



# Riverside County Fire Department

## Commercial Cooking Fire Extinguishing Systems Guideline OFM-04

### PURPOSE

This guideline has been prepared to assist those responsible for the design, installation, testing, and inspection of wet chemical fire extinguishing systems used to protect commercial cooking appliances to comply with 2021 NFPA 17A; 2020 NFPA 96; 2022 California Fire Code (CFC) Chapter 9, Section 904.5, 905.13; and the 2022 California Mechanical Code (CMC) Chapter 5. The information contained in this document is intended to promote compliance and to ensure that commercial type food heating and processing operations are adequately protected in the event of a grease fire.

### SCOPE

This guideline applies to any facility where commercial cooking operations produce grease laden vapors. Cooking appliances producing grease laden vapors shall be equipped with an exhaust system with the following components: hood, grease removal devices, duct system, and fire extinguishing equipment. This guideline defines protection for cooking surfaces, deep fat fryers, griddles, upright broilers, char-broilers, range tops and grills, open face ovens, salamanders, cheese melters, woks, open face pizza ovens, and other similar cooking appliances. Protection shall also be provided for the enclosed plenum space within the hood, above filters, and in exhaust ducts serving the hood.

### DEFINITIONS

General- The definitions contained in this Guideline shall apply to the terms used in this standard. Where terms are not defined in this Guideline, they shall be defined using their ordinarily accepted meanings within the context in which they are used.

**Approved** - Acceptable to the authority having jurisdiction.

**AHJ** - Authority Having Jurisdiction (Also See RVC-OFM)

**Branch Duct** - The duct work that contains the exhaust air from a single hood or hazard area.

**Certified** - A formally stated recognition and approval of an acceptable level of competency, acceptable to the AHJ.

**Common Duct** - The duct work containing the exhaust air from two or more branch ducts.

**Commercial Cooking Appliances** – Appliances used in a commercial food 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 include deep fat fryers, upright broilers, griddles, broilers, steam jacketed kettles, hot-top ranges, under-fired broilers, ovens, barbecues, rotisseries, and similar appliances. For the purposes of this definition, a food service establishment shall include any building, or a portion thereof used for the preparation and serving of food.

**Indicator** - A mechanical or electrical device shall be provided that shows when an extinguishing system or critical component of it is ready to operate, or if it has already operated. NFPA 17A - 5.2.1.8.

**Maintenance** - Work performed to ensure that equipment operates as directed by the manufacturer.

**Owner's Manual** - A pamphlet containing the manufacturer's recommendations for the proper inspection and operation of the extinguishing system.

**RVC-OFM** – Riverside County Fire Department, Office of the Fire Marshal (Also See AHJ).

**Trained** - One who has undergone the instructions necessary to competently, and safely design, install, and reliably perform the maintenance and recharge service in accordance with the manufacturer's listed manual.

## **SUBMITTAL REQUIREMENTS**

All plan submittals and revisions must be electronically submitted via the Riverside County PLUS portal at: . These plans shall contain the following information and items:

1. Scope of work for the project.
2. Complete address of the project, including the Assessor's Parcel Number (APN).
3. Design manual from the manufacturer of the system (1 copy)
4. Only persons properly trained shall be considered competent to design, install, and service pre-engineered wet chemical systems. Proof of proper training for the designer and installer shall be provided upon plan submittal. CMC 513.9 and NFPA 17A 7.2.
5. Applicable codes and standards used for the system design (e.g., 2022 CFC, 2022 CBC, etc.).
6. Sectional view of cooking appliances with the dimensions of each piece of cooking equipment specified.
7. Specify the size and location of the back shelf, if any. If there is a shelf, specify the manufacture's detail depicting nozzle aim and placement or reference the nozzle placement detail. Detail for each nozzle placement shall be readily available during inspection.
8. If applicable to the appliances on site, specify the following:
  - Whether or not the fryer has a drip board
  - Type of char-broiler
  - The depth and diameter of wok (not the burner opening diameter)
9. A scaled floor plan layout that includes the location of the cooking equipment, exit doors, manual pull, and other non-protected appliances indicated.
10. Fire extinguishing protection is required for open pizza ovens. If the pizza oven is closed, and no protection is provided, this must be specified on the plan.
11. Hood, plenum, and duct dimensions.
12. An elevation view of the hood, plenum, and all duct work to the exhaust point above the roof. Note: In some cases, additional protection may be required.
13. Piping schematic that includes the equivalent pipe length calculation (if applicable); the number and type of nozzles; and the location, height, and direction of nozzle placement over each piece of cooking equipment.
14. When applicable, provide calculations that demonstrate minimum and maximum volume quantities meet manufacture's specifications per the General Piping Requirements.
15. An equipment legend for each supply tank (multiple cylinders supplying the same nozzles shall be combined on legend). The legend shall include the type of nozzles that are connected to that tank, the tip number and/or identifier, the total number of flow points used, and the number of flow points allowed for that size tank.
15. Detection schematic that includes the location of each fusible link, or other type of detector for all protected equipment, the location of the manual pull, and the cable length of the detection system.
16. Identify that a durable placard shall be placed adjacent to the cooking area that depicts the cooking appliances (type, width, depth) configuration for the suppression system.
17. Where deep-fat fryers are used, specify the deep-fat fryers shall be equipped with a separate high-limit control in addition to the adjustable operating control (thermostat) to shut off fuel or energy when the fat temperature reaches 475°F at 1 in. below the surface. CMC § 515.2
18. **NEW EXHAUST SYSTEMS:** Provide a copy of the final construction plans for the complete hood exhaust system (if applicable). Sufficient drawings shall be provided that depicts the hood, plenum, duct, pollution control units if applicable, from the hood to the exhaust ejection point to the atmosphere.

19. **EXISTING EXHAUST SYSTEMS:** Provide a scaled elevation view of the exhaust system from the floor through the roof/wall to the point where the exhaust is ejected to the atmosphere. The cooking appliances and any pollution control unit or smoke/odor scrubber shall be depicted. If there are areas that cannot be surveyed due to lack of access, they shall be identified within the elevation view.
20. If ultra-violet hoods are used, they shall be specifically identified on the plans. They shall be installed, maintained, and protected in accordance with the terms of their listing and the manufacturer's instructions. CMC 508.2.1
21. Any equipment listed or otherwise, that provides secondary filtration or air pollution control and that is installed in the path of travel of exhaust products shall be identified and provided with an approved automatic fire-extinguishing system for the protection of the component sections of the equipment and shall include protection of the ductwork downstream of the equipment, whether or not the equipment is provided with a damper. If the equipment can be a source of ignition, it shall be provided with appropriate detection to operate the fire-extinguishing system. CMC 512.3.3, 512.3.4.
22. Where a cooking exhaust system employs an air pollution control device that re-circulates air into the building, the provisions of CMC 516.0 and the manufacturing instruction manual shall apply. CMC 512.3.2
23. **Recirculation Systems:** The plans shall demonstrate compliance with all requirements specified by CMC § 516.0 and all applicable subsections.
24. **Solid-Fuel Cooking:** The plans shall demonstrate compliance with all requirements specified by CMC § 517.0 and all applicable subsections.
25. **Downdraft Appliances:** The plans shall demonstrate compliance with all requirements specified by CMC § 518.0 and all applicable subsections.

*NOTE: If the chemical fire extinguishing system is not designed to fully protect the duct, then the duct will also require fire sprinklers to be installed as per 2019 NFPA 13, Section 8.9.3.*

## **PROTECTION OF COMMON EXHAUST DUCT**

1. A fusible link or other mechanically operated heat detection device from the common duct fire-extinguishing system shall be located at each branch duct-to-common duct connection where electrical operation of the common duct fire extinguishing system does not meet the requirements of NFPA 17A section 5.6.2.1.1
2. Where a fusible link or mechanically operated heat detector is located at a branch duct-to-common duct connection, an access panel shall be installed in accordance with NFPA 96, to enable servicing of the detector where the detector is not accessible from the branch duct connection to the exhaust hood. NFPA 17A section 5.6.2.1.2

## **REQUIRED NOTES**

**Provide the following notes on the plan, verbatim, under the heading "RVC-OFM" NOTES":**

1. Riverside County Fire, Office of the Fire Marshal (RVC-OFM) inspections are required for this project. Email: [RRUOFMSCHEDULING@FIRE.CA.GOV](mailto:RRUOFMSCHEDULING@FIRE.CA.GOV). Please provide at least 2-days advance notice.
2. This system is designed in accordance with ANSI/UL 300, 2021 NFPA 17A; 2020 NFPA 96, 2022 CFC, 2022 CMC, and the most recent Manufacturer's Manual.
3. 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. CFC 904.3.5.
4. The approved system shall be pre-tested prior to the RVC-OFM scheduled required acceptance test.
5. Piping shall be rigidly supported to prevent movement (shall not be able to sway for cleaning). Swivel nozzles shall be rotated to a predetermined aiming point and then tightened to hold that angle. Careful attention shall be given at the time of designing the system as nozzles cannot be moved "out of the way" once approved in the field. Any moving of the pipe or nozzles shall require an approved contractor to evaluate the pipe/nozzle layout.

6. Provide permanent floor markings or other approved devices to ensure each piece of cooking equipment can be returned to its approved location after cleaning or service.
7. Appliances with wheels shall be secured in place (wheel chocks, or other approved method).
8. Manual pull stations shall be located no higher than four (4) feet above finished floor and shall be readily accessible for use.
9. All gas fueled, electrically powered, and heat producing equipment located under the hood shall shut down upon activation of the extinguishing system.
10. All discharge nozzles shall be provided with caps, covers, or other suitable protective devices.
11. All discharge nozzles shall be located and installed in relation to the protected appliance as shown in the manufacturer's listed installation manual.
12. Hood and duct construction and installation shall be in accordance with the CMC and nationally recognized standards. These assemblies are subject to approval and inspection by the applicable Building Official and are not part of the RVC-OFM plan review process except as it relates to the installation of the hood extinguishing system.
13. Where multiple manual actuators are installed for protection of separate extinguishing systems, they shall be identified as to which extinguishing system each will activate.
14. Hood exhaust fans shall continue to operate after the extinguishing system has been activated unless fan shutdown is required by a listed component of the ventilation system or by the design of the extinguishing system.
15. The inside edge of the hood shall overhang a horizontal distance of not less than six (6) inches beyond the edge of the cooking surface on all open sides, and the vertical distance between the lip of the hood and the cooking surface shall not exceed four (4) feet unless the manufacturer's specifications state otherwise.
16. Where a cooking exhaust system employs an air pollution control device that re-circulates air into the building, the provisions of CMC 516.0 and the manufacturing instruction manual shall apply. CMC 512.3.3
17. A Class K rated extinguisher shall be provided within a maximum of 30 ft. of cooking equipment as required by CFC 906.4. Additional Class K fire extinguishers are required if more than 4 deep fat fryers are present with a grease capacity exceeding 80 pounds each. T19, Div 1 Section 573, and CFC 906.4.2
18. A placard shall be conspicuously placed near each extinguisher that states:  
"Fire Protection System Shall Be Activated Prior To Using The Fire Extinguisher."
19. Instructions for manually operating the fire-extinguishing system shall be posted conspicuously in the kitchen. CMC 514.1.3
20. Deep-fat fryers shall be equipped with a separate high-limit control in addition to the adjustable operating control (thermostat) to shut off fuel or energy when the fat temperature reaches 475°F at 1 in. below the surface. CMC § 515.2; NFPA 96 § 13.2
21. A durable placard shall be placed adjacent to the cooking area depicting the cooking appliances (type, width, depth) and configuration for the suppression system. The placard shall be affixed in a manner to prevent easy removal or tampering. CFC § 104.1.

## **TESTING & INSPECTION**

The system shall be pre-tested prior to RVC-OFM inspection to determine that the system is properly installed and functions in accordance with the approved plans, the manufacturer's installation, and maintenance manual. Testing during the RVC-OFM inspection shall include: a manual and automatic activation via fusible link and/or other detection device, a shutdown of all electrical and gas cooking equipment, verification of nozzle type and height, and orientation relative to placement of cooking appliances will also be verified during the inspection.