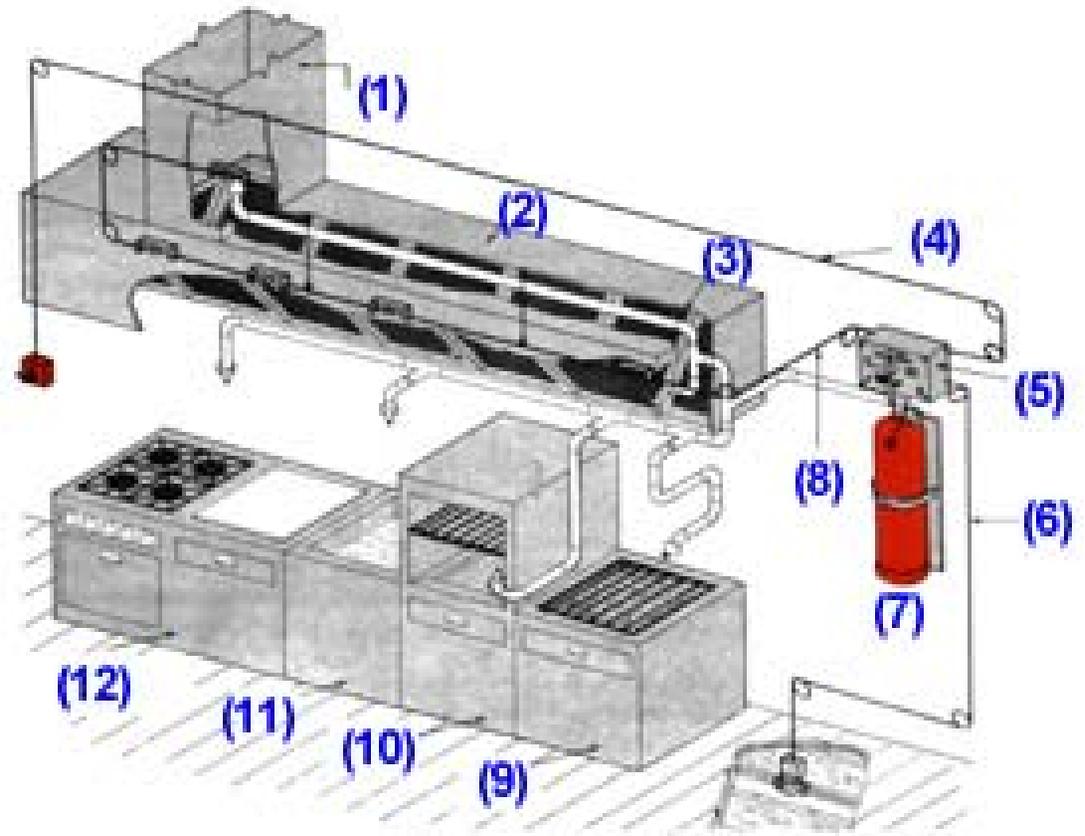


Wet-chemical extinguishing systems, NFPA 17A

Part III CFSC

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.



- (1) Duct
- (2) Plenum
- (3) Filters
- (4) To Remote Pull Station
- (5) Control Head
- (6) To Gas Shut-off Valve
- (7) Dry Chemical Cylinder
- (8) To Fusible Link Detectors
- (9) Char Broiler
- (10) Upright Broiler
- (11) Fryer
- (12) Range/Griddle Combination

Wet-chemical extinguishing systems, NFPA 17A





Wet-chemical extinguishing systems, NFPA 17A





WARNING
IN CASE OF APPLIANCE FIRE, USE
THIS EXTINGUISHER AFTER BUSED

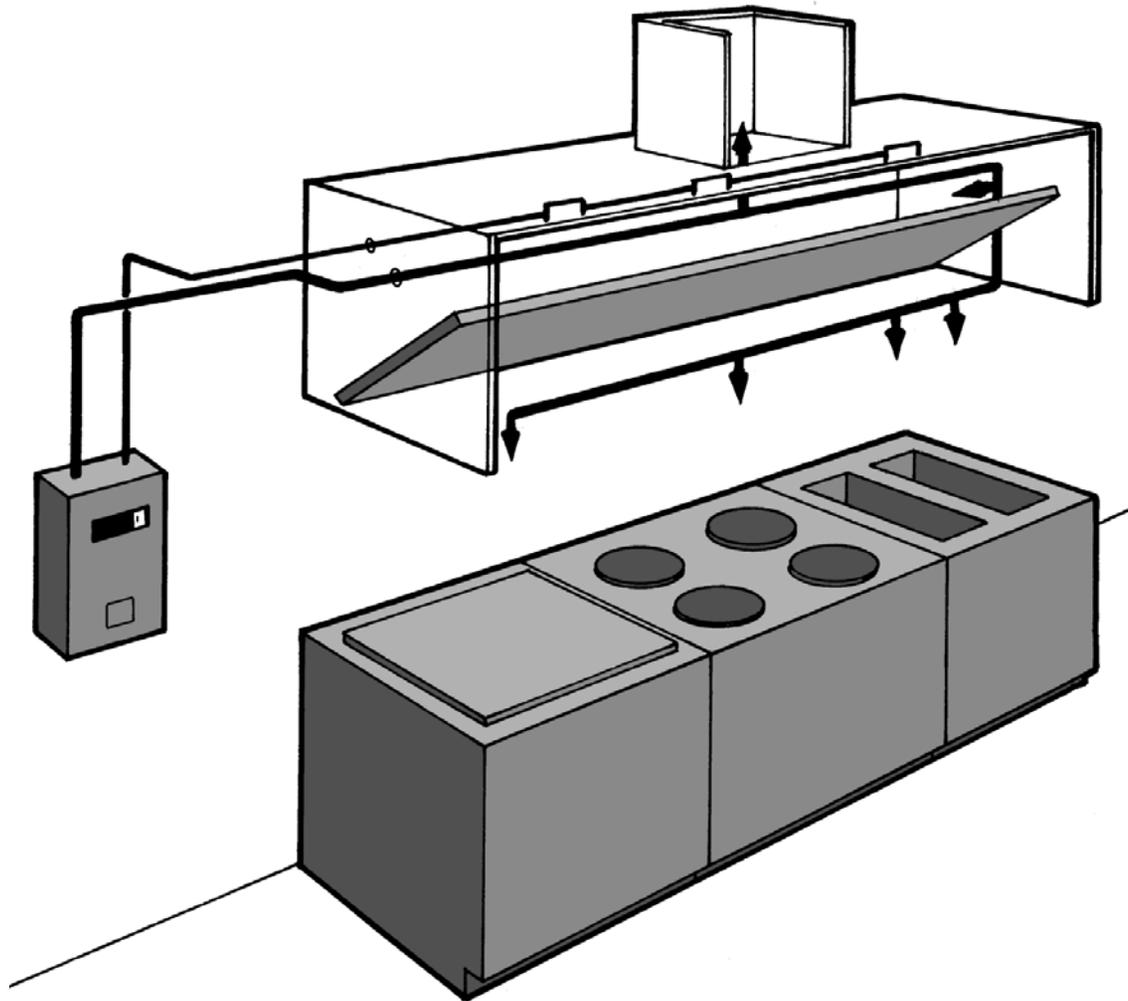
IN CASE OF
FIRE

Wet-chemical system nozzle





Nozzle placement





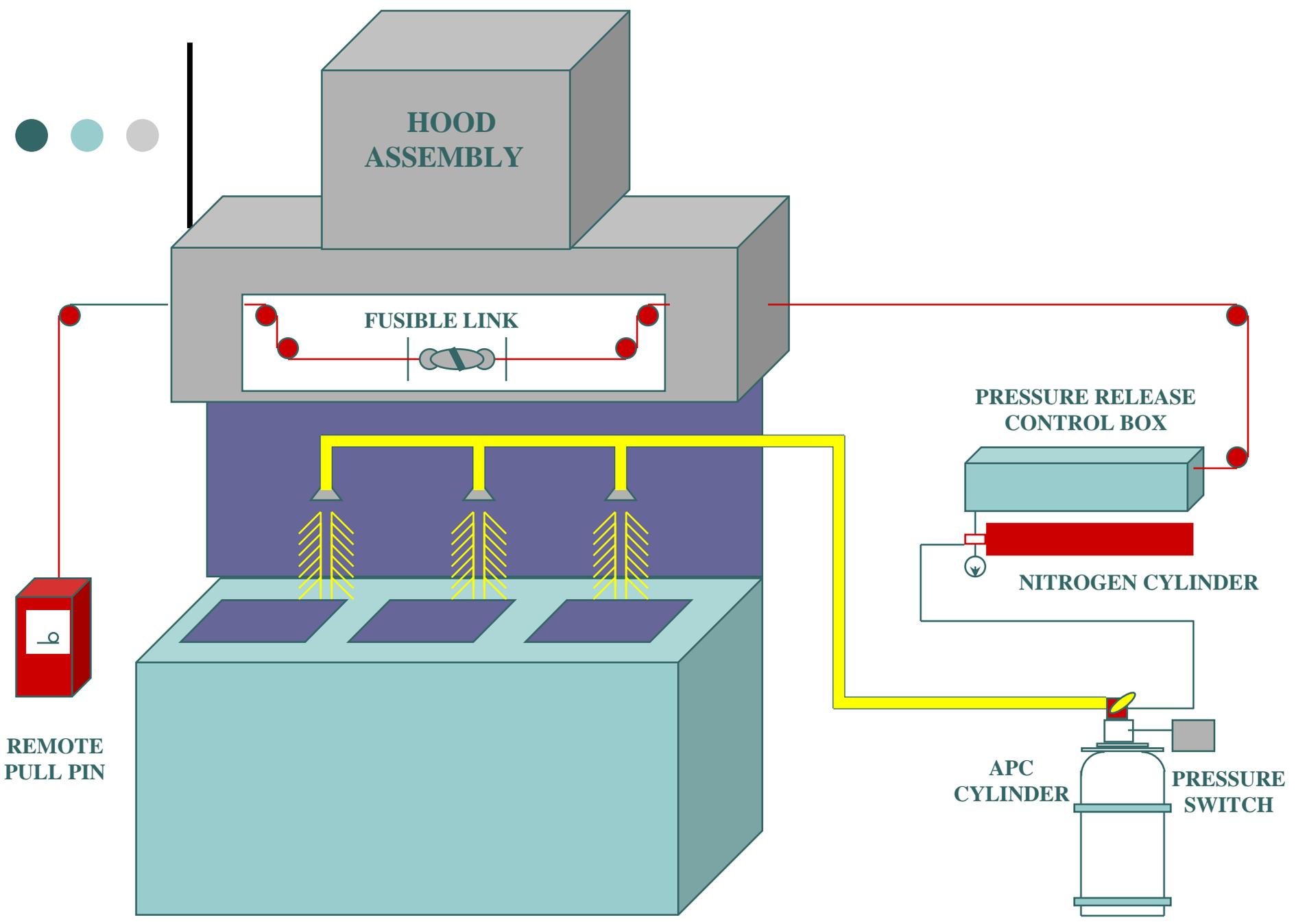
Pre-engineered Systems

- Predetermined flow rates, nozzle pressures, and quantities of extinguishing agent.
- Maximum and minimum pipe lengths
- Hazards limited
- Limitations on hazards

904.11.1 Manual system operation

- A manual actuation device is Required 10 feet to 20 feet from the kitchen exhaust system.
- A force of 40 pounds and a maximum movement of 14 inches to actuate the fire suppression system







904.11.2 System interconnection

Actuation of the fire extinguishing system shall automatically shut down the fuel or electrical power supply to the cooking equipment.



904.11.2 System interconnection continued...

Commentary:

"The actuation of any fire suppression system must automatically shut off all sources of fuel or power to all cooking equipment *located beneath the exhaust hood* and protected by the suppression system."

Ref IFC Commentary 2003 Edition



Gas Valves



MECHANICAL GAS VALVE



ELECTRICAL GAS VALVE



904.11.5 Portable fire extinguishers

Portable fire extinguishers shall be provided within a 30-foot travel distance of commercial-type cooking equipment.

904.11.5 Portable fire extinguishers

Cooking equipment involving vegetable or animal oils and fats shall be protected by a Class K rated portable extinguisher





Video



Acceptance Test

1. Review plans and confirm as-built design.
2. Confirm alarm connection if applicable and notifications are made.
3. Check to see that blow-off caps are in place.
4. Confirm that agent tank is not connected.
5. Confirm that fire is on before firing system.
6. Check test link

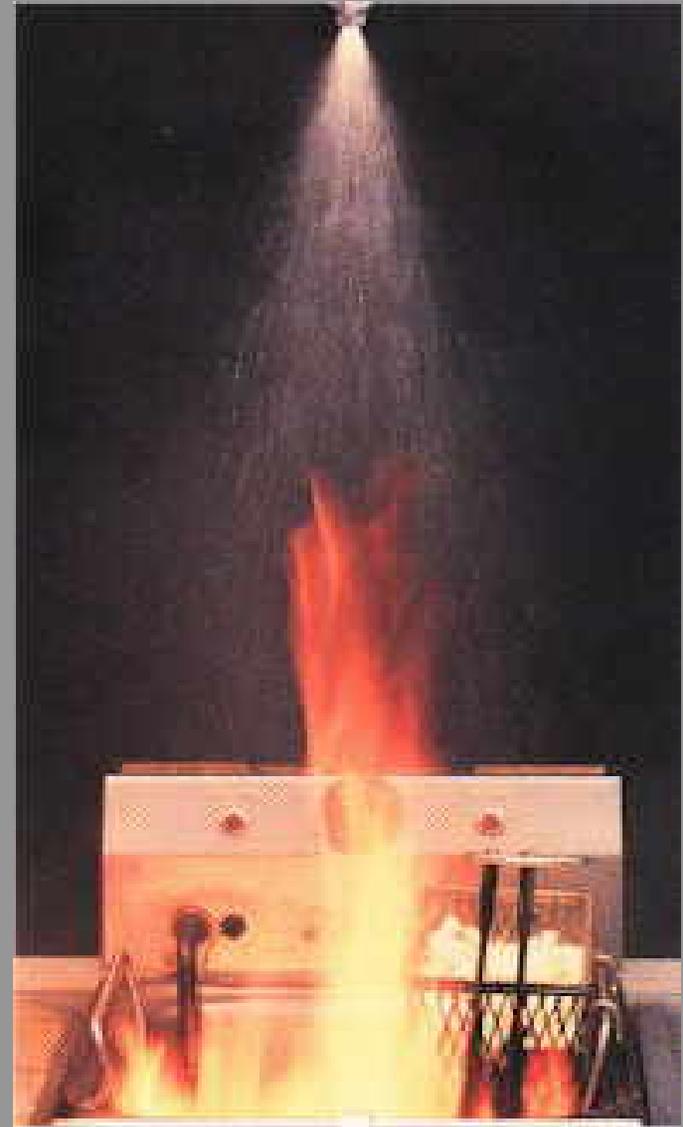


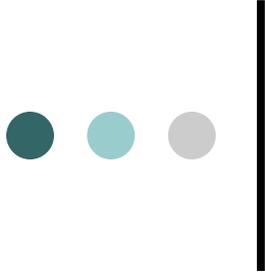
Part V, Chapter 50 Commercial Cooking Equipment

50.1.1* The operation, inspection and maintenance of commercial cooking equipment having a commercial kitchen exhaust hood as required elsewhere in this code shall comply with this chapter.



Part V, Chapter 50 Applies to new and existing buildings





50.2.3 The following equipment shall be kept in good working condition:

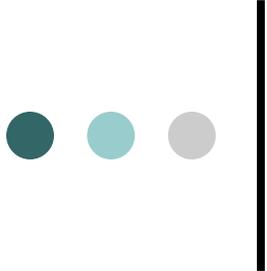
- (1) Cooking equipment
- (2) Hoods
- (3) Ducts (if applicable)
- (4) Fans
- (5) Fire-extinguishing systems
- (6) Special effluent or energy control equipment [96:4.1.3]



50.5.1 Operating Procedures

50.5.1.1 Exhaust systems shall be operated whenever cooking equipment is turned on.

50.5.1.2 Filter-equipped exhaust systems shall not be operated with filters removed. [96:11.1.2]



50.5.2 Inspection of Fire-Extinguishing Systems

50.5.2.1* An inspection and servicing shall be made at least every 6 months by properly trained and qualified persons. [96:11.2.1]

50.5.2 Inspection of Fire-Extinguishing Systems continued...

- Actuation components shall be checked for proper operation
- Fusible links shall be replaced at least annually 
- The tag shall be signed by the installer

50.5.2 Inspection of Fire-Extinguishing Systems continued...

- Inspection for grease buildup.
- Frequencies in accordance with Table 11.3





Table 50.5.3 Exhaust System Inspection Schedule

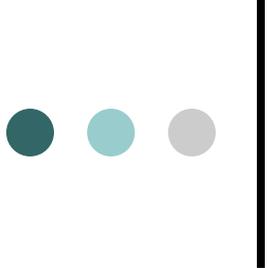
Type or Volume of Cooking	Frequency
Systems serving solid fuel cooking operations	Monthly
Systems serving high-volume cooking operations such as 24-hour cooking, charbroiling, or wok cooking	Quarter
Systems serving moderate-volume cooking operations	Semiannually
Systems serving low-volume cooking operations, such as churches, day camps, seasonal businesses, or senior centers	Annually

Source: Table 11.3 of NFPA 96



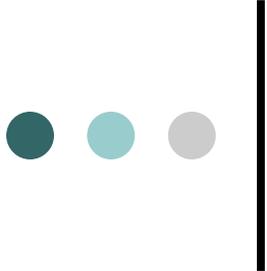
50.5.4 Cleaning of Exhaust Systems

50.5.4.1 Upon inspection, if found to be contaminated, the entire exhaust system shall be cleaned by a properly trained, qualified, and certified person(s) [96:11.4.1]



50.5.4 Cleaning of Exhaust Systems continued...

- fire system shall not be rendered inoperable during cleaning process
- cleaning chemicals shall not be applied on fusible links or other detection device
- after the exhaust system is cleaned to bare metal, it shall not be coated with powder or other substance



20-Steps for Maintenance of Kitchen Fire Systems

1. Check for visible signs that the system has been fired, tampered with or leaked.
2. Disconnect system for inspection.
3. Check cylinder condition and hydrostatic test and six-year maintenance dates on cylinder.
4. Check all piping and conduit for rigidity.
5. Check the regulator test date of the system, if applicable.



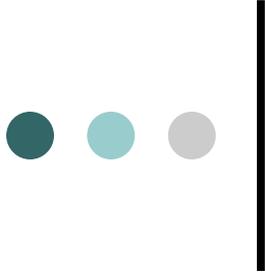
System Maintenance continued...

6. Check and verify nozzles are free of blockage and properly aimed.
7. Replace all fusible links.
8. Check detectors and control panel (if system is electrical)
9. Dry test the system for automatic operation.
10. Dry test the system with manual release at cylinder and/or remote location.



System Maintenance continued...

11. Check operation of gas shutoff and/or electrical shutoff with manual reset relay.
12. Confirm the fuel shutoff is in the "on" position.
13. Weigh or replace fire system cartridges as required.
14. Check all nozzles for proper type of caps or covers.
15. Check the chemical type and quantity.



System Maintenance continued...

16. Verify the filter type in the hood.
17. Verify the proper decals are installed at the remote pull station and on the hood.
18. Reconnect system and remove system-locking tools.
19. Complete restaurant inspection report and attach inspection tags.
20. Check for proper type of portable fire extinguisher in kitchen area (K Class) and verify portable fire extinguishers have been properly inspected.

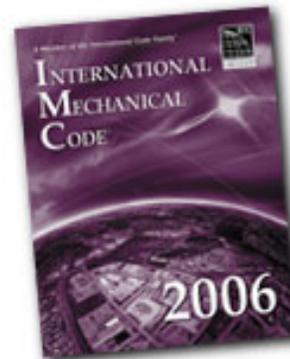
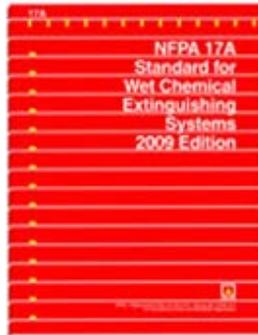
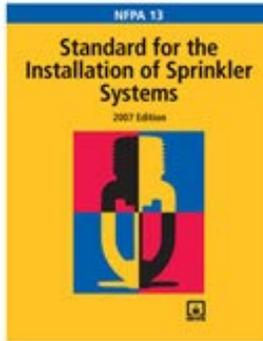


50.5.5 Maintenance

All fire protection systems for commercial cooking equipment shall be maintained in accordance with Section 13.1 and Section 13.8. of

Chapter 13 Fire Protection Systems





Questions?