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**SECTION 07 84 00
FIRESTOP SYSTEMS**

SECTION 07 84 00 – FIRESTOPPING AND SMOKE SEALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section, including both empty openings and openings containing penetrating items.

1.2 SUMMARY

- A. Provide asbestos free firestopping and smoke sealing systems including accessories for a complete system as indicated and specified.
- B. This Section includes firestopping at:
 - 1. New penetrations and openings in fire resistance rated walls, floors, ceilings and roofs including those around mechanical and electrical services.
 - 2. Repairing existing disturbed penetrations and openings.
 - 3. Openings and sleeves installed for future openings.
- C. Related Sections include the following:
 - 1. Division 03 specifying concrete.
 - 2. Division 04 specifying unit masonry assemblies.
 - 3. Division 06 specifying rough carpentry.
 - 4. Division 07 specifying joint sealants.
 - 5. Division 09 specifying gypsum board.
 - 6. Division 15 specifying mechanical.
 - 7. Division 16 specifying electrical.

1.3 REFERENCES

- A. Comply with current edition of referenced standards unless indicated otherwise.
- B. CAN/ULC National Standard of Canada / Underwriters Laboratories of Canada:
 - 1. CAN/ULC S101 – Standard Methods of Fire Endurance Tests of Building Construction and Material.
 - 2. CAN/ULC S102 – Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
 - 3. CAN/ULC S115 – Standard for Fire Tests of Firestops Systems.

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1.4 PERFORMANCE REQUIREMENTS

- A. General: For penetrations through fire-resistance-rated construction, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases and maintain original fire-resistance rating of construction penetrated.
 - 1. Fire-resistance-rated walls including fire walls and fire barriers.
- B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per CAN/ULC S115:
 - 1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.
- C. Provide systems that are listed by at least one of the following:
 - 1. Underwriters Laboratories Inc. (UL), in "Fire Resistance Directory"
 - 2. Intertek Testing Services (ITS) (includes agency formerly know as Omega Point Laboratories), in "Directory of Listed Products"
 - 3. Any other qualified independent testing and inspection agency that conducts periodic follow-up inspections and is acceptable to Authorities Having Jurisdiction (AHJ).
- D. Provide products identical to those tested and listed for classification by UL, ITS or any other qualified independent testing agency.
- E. Provide products that bear classification marking of qualified independent testing agency.
- F. Use only products specifically listed for use in listed systems.
- G. Provide products that meet the intent of the state or local and LEED® guidelines on volatile organic compounds (VOC).
- H. Provide products with the appropriate flame spread index and smoke develop index, when tested in accordance with CAN/ULC S 102.
- I. Firestopping materials must meet and be acceptable for use by all building codes and NFPA codes.
- J. Provide products that are compatible with each other, with the substrates forming openings and with penetrating items, if any.

1.5 SUBMITTALS

- A. Submit under provisions of the Contract and Division 01 – General Requirements.
- B. Shop Drawings: For each firestop system, show each type of construction penetrated, relationships to adjoining construction and type of penetrating item. Include firestop

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design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.

1. An applicable listing agency's detailed drawing showing opening, penetrating item(s) and firestopping materials; identified by listing agency's name, number or designation and fire rating achieved.
2. Where project conditions require modification to a listing, submit listing agency's drawing marked to show modifications and approved by firestop system manufacturer.

C. **Product Certificates:** Submit certificates of conformance signed by firestop system manufacturer certifying that materials furnished comply with requirements.

D. **Product Data Sheets:** Furnish firestop system manufacturer's product data sheets on each material to be used in firestop systems. Information on manufacturer's product data sheet should include:

1. Product characteristics including compliance with appropriate ANSI/UL/ASTM testing standards.
2. Storage and handling requirements and recommendations.

E. **Installation Instructions:** Furnish firestop system manufacturer's installation instructions.

F. **Through-Penetration Firestop System Schedule:** Indicate locations of each through penetration firestop system, along with the following information:

1. Type of penetrating item(s).
2. Types of constructions penetrated, including fire-resistance ratings and where applicable, thickness of construction penetrated.
3. Through-penetration firestop systems for each location identified by listing agency's number or designation.

G. **Qualification Data:** For Installer.

H. **Sustainable or LEED Submittals:**

1. **VOC Content:** For fire-resistance joint and gap systems, furnish documentation of VOC content.

1.6 QUALITY ASSURANCE

A. **General:** All through-penetrations firestop systems shall be installed with approved methods using material that have been tested and classified to produce an approved assembly.

B. **Installer Qualifications:** A firm experienced in installing through-penetration firestop systems similar material(s), design(s) and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance.

C. **Installation Responsibility:** Assign installation of all through-penetration firestop systems in Project to a single qualified installer.

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- D. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and conditions indicated, through one source from a single firestop system manufacturer.
- E. Codes: Where a firestop systems manufacturer's application procedures are in conflict with those of the code authority having jurisdiction (AHJ), the more strict guidelines will prevail.
- F. Pre-installation Conference: Conduct conference at Project site to agree on firestop requirements, conditions, and firestop system manufacturer's instructions.
 - 1. Coordinate construction and cutting of openings so that each particular firestop system may be installed in accordance with its listing, including sizing, sleeves and penetrating item(s).
 - 2. Do not cover-up through-penetration firestop system installations that become concealed behind other construction until each installation has been examined by inspecting agency, building inspector, if required by authorities having jurisdiction.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store through-penetration firestop system products to Project site in original, unopened packaging with intact and legible manufacturer's labels and identifying product and manufacturer, date of manufacture, lot number, shelf life, listing agency's classification marking, curing time and mixing instruction if applicable.
- B. Store and handle materials for firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants or other causes; follow manufacturer's instructions.
- C. Store and dispose of hazardous material, and material contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction (AHJ).

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install firestop systems when ambient or substrate temperatures are outside limits permitted by firestop system manufacturer or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilation: Provide ventilation as per firestop systems manufacturer's instructions; by natural means, or where this is inadequate, by forced-air circulation.
- C. Maintain environmental conditions (ventilation, humidity and temperature) within limits recommended by the firestop manufacturer. Do not install the firestopping when the environmental conditions recommended are not met.

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1.9 WARRANTY

- A. Provide a copy of the firestop manufacturer's standard limit warranty against manufacturing defects, terms, conditions and exclusion from coverage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Project include, but are not limited to the following;
1. Passive Fire Protection (PFP) Partners, Delta, BC V3M 6T8 Toll Free: 800.810.1788 email: firestop@firestop.com website: www.firestop.com
- B. Substitutions: Requests for substitutions will be considered in accordance with Section 01 60 00.
- C. Single Source: To maintain control and integrity of the firestop applications a single firestopping manufacturer should be used. Specific UL, ITS and or other approved listing agencies systems applicable to each type of firestop condition should be supplied by one firestopping manufacturer.

2.2 FIRESTOPPING GENERAL

- A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per CAN/ULC S115, ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01 in. of water (2.5 Pa).
1. Fire-resistance-rated walls include firewalls, fire barrier walls, smoke-barrier walls and fire partitions.
 2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per CAN/ULC S115, ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01 in. of water (2.5 Pa).
1. Horizontal assemblies include floors, floor/ceiling assemblies and ceiling membranes of roof/ceiling assemblies.
 2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
 3. T-Rating: At least 1 hour, but not less than the fire-resistance of construction penetrated except for floor penetrations within the cavity of a wall.

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- D. Firestopping and Smoke Sealing Systems: Low VOC, asbestos free, capable of maintaining an effective barrier against flame, smoke, gases, temperature rise and hose stream (where noted) in accordance with CAN/ULC S115, ASTM E814 or UL 1479 and not exceeding opening sizes or design limitations for which they are intended.
- E. Fire resistance rating of installed firestopping assembly shall not be less than the fire resistance rating of penetrated assembly and to be Type F, FT, FH or FTH in accordance with the National Building Code of Canada, local Building Codes and applicable Standard requirements.
- F. Sealants:
1. Vertical and overhead joints: non-sagging type
 2. Horizontal joints and fluid seals at floors: self-leveling type including sprays
 3. Flexible: elastomeric type allowing movement and capable of returning to original configuration with damage to seal and without adhesive or cohesive failure.
- G. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 50, respectively, as determined per CAN/ULC S 102.
- H. VOC Content: Provide penetration firestopping that complies with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
1. Architectural Sealants: 250 g/L.
 2. Sealant Primers for Nonporous Substrates: 250 g/L
 3. Sealant Primers for Porous Substrates: 775 g/L
- I. Accessories: Provide components for each penetration firestopping system that needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspection agency for firestopping indicated.
1. Permanent forming/damming/backing material include the following:
 - a. Slag/rock-wool or mineral wool fiber insulation
 - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
 - c. Fire-rated form board.
 - d. Fillers for sealants
 2. Temporary forming materials
 3. Substrate primers
 4. Collars.
 5. Steel sleeves.

2.3 FIRESTOP SYSTEMS MATERIALS

- A. PFP Partners 3300PS: One component moldable putty. Non-hardening intumescent putty.

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- B. PFP Partners 3500SI Mastic: One component, low VOC, water-based latex, intumescent spray.
- C. PFP Partners 3600EX Sealant: One component, low VOC, intumescent, water based, acrylic latex sealant
- D. PFP Partners 4100SL Sealant: One component, low VOC, water-based latex, self-leveling for floor openings.
- E. PFP Partners 4100NS Sealant: One component, low VOC, water-based latex, non-sag sealant for floor and wall openings.
- F. PFP Partners 4800DW Sealant: One component, low VOC, water-based latex, low sag, paintable sealant.
- G. PFP Partners 5100SP Mastic: One component, low VOC, water-based latex, endothermic spray.
- H. PFP Partners EBI 60 electrical box insert: One component, non-hardening compound for single and double electrical boxes.
- I. PFP Partners FCW-44 Firestop Cable Way: One-piece device for firestopping blanks, cable, cable bundles and ENT through rated walls.
- J. PFP Partners MP-1 Putty Pads: One component for firestopping single electrical boxes.
- K. PFP Partners Pillows: Self contained, intumescent pillow for firestopping large openings with multiple penetrations and cable trays penetrations through walls and floors.
- L. PFP Partners PPC Collar: Intumescent device for firestopping plastic pipe penetrations through rated walls and floors:
- M. PFP Partners WS-1 Wrap Strip: Flexible, intumescent wrap strip used to firestop plastic pipe penetrations through walls and floors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Before beginning installation, verify that substrate conditions previously installed under other sections are acceptable for installation of firestopping in accordance with manufacturer's installation instructions and technical bulletins.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

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3.2 PREPARATION

- A. Surface Cleaning: All surfaces shall be free of foreign materials (dirt, grease, oil, scale, rust, releasing agents, water repellents) and any other substances that could interfere with the adhesion of the through-penetration firestop systems.
- B. Provide masking and temporary covering to protect adjacent surfaces, when required. Remove tape as soon as possible without disturbing

3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

- A. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for product and application indicated.
- B. Installation Instructions: Comply with (UL), (ITS) or and or other approved listing agencies Listings and through-penetration firestop manufacturer's instructions for installation of firestopping products and the following:
 - 1. Seal all openings or voids made by penetrations to ensure an air and water resistant seal
 - 2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of through-penetration firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
 - 3. Protect materials from damage on surfaces subjected to traffic.
 - 4. Fill voids and cavities formed by openings, form materials, accessories and penetrating items as required to achieve fire-resistance ratings indicated.
 - 5. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 6. Clean through-penetration firestop materials surfaces.
 - 7. Notify AHJ when installation is ready for inspection, obtain advance approval of anticipated inspection dates and phasing, if any, required to allow subsequent construction to proceed.
 - 8. Do not cover installed through-penetration firestop systems with other construction until approval of AHJ has been received.

3.4 IDENTIFICATION

- A. Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Include the following information on labels:
 - 1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.

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3. Through-penetration firestop system designation of applicable testing and inspecting agency.
4. Date of installation.
5. Through-penetration firestop system manufacturer's name.
6. Installer's name.

3.5 REPAIRS AND MODIFICATIONS

- A. Identify damage or re-entered seals requiring repair or modification
- B. Remove loose or damaged materials
- C. If penetrating item(s) are to be added, remove sufficient material to insert new elements. Care must be used not to cause damage to the balance of the seal.
- D. Insure that surfaces to be sealed are clean and dry.
- E. Install materials in accordance with Paragraph 3.3 as required. Use only materials approved by through-penetration firestop manufacturer as suitable for repair of original seal. Never mix different manufacturer's firestopping materials.

3.6 FIELD QUALITY CONTROL

- A. Notify Consultant when completed installations are ready for inspection prior to concealing or enclosing an area containing firestopping materials.
- B. Arrange for inspection by the Owners independent inspection and testing company appointed and paid by Owner.
- C. Following field inspections, where deficiencies are found, all repairs or replacements as required to ensure compliance with the Contract Documents.

3.7 CLEANING AND PROTECTION

- A. Clean off excess material adjacent to openings as Project progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new material to produce systems complying with specified requirements.

END OF SECTION 07 84 00