DEVELOPMENTS IN FIRE-RATED FIRE PROTECTION CABINETS FOR WALLS

A combination of active and passive fire protection is integral to life safety in the building design process, where passive fire protection, such as fire and smoke-resistant walls, are utilized to impede the spread of the fire in a building. All building materials used in these fire barriers are required to meet local, state and international building code standards, which have been established with specific codes for different parts of the building.

THE PROBLEM

In the late 1980s, interior building components, such as cables, access panels, floor doors or fire protection cabinets, required the fire barrier be penetrated for installation, which meant it was necessary that the modified opening and installed materials maintained the fire-rating of the barrier. Since a fire-rated version of recessed cabinets did not exist, the installer would patch around the wall cavity using fire-rated material at hand, which was typically fire-rated (often referred to as "type x") gypsum board.

In fact, there was legitimate concern that using such a solution at the time of installation may have compromised the fire barriers. Architects from a number of firms across the U.S. requested Fire Equipment Manufacturers Association (FEMA) manufacturers to come up with a solution.

This field-improvised method of lining the opening with "type x" gypsum board, taping and spackling was labor-intensive and lacked both consistency and quality control. In fact, there was legitimate concern that using such a solution at the time of installation may have compromised the fire barriers. Architects from a number of firms across the U.S. requested Fire Equipment Manufacturers Association (FEMA) manufacturers to come up with a solution.

THE SOLUTION

Twenty-five years ago, fire equipment manufacturers developed a fire-rated and listed version of the penetrating item that would correct the shortcomings of the field-improvised method with the quality control needed to insure that the fire barrier is not compromised.

Beginning in 1991, the new fire-rated cabinets were tested under the ASTM standard E814 "through penetration of firestop systems", and were approved for use in fire barriers. The testing was done by independent testing agencies, including Intertek Testing Services (ITS) and Underwriters Laboratories independent testing agency (UL), which simulated actual conditions in a fire and evaluated the component's ability to maintain building integrity.

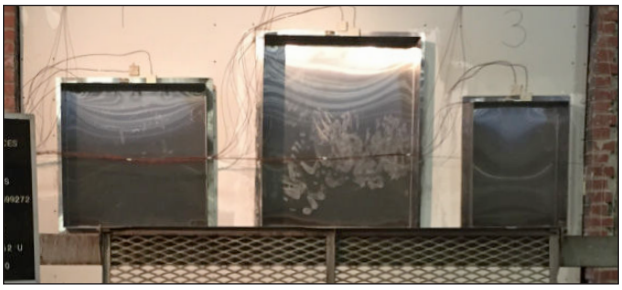
Use of these materials assures that every fire-rated assembly within a building is comprised of tested components, and eliminates the liability associated with contractor-created solutions. Architects, distributors and contractors saw the advantage of what these manufacturers were introducing and began specifying, asking for and installing the new fire-rated cabinets.

Testing and Certification

The cabinets underwent testing and certification by UL to maintain two-hour fire-rated wall barriers, in accordance with "Standard for Fire Tests of Penetration Firestops" UL-1479 (ASTM E814, ANSI 7N43, UBC 43-6). At the test facility, cabinets were installed in a fire-rated wall that was constructed like it would be in the field (See Photo B). Thermocouples were attached to measure the temperature rise on the unexposed side of the wall.

Continued on reverse side.

Photo A: Test structure set up during testing



The wall was then subjected to fire with temperatures up to 1,800°F in a test that determined if the barrier would last for the required duration of 120 minutes. The test showed whether the components maintain the fire resistive qualities of the wall. At the conclusion of the fire test, the entire assembly was removed from the oven and sprayed by a high-pressure (30 psi) fire hose, similar to what might occur during a real fire.

Photo B: Test structure for UL-1479

The basic requirements for a successful result under UL-1479 are:

1. No burn-through of the test wall
2. No temperature rise for any thermocouple on the unexposed surface of more than 325°F over ambient
3. Acceptable performance under the application of a hose stream test.

During the hose stream test, the product must remain securely fastened to the wall studs in order to pass. As seen in Photo B, the cabinets retained their integrity and remained firmly attached to the studs even after the wall disintegrated.

THE MARKET TODAY

In the current commercial construction market, fire-rated extinguisher, hose and valve cabinets meet this valuable need and make up approximately 25 percent of installed cabinets sales. FEMA cabinet manufacturers all offer choices of fire-rated cabinets for meeting the building needs of today's building owners.

About the Fire Equipment Manufacturers' Association

The Fire Equipment Manufacturers' Association is a more than 60-year-old non-profit trade association dedicated to saving lives and protecting property by providing education of a balanced fire protection design. For additional information, including videos, interactive questionnaires and training websites about fire safety and protection, visit www.femalifesafety.org or call 216-241-7333. For a complete listing of member companies, visit the Member Profiles page of the association's website at www.femalifesafety.org/membership.html.

Fire Hose, Cabinet & Valve Division Member Companies Include:

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