

PLUMBING

P E R S P E C T I V E

Firestopping Penetrations

Much more than red caulk!

Proper installation of complex firestop systems to maintain fire ratings demands understanding and precision. With firestopping being one of the most misunderstood areas in construction, is it worth putting life safety at risk by choosing toxic piping materials?

FIRE STOPPING

Every day across the globe, injuries, deaths, and property destruction result from fire-related events in structures. Interestingly enough, these fires occur even though there were fire safety precautions incorporated into the buildings—from sprinkler systems to firestopping of wall, floor, and ceilings penetrations. Just as important to consider is the fact that many of these structural losses, and the associated tragedy, are thwarted every day due to these safety precautions being installed *correctly*.

A raging building fire will use any opportunity to circulate deadly gases, toxic smoke, and flames through penetrations into areas that were supposed to be protected—even the smallest opening or seam around a plumbing pipe, conduit, or wire can become a direct passage.

Firestopping is a fire-defense system that is critical yet oftentimes not given credit for its importance in preventing loss of life by preventing products of combustion from spreading throughout a building. This is not an “active” fire-suppression system, such as a sprinkler system designed to extinguish a fire once started, but rather a “passive” firestopping system that is intended to contain a fire from spreading flame and smoke.

Just as contractors and installers consider their individual trades (plumbing, HVAC, etc.) to be held sacred, scientific, and precise, the act of installing these important life safety products should be considered to be just as important to maintaining the integrity of the structure while reducing risk to occupants and the building. In fact, firestopping crosses all trades and industries on the job site and is as important as any other trade to contributing to the overall durability and reliability of the final structure.

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THE BASICS

A firestop system consists of materials installed and intended to retain the integrity of fire-resistance-rated construction components by maintaining an effective barrier against the spread of flame, smoke, and hot gases, breaching structural members through penetrations or gaps in walls, ceilings, and floors created by other components, such as piping, conduit, cables and wires, or building seams.

Just as a trained installer can save a contractor on the job thousands of dollars in the long run, a job that is not manned by a trained installer could cost as much or more in time and money. Many times a special inspector is charged with verify-



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PENETRATIONS

ing compliance during and after the installation is complete. A savvy inspector, steeped in the intricacies of firestop materials and penetrations is a caulk-and-walk firestop installer's worst nightmare. Before grabbing a caulking gun, a tube of red caulk, some mineral wool and heading to the job site to save some money, it is important to understand that it is much more complicated. In fact, there are thousands of different types of systems and installation methods created by many different manufacturers. Typically, there are several diverse systems on the same job site, and more than a basic understanding is necessary to be a competent installer.



Firestopping materials are specialized systems and consist of materials that differ from manufacturer to manufacturer. Manufacturers such as 3M, Hilti, and STI, have diverse and differing product lines made of everything from intumescent and endothermic caulks, to solid strips of materials, variations of cement and putty-like material. These have ratings that are imperative to understand and apply accordingly to the types of penetrations and the material penetrating the walls, ceilings, roofs, and floors. The appropriate “F” and “T” ratings should be understood and chosen.

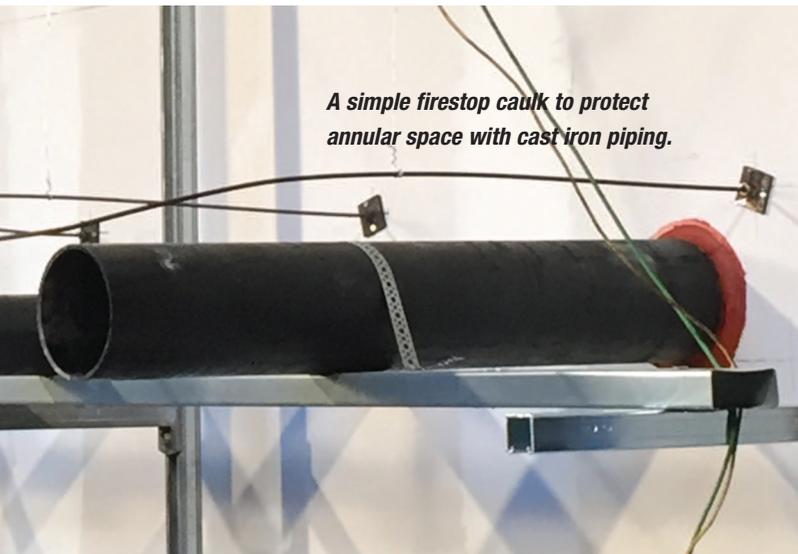
No firestopping product has an hour rating on its own. The hour rating is determined by the Listed System and must be installed in accordance with the appropriate listing for the correct application. Remember, while a tube of caulk may say it can provide up to four hours of protection, that is true only when installed as the appropriate listing states.

Safe installations will contain materials that are tested and listed to meet the industry standards created by standards developers, such as Underwriters Laboratories (UL), Factory Mutual (FM), and the American Society for Testing and Materials (ASTM). They will be installed by contractors and installers who are trained by leading industry trade associa-

tions such as the Firestop Contractors International Association (FCIA), and the end product will be inspected by agencies and inspectors that are accredited by the International Accreditation Service and International Firestop Council (IFC).

When completed correctly, the penetrations should be protected and follow the strict code provisions contained within the building, fire, electrical, plumbing, and mechanical codes authored by the International Code Council (ICC), the National Fire Protection Association (NFPA) and the International Association of Plumbing and Mechanical Officials (IAPMO).

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A simple firestop caulk to protect annular space with cast iron piping.



A firestop device collar as part of a complex firestop system that is required for protection of polyvinyl chloride piping.

IF IT IS AN AFTERTHOUGHT, IT'S TOO LATE

Does it matter which type of building material is penetrating the wall when choosing the firestop system? Of course it does. One firestop material does not fit all applications. A polyvinyl chloride (PVC) or acrylonitrile-butadiene-styrene (ABS) drain, waste, or vent (DWV) piping system needs much more intricate and expensive protection than a cast iron pipe penetrating the same wall, due to the fact that they are combustible materials. A contractor or designer should evaluate the true installed cost to protect each of these different penetrations at the beginning of the project and not treat this as an afterthought. In fact, using the plastic and cast iron example, a contractor may evaluate and find it less expensive on the material cost to use a plastic DWV piping system rather than cast iron piping system, only to discover that it would have been less expensive to have chosen the cast iron plumbing system due to the added expense

of the complex firestopping systems required for plastic pipe penetrations.

Firestopping is one of the most misunderstood areas in construction. For example, an installation can be the correct firestop, but the wrong application. It's important to know the proper system for each application as there are intricacies requiring knowledge and skill in their installation and inspection. Do not make firestop an afterthought. It is not just a tube of red caulk and some rock wool.

If you are not trained, licensed, certified, or experienced in the intricacies of inspecting or installing complex firestop systems in a structure, it is simple: Either get trained or just don't take on the risk! More than just saving money, a properly planned, installed, and inspected firestop system saves lives.

MORE QUESTIONS THAN ANSWERS?

If you can't answer these questions, then you either need more training or additional help from a certified firestop company.

- Is the Installing contractor licensed?
- Is the contractor's installer trained and certified?
- Is the right combination of systems installed? In the correct locations?
- Is it certified or listed for the application and type of penetration?
- Has the system been inspected per the building code?
- Is the inspector certified to inspect the intricate systems and identify the proper certifications? Has a log been made of every firestop penetration system?
- Is there a maintenance inspection plan in place?