

SECTION 07 84 00
FIRESTOPPING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes firestopping for joints and through-penetrations through the following fire-resistance rated assemblies, including both blank openings and openings containing penetrating items:
1. All openings in fire-rated floors, wall and roof assemblies, both empty and those accommodating penetrating items such as cables, conduits, pipes, ducts, cable trays, bus ducts, etc.
 2. Construction gaps where the top of a wall meets a floor or roof and the gap between the floor slab and building exterior.
 3. Expansion joints in fire-rated walls, shaft wall assemblies and floors.
 4. Openings at each floor level in shafts or stairwells
 5. Joints and penetrations in fire and smoke rated walls, barriers, and partitions
- B. Related Sections include the following:
1. Section 01 81 13 Sustainable Design Requirements
 2. Section 03 30 00 Cast-In-Place Concrete
 3. Section 04 22 00 Concrete Unit Masonry
 4. Section 07 90 00 Joint Protection
 5. Section 08 90 00 Curtain Wall Assemblies
 6. Section 09 20 00 Plaster and Gypsum Board
 7. Section 22 00 00 Plumbing
 8. Section 23 00 00 HVAC
 9. Section 26 00 00 Electrical
 10. Section 27 00 00 Communications

1.3 PERFORMANCE CRITERIA

A. FIRE TEST REQUIREMENTS

1. Underwriters Laboratories, Inc. (UL):
 - a. ANSI / UL1479 "Fire Tests of Through Penetration Firestop"
 - b. ANSI / UL2079 "Tests for Fire Resistance of Building Joint Systems"
 - c. ANSI / UL263 "Fire Tests of Building Construction and Materials"
 - d. ANSI / UL723 "Surface Burning Characteristics of Building Materials"
2. American Society of Testing and Materials (ASTM):
 - a. ASTM E-814 "Fire Tests of Through Penetration Fire Stops"
 - b. ASTM E-1966 "Test Method for Fire Resistive Joint Systems"
 - c. ASTM E-2307 "Test Method for Perimeter Fire Barrier Systems"
 - d. ASTM E-119 "Fire Tests of Building Construction and Materials"

- e. ASTM E-84 "Surface Burning Characteristics of Building Materials"
- f. ASTM E-2174 "Standard Practice for On-site Inspection of Installed Firestop"
- g. ASTM E-2393 "Standard Practice for On-Site Inspection of Installed Fire Stop Joint Systems"

B. REFERENCES

1. Building codes:
 - a. 2024 Ohio Building Code
 1. Do not construe approval from the AHJ as relieving installer from compliance with the requirements of this project that are in excess of Code requirements.
2. National Fire Protection Association (NFPA) "NFPA 70: National Electrical Code".
3. Approved Independent Testing Agencies
 - a. Underwriters Laboratories (UL)
 - b. Intertek Testing Services NA Ltd.

C. PERFORMANCE REQUIREMENTS

1. All firestopping shall be installed in accordance to the U.L. tested system designed for the application.
 - a. F-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with F ratings indicated, as determined per ASTM E-814, but not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.
 - b. T-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with T ratings not less than one hour but equal to the fire-resistance rating of the floor being penetrated as determined per ASTM E-814, the firestop systems protect penetrations located outside of wall cavities.
 - c. L-Rated Through-Penetration Firestop Systems: Provide firestop systems with L Ratings for joints and penetrations in both rated and non-rated Smoke Barriers, Smoke Walls and Smoke Partitions. The air leakage rating shall not exceed 5 CFM per square foot at 0.30 inch of water for both ambient and elevated temperatures as determined per UL 1479.
 - d. W-Rated Through-Penetration Firestop Systems: Provide firestop systems with W Water Resistance ratings, in addition to F, T and L ratings, as determined per UL 1479, where indicated in areas subject to frequent ponding exposure.
2. Provide products that upon curing shall not re-emulsify, dissolve, leach, break down or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture characteristic during and after construction.
3. Provide firestop sealants that shall be sufficiently flexible to accommodate motion such as pipe vibration, water hammer, thermal expansion and other normal building movement without damage to the seal.

4. Provide fire-resistive joint sealants shall accommodate a specific range of movement and tested for this purpose in accordance with cyclic movement test criteria as outlined in Standards ASTM E-1966 or ANSI / UL 2079.
5. Provide fire-resistive joint systems shall have been subjected to an air leakage test conducted in accordance with ASTM E-1966 or ANSI / UL2079 with published L-Ratings for ambient and elevated temperatures as evidence of the ability of the fire-resistive joint system to restrict the movement of smoke.
6. Provide fire-resistive joint sealants that shall have been tested to maintain STC ratings of barriers and partitions being penetrated.
7. Provide firestopping for conditions specified whether or not firestopping is indicated on drawings and, if indicated, whether such material is designated as insulation, safing, or otherwise. Insulation types specified in contract documents shall not be installed in lieu of firestopping.

1.4 SUBMITTALS

- A. Product Data: For each type of firestopping product indicated.
- B. System Drawings: Submit documentation from a qualified third-party testing agency that is applicable to each firestopping system configuration for construction, joint opening width and/or penetrating items.
- C. Product Certificates: Certificate of conformance signed by manufacturers of firestopping products certifying that products comply with requirements
- D. LEED Credit: Documentation for each product/material highlighting VOC content information.

1.5 QUALITY ASSURANCE

- A. Provide firestopping systems that comply with the following requirements and those specified in "Performance Criteria" Article:
 1. Firestopping tests are performed by a qualified, testing and inspection agency. A qualified testing and inspection agency is UL, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
 2. Firestopping products bear classification marking of qualified testing and inspection agency.
- B. Engage an experienced firestop installer who is:
 1. UL Qualified Firestop Contractor
 2. Licensed by the State or local authority, where applicable
 3. Shown to have successfully completed not less than 5 comparable scale projects
 - a. A manufacturer's willingness to sell its through-penetration firestop system products to Contractor or to an installer engaged by Contractor does not in itself confer qualifications on buyer.
- C. Obtain firestop systems for each type of penetration or joint opening and construction condition indicated from a single manufacturer.
- D. The use of Engineering Judgments is limited to only those applications where no tested assembly exists and then only with the express written permission of the architect prior to installation.
 1. Engineering judgments are NOT to be used:
 - a. to remedy defective construction

- b. as a cost savings alternative to defend improper construction that has already been installed
 - 2. Engineering Judgments may be employed in cases of:
 - a. Existing or archaic construction for which no tested system exists
 - b. Minor deviations from tested systems for penetration / hole size / annular spacing
- E. Architect must submit the review Engineering Judgment along with all back up documentation prior to installation.
- F. Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings".

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver firestopping products to Project site in original, unopened containers or packages with intact and legible manufacturer's labels identifying product and manufacturer, date of manufacture; lot number; shelf life, if applicable; qualified testing and inspection agency's classification marking; and mixing instructions for multi-component materials.
- B. Store and handle materials for firestopping products to prevent their deterioration or damage due to moisture, temperature changes, contaminants or other causes.

1.7 PROJECT CONDITIONS

- A. Do not install firestopping products when ambient or substrate temperatures are outside limitations recommended by manufacturer.
- B. Do not install firestopping products when substrates are wet due to rain, frost, condensation, or other causes.

1.8 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes or cut openings to accommodate through-penetration firestop systems.
- C. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

PART 2 – PRODUCTS

2.1 FIRESTOPPING, GENERAL

- A. Provide firestopping products that are compatible with one another, with the substrates forming openings, and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by firestopping products manufacturer based on testing and field experience.
- B. Provide components for each firestopping system that are needed to install fill materials. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

2.2 ACCEPTABLE MANUFACTURERS

1. Basis of Design
 - a. Firestop products manufactured by Specified Technologies, Inc. (STI) and supplied by INTEK Construction Products Inc. 888-721-6911 shall be the basis of design for the project.
2. Alternate Manufacturers:
 - a. 3M Fire Protection Products 800-328-1687
 - b. Metacaulk 800-231-3345
3. No other manufacturers will be considered.

2.3 MATERIALS

- A. General: Use only firestopping products that have been tested for specific fire-resistance-rated construction conditions conforming to construction assembly type, penetrating item type or joint opening width and movement capabilities, annular space requirements and fire-rating involved for each separate instance.
 1. Intumescent Firestop Sealant
 2. Elastomeric Firestop Spray & Sealants
 3. Firestop Putty & Putty Pads
 4. Firestop Pillows
 5. Composite Sheets
 6. Firestop Collars
 7. Firestop Wrap Strip
 8. Firestop Mortar
 9. Cast In Place Firestop Sleeves
 10. Smoke / Sound Sealant (smoke partitions and non- rated walls only)

PART 3 – EXECUTION

3.1 CONDITIONS REQUIRING FIRESTOPPING

- A. General
 1. Provide firestopping for conditions specified whether or not firestopping is indicated on drawings and, if indicated, whether such material is designated as insulation, safing, or otherwise. Insulation types specified in contract documents shall not be installed in lieu of firestopping.
 2. All firestopping shall be installed in accordance to the U.L. tested system designed for the application.
 3. Grout, Mortar, or Gypsum based products shall not be installed in lieu of firestopping material specified herein.
- B. Penetrations - Provide Firestopping:
 1. Where penetrations including conduit, cable, wire, pipe, duct, or other elements pass through one or both outer surfaces of a fire rated wall or floor.
 2. Pipe insulation shall not be removed, cut away or otherwise interrupted through wall or floor openings. Provide a tested assembly appropriate for

the thickness and type of insulation utilized.

3. Provide firestop devices, collars or wrap strip tuck-in systems for Plastic DWV piping penetrations. Caulk only systems will not be accepted for penetrations larger than nominal 1" trade pipe sizes.
4. These requirements for penetrations shall apply whether or not sleeves have been provided, and whether or not penetrations are to be equipped with escutcheons or other trim. If penetrations are sleeved, firestop annular space, if any, between sleeve and wall opening.
5. Single membrane penetrations shall be firestopped as one half of a symmetrical through penetration firestop system.
6. No penetrations shall be installed within 4 vertical inches of the bottom edge of Head of Wall joints.
7. Provide firestopping to fill blank openings in fire-rated construction.

C. Fire Rated Joints – Provide firestopping:

1. All fire rated joint assemblies must maintain a 1-hour fire ("F") rating or that which is equal to the rating of the wall and a leakage ("L") rating of less than 1 CFM/LF.
2. Firestop joint systems for areas subject to movement from dynamic loading, thermal expansion, or building movement shall be tested per UL 2079 for 500 cycles at a minimum of 10 cycles per minute.
3. Joint system shall be capable of withstanding the anticipated movement requirements for deflection, thermal and wind load.
4. Firestop joint systems shall not be used in lieu of mechanical joint systems for any seismic building joint.
5. Where the top edge of a fire-rated wall abuts the bottom of a floor or roof with or without fluted-type metal decking, provide a fire rated joint system that allows for the dynamic movement of the floor or roof deck with a minimum 1-hour fire rating or that which is equal to the rating of the wall.
6. No penetrations shall be installed within 4 vertical inches of the bottom edge of the Head of Wall joint.
7. Mineral wool safing may not be used alone but only as a component of a UL tested firestop joint system and must be fully encapsulated with firestop spray/sealant.
8. There shall be no drywall tape or joint compound installed in the joint opening prior to the installation of the fire rated joint assembly.
9. Where a wall or partition is continuous past a structural floor, such as at stairwells and vertical shafts, and a space would otherwise remain open between the sheathing of the wall and edge of the adjoining structural floor, provide a fire rated joint system designed to maintain a minimum 1-hour fire rating or equal to the rating of the floor. Whether or not there are any clips, angles, plates or other members bridging or interconnecting the floor and wall systems.
10. Where a drywall partition abuts the floor provide a fire rated bottom of wall joint system designed to maintain the fire rating equal to the rating of the wall.
11. Where joint application is exposed to the elements, fire-resistive joint sealant must be approved by manufacturer for use in exterior applications and shall comply with ASTM C-920, "Specification for Elastomeric Joint Sealants".

- D. Perimeter Fire Barrier Systems – Provide Firestopping:
1. To fill the gap between the edge of the floor slab and the exterior sheathing or curtain wall assembly, the Perimeter Fire Barrier System selected shall have been tested to ASTM E-2307 employing the Intermediate Scale Multi-story Apparatus for exterior wall systems similar to actual field conditions.
 2. Where exterior facing is continuous past a structural floor, and a space would otherwise remain open between the inner face of the wall construction and the perimeter edge of the structural floor, provide a perimeter fire barrier system designed to maintain a minimum 1-hour fire rating or equal to the rating of the floor.
 3. Where an exterior wall of composite type construction is continuous past a structural floor/roof, and a space would otherwise remain open at the intersection of the floor/roof and the exterior sheathing of the wall system, provide a perimeter fire barrier system designed to maintain a fire rating or that is equal to the rating of the floor/roof.
- E. Full Height Partitions, Sound Walls & Smoke Partitions – Provide Smoke stopping:
1. Smoke / Sound sealant shall be tested to UL 1479 for air leakage and maintain the STC Rating of the wall for both joints and penetrations.
 2. Where the top edge of a fire-rated wall abuts the bottom of a floor or roof with or without fluted-type metal decking, provide a smoke rated joint system that allows for the dynamic movement of the floor or roof deck.
 3. Where a drywall partition abuts the floor provide a bottom of wall joint system.
 4. Mineral wool safing may not be used alone but only as a component of the joint system and must be fully encapsulated with smoke spray / sealant.
 5. There shall be no drywall tape or joint compound installed in the joint opening prior to the installation of the joint assembly.
 6. Joint system shall be capable of withstanding the anticipated movement requirements for deflection, thermal and wind load.
 7. Penetrations shall be sealed on both sides of the wall.

3.2 PREPARATION

- A. Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
- B. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, scale, laitance, rust, release agents, water repellents, and any other substances that may inhibit optimum adhesion.
- C. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
- D. Do not proceed until unsatisfactory conditions have been corrected.

3.3 FIRESTOPPING INSTALLATION

- A. General Requirements: Install through-penetration firestop systems and fire-resistant joint systems in accordance with “Performance Criteria” Article and in accordance with the conditions of testing and classification as specified in the published design.
- B. Manufacturer’s Instructions: Comply with manufacturer’s instructions for installation of firestopping products.

1. Seal all openings or voids made by penetrations to ensure a proper seal.
 2. Protect materials from damage on surfaces subjected to traffic.
 3. Where joint application is exposed to the elements, fire-resistive joint sealant must be approved by manufacturer for use in exterior applications and shall comply with ASTM C-920, "Specification for Elastomeric Joint Sealants".
- C. Remove equipment, materials and debris, leaving area in undamaged, clean condition.
- D. Clean all surfaces adjacent to sealed openings to be free of excess firestopping materials and soiling as work progresses.

3.4 FIELD QUALITY CONTROL

- A. Independent inspection agency employed and paid by owner, will examine penetration firestopping in accordance with ASTM E-2174, "Standard Practice for On-Site Inspection of Installed Fire Stops and ASTM E-2393, "Standard Practice for On-Site Inspection of Installed Fire Stop Joint Systems.
- a. Destructive testing methods shall be employed in accordance with the standards.
- B. Keep areas of work accessible until inspection by authorities having jurisdiction.
- C. Where deficiencies are found, repair or firestopping products so they comply with requirements.

END OF SECTION