

Firestops and Fire Caulking



Typical fire caulk material sealing the openings around the systems.



Unprotected or improperly protected wall penetrations have been a major concern for approximately 40 years. In 1996, an electrical fire occurred at 30 Rockefeller Plaza in New York City. The arriving firefighters discovered several fires had broken out in five remote locations throughout the building and that many different areas had filled with smoke. This occurred because there were open holes in the walls.

Many fires like this have emphasized the need for firestopping the penetrations made by electrical and mechanical systems.

Studies have shown:

- According to the National Fire Protection Association (NFPA), most fire deaths are the result of smoke inhalation and not actual burns.
- NFPA states that smoke travels 120-420 feet per minute under fire conditions.
- NFPA also states that approximately 57% of fire-related deaths happen in rooms away from the actual fire's origin.

As a result, construction requirements state that any penetrations through walls must be properly protected.

What is firestopping?

Firestopping, just one component of a fire protection system, is the process of using a combination of fire-rated building materials to prevent the spread of flames, smoke, or gases through penetrations, gaps, and joints in fire-rated floors, walls, and ceilings.

There are more than 8,000 tested systems. The type of system needed is determined by the location, substrate, and application (construction joint, plastic pipe, cable tray, grease duct, etc.). The U.L. Fire Resistive Directory is designed to list tested systems. The American Society of Testing Materials (ASTM) rates the firestopping materials. The ASTM is the recognized industry standard that evaluates firestop systems in fire-rated floor, wall, or floor/ceiling assemblies.

Why is ASTM important?

The ASTM test establishes ratings listed as “F,” “T,” and “L.” The purpose of the rating is to return the floor, wall, or floor/ceiling assembly to the original fire-rating design.

1. The “F” rating is FLAME expressed in hours. This number indicates the specific length of time a barrier can withstand fire before being consumed or before permitting the flame through an opening.
2. The “T” rating is TEMPERATURE expressed in hours. It indicates the length of time the temperature on the side of the penetration without fire doesn't exceed 325 degrees Fahrenheit above the ambient or air temperature. This ensures the temperature on the side of the wall away from the flame doesn't reach the flash point of any materials on that side of the wall.
3. The “L” rating is SMOKE or the amount of air (smoke) that can leak through a penetration, measured in cubic feet per minute. The test is administered at ambient temperature and at 400 degrees Fahrenheit to determine the actual performance of firestopping materials at different temperatures.

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Is spray-on fireproofing, joint compound, or mortar an adequate firestop in construction joints?

NO! All material used in firestopping joints, such as top or head of wall, perimeter/curtain-wall gap, control joints, etc., must pass a cyclical test (500-cycles - UL 2079) and then pass the fire and hose stream test in a fully-extended situation.

Is firestopping expensive?

Careful planning is the key to managing the cost. If the firestop systems are installed incorrectly or aren't installed at all, the installation cost can be expensive. A last-minute rush is usually what makes firestopping truly expensive.

Proper planning during the design phase and before the start of construction, however, can reduce the costs considerably.

Proper firestopping can reduce smoke damage, help control the fire spread, and, ultimately, spare property and save lives.

If you need additional fire prevention-related information, please contact your West Bend Mutual Insurance loss control representative. Many more loss control resources are also available at www.thesilverlining.com.