

CONSTRUCTION STANDARD SPECIFICATION

SECTION 07270

FIRESTOP AND SMOKESTOP SYSTEMS

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- C. Factory Mutual Approved Guide (FM)
- D. Underwriter's Laboratories, Inc. (UL)
1479 Fire Tests of Through-Penetration Firestops
- E. Uniform Building Code (UBC)
Standard No. 7-1 Fire Tests of Building Construction and Materials

1.03 DEFINITIONS

- A. Fire Rated: Having the ability to withstand the effects of fire for a specified time period, as determined by approved qualified testing.
- B. Fire Rated Assembly: A composite able to withstand a design fire and hose stream test without failure.
- C. Fire Resistance Rating: The time, in hours, for which the rated assembly can withstand the effects of fire without burn-through or structural failure.
- D. Firestop: A means of sealing openings in fire barriers to preserve or restore the fire resistance rating.
- E. Firestop System: The combination of materials and/or devices, including the penetrating items, required to make up a complete firestop.
- F. Fire Barriers: Any wall, floor, ceiling, or roof which is indicated as having a fire-resistance rating.
- G. Penetrating Item: A pipe duct, conduit, cable tray, cable, or other element passing through an opening in a fire rated assembly.
- H. "F" Rating: Given in hours, it is the fire endurance rating of the Firestop System. In the standard fire test, no opening developed which might have permitted the passage of fire, nothing ignited on the unexposed surface, and no water passed through during the hose stream test. This rating is closely related to the fire endurance rating of the basic wall or floor assembly.
- I. "T" Rating: Given in hours and fractions, is the length of time required for any temperature on the unexposed side to increase by more than 325 degrees F (163 degrees C) over its initial value. The first point to rise by 325 degrees F (163 degrees C) is almost always on the penetrating item.
- J. Smoke Barrier: Any wall, floor, ceiling, or roof which is indicated as being designed to prevent passage of smoke and gases; may be indicated as "Smoke Barrier," "Smoke Partition," or "Smoke Wall."

1.04 SYSTEM DESCRIPTION

- A. General: Provide firestopping and smokestopping systems that are produced and installed to resist the spread of fire and smoke, according to requirements indicated, and the passage of other gases.
- B. F-Rated and T-Rated Through-Penetration Firestop and Smoketop Systems: Provide through-penetration firestop and smokestop systems with F & T ratings indicated, as determined per ASTM E814, but not less than that equaling the fire-resistance rating of the assembly penetrated.

1.05 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and, Section 01300, "Descriptive Submittals."
- B. Product Data: Submit complete product or manufacturer's specifications and installation instructions for each product.
- C. Maintenance Data: Submit detailed instructions for repair and for modification due to changes in penetrating items.
- D. Asbestos-Free and Lead-Free Paint Certification: Submit manufacturer's written certification that all materials are free of asbestos and lead paint.
- E. Material Safety Data Sheet (MSDS): Submit MSDS for firestop and smokestop system products.

1.06 QUALITY ASSURANCE

- A. Testing and Inspecting Requirements: Testing and inspecting shall have been conducted by one of the following testing and inspecting agencies listed below:

Factory Mutual System "Approval Guide."
Underwriters Laboratories Inc. "Fire Resistance Directory."
Warnock Hersey "Certification Listing."

Test Methods: UBC Standard No. 7-1; Test conducted in accordance with ASTM E814 will be acceptable.

- B. Installer Qualifications: Engage an experienced installer who has completed firestop and smokestop system applications similar in materials, design and extent to that indicated for project that have resulted in construction with a record of successful in-service performance.
- C. Single Source Responsibility for Firestop and Smokestop Materials: Obtain firestop and smokestop materials from a single manufacturer for each different product required.
- D. Firestopping and smokestopping work shall be performed by a single subcontractor to maintain consistency and accountability on the project.

1.07 DELIVERY, STORAGE, AND HANDLING

Deliver and store packaged materials in manufacturer's original unopened containers with seals unbroken and labels intact until time of use. Store materials off ground and under cover to prevent damage or contamination to materials by water, freezing, foreign matter or other causes. Promptly remove from site any materials which show evidence of damage, and immediately make all replacements necessary.

1.08 SEQUENCING AND SCHEDULING

- A. Notify Sandia Delegated Representative (SDR) at least 1 week in advance of any firestopping and smokestopping installations; Confirm dates and times on days preceding each series of installations.
- B. Do not cover up those firestop and smokestop installations that will become concealed behind other construction until SDR has examined each installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Manufacturers: Products made by the following manufacturers, provided they comply with requirements of the Contract documents, will be among those considered acceptable, however, it is the contractor's responsibility to provide only products compatible with adjacent materials in the assembly.

American Vamag Company, Inc.
Dow Corning Corporation
Flamemaster Corporation
GE Silicones
Hevi-Duty/Nelson
Insta-Foam Products, Inc.
Semco Division/Products Research and Chemical Corporation
The Carborundum Company
3M Ceramic Materials Department

2.02 MATERIALS

- A. Compatibility: Provide firestopping and smokestopping composed of components that are compatible with each other, the substrates forming opening, and the items, if any, penetrating the firestopping and smokestopping under conditions of service and application.
- B. Firestopping Materials: Provide penetration seal assemblies whose fire-resistance ratings have been determined by testing in the configurations required and which have fire-resistance ratings at least as high as that of the fire-rated assembly in which they are to be installed.

1. Provide products which:
 - a. Allow normal expansion and contraction movement of the penetrating item without failure of the penetration seal.
 - b. Emit no hazardous, combustible, or irritating by-products during installation or curing period.
 - c. Do not require special tools for installation.
- C. Smokestopping Materials: Use any gunnable or pourable joint sealant suitable for the application; use only fully curing types where accessible in the finished work. Provide products which:
 1. Allow normal expansion and contraction movement of the penetrating item without failure of the penetration seal.
 2. Emit no hazardous, combustible, or irritating by-products during installation or curing period.
- D. Labels: Red, permanent marking using the words "FIRESTOP AND SMOKESTOP FIRE-RATED ASSEMBLY - DO NOT DISTURB - SEE MAINTENANCE INSTRUCTIONS" and the testing agency designation.

For marking firestopping and smokestopping assemblies, use self-adhesive tape or wired-on labels.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that all penetrating elements and supporting devices have been installed and all temporary lines have been removed.
- B. Inspect all fire and smoke barriers for penetrations of any type; mark or otherwise identify all penetrations indicating action required. Conduct inspection prior to covering up or enclosing walls or ceilings.

3.02 PREPARATION

General: Comply with manufacturers recommendations and with the following:

- A. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping and smokestopping.
- B. Clean concrete, masonry, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, acid washing, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with firestop and smokestop systems.

- C. Remove laitance and form release agents from concrete prior to installation of sealants.
- D. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.
- E. Prime substrates where recommended by the firestop and smokestop manufacturer. Confine primers to areas of bond; Do not allow spillage and migration onto exposed surfaces.
- F. Use masking tape to prevent firestopping and smokestopping from contacting adjoining surfaces that will remain exposed upon completion of work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping and smokestopping materials. Remove tape as soon as it is possible to do so without disturbing firestopping's and smokestopping's seal with substrates.

3.03 INSTALLATION

- A. Install firestopping and smokestopping materials in exact accordance with tested assembly and manufacturer's instructions at all locations shown in Contract documents and at all fire and smoke barriers constructed or modified in this Contract.
- B. Follow design requirements pertaining to cable separation.
- C. Follow manufacturer's recommendations to obtain a smooth, professional finish.
- D. If forms or damming materials are installed, they shall be removed after the designated cure time unless the support materials used are to remain as part of the fire resistant assembly.

3.04 PERMANENT IDENTIFICATION OF PENETRATIONS

Near fire and smoke barriers, mark each exposed penetration with labels (per 2.02C) identifying it as a firestop or smokestop assembly.

3.05 REPAIRS AND MODIFICATIONS

- A. Identify damaged or re-entered seals requiring a repair or modification.
- B. Remove loose or damaged materials.
- C. If penetrating elements are to be added, remove enough material to insert new elements, being careful not to cause damage to the balance of the seal. Re-seal voids in the penetration.
- D. Ensure that surfaces to be sealed are clean and dry.

3.06 FIELD QUALITY CONTROL

- A. Examine penetration seals for proper installation, adhesion and curing as may be appropriate for the respective seal materials.
- B. Keep areas of work accessible.

3.07 CLEANING

Clean up excess material adjacent to penetrations promptly; use methods and materials approved by the manufacturers of the penetration seals and of surfaces to be cleaned.

3.08 PROTECTION

- A. Protect installed work during curing period.
- B. Protect installed work from damage from construction operations using substantial barriers if necessary.
- C. Repair damaged materials in accordance with manufacturer's instructions.

END OF SECTION