Coffee Break Training - Fire Protection Series

Building Construction: Rooftop Smoke and Heat Vents

No. FP-2014-37 September 16, 2014

Learning Objective: *The student will be able to list the fire protection concerns regarding the use of rooftop smoke and heat vents.*

Automatic rooftop vents are installed in some occupancies to allow smoke and heat to escape, thereby improving visibility for firefighters, minimizing property damage, and confining a fire to a smaller area. Vents may be passive, such as the illustrated shrink-out plastic vents, or active, meaning they operate by fusible link, remote operation or manual release on the rooftop. (See Coffee Break Training FP-2006-28 for manual vent testing procedures.)

These plastic roof vents are designed to shrink, melt and fall out of their frames to allow smoke and heat to escape.

Rooftop vents are found most often in storage occupancies and some legacy applications for buildings that have extremely large areas. Smoke and vents, however, are controversial in fire protection. For example, in buildings protected by automatic sprinklers, water discharge at the ceiling may cool the thermal plume to the level where the vents are unable to operate automatically. Conversely, if rooftop vents are installed in nonsprinklered properties, experience has shown that fire conditions are worsened by the operation of too many vents.

Vent devices that normally are in the closed position should be listed and labeled in accordance with American National Standards Institute/Underwriters Laboratories 793, *Standard for Automatically Operated Roof Vents for Smoke and Heat*; FM Global 4430, *Approval Standard for Heat and Smoke Vents*; or other approved, nationally recognized standards.

The model fire codes require some sort of venting in high-piled combustible storage applications. Designers and code officials should consider a full analysis of the value and application of vent methods. According to National Fire Protection Association (NFPA) 204, *Standard for Smoke and Heat Venting*, "designers are strongly cautioned that use of venting with automatic sprinklers is an area of ongoing research to determine its benefit and effect in conjunction with automatic suppression."

The International Fire Code specifies the size, location and distribution of vents based on the hazard class of the commodity being stored. NFPA 1, *Fire Code* refers users to NFPA 204 for design and installation guidance.

For additional information, consider enrolling in the National Fire Academy course "Hot Topics Research in Fire Protection" (R0138) at http://apps.usfa.fema.gov/nfacourses/catalog/details/10436.