



Coffee Break Training - Fire Protection Series

Commercial Cooking: Hood Plenum Fire Protection

No. FP-2015-22 June 2, 2015

Learning Objective: The student will be able to identify the elemental components of fire extinguishing equipment installed in a cooking hood plenum.

Take a peek behind the filters of a newly installed commercial cooking range hood and duct assembly, and this is likely what you will see: detection and extinguishing components of the fire extinguishing system. The model codes require these heavy-duty exhaust control systems and fire extinguishing in cooking systems that produce “smoke or grease-laden vapors.”

The space in the hood and duct system behind the filters is called the “plenum.” It is where all the emitted grease vapors and smoke from the cooking processes collect before being discharged through the exhaust duct. It is a highly flammable environment due to the mix of high-temperature, grease-laden vapors and air.

Note: This picture was taken of a mock hood system installed for training purposes.

On the left side of this picture, you can see a rigid metal tube (often called “conduit” or “EMT tube”). Inside the tube is a tensioned cable that connects to the fire suppression system release head. A fusible link (rated from 100 to 400 F (38 to 204 C) depending upon ambient conditions) is installed in this grease flow path to operate the system in the event of a fire in the plenum.

The suppression system distribution pipe (ranging from 1/4 to 3/4 inch (6.35 to 19.05 millimeters) depending upon system capacity) carries the extinguishing fluid from the tank to the nozzles. There generally are three nozzle types, two of which are illustrated here:



This mock-up hood system plenum space shows the typical placement of fire extinguishing system equipment.

Nozzle Type	Location/Use
Appliance (not shown)	Visible outside the filters, directed at specific cooking surfaces.
Plenum*	Installed behind the filters to suppress fires in the plenum.
Duct*	Upright-facing nozzles, installed at the base of the duct connection, to suppress fire traveling into the exhaust duct.

* Illustrated here.

The number, placement and selection of nozzles are based on the hazard being protected and will be explained in future Coffee Break Training items.

For more information, consider enrolling in the National Fire Academy (NFA) course “Fire Inspection Principles” (R0220). Information and applications can be obtained at <http://apps.usfa.fema.gov/nfacourses/catalog/details/47>. The course is available at the NFA in Emmitsburg, Maryland, or through your state fire service training agency.



Eligible for Continuing Education Units (CEUs)
at www.usfa.fema.gov/nfaonline

For archived downloads, go to:

http://www.usfa.fema.gov/training/coffee_break/