A.4.4.3.6 NFPA 10, Annex A, provides recommendations for placards. [**96:**A.10.2.2]

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 design, installation, and maintenance manual. Therefore, it is not necessary for a professional engineer or architect to seal the design of these systems.

A.4.5.4 Piping and fittings should be installed in accordance with good commercial practices. Care should be taken to avoid possible restrictions due to foreign matter, faulty fabrication, or improper installation. The following is considered a good practice:

(1) Prior to assembly, pipe should be reamed and cleaned internally by means of swabbing, using a suitable nonflammable cleaner.
(2) Once piping is assembled and prior to nozzle installation, the entire piping system should be blown out with nitrogen or dry air.
(3) The piping system should be securely supported and should not be subject to mechanical, chemical, or other damage.
(4) All piping should be installed in pipe hangers or brackets and fastened to rigid surfaces.
(5) Piping mounting brackets, hangers, and support fixtures should be installed in a manner that ensures nozzles are properly aligned and that prevents nozzles from being moved out of alignment.
(6) A union should be installed between the extinguishing agent storage container and the supply line.

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

The solution's 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, effectively preventing re-ignition of the grease.

Extinguishing Mechanisms. Wet chemical solution applied to flammable liquid surfaces results in the rapid spread 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 source 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.4.9.1 Contaminants and foreign materials can affect the extinguishing agent distribution due to a reduction in the effective nozzle orifice area.

A.5.1.2 Pre-engineered systems protect hazards posed by the duct, plenum, and cooking surfaces of appliances and are defined by the manufacturer's design, installation, and maintenance manual. Fires that start outside the protected area might not be extinguished by the pre-engineered system.

A.5.2.1.10 Mounting location is recommended to be a minimum of 10 ft (3 m) and a maximum of 20 ft (6 m) from the protected hood. [**96:**A.10.5.1.1]

A.5.2.1.10.2 Section 10.2 of NFPA 96 specifies that the automatic fire-extinguishing system is the primary protection for commercial cooking operations. It also requires that signage be provided at portable fire extinguishers stating that "the fire protection system shall be activated prior to using the fire extinguisher." The correct response to a fire, particularly one involving a deep-fat fryer that contains a large quantity of hot grease, requires that the source of heat energy, whether electric or gas, be shut down so that the grease can cool. The fire-extinguishing system does that automatically on activation. Although a portable fire extinguisher might initially knock down the fire, it does not shut down the source of heat. Unless the grease cools below its autoignition temperature, the fire is likely to resume.

A.5.2.1.10.3 Installing a guard should reduce the likelihood of an unwanted discharge of the fire-extinguishing system. [**96:**A.10.5.1.3]

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

A.5.5 All discharge nozzles should be located, installed, supported, and protected so that they are not subject to mechanical, environmental, or other conditions that could render them inoperative.

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 4.4.4. *[See Figure A.5.6.2.1(1).]*

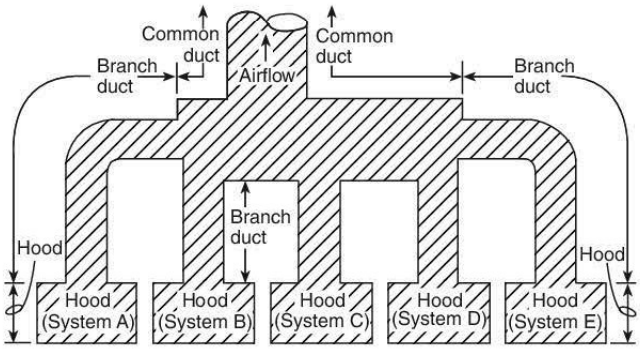

FIGURE A.5.6.2.1(1) Simultaneous Operation of All Systems.