

## SECTION 07840

### FIRESTOPPING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section includes the filling of voids and cavities around wall and perimeter edges of rated walls and floors with firestopping and smoke sealing materials to maintain the required fire-rated condition of substrate.
- B. Related Work Specified in Other Sections
  - 1. Concrete – Division 3.
  - 2. Masonry – Division 4.
  - 3. Sealants and Calking - Division 7.
  - 4. Gypsum Board – Division 9.
  - 5. Mechanical Work - Division 15.
  - 6. Electrical Work - Division 16.

##### 1.2 PERFORMANCE REQUIREMENTS

- A. Fire stopping materials shall be UL tested or other test acceptable, such as Omega Point Laboratories, to authorities having jurisdiction and classified as “Through-Penetration System” and “Fill, Void or Cavity Material”. Material shall provide fire-rating equal to that of the floor or wall construction being penetrated.
- B. Test Requirements: ASTM E 814, "Standard Method of Fire Tests of Through Penetration Fire Stops".
- C. Test Requirements: UL 1479, "Fire Tests of Through-Penetration Firestops".
- D. Test Requirements: UL 2079, "Tests for Fire Resistance of Building Joint Systems".
- E. Underwriters Laboratories (UL) of Northbrook, IL publishes tested systems in their "FIRE RESISTANCE DIRECTORY" that is updated annually.
  - 1. UL Fire Resistance Directory:
    - a. Firestop Devices (XHJI).
    - b. Fire Resistance Ratings (BXRH).
    - c. Through-Penetration Firestop Systems (XHEZ).
    - d. Fill, Voids or Cavity Material (XHHW).
    - e. Forming Materials (XHKU).
    - f. Joint Systems (XHBN).
    - g. Perimeter Fire Containment Systems (XHDG).
    - h. Batts and Blankets (BKNV)
    - i. Mineral and Fiber Boards (BQXR)

- 2. Alternate Systems: "Omega Point Laboratories Directory" (updated annually).
- F. Test Requirements: ASTM E 1996, "Standard Test Method for Fire Resistive Joint Systems".
- G. Test Requirements: ASTM E 2307, "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus".
- H. Inspection Requirements: ASTM E 2174, "Standard Practice for On-site Inspection of Installed Fire Stops".
- I. ASTM E 84, "Standard Test Method for Surface Burning Characteristics of Building Materials".
- J. ASTM C 553, "Standard Specification for Mineral Fiber".
- K. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgements", Blanket Thermal Insulation for Commercial and Industrial Applications.
- L. Building Codes:
  - 1. 2003 International Building Code.
  - 2. 2003 International Fire Code.
- M. NFPA 101 – Life Safety Code.
- N. NFPA 70 – National Electric Code.
- O. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814, which is equal to the fire rating of the construction being penetrated.
- P. Provide a firestop system with an Assembly Rating as determined by UL 2079, which is equal to the fire rating of the construction joint assembly.

### 1.3 SUBMITTALS

- A. Furnish submittals for items that are identified in this Section by a different typeface and a bracketed code (e.g., *Item [L]*). Refer to Division 1 for definition of codes for types of submittals and the administrative requirements governing submittal procedure. General submittal requirements pertaining to this Section are specified herein under this Article.
- B. Submit product data where specified, describing composition, together with color chart and recommendations or directions for surface preparation, material preparation and material installation. Include "F" and "T" ratings for each penetration condition. UL – Classified Systems specified in Paragraph 3.3. "Through-Penetration Firestop System Schedule" have been selected based on one manufacturer. Submit alternative UL-Classified Systems Numbers for substitute manufacturer per General Conditions. Submit MSDS sheets for any hazardous products.

- C. Guarantee: Submit guarantee attesting that firestopping material will remain in a serviceable, elastic, adhesive condition for a period of three years from date of final acceptance of the Project, with provision to make good, at no cost to the Owner, imperfections which may develop during the guarantee period, as well as any damage to other work caused by such imperfections or by their repair.

#### 1.4 INSTALLER QUALIFICATIONS

- A. Engage an experienced installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements. A supplier's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification of the Installer.

#### 1.5 PRODUCT DELIVERY, STORAGE AND MATERIALS

- A. Wrap, carton, and crate as required to provide physical and climatic protection during loading, shipping and job site storage and handling.
- B. Deliver packaged materials to the project site in the manufacturer's original, unopened containers which bear intact, legible and visible labels that identify the manufacturer's name and brand name, the contents, grade, type and UL label, where applicable.
- C. Upon delivery, immediately inspect shipments to assure their compliance with the requirements of the Contract Documents and approved submittals, and that products are complete, undamaged and adequately protected. Immediately report damaged, missing, or defective items. Remove broken, damaged or unlabeled items from the site immediately.
- D. Store products in accordance with manufacturer's instructions with seals and labels intact, legible, and visible. Store products in a manner to prevent damage, soiling, theft, deterioration and contamination. Damaged materials will be rejected. Store materials subject to damage by climatic conditions in weathertight enclosures. Maintain temperature and humidity within the ranges required or recommended by the manufacturer.
- E. Repair items that have been damaged or displaced that can be restored to an "as new" condition at no cost to the Owner. Additional time or expenses required to secure replacements and to make repairs will not be considered to justify an extension in the Contract time of completion or an increase in the Contract amount.

#### 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install sealant or putty compounds when ambient air temperature exceeds that of the manufacturer's recommended installation limitations or when recesses are wet or damp; provide temporary heated enclosures to comply with this requirement.

- B. Protect adjacent exposed finished surfaces from damage, by masking or other approved means, prior to performing work. Remove protection when no longer required and clean adjacent, exposed surfaces of any sealant or putty compound deposited upon such surfaces.

## 1.7 PROJECT SITE CONDITIONS

- A. Product Restrictions
  - 1. Silicone based products are prohibited on the Project.
- B. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
- C. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.
- D. Do not use materials that contain flammable solvents.
- E. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
- F. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.

## PART 2 PRODUCTS

### 2.1 FIRESTOPPING GENERAL

- A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping manufacturer based on testing and field experience.
- B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
- C. Firestopping Materials are either "cast-in-place" (integral with concrete placement) or "post installed". Provide cast-in-place firestop devices prior to concrete placement.
- D. Subject to compliance with through penetration firestop systems (XHEZ), joinsystems (XHBN), and perimeter firestop systems (XHDG) listed Volume 2 of the UL Fire Resistance Directory; provide products of the following manufacturers as identified below in the product sections.

## 2.2 FORMED IN PLACE

- A. *Sealant [P,T]*: One-part, gun grade, non-sag material, tested and rated per ASTM E814.
1. Bio Fireshield Inc. "Biotherm 100/200SL".
  2. Hilti "FS 601S Elastomeric Firestop Sealant".
  3. Nelson Fire Stop "CLK".
  4. 3M "Fire Barrier CP25WB + Caulk".
  5. Tremco "Tremstop Acrylic".
  6. Hilti "FS-One High Performance Intumescent Firestop Sealant".
- B. *Putty [P,T]*: One-part, hand pliable, intumescent or endothermic material, tested and rated per ASTM E814.
1. Bio Fireshield, Inc.
  2. Nelson Firestop Products "FSP Firestop Putty Bar and Pad".
  3. 3M Fire Protection Products "Fire Barrier Moldable Putty".
  4. Hilti "CP618 Firestop Putty Stick".
- C. *Safing Insulation [P,T]*: Non-combustible ceramic or mineral wool fiber product formed into flexible blankets. Material shall be tested and rated per ASTM E84/UL723 as zero flame spread, fuel contribution and smoke development.
1. Roxul Inc., "SAFE".
  2. Thermafiber Fire Span Insulation.
  3. Owens Corning – Mineral Wool Safing Insulation.
- D. *Mortar [P,T]*: Factory mixed, cementitious formulation not containing asbestos, that when mixed with water will have controlled swelling, negligible shrinkage and required little or no damming. Material shall be tested and rated per ASTM E814.
1. Bio Fireshield Inc. "Bio Fire Rated K-10 Mortar".
  2. Nelson Firestop Products "Nelson CMP".
  3. Hilti "CP 637 Trowelable Firestop Compound".
  4. 3M "Fire Barrier Mortar"
  5. Tremco "Tremstop Fire Mortar"

## 2.3 MECHANICAL DEVICES

- A. *Pre-cast Intumescent Collars for Pipes [P, T]*: Precast collars enclosing intumescent material inserts.
1. Bio Fireshield Inc. "Bio Fire Rated Pipe Collars".
  2. Hilti "CP 642 Firestop Collar".
  3. Nelson Firestop Products "PCS Pipe Choke System".
  4. 3M "Fire Barrier Plastic Pipe Sleeve".
  5. Hilti "CP643 Firestop Collar".
  6. Tremco, "Tremstop MCR":

## 2.4 FIRESTOP SPRAY

- A. *Firestop Spray [P, T]*: Sprayable fire-rated mastic for firestopping building joint or top of fire rated walls systems.
1. Bio Fireshield, Inc., "Biostop 700 Intumescent Firestop Mastic".
  2. Hilti "CP672 Firestop Joint Spray".
  3. 3M "FireDam Spray"
  4. Tremco, "Tremstop Acrylic Spray".

## 2.5 SLAB EDGE FIRESTOP SPRAY

- A. *Slab Edge Firestop Spray [P, T]*: Sprayable fire-rated fill material spray applied over top of slab edge forming material.
1. Specified Technologies Inc., "Spec-Seal AS200 Elastomeric Spray".
  2. Rectorseal, "Metacaulk 1200 Spray".
  3. Hilti "CP672 Firestop Joint Spray".

## 2.6 BLOCKS OR PILLOWS

- A. Firestop blocks or pillows for large telecommunication penetrations or multiple electrical wiring penetrations.
1. Bio Fireshield, Inc., "Bio Stop EZ-Block".
  2. Bio Fireshield, Inc., "Bio Firestop Pillows".
  3. Nelson Firestop Products, "Fire Brick".
  4. Nelson Firestop Products, "PLW Pillows".
  5. 3M "Fire Barrier Pillows.

## 2.7 FIRESTOP PANELS

- A. Composite intumescent firestop boards or sheets suitable to fill large openings or openings planned for future penetrations.
1. Nelson Firestop Products, "CPS Composite Sheet".
  2. Hilti, "CP675 Firestop Boards".
  3. 3M. "Fire Barrier CS-195+ Composite Sheet".

## 2.8 FIRESTOP FOAM

- A. Intumescent firestop foaming agent to fill openings around multiple penetrations.
1. Hilti, "CP620 Fire Foam".

# PART 3 EXECUTION

## 3.1 PREPARATION

- A. Prepare substrate surfaces to receive firestopping materials and verify compatibility of intended material or system to substrate. Failure of firestopping material in the future, due to claimed

incompatibility of substrate material used, will not be valid. Installation of firestopping material will be considered as evidence that substrate and material selection, are compatible.

- B. Follow manufacturer's recommendations for cleaning surfaces to receive firestopping materials so as to be free of dirt, dust, loose material, oil, grease, form release agents and other substances detrimental to proper installation of firestopping materials. Remove lacquer and other protective coatings from metal surfaces, without damaging the metal finish; use oil-free solvents. Apply masking tape to metal surfaces adjacent to recesses receiving firestopping materials to prevent smearing or staining of such metal surfaces.
- C. Provide depth of recess to receive sealant or putty compounds per UL Design requirements. Where depth of recess is in excess of specified depth, place back-up safing insulation material in recess, forced into place under compression, to provide the specified recess depth. Where depth of recess is less than specified depth, cut the back surface of recess to the specified recess depth.
- D. Recesses shall be dry when sealant or putty compounds are installed. Prime all recesses, in accordance with the compound specific through penetration fire stop systems in UL's Fire Resistance Directory.

### 3.2 INSTALLATION

- A. Use materials as received from the manufacturers, without additives or adulterations. Use one specific tested through-penetration fire stop systems in UL's Fire Resistance Directory, or other approved documented test agency system.
- B. Install firestopping where indicated on Drawings, and where application is required as part of a fire rated assembly or is required to maintain the fire rating of the assembly, and per specific through-penetration fire stop systems in UL's Fire Resistance Directory, or other approved documented test agency system.
- C. Install formed-in-place firestops immediately after adjoining work is in condition to receive such work. Fill all joints completely, regardless of variation of joint widths, and to full depth as prepared, at no extra cost to the Owner. Install compounds under pressure, without smearing adjacent surfaces. Firestop materials must have full and uniform contact with, and adhesion to, side surfaces of recess.
- D. Sealants shall be finished and putty compounds may be finished to produce a smooth and even flat face, flush with face of material at each side. Tooling shall be in accordance with manufacturer's recommendations without damaging the seal or tearing the compound.
- E. Install fire stopping to fill voids such as between perimeter edges of floor slabs and walls, at tops of walls and underside of deck at mechanical and electrical penetrations or where indicated on the Drawings per tested UL systems.
- F. Keep areas of work accessible until inspection by applicable code authorities

- G. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.
- H. Install metal closures or sealants to contain fire safing insulation and prevent its displacement.
- I. Provide firestopping at all joints in fire rated construction to carry the fire rating of the assembly to either the adjoining wall, floor or underside of deck.

### 3.3 THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE

- A. Where UL-classified systems are indicated, refer to the alpha-alpha-numeric designations listed in UL's "Fire Resistance Directory" under product Category XHEZ.
- B. Firestop Systems for Metallic Pipes, Conduit or Tubing, comply with the following:
  - 1. Concrete Floor/Wall or Block Wall UL-Classified System: Submit tested system.
  - 2. Gypsum Wall Assembly UL-Classified System: Submit tested system.
  - 3. Gypsum Wall Assembly UL-Classified System: Submit tested system.
  - 4. Type of Fill Materials: One or more of the following to meet UL tested system
    - a. Latex or acrylic sealant.
    - b. Silicone or elastomeric sealant.
    - c. Intumescent putty.
    - d. Mortar.
    - e. Firestop foam.
- C. Firestop Systems for Nonmetallic Pipe, Conduit, or Tubing, comply with the following:
  - 1. Concrete Floor/Wall or Block Wall UL Classified System: Submit tested system.
  - 2. Gypsum Wall Assembly UL-Classified System: Submit tested system.
  - 3. Type of Fill Materials: One of more of the following to meet UL tested system:
    - a. Latex or acrylic sealant.
    - b. Silicone or elastomeric sealant.
    - c. Intumescent putty.
    - d. Intumescent wrap strips.
    - e. Firestop collar.
- D. Firestop Systems for Electrical Cables, Cable Trays and Bundles, comply with the following:
  - 1. Concrete Floor/Wall or Block Wall UL-Classified System: Submit tested system.
  - 2. Gypsum Wall Assembly UL-Classified System: Submit tested system.
  - 3. Type of Fill Materials: One of more of the following:
    - a. Latex or acrylic sealant.
    - b. Silicone sealant.
    - c. Intumescent putty.
    - d. Firestop foam.
    - e. Fire blocks or pillows.
- E. Firestop Systems for Insulated Pipes, comply with the following:
  - 1. Concrete Floor/Wall or Block Wall UL-Classified System: Submit tested system.

2. Gypsum Wall Assembly UL-Classified System: Submit tested system.
  3. Type of Fill Materials: One of more of the following to meet UL tested system:
    - a. Latex or acrylic sealant.
    - b. Intumescent putty.
    - c. Firestop foam.
- F. Firestop Systems for Miscellaneous Electrical Penetrants, comply with the following:
1. Concrete Floor/Wall or Block Wall UL-Classified: Submit tested system.
  2. Gypsum Wall Assembly UL-Classified: Submit tested system.
  3. Type of Fill Materials: One of more of the following:
    - a. Latex or acrylic sealant.
    - b. Intumescent putty.
    - c. Mortar.
- G. Firestop Systems for Miscellaneous Mechanical Duct Penetrations: Comply with the following:
1. Concrete Floor/Wall or Block Wall UL-Classified: Submit tested system.
  2. Gypsum Wall Assembly: Submit tested system.
  3. Type of Fill Materials: One or both of the following:
    - a. Latex or acrylic sealant.
    - b. Intumescent putty.
- H. Firestop Systems for Top of Fire Rated Partitions: Comply with one of the following:
1. Top of Gypsum Board Wall Assembly UL-Classified System: Submit tested system.
  2. Top of Block Wall UL-Classified System: Submit tested system.
  3. Type of fill materials. One or more of the following:
    - a. Firestop Spray.
    - b. Safing Insulation.
- I. Firestop Systems for Floor to Wall Joints and edges of slab: Comply with UL tested assembly joint (XHDG) CW-D series of tests:
1. Firestop spray.
  2. Safing Insulation.
- J. Firestop Systems With Large Complex Openings or No Penetrating Items:
1. Concrete Floor/Wall or Block Wall UL Classified System: Submit tested system.
  2. Gypsum Wall Assembly UL Classified System: Submit tested system.
  3. Type of Fill Materials: One or more of the following to provide UL tested system.:
    - a. Firestop Panels.
    - b. Firestop Blocks or Pillows.

### 3.4 ADJUSTING AND CLEANING

- A. Remove firestopping materials not complying with the requirement of this Section, re-prepare the recesses and install new materials to provide finish work complying with the requirement specified, at no extra cost to the Owner.

- B. Clean surfaces adjacent to the sealed joints, and remove sealant and putty compound smears and other soiling resulting from application of materials. At metal surfaces, remove masking tape and other residue. Exercise care in cleaning and removal operations so as not to mar or damage finishes on materials adjacent to joints. Repair or replace marred or damaged materials, at no extra cost to the Owner.

END OF SECTION

<b>Revision History</b>	
<b>Date</b>	<b>Rev. No.</b>
02-19-09	0

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