SECTION 078400 - FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Penetration firestopping systems.
2. Firestopping of joints and penetrations in fire-resistance-rated assemblies, whether indicated on drawings or not, and other openings indicated.

B. Related Requirements:

1. Section 079200 "Joint Sealants" for non-fire-resistance-rated joint sealants.
2. Section 079219 "Acoustical Joint Sealants" for sealing joints in sound-rated construction.
3. Section 092216 "Non-Structural Metal Framing" .
4. Plumbing work for penetrations into rated shaft areas and through concrete floors.
5. Electrical work for penetrations into rated shaft areas and electrical closets, concrete floors.
6. Mechanical work for penetrations into rated shaft areas.

1.2 COORDINATION

A. Coordinate construction of breaches for separation of adjacent spaces and breaches made for penetrating items that enter the breach, to ensure that penetration and joint firestopping systems can be accessed and installed in accordance with specified firestopping system listing and manufacturer's written instructions.

B. Coordinate sizing of sleeves, openings, core-drilled holes, and cut breaches in assemblies to accommodate penetration and joint firestopping systems.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of specified product.

1. Include manufacturer's written installation and repair instructions.

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B. Listed Firestopping Assemblies Schedule: For each firestopping system. Include illustration of firestopping system and design designation of qualified fire testing agency.

1.5 INFORMATIONAL SUBMITTALS

A. Listed System Designs (Listings): For each firestopping system, for tests performed by a qualified testing agency.

B. Firestop Compatibility and Non-Compatibility Charts: For each firestopping system, provided by firestop manufacturer.

1.6 CLOSEOUT SUBMITTALS

A. Installer Project Certificate of Completion: From Installer indicating that firestopping systems have been installed in compliance with listing requirements and manufacturer's written installation instructions, including UL Solutions Master Certificate of Compliance.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install firestopping systems when ambient or substrate temperatures are outside limits permitted by firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

B. Install and cure firestopping system materials in accordance with manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain firestopping systems for each type of opening or joint indicated from single manufacturer to the greatest extent possible.

2.2 PENETRATION FIRESTOPPING SYSTEMS

A. General: Provide penetration firestopping systems that resist spread of fire, heat, resist passage of smoke when required by the assembly type, and maintain original fire-resistance rating or smoke resistance of construction penetrated. Penetration firestopping systems must be compatible with one another, with the substrates forming openings, and with penetrating items.

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1. Penetration firestopping systems must be installed with products bearing the classification marking of a qualified nationally recognized testing agency.

    a. UL Solutions in its online directory "Product iQ."

    b. FM Approvals in its "Approval Guide."

2. Provide components for each penetration firestopping system that, upon curing, do 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 that are characteristic during and after construction.
3. Provide components for each penetration firestopping system that do not contain ethylene glycol.
4. Provide components for each penetration firestopping system that are sufficiently flexible to accommodate movement such as pipe vibration, water hammer, thermal expansion, and other normal building movement without damage to assembly.
5. Provide components for each penetration firestopping system that are appropriately tested for the thickness and type of insulation utilized.

B. Penetration Firestopping Systems in Fire-Resistance-Rated Walls:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Hilti, Firestop & Fire Protection products
    b. 3M, Fire Protection Solutions

2. Fire-Resistance Rating: Determined in accordance with ASTM E814 or UL 1479.
3. F-Rating: Not less than the fire-resistance rating of the wall assembly penetrated.

C. Penetration Firestopping Systems in Horizontal Assemblies:

1. Fire-Resistance Rating: Determined in accordance with ASTM E814 or UL 1479.
2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of the floor/ceiling assembly penetrated.
3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of the floor/ceiling or wall assembly. The following horizontal penetrations do not require a T-rating:

    a. Those within the cavity of a wall.
    b. Floor, tub, or shower drains within a concealed space.
    c. **4-inch** or smaller metal conduit penetrating directly into metal-enclosed electrical switchgear.

4. W-Rating: Provide penetration firestopping systems with a Class 1 W-rating in accordance with UL 1479.

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2.3 JOINT FIRESTOPPING SYSTEMS

A. General: Provide joint firestopping systems that resist spread of fire, heat, passage of smoke when required by the assembly type, and maintain original fire-resistance rating or smoke resistance of assemblies in or between installed joint firestopping systems. Joint firestopping systems must accommodate building movements without impairing their ability to resist the passage of fire and hot gases.

1. Joint firestopping systems must be compatible with one another, with the substrates forming openings, and with penetrating items, if any.
2. Provide products that, upon curing, do 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.
3. Provide firestop products that do not contain ethylene glycol.

2.4 ACCESSORIES FOR FIRESTOPPING

A. General: Provide components for each firestopping system that are needed to install fill materials and to maintain ratings required. Use only components specified by firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated, including but not limited to the following:

1. Permanent forming/damming/backing materials.
2. Substrate primers.
3. Collars.
4. Steel sleeves.

B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

C. Firestopping Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.

E. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric strips for use around combustible penetrants.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogeneous mortar.

H. Pillows/Bags: Compressible, removable, and reusable intumescent pillows encased in fire-retardant polyester or glass-fiber cloth. Where exposed, and when required by a listed system, cover openings with steel-reinforcing wire mesh to protect pillows/bags

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from being easily removed or dislodged.

I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.

J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.

K. Thermal and Endothermic Wraps: Flexible, insulating, and fire-resistant protective wraps tested and listed for up to 2-hour fire ratings in accordance with ASTM E814 or UL 1479; for protecting membrane penetrations of utility boxes, critical electrical circuits, communications lines, and fuel lines, and for thermal barrier and circuit integrity protection in accordance with ASTM E1725 or UL 1724.

L. Fire-Rated Cable Sleeve Kits: Complete kits designed for new or existing cable penetrations through walls that accept standard accessories.

M. Fire-Rated Cable Pathways: Single or gangable device modules composed of a steel raceway with integral intumescent material and requiring no additional action in the form of plugs, twisting closure, putty, pillows, sealant, or other items to achieve fire and air-leakage ratings.

1. Fire-rated cable pathway devices are the preferred product for data, video, and communications cable penetrations. Install these devices in locations where frequent cable moves, add-ons, and changes will occur. Such devices must be:

    a. Capable of retrofit around existing cables.
    b. Designed so that two or more devices can be ganged together.
    c. Maintenance free so no action is required to activate the smoke- and fire-sealing mechanism.

2. Where fire-rated cable pathway devices are not practical, openings within walls and floors designed to accommodate data, video, and communications cabling must be provided with re-enterable products specifically designed for retrofit, such as retrofit devices for cable bundles, firestopping putty, plugs, or pillows.

N. Retrofit Device for Cable Bundles: Factory-made, intumescent, collar-like device for existing over-filled cable sleeves, and capable of being installed around projecting sleeves and cable bundles.

O. Wall-Opening Protective Materials: Intumescent, non-curing putty pads or self-adhesive inserts for protection of electrical switch and receptacle boxes.

P. Fire-Rated HVAC Retaining Angles: Steel angle system with integral intumescent firestopping gasket for use around rectangular steel HVAC ducts without fire dampers.

Q. Firestopping Plugs: Flexible, re-enterable, intumescent, foam-rubber plug for use in blank round openings and cable sleeves.

R. Fire-Rated Cable Grommets: Molded two-piece grommet made of plenum-grade

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polymer and foam inner core for sealing small cable penetrations in gypsum walls up to **1/2 inch** in diameter.

S. Closet Flange Gaskets: Molded, single-component, flexible, intumescent gasket for use beneath a water closet (toilet) flange in floor applications.

2.5 MIXING

A. Firestopping Materials: For those products requiring mixing before application, comply with firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrate surfaces and conditions, with Installer present, for compliance with requirements for opening and joint configurations, penetrating items, substrate surfaces, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Before installing firestopping systems, clean surfaces in accordance with manufacturer's written instructions and with the following requirements:

1. Remove foreign materials from substrate surfaces that could interfere with adhesion of firestopping materials.
2. Clean substrate surfaces and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping system materials as recommended by manufacturer. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Prime substrate surfaces in accordance with firestopping system manufacturer's written installation instructions, using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

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3.3 INSTALLATION OF PENETRATION FIRESTOPPING SYSTEMS

A. General: Install penetration firestopping systems in accordance with manufacturer's written installation instructions, fire-test-laboratory listings, and published design drawings for products and applications.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire-resistance ratings indicated in accordance with manufacturer's written instructions and fire-test-laboratory listings.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories that are not permanent components of firestopping systems.

C. Fill Materials: Install in accordance with manufacturer's written instructions to produce the following results:

1. Install fill materials into breaches, voids and cavities formed by openings, forming materials, accessories, and penetrating items to achieve required fire-resistance ratings.
2. Apply fill materials so they contact and adhere to substrate surfaces formed by wall or floor assembly and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 INSTALLATION OF JOINT FIRESTOPPING SYTEMS

A. General: Install joint firestopping systems in accordance with manufacturer's written installation instructions and published design drawings for products and applications indicated.

B. Elastomeric Fill Materials: Install for joint firestopping systems by proven techniques to produce the following results:

1. Apply elastomeric fill in voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.5 FIELD QUALITY CONTROL

A. Owner will engage a qualified inspection agency to conduct and report on inspections in accordance with ASTM E2174 for penetration firestopping and ASTM E2393 for fire-resistive joint firestopping and perimeter fire-barrier systems.

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B. Where deficiencies are found or firestopping system is damaged or removed because of testing, repair or replace firestopping system in accordance with manufacturer's written repair instructions to comply with requirements.

C. Proceed with enclosing firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING

A. Clean off excess fill materials adjacent to openings and joints as the Work progresses by methods and with cleaning materials that are approved in writing by firestopping system manufacturers and that do not damage materials in which openings occur.

3.7 PROTECTION

A. Provide final protection and maintain conditions during and after installation that ensure that firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated firestopping material and install new materials to produce systems complying with specified requirements.

END OF SECTION 078400

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