Firestop Products – Quick Tips

During a fire, a small hole in a wall or floor can result in smoke filling a room in a matter of minutes. According to estimates from the National Fire Protection Association (NFPA), smoke exposure outpaces burns as the cause of all fire-related deaths by a 2-1 ratio. When the focus is strictly home fires, smoke surpasses burns as the cause of death by an 8-1 margin. Firestop products were developed to prevent the spread of smoke and fire through walls or floors.

A textbook definition of firestopping is “the process of installing third-party tested and listed materials into openings in fire-rated barriers to restore hourly fire-resistance ratings.” A wall or floor may have been constructed with a fire-resistance rating but when an opening is created for conduit, cable or some other service element, the original fire-resistance rating is compromised. A properly firestopped opening restores the barrier’s ability to resist the passage of fire.

Within a facility, a comprehensive fire protection program is comprised of both active and passive components. Active fire protection measures are those that take direct physical action to reduce both fire and smoke. Active components include sprinkler systems, smoke control systems and fire extinguishers, and the detection devices that activate the systems. Firestop products fall under the umbrella of passive fire protection. These are components like fire-rated doors, walls/floors and ventilation dampers that work together to contain a fire and prevent it from spreading beyond the point of origin. Passive design and construction measures compartmentalize a building. Firestop products are used to ensure compartmentalization.

The role of compartmentalization is especially critical in healthcare facilities. Many patients are incapable of evacuating the building on their own. Because of this unique situation healthcare facilities are designed to “defend in place” and firestop products play an important role in the overall fire safety design of the buildings.

One common misconception is that firestopping simply requires the application of a specifically approved firestop sealant or caulk to close a wall or floor opening. But the firestop sealing material is just one part of a complete system that, when used together, has an Underwriter’s Laboratory (UL) and/or ASTM approval. Complete systems are made up of the fire-rated barrier itself (wall or floor), the penetrating material, (conduit for electrical applications or copper/PVC piping for plumbing), and the firestop sealing agent. There are two virtually identical standards that contain both the testing protocols and approved component assemblies for firestop systems. UL 1479, Fire Tests of Through-Penetration Firestops, and ASTM E814, Standard Test Method for Fire Tests of Penetration Firestop Systems, are the two firestopping standards that are specified in local building codes. These standards contain the approved firestop system for all building scenarios within the U.S.

In addition to UL 1479 and ASTM E814, firestopping is addressed in numerous other codes. Some of these include NFPA 101, Life Safety Code, NFPA 70, National Electrical Code, and the International Code Council's, International Building Code. When it comes to the firestopping system requirements for your building, always consult your local Authority Having Jurisdiction (AHJ) for guidance. Your AHJ could be either your local Fire Marshal or Building Code Inspector. They are the best resource for compliance questions because fire codes are locally developed and enforced.

One term that's commonly used with firestop sealant products is "intumescent." An intumescent material is one that expands when exposed to heat. As a general rule, intumescent firestop sealants are used with a penetrating material, like PVC piping, that can melt or burn when exposed to elevated temperatures and/or fire. Where used appropriately, the intumescent sealant will expand and close the opening in a fire-rated surface when the penetrating material burns away.

The following are examples of a few types of firestop products:

Penetration Sealants – are sealants that are primarily used to seal around metallic pipes, conduits, tubing and ducting that have penetrated a fire wall or another fire barrier. They can also be used for small non-metallic pipes, conduits and tubing. These sealants are made in a variety of colors.

Pillows – are intumescent and designed for firestopping medium to large openings containing various penetrating items such as pipes, conduits, cables, insulated metal pipes, bus ducts and HVAC ducts. Pillows offer easy retrofitting of cable installations without the need to damage the firestop seal.

Pass Through Devices – are self-adjusting intumescent cable pass-through devices that eliminate the need to reinstall or adjust firestop materials. These are useful when future cable penetrations through a fire wall or barrier are expected.

Sleeves – are used for cable penetrations through a fire wall or barrier. They are supplied with intumescent putty which remains soft and easy to remove for future cable penetrations.

Cast In Devices – are installed during the construction phase of a building. They are cast in fire walls and barriers where pipe and cable penetrations are expected.

Composite Sheets – are intumescent sheets that can be used to firestop blank openings and larger penetrations such a cable trays, conduit and HVAC ductwork openings in a fire wall or barrier. They can be cut to size and in irregular shapes if desired.

Pipe Collars – are used for large plastic pipe penetrations through a fire wall or barrier. They contain intumescent material that seals up the opening if the plastic pipe is destroyed in a fire.

Firestop Definitions

Annular Space – The gap between the penetrating item and the edge of the opening. A point of contact or an area where no gap exists is referred to as zero annular space.

Backing Material or Forming Material – Noncombustible material used to provide support for fire-rated sealant (i.e. foam backer rod or mineral wool).

Collar – A sheet metal restricting device normally used in conjunction with plastic pipe to direct and control the intumescent action of the firestop sealant with which it is filled.

F-Rating – The time in hours that a firestop system will prevent the passage of flames through an opening, remain in place, and not permit the projection of a water stream as determined by standard test methods ASTM E814 or UL 1479.

T-Rating – The time in minutes required for the temperature on the unexposed surface of a firestop system or any penetrating item to rise 325 degrees Fahrenheit above the ambient temperature as determined by ASTM E814 or UL 1479.

Frequently Asked Questions

Q: Are firestop sealants only red in color?

A: No, firestop sealants are available in a variety of colors. Choosing the right sealant is based on application, not color.

Q: Who can I contact to find out the correct firestop system to use?

A: Your local Fire Marshal and Building Code Inspector are the first line of resources to contact for information on the proper firestop system to use. Additional information can be obtained from firestop manufacturers and suppliers.

Sources for Information:

International Firestop Council

Specified Technologies Inc.

3M Firestop

Source: Grainger Know How – https://www.grainger.com/know-how