

7.5.2.2 The test procedure shall be in accordance with the manufacturer's detailed written hydrostatic test instructions.

7.5.2.3\* Prior to being refilled or transported, in accordance with DOT or TC requirements, containers bearing DOT or TC markings shall be retested or replaced in accordance with the appropriate DOT or TC requirements.

7.5.3 Wet chemical agent removed from the containers prior to hydrostatic testing shall be discarded.

7.5.4 To protect the hazard during hydrostatic testing, if there is no connected reserve, alternate protection acceptable to the authority having jurisdiction shall be provided.

## Annex A Explanatory Material

*Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.*

A.1.1 The wet chemical systems described in this standard are designed to discharge wet chemical from fixed nozzles and piping by means of expellant gas. The intent of the standard is to present the design considerations applicable to these systems.

The wet chemicals produced by various manufacturers usually are not identical in all characteristics, and each manufacturer designs equipment for use with a specific wet chemical. Therefore, system design principles applicable to the products of one manufacturer are not applicable to the products of another manufacturer. As a result, it is not practical to include system design details as part of this standard. However, such system design details are an integral part of the listing of the systems and are included in the manufacturer's listed installation and maintenance manual.

A.1.6.1.1 See IEEE/ASTM SI 10, *Standard for Use of the International System of Units (SI): The Modern Metric System*.

A.1.7 Although training and qualification might be available elsewhere, it is recommended that such training and qualification be performed by the manufacturer of the equipment being installed, or serviced.

It might be necessary for many of those charged with the purchasing, inspecting, testing, approving, operating, and maintaining of this equipment to consult an experienced fire protection engineer, competent in this field, in order to discharge their respective duties effectively.

A.3.2.1 **Approved.** The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 **Authority Having Jurisdiction (AHJ).** The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and

approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.2.3 **Listed.** The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A.3.3.6 **Inspection.** This is done by seeing that the system is in place, that it has not been activated or tampered with, and that there is no obvious physical damage or condition to prevent operation.

A.3.3.9.1 **Manufacturer's Listed Installation and Maintenance Manual.** It contains a description of the hazards that can be protected as well as the limitations of the wet chemical extinguishing system. This pamphlet also requires that the wet chemical extinguishing system be designed, installed, inspected, maintained, and serviced in accordance with this standard.

A.3.3.10 **Operating Devices.** Including "actuating devices" initiating operation (automatic detection devices or systems and manual actuation devices such as manual pulls or strike buttons) or "operating devices" responding to the actuation (release mechanisms, shutoff devices, alarms, and auxiliary equipment).

A.3.3.13 **Pre-Engineered Systems.** These systems have the specific pipe size, maximum and minimum pipe lengths, flexible hose specifications, number of fittings, and number and types of nozzles prescribed by a testing laboratory. The maximum and minimum pipe lengths and the number of fittings shall be permitted to be expressed in equivalent feet of pipe. The hazards protected by these systems are specifically limited as to type and size by a testing laboratory, based on actual fire tests. Limitations on hazards that are permitted to be protected by these systems and piping and nozzle configurations are contained in the manufacturer's listed installation and maintenance manual, which is part of the listing of the system.

A.3.3.21 **Wet Chemical.** The terms *liquid agent* and *wet agent* are used interchangeably with *wet chemical*.

A.4.3.1.4 Stamping part numbers into the body of the nozzle is an acceptable method of meeting the identification requirement.

A.4.5.1 Pre-engineered systems do not need calculations for flow rate, pressure drop, and nozzle pressure, since they have been tested for fire extinguishment with minimum and maximum piping limitations and minimum and maximum temperature limitations. These limitations have been verified by testing laboratories and are published in the manufacturer's listed installation and maintenance manual.

A.4.6.1 A wet chemical solution is generally, including but not limited to, potassium carbonate-based, potassium acetate-based, potassium citrate-based, or a combination thereof, and mixed with water to form an alkaline solution capable of being discharged through piping or tubing when under expellant gas pressure.

Its effect on fires in common cooking oils and fats is to combine with these materials to form a vapor suppression foam that floats on a liquid surface, such as in deep fat fryers, and effectively prevents reignition of the grease.

**Extinguishing Mechanisms.** Wet chemical solution applied to flammable liquid surfaces will result in the rapid spreading of a vapor-suppressing foam on the fuel surface. The foam extinguishes and secures the flame by forming a barrier between the liquid fuel and oxygen. This barrier excludes oxygen from the fuel surface and eliminates the release of flammable vapors from the fuel surface. The cooling effect of this solution also lowers the temperature of the flammable fuel, further decreasing fuel vapor release.

**CAUTION:** Wet chemical, when discharged, is in the form of a fine spray. Some of the agent can settle on surrounding surfaces and can have a corrosive effect on electrical components and cooking equipment. Prompt cleanup will minimize staining or corrosion.

A.5.2.1.10 Common exhaust ducts normally are located in concealed areas such that the need for manual discharge of the system may not be readily apparent. It is recommended that the number and location of remote controls, if any, be given careful consideration.

A.5.4 The phrase "wet chemical containers and expellant gas assemblies" is understood to include stored pressure assemblies.

A.5.6.2 One example of each acceptable method is presented in the figures in A.5.6.2.1(1) and A.5.6.2.1(2). These figures are not intended to be all-inclusive. For additional guidance consult the system manufacturer.

A.5.6.2.1(1) Separate cooking appliance, hood, and branch duct systems are interconnected so that they operate simultaneously.

Scenario: A fire is detected by System A. System A, protecting cooking appliances, a hood, and a branch duct, is actuated. Simultaneously, Systems B, C, D, and E are also actuated. Shutdown of all appliances is in accordance with 4.4.3. [See Figure A.5.6.2.1(1).]

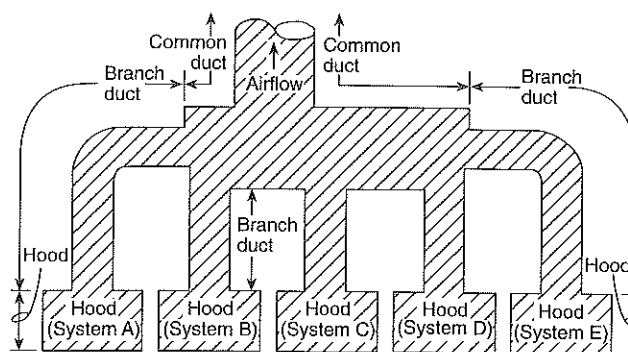


FIGURE A.5.6.2.1(1) Simultaneous Operation of All Systems.

A.5.6.2.1(2) Simultaneous operation of a single cooking appliance, hood, or branch duct system, and the system protecting the entire common exhaust duct.

Scenario No. 1: System 1 protecting the entire common exhaust duct is separate from Systems A, B, C, D, and E. A fire is detected in System A. System A and System 1 are operated simultaneously. Shutdown of all appliances protected by systems A, B, C, D, and E is in accordance with 4.4.3. [See Figure A.5.6.2.1(2)(a).]

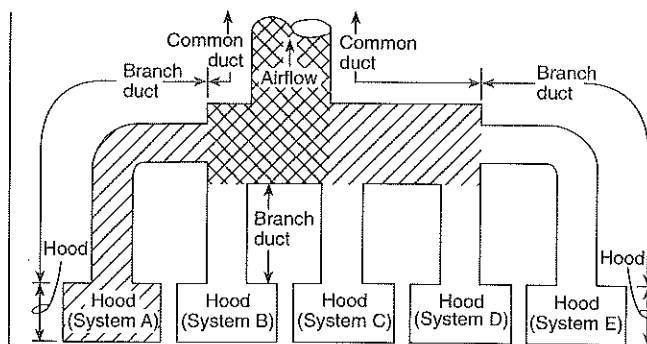


FIGURE A.5.6.2.1(2)(a) Simultaneous Operation of a Single Cooking Appliance, Hood, or Branch Duct System, and the System Protecting the Entire Common Exhaust Duct.

Scenario No. 2: System E also provides protection for the entire common exhaust duct. A fire is detected in System C. System C and System E operate simultaneously. Shutdown of all appliances protected by systems A, B, C, D, and E is in accordance with 4.4.3 [See Figure A.5.6.2.1(2)(b).]

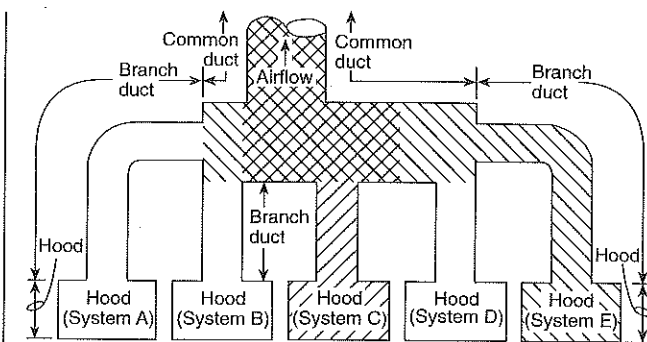


FIGURE A.5.6.2.1(2)(b) Simultaneous Operation of Two Systems in Which One Also Provides Common Duct Protection.

Scenario No. 3: System E also provides protection for the entire common exhaust duct. A fire detected in System E will result in the actuation of System E only. Shutdown of all appliances protected by systems A, B, C, D, and E is in accordance with 4.4.3. [See Figure A.5.6.2.1(2)(c).]

A.5.6.3 Examples of ignition sources include, but are not limited to, in-duct electrostatic precipitators, permanently installed lights, and in-line fans, but does not include external spark arresters, and terminal exhaust fans.