



Firestop Contractors International Association

To: General Public

From: Firestop Contractors International Association (FCIA)

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Re: Compatibility of Firestop Products and Surfaces Contacted – Metallics to Plastics

FCIA Standard Answers Series – Compatibility of Firestop Products and Surfaces Contacted – Metallics to Plastics

Executive Summary:

The International Building Code states the minimum required to install firestopping in the following passage:

714.2 Installation. A listed *penetration firestop* system shall be installed in accordance with the manufacturer’s installation instructions and the listing criteria.

Section 715.2 states the same requirements as well.

Code requirements, manufacturers’ installation instructions, AND the listings (*e.g.*, UL, ULC, Intertek, FM Tested and Listed Systems), also known as systems, are needed to install firestopping.

However, when it comes to actual field installations, it seems manufacturers’ installation instructions and listings might not have enough information to install firestopping in accordance with the building code requirements. Product compatibility is not a subject of listings and should be found on manufacturers’ installation instructions. However, that is not always the case.

Statements:

FCIA has learned of situations where contractors have had to discover in the field, after inspection agencies or others questioned an installation, that there is an issue with compatibility between certain firestop products and the surfaces with which they come in contact in construction. The firestop product (sealant or other products) is incompatible with either the surface, the treatment of the surface, or the penetrating item, coverings, or assembly.

For example, issues were discovered with firestop product compatibility with penetrating items long after the manufacturer introduced firestop products to the marketplace:

- **Solvent Based Firestop Sealant Products** were found to cause issues with some plastic penetrating items. The firestop manufacturers then required separation of the sealant and certain types of plastic piping.

Manufacturers discontinued selling solvent-based firestop sealant products in the mid to late 1990's, moving towards latex-based sealants.

- **The Copper Development Association published a bulletin** stating that latex sealants might have an adverse effect on copper penetrating items. Manufacturers of firestop products responded with compatibility statements for these products, stating that sealants were allowed to be used in contact with copper penetrating items in firestop systems.
- **The CPVC plastic pipe producers** have stated there might be compatibility problems with some firestop products that contact these penetrating items, potentially causing piping deterioration. Firestop manufacturers have responded with guidelines for installation of firestop sealants that contact CPVC piping, and the piping industry has also published guidelines about compatibility.
- It has recently been stated by firestop material manufacturers that some sealants used with **Black Ductile Iron Piping** may have compatibility issues with the black asphaltic coating used for exterior pipe corrosion protection. Also, note that asphaltic coatings are not the only method to protect ductile iron piping. E-coatings and epoxies might also be used. It is not clear if sealants may have compatibility issues with these coatings. Fire-resistance does need to be confirmed in all cases where some surfacing is applied to the penetrating item.

After reviewing several manufacturer installation instructions, product data sheets, safety data sheets, and sell sheets, FCIA found that direct statements regarding the compatibility or incompatibility of firestop products with the many surfaces they can be expected to touch are not consistently included. Additionally, there seems to be no direct statements about 'how clean is clean' for surface preparation prior to firestop product installation. That's one of the reasons FCIA was a proponent of including the manufacturer's instructions and listings in Sections 714.2 and 715.2 of the International Building Code, starting in 2017.

FCIA's Code Committee's proposal(s) to the International Building Code (IBC) in 2016/2017 through 2021 made it clear that firestop products are installed in accordance with the listing (tested and listed system) and the manufacturers' installation instructions.

This passage in the building code is important, as it sets up the need for manufacturers to clearly communicate in the installation instructions the intricate details required for the installation to reflect what was tested in the laboratory.

The 'manufacturers' installation instructions' include the following:

- Product data sheets
- Safety data sheets
- Installation instructions
- Sell sheets
- Manufacturers' other technical literature

After reviewing the major firestop manufacturers' installation instructions, FCIA found that these documents seem to be vague with respect to surface preparation instructions, compatibility or incompatibility with the surfaces the products touched, and the exposures to which the products should NOT be subjected. This lack of information can be misleading to Specialty Firestop Installation Contractors.

Most firestop product manufacturers have written installation instructions that:

- Seem to show 'simple, easy' installation.

- Show pictures, but may not reflect the complexity of the installation, a detail that should be included in the installation instructions.
- Do NOT state how clean the surfaces to which firestop products are applied must be prior to application and after 'brushing'.
- Show a brush cleaning surfaces, while not defining the type of brush.
- State that the penetrating item "Shall be free of oil, loose dirt, rust or scale", but do not indicate answers to the following questions:
 - Does that mean that some dirt is ok? How much dirt is allowed?
 - Is it oil that must be removed? What cleaning agent is allowable?
- Seem to be silent regarding coatings on the penetrating item(s).
- Have installation instruction pictures from manufacturers that seem to depict a penetrating item with a 'spiral wrap', but do not include details on the allowable type of wrap material, asphaltic spiral wrap, cloth, polyethylene, or other wraps.
- Do NOT seem to have a compatibility chart of firestop product to assembly and/or penetrating item surfaces.
- Do NOT show that the firestop product must come in contact ONLY with a bare pipe surface.
 - If firestop products are compatible with bare pipe only, does this mean firestop products cannot be used against insulation?
- One manufacturer's installation instructions state to visit a third-party published guide for further information, ASTM E3157, *Standard Guide for Understanding and Using Information Related to Installation of Firestop Systems*. There is no mention in ASTM E3157 of a bare pipe being the only acceptable surface to install firestopping, nor is there any mention of any coating incompatibility.

In FCIA's opinion, manufacturers of firestop products are responsible for providing specific installation instructions for their products, not an ASTM Guide. ASTM Guides should be for expanding on product testing standards. Manufacturer-specific installation instructions respect the unique chemistries for each manufacturer's formulations.

Further, firestop product manufacturers' installation instructions do not seem to address whether the firestop product is compatible or incompatible with all surfaces that the product can reasonably be foreseen to come in contact with in buildings where the product is used.

For instance, most ductile iron pipe is supplied with an asphaltic or other type of coating, as has been the standard practice for decades. As of October 2022:

- There is no specific warning or statement in product data sheets from the firestop product manufacturers to instruct contractors to remove asphaltic or other coatings of any type from the ductile iron pipe and to only apply firestop products to bare piping.
- Firestop product manufacturers' instructions mention oils that impede adhesion, but they do not mention any adhesion issues related to coatings.

According to some manufacturers' firestop Safety Data Sheets (SDS), the following is stated regarding latex intumescent firestop sealant:

- It is only incompatible with strong oxidizers, which are not defined in the SDS or other installation instructions.
- The product does not have hazardous polymerization or reaction. This leads the user to think there are no compatibility issues.
- The product compatibility statement is that "No additional information is available." This follows the reactivity section, where the product is called "Stable".
- Contractors are to avoid incompatible chemicals, but the SDS does not define these incompatible chemicals.

Some manufacturers' SDS' states that the sealant "will adhere to all common construction and penetrant materials and contains no solvents that might adversely affect plastic pipes or cable jackets." It is important to note that ductile iron pipe with asphaltic coating is a common construction and penetrant material.

One firestop product manufacturer states,

"This product has been designed to be safe with plastics. It has been used extensively and successfully with various types of plastic pipes, tubes, and plastic cable insulations. Variations in these materials, however, make it impossible to guarantee compatibility. XXX Manufacturer strongly recommends that the user consults with the pipe, tubing, or cable manufacturer in question regarding any known sensitivities or potential restrictions before applying this product."

In this section, it only discusses plastic pipe and not metallic penetrating items, then it puts the responsibility on the piping manufacturer to determine compatibility of the plastic pipe with the firestop product. There is no mention of metallic penetrating item compatibility issues in the data sheets.

FCIA believes it is not the firestop contractor's role to verify all product compatibility. FCIA believes that it is the manufacturer's role to review and verify compatibility during an ongoing product development due diligence and to communicate it clearly to the user.

Another firestop product manufacturer states,

"The surface of the opening and any penetrating items should be cleaned to allow for the proper adhesion of the XXX Firestop Manufacturer's Sealant. Ensure that the surface of the substrates are not wet and are frost free. Sealant can be installed with a standard caulking gun, pneumatic pumping equipment or it can be easily applied with a putty knife or trowel."

Again, there is no mention of the product not being compatible with certain coatings, such as asphaltic or epoxy coatings on ductile iron piping. Nor is there a statement that the pipe must be 'bare'. There is no statement as to what method, chemicals, or solvents are needed to clean pipe surfaces before installing firestop products. And, the installation instructions, product data sheets, and sell sheets are not specific about cleanliness of the surfaces to which the sealant is to adhere after installation.

Ductile iron pipe coatings are mentioned at the Ductile Iron Pipe Institute and Wikipedia, along with the external coatings:

"Ductile Iron Pipe, which is manufactured with an asphaltic shop coating, needs no external corrosion protection in the majority of installations. There are, however, highly aggressive soil conditions where the use of external protection is warranted. In these cases, DIPRA normally recommends encasing the pipe with V-Bio® Enhanced Polyethylene Encasement."

Note that the polyethylene encasement is in addition to the asphaltic shop-applied coating.

"Protective internal linings and external coatings are often applied to ductile iron pipes to inhibit corrosion: the standard internal lining is [cement mortar](#) and standard external coatings include bonded zinc, [asphalt](#) or [water-based paint](#)."

The SDS' of the Asphaltic Coatings used on ductile iron pipe also state that there is no chemical reactivity to the cured product, and the product is chemically stable. The only compatibility issue outlined is that hot asphalt is not to come in contact with water. This is not for compatibility, but for safety reasons. This would lead the firestop installation

contractor to believe there is no compatibility issue, in the absence of publicly available compatibility statements from firestop product manufacturers.

Conclusions:

FCIA believes that Firestop Product Manufacturers need to provide clear guidance in manufacturers' product installation instructions. Clear guidance should be in manufacturers product data sheets, sell sheets, and/or listings about the detail needed for surface preparation and compatibility of firestop products commonly used on jobsites with surfaces commonly found on such jobsites to which firestop products come in contact. This includes Ductile Iron Pipe Coatings.

Below are a few, but not all, issues manufacturers should cover in their installation instructions:

- Compatibility with surfaces to which the products will come in contact.
- Compatibility with other products, including but not limited to hydraulic fluids, cleaning chemicals, etc., that the firestop products may be exposed to in buildings.

Based on their own company philosophies, some FCIA Member Firestop Installation Contractors request the following from manufacturers prior to application of their products:

- Verify requirements for surface cleanliness, compatibility of firestop products with surfaces, and compatibility with other product exposures with which the firestop product may come in contact during the life of the building.
- Written description of what 'clean, dry, frost free, free of loose dirt' means, how clean the penetrating items must be, and what the penetrating items can be cleaned with (i.e., chemicals or water), including how the manufacturer cleaned the surfaces in preparation for the fire test.

Some manufacturers have recommended 'fixes' for surface compatibility and fire-resistance through Engineering Judgements (EJ's) or Equivalent Fire-Resistance-Rated Assemblies (EFRRRA), as they have recently determined that the coatings are not part of the listings. Each manufacturer's EJ/EFRRRA might be somewhat different than the others because it is that manufacturer's opinion regarding how the particular product will uniquely react to various exposures and fire-performance.

Firestop system manufacturers should provide compatibility statements regarding the products used to protect breaches in fire-resistance-rated assemblies and the penetrating item(s), in addition to assurance that the expected fire-resistance performance remains the same, even with coatings applied to the penetrating items.

FCIA recommends using this information as a tool. Members should consider how best to protect their interests regarding firestop system compatibility and other issues on their own volition.

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For more information, contact Info@FCIA.org