SECTION 07 84 00

FIRESTOPPING

PART 1 – GENERAL

* 1. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
   1. SUMMARY
2. This section includes firestopping for through-penetrations and joints in or between the following fire-resistance rated assemblies, including both blank openings, linear openings, and openings containing penetrating items:
   1. Floor-ceiling assemblies.
   2. Roof-ceiling assemblies.
   3. Walls and partitions.
   4. Smoke barriers.
   5. Construction enclosing compartmentalized areas.
3. Related Sections include the following:
   1. Division 3 – Section 03 30 00 – Cast-In-Place Concrete
   2. Division 4 – Section 04 22 00 – Concrete Unit Masonry
   3. Division 7 – Section 07 90 00 – Joint Protection
   4. Division 9 – Section 09 20 00 – Plaster and Gypsum Board
   5. Division 22 – Section 22 00 00 – Plumbing
   6. Division 22 – Section 22 07 00 – Plumbing Insulation
   7. Division 23 – Section 23 00 00 – HVAC
   8. Division 23 – Section 23 07 00 – HVAC Insulation
   9. Division 26 – Section 26 00 00 – Electrical
   10. Division 27 – Section 27 00 00 – Communications
   11. PERFORMANCE CRITERIA
4. FIRE TEST REQUIREMENTS
   1. Underwriters Laboratories, Inc. (UL):

a. ANSI/ UL1479, “Fire Tests of Through Penetration Firestops”.

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”.

* 1. American Society of Testing and Materials (ASTM):

a. ASTM E814, “Fire Tests of Penetration Fire Stops”.

b. ASTM E1966, “Test Method for Fire Resistive Joint Systems”.

c. ASTM E119, “Fire Tests of Building Construction and Materials”.

d. ASTM E84, “Surface Burning Characteristics of Building Materials”.

e. ASTM E2307, “Fire Tests of Perimeter Fire Barrier Systems Using Intermediate Scale, Multi-Story Test Apparatus”.

f. ASTM E2837, “Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies”.

g. ASTM E2174, “Standard Practice for On Site Inspection of Installed Fire Stops”.

h. ASTM E2393, “Standard Practice for On Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers”.

i. ASTM E1725, “Standard Test Methods for Fire Tests of Fire-Resistive Barrier Systems for Electrical System Components”.

1. REFERENCES
   1. Underwriters Laboratories (UL) of Northbrook, IL “Fire Resistance Directory”.

a. Through Penetration Firestop Systems (XHEZ)

b. Joint Systems (XHBN)

c. Perimeter Fire Containment Systems (XHDG)

d. Continuity Head-of-Wall Joint Systems (XHBO)

e. Fill, Void or Cavity Materials (XHHW)

f. Firestop Devices (XHJI)

g. Forming Materials (XHKU)

h. Wall Opening Protective Materials (CLIV)

* 1. All major building codes:

a. International Building Code published by ICC.

(Note to specifier: Retain or delete the building codes listed above as applicable).

* 1. National Fire Protection Association (NFPA) of Quincy, MA “NFPA 101: Life Safety Code”.
  2. National Fire Protection Association (NFPA) of Quincy, MA “NFPA 70: National Electrical Code”.
  3. Factory Mutual Approvals (FM) of Norwood, MA “FM 4991: Standard for Approval of Firestop Contractors”.
  4. Underwriters Laboratories (UL) of Northbrook, IL “UL Qualified Firestop Contractor Program”

1. PERFORMANCE REQUIREMENTS
   1. Provide products that upon curing do not re-emulsify, dissolve, leach, breakdown, or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture characteristic during and after construction.
   2. When intumescent products are used, provide products that do not contain sodium silicate or any other water soluble intumescent ingredient in the formulation.
   3. Provide firestop products that do not contain ethylene glycol.
   4. Provide firestop sealants sufficiently flexible to accommodate motion such as pipe vibration, water hammer, thermal expansion and other normal building movement without damage to the seal.
   5. Pipe insulation shall not be removed, cut away or otherwise interrupted through wall or floor openings. Provide products appropriately tested for the thickness and type of insulation utilized.
   6. Fire rated pathway devices shall be the preferred product and shall be installed in all locations where frequent cable moves, add-ons and changes will occur. Such devices shall be:
      1. Capable of retrofit around existing cables
      2. Designed such that two or more devices can be ganged together
      3. Maintenance free such that no action is required to activate the smoke and fire sealing mechanism
   7. When mechanical cable pathways are not practical, openings within walls and floors designed to accommodate voice, data and video cabling shall be provided with re-enterable products specifically designed for retrofit.
   8. Provide fire-resistive joint sealants sufficiently flexible to accommodate movement such as thermal expansion and other normal building movement without damage to the seal.
   9. Provide fire-resistive joint sealants designed to accommodate a specific range of movement and tested for this purpose in accordance with a cyclic movement test criteria as outlined in Standards, ASTM E1966, or ANSI/ UL 2079.
   10. Provide penetration firestop systems, fire-resistive joint systems, or perimeter fire barrier systems subjected to an air leakage test conducted in accordance with Standard, ANSI/ UL1479 for penetrations and ANSI/UL2079 for joint systems with published L-Ratings for ambient and elevated temperatures as evidence of the ability of firestop system to restrict the movement of smoke.
   11. Provide T-Rating Collar Devices tested in accordance with ASTM E814 or ANSI/UL1479 for metallic pipe penetrations requiring T-Ratings per the applicable building code.
   12. Provide a fire-rated grommet for all individual or small grouped cable applications up to 0.53 in. (14 mm).
   13. Provide moisture-curing products where inclement weather or greater than transient water exposure is expected.
   14. SUBMITTALS
2. Product Data: For each type of firestopping product indicated.
3. 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.
4. Product Certificates: Certificate of conformance signed by manufacturers of firestopping products certifying that products comply with requirements.
   1. QUALITY ASSURANCE
5. 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.
6. Engage an experienced installer who is certified, licensed, FM Approved in accordance with FM 4991, Certified by UL as a Qualified Contractor, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install firestop products per specified requirements. A manufacturer’s willingness to sell its firestopping products to Contractor or to an installer engaged by Contractor does not in itself confer qualifications on buyer.
7. Obtain firestop systems for each type of penetration or joint opening and construction condition indicated from a single manufacturer.
8. Conduct conference at Project site to comply with requirements in Division 1 Section “Project Meetings”.
   1. DELIVERY, STORAGE AND HANDLING
9. 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.
10. Store and handle materials for firestopping products to prevent their deterioration or damage due to moisture, temperature changes, contaminants or other causes.
    1. PROJECT CONDITIONS
11. Do not install firestopping products when ambient or substrate temperatures are outside limitations recommended by manufacturer.
12. Do not install firestopping products when substrates are wet due to rain, frost, condensation, or other causes.
13. Do not use materials that contain flammable solvents.
    1. COORDINATION
14. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.
15. Coordinate sizing of sleeves, openings, core-drilled holes or cut openings to accommodate through-penetration firestop systems.
16. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

PART 2 – PRODUCTS

* 1. FIRESTOPPING, GENERAL

1. 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.
2. 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.
   1. ACCEPTABLE MANUFACTURERS
3. Subject to compliance with through-penetration firestop systems (XHEZ) and/or wall opening protective materials (CLIV) and/or joint systems (XHBN) and/or perimeter fire containment systems (XHDG) and/or continuity head-of-wall joint systems (XHBO) listed in Volume 2 of the UL Fire Resistance Directory, provide products of the following manufacturers as identified below:
   1. Acceptable Manufacturer: Specified Technologies Inc., 210 Evans Way, Somerville, NJ 08876. Tel: (800) 992-1180, Fax: (908) 526-9623, Email: [specseal@stifirestop.com](mailto:specseal@stifirestop.com), Website: [www.stifirestop.com](http://www.stifirestop.com/).
   2. Substitutions: Not permitted.
   3. Single Source: Obtain firestop systems for each type of penetration and construction condition indicated only from a single manufacturer.
   4. MATERIALS
4. 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.
5. Premium Grade Intumescent Sealants: The firestopping sealant shall be a one-part, two-stage intumescent latex compound. The sealant, when exposed to high heat or flame shall be capable of expanding a minimum of 8 times. Range of continuing expansion shall be from 230°F to less than 1,000°F (110°C to less than 538°C). The sealant shall be thixotropic and shall be capable of caulking or troweling onto vertical surfaces or overhead. The sealant shall be UL Certified and/or FM Systems Approved and tested to the requirements of ASTM E814 (UL1479) and CAN/ULC-S115 and shall meet Class A finish requirements when tested in accordance with ASTM E84 (UL723).The following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal Series SSS Intumescent Sealant
6. Contractor Grade Intumescent Sealants: The firestopping sealant shall be a water-resistant, intumescent latex sealant. The sealant, when exposed to high heat or flame shall exhibit a free expansion of up to 10 times its original volume. The firestopping sealant shall contain no water soluble nor hygroscopic ingredients and shall be acoustically tested. The sealant shall be UL Certified and/or FM approved and tested to the requirements of ASTM E814 (UL1479), CAN/ULC-S115 and shall meet Class A finish requirements when tested in accordance with ASTM E84 (UL723). The following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal Series LCI Intumescent Sealant
7. Endothermic Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal Series LC Endothermic Sealant
8. Elastomeric Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture and accommodate minimum ±25 percent movement when tested according to ASTM E1399. Products shall be tested for use in construction joints incorporating floors and structural steel elements protected with Spray-applied Fire Resistive Materials, when present. The following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal Series AS Elastomeric Spray
   2. Specified Technologies, Inc. (STI) SpecSeal Series ES Elastomeric Sealant
9. Firestop Devices: Factory-assembled steel collars lined with intumescent material capable of expanding a minimum 30 times sized to fit specific outside diameter of penetrating item, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal Series SSC Firestop Collars
   2. Specified Technologies, Inc. (STI) SpecSeal Series LCC Firestop Collars

D. Fire Rated Cable Pathways: Gangable device modules capable of being retrofitted around existing cables and comprised of steel raceway with intumescent foam pads allowing 0 to 100 percent cable fill and requiring no additional action in the form of plugs, twisting closure, putty, pillow, or sealant to achieve fire and leakage ratings, the following products are acceptable:

* 1. Specified Technologies Inc. (STI) EZ-Path Fire Rated Pathway

1. Wall Opening Protective Materials: Intumescent, non-curing pads or inserts for protection of electrical switch and receptacle boxes to reduce horizontal separation to less than 24” (610 mm), the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal Series SSP Firestop Putty Pads
   2. Specified Technologies, Inc. (STI) SpecSeal Series EP PowerShield Insert Pads
2. Firestop Putty: Intumescent, 100% solids, non-hardening, water resistant, butyl rubber based putties containing no solvents or silicone compounds, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal Series SSP Firestop Putty
3. Wrap Strips: Single component intumescent elastomeric strips faced on both sides with a plastic film and capable of expanding a minimum 30 times, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal Series RED2 Wrap Strip
   2. Specified Technologies, Inc. (STI) SpecSeal Series BLU2 Wrap Strip
4. Firestop Pillows: Re-enterable, non-curing, mineral fiber core encapsulated with an intumescent coating on all six sides contained in a flame retardant poly bag, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal Series SSB Firestop Pillows
5. Mortar: Portland cement based dry-mix product formulated for mixing with water at Project site to form a non-shrinking, water-resistant, homogenous mortar, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal Series SSM Firestop Mortar
6. Silicone Sealants: Moisture curing, single component, silicone elastomeric sealant for horizontal surfaces (pourable or nonsag) or vertical surface (nonsag), the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal SIL300 Silicone Firestop Sealant
   2. Specified Technologies, Inc. (STI) SpecSeal SIL300 SL Self-Leveling Silicone Firestop Sealant’
7. All-Weather Coatings: Moisture curing, single component silicone copolymer elastomeric spray coatings for horizontal surfaces where greater water resistance is required or inclement weather is anticipated, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal FT305 Firestop Spray
8. Silicone Foam: Multicomponent, silicone-based liquid elastomers, that when mixed, expand and cure in place to produce a flexible, non-shrinking foam, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) Pensil 200 Silicone Foam
9. Composite Sheet: Intumescent material sandwiched between a galvanized steel sheet and steel wire mesh protected with aluminum foil capable of sustaining a minimum 2,500 lbs (1,134 kg) when subjected to load testing, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal CS Composite Sheet
10. Cast-In-Place Firestop Device: Single component molded firestop device installed on forms prior to concrete placement with totally encapsulated, tamper-proof integral firestop system and smoke sealing gasket, the following products are acceptable:
    1. Specified Technologies, Inc. (STI) SpecSeal CD Cast-In Firestop Device
11. Fire-Rated HVAC Retaining Angles: Steel angle system with integral intumescent firestop gasket for use on steel HVAC ducts, the following products are acceptable:
    1. Specified Technologies, Inc. (STI) SpecSeal FyreFlange Firestop Angles
12. Firestop Plugs: Re-enterable, foam rubber plug impregnated with intumescent material capable of expanding minimum 10 times with expansion beginning at 350°F (177°C) for use in blank openings and cable sleeves, the following products are acceptable:
    1. Specified Technologies, Inc. (STI) SpecSeal Series FP Firestop Plug
13. Fire-Rated T Rating Collar Device: Louvered steel collar system with synthetic aluminized polymer coolant wrap installed on metallic pipes where T Ratings are required by applicable building code requirements, the following products are acceptable:
    1. Specified Technologies, Inc. (STI) SpecSeal T-Collar Device
14. Fire-Rated Cable Grommet: Molded two-piece grommet made from plenum grade polymer with a foam inner core for sealing cable penetrations up to 0.53 in. (14 mm) diameter, the following products are acceptable:
    1. Specified Technologies, Inc. (STI) EZ-Firestop Grommet (RFG1 or RFG2)
15. Fire-Rated Closet Flange Gasket: Molded, single-component, intumescent gasket for use beneath a closet flange in floor applications, the following products are acceptable:
    1. Specified Technologies, Inc. (STI) SpecSeal Series CF34 Closet Flange Firestop Gasket
16. Protective Wrap: Endothermic Wrap incorporating foil scrim evaluated for protection of cable pathways, liquid fuel lines, as well as in through-penetration and membrane-penetration firestopping. Testing to incorporate protection of Electrical Metallic Tubing (EMT), Rigid Metallic Conduit (RMC), Cable Trays, single and/or multi containment liquid fuel lines. Wrap to have a maximum weight of no greater than 1.4 lbs/ft2 and allow for the use of steel tie wire when installed around piping, conduits, and/or cable trays. The following products are acceptable:
    1. Specified Technologies, Inc. (STI) E-Wrap™ Endothermic Wrap

PART 3 – EXECUTION

* 1. PREPARATION

A. Examination of Conditions: 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.

1. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
2. Do not proceed until unsatisfactory conditions have been corrected.
   1. FIRESTOPPING INSTALLATION

A. General Requirements: Install through-penetration firestop systems and fire-resistive joint systems in accordance with “Performance Criteria” Article and in accordance with the conditions of testing and classification as specified in the published design.

1. Manufacturer’s Instructions: Comply with manufacturer’s instructions for installation of firestopping products.
   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. Apply a suitable bond-breaker to prevent three-sided adhesion in applications where this condition might occur such as the intersection of a gypsum wallboard/steel stud wall to floor or roof assembly where the joint is backed by a steel ceiling runner or track.
   5. 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”.
   6. FIELD QUALITY CONTROL
2. Inspections: Owner shall engage a qualified independent inspection agency to inspect through-penetration firestop systems in accordance with ASTM E2174, “Standard Practice for On Site Inspection of Installed Fire Stops” or joint systems in accordance with ASTM E2393, “Standard Practice for On Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers”. NOTE: Manufacturers are not qualified inspection agencies, and it is a conflict of interest for the manufacturer to perform inspections of installed firestopping systems according to the aforementioned inspection standards.
3. Keep areas of work accessible until inspection by authorities having jurisdiction.
4. Where deficiencies are found, repair or firestopping products so they comply with requirements.
   1. ADJUSTING AND CLEANING
5. Remove equipment, materials and debris, leaving area in undamaged, clean condition.
6. Clean all surfaces adjacent to sealed openings to be free of excess firestopping materials and soiling as work progresses.

END OF SECTION

SpecSeal Firestop Products

EZ-Path Fire Rated Pathways

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