

SECTION 07 84 46 - FIRE-RESISTIVE JOINT SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide fire-resistive joint systems in accordance with requirements of the Contract Documents.
- B. Section Includes:
 - 1. Joints in or between fire-resistance-rated constructions.
 - 2. Joints at exterior curtain-wall/floor intersections.
 - 3. Joints in smoke barriers.
- C. Related Sections:
 - 1. Section 07 21 00 "Thermal Insulation" for floor-to-wall joints indicated as perimeter fire-containment systems between perimeter edge of fire-resistance-rated floor assemblies and back of non-fire-resistance-rated exterior curtain walls.
 - 2. Section 07 84 13 "Penetration Firestopping" for penetrations in fire-resistance-rated walls, horizontal assemblies, and smoke barriers.
 - 3. Section 07 95 00 "Expansion Control" for fire-resistive architectural joint systems.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each fire-resistive joint system, show each kind of construction condition in which joints are installed and relationships to adjoining construction. Include fire-resistive joint system design designation of testing and inspecting agency acceptable to authorities having jurisdiction that demonstrates compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each fire-resistive joint system configuration for construction and penetrating items.
 - 2. Where project conditions require modification of qualified testing and inspecting agency's illustration to suit a particular through-penetration firestop condition, submit engineer judgement drawing developed by joint firestop system manufacturer's fire-protection engineer in accordance with the provisions of the International Firestop Council.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Installer Certificates: From Installer indicating fire-resistive joint systems have been installed in compliance with requirements and manufacturer's written recommendations.

- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fire-resistive joint systems.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."
- B. Installer Qualifications: A firm experienced in installing fire-resistive joint systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its fire-resistive joint system products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.
- C. Installation Responsibility: Assign installation of fire-resistive joint systems and through-penetration firestop systems in Project to a single qualified installer.
- D. Source Limitations: Obtain fire-resistive joint systems from a single manufacturer.
- E. Fire-Test-Response Characteristics: Fire-resistive joint systems shall comply with the following requirements:
 - 1. Fire-resistive joint system tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Fire-resistive joint systems are identical to those tested per testing standard referenced in "Fire-Resistive Joint Systems" Article. Provide rated systems complying with the following requirements:
 - a. Fire-resistive joint system products bear classification marking of qualified testing agency.
 - b. Fire-resistive joint systems correspond to those indicated by reference to designations listed by the following:
 - 1) UL in its "Fire Resistance Directory."
 - 2) Intertek ETL SEMKO in its "Directory of Listed Building Products."
- F. Installer Training: Individuals performing the installation of fire-resistive joint systems shall be trained by a direct representative of the fire-resistive joint systems materials manufacturer, not a distributor or agent.
- G. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

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

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by fire-resistive joint system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure fire-resistive joint systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

- A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
- B. Coordinate sizing of joints to accommodate fire-resistive joint systems.
- C. Notify Owner's testing agency at least seven days in advance of fire-resistive joint system installations; confirm dates and times on day preceding each series of installations.
- D. Do not cover up fire-resistive joint system installations that will become concealed behind other construction until Owner's inspecting agency and building inspector, if required by authorities having jurisdiction, have examined each installation.

1.8 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace fire-resistive joint systems that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which fire-resistive joint systems manufacturer agrees to furnish fire-resistive joint systems material to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Life of the building.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Provide fire-resistive joint systems that are produced, tested 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 assembly in which fire-resistive joint systems are installed.
- B. Joint Systems in and between Fire-Resistance-Rated Constructions: Provide systems with assembly ratings equaling or exceeding the fire-resistance ratings of construction that they join, and with movement capabilities, W and L-ratings indicated as determined by UL 2079 (ASTM E1966) under a positive pressure

differential not less than 0.01 in. water column and classified with ratings for fire resistance, leakage, and movement capability to meet the specified requirements.

- C. Perimeter Fire-Containment (Barrier) Systems: For joints between edges of fire-resistance-rated floor assemblies and exterior wall assemblies, provide systems of type as determined by NFPA 285 and ASTM E2307 under positive pressure differential of not less than 0.01 in. water column and classified with ratings for integrity, insulation, leakage, and movement capability to meet the specified requirements.
 - 1. UL listed, Fire Resistance of Perimeter Fire-Containment Systems: Integrity and insulation ratings equal or exceeding fire resistance ratings of floor or floor wall and floor ceiling assembly forming one side of joint, as indicated as determined by applicable codes and UL 2079.
- D. For fire resistive joint systems assemblies exposed to view:
 - 1. Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
 - 2. At traffic, moisture and subject physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
- E. Building Movement: Provide fire resistive joint systems suitable to withstand building movements, including thermal movements, loading deflections, shrinkage, creep and similar movements, when tested in accordance with specified standards.

2.2 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Basis-of-Design Products: The design for each fire-resistive joint system is based on products named in Part 2 articles. Subject to compliance with requirements, provide either the named products or comparable products by one of the following:
 - a. Hilti, Inc.
 - b. RectorSeal Corporation.
 - c. Specified Technologies Inc.
 - d. 3M Fire Protection Products.
 - e. Tremco, Inc.; Tremco Fire Protection Systems Group.

2.3 FIRE-RESISTIVE JOINT SYSTEMS

- A. Where required, provide fire-resistive joint 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 assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
- B. Joints in or between Fire-Resistance-Rated Construction: Provide fire-resistive joint systems with ratings determined per ASTM E 1966 or UL 2079:
 - 1. Joints include those installed in or between fire-resistance-rated walls floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies.

2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of construction they will join.
- C. Joints at Exterior Curtain-Wall/Floor Intersections: Provide fire-resistive joint systems with rating determined by ASTM E 2307 based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
 1. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the floor assembly.
- D. Joints in Smoke Barriers: Provide fire-resistive joint systems with ratings determined per UL 2079.
 1. L-Rating: Not exceeding 5.0 cfm/ft (0.00775 cu. m/s x m) of joint at 0.30 inch wg (74.7 Pa) at both ambient and elevated temperatures.
- E. Exposed Fire-Resistive Joint Systems: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- F. VOC Content: Fire-resistive joint system sealants shall comply 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.
- G. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install fill materials and to maintain ratings required. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing agency for systems indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, 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: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. Remove loose particles remaining from cleaning operation.
 3. Remove laitance and form-release agents from concrete.

- B. Priming: Prime substrates where recommended in writing by fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing fire-resistive joint system's seal with substrates.

3.3 INSTALLATION

- A. General: Install fire-resistive joint systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.
- C. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
 - 2. Apply fill materials so they contact and adhere to substrates formed by joints.
 - 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 IDENTIFICATION

- A. Identify fire-resistive joint systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of joint edge so labels will be visible to anyone seeking to remove or penetrate joint system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 - 1. The words "Warning - Fire-Resistive Joint System - Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Designation of applicable testing agency.
 - 4. Date of installation.
 - 5. Manufacturer's name.
 - 6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections.

- B. Where deficiencies are found or fire-resistive joint systems are damaged or removed due to testing, repair or replace fire-resistive joint systems so they comply with requirements.
- C. Proceed with enclosing fire-resistive joint systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTING

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

3.7 FIRE-RESISTIVE JOINT SYSTEM SCHEDULE

- A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHBN or Category XHDG.
 - 1. Equivalent approved systems by the following are acceptable:
 - a. Intertek ETL SEMKO-approved systems that are listed by design numbers in Intertek ETL SEMKO's "Directory of Listed Building Products" under "Firestop Systems."
- B. Floor-to-Floor, Fire-Resistive Joint System:
 - 1. Acceptable UL-Classified Products equivalent to, but not limited to, the following:
 - a. FFD1013, FFD1039, FFD1047, FFD1087 by Hilti.
 - b. FFD1024 & FFD1027 – RectorSeal Flamesafe®.
 - c. FFD0042, FFD0073, FFD0074, FFD1057, FFD1085, FFD1058, FFD1060, FFD1061 – Tremco TREMstop Firestopping.
 - 2. Assembly Rating: Refer to Drawings.
 - 3. Nominal Joint Width: As indicated.
 - 4. Movement Capabilities: Class II; refer to Drawings.
- C. Wall-to-Wall, Fire-Resistive Joint System equivalent to, but not limited to, the following:
 - 1. Acceptable UL-Classified Products:
 - a. WWD0017, WWD0032, WWD0040 by Hilti.
 - b. WWD1028 & WWD1029 – RectorSeal Flamesafe®.
 - c. WWD1052 & WWD0089 – Tremco TREMstop Firestopping.
 - 2. Assembly Rating: Refer to Drawings.
 - 3. Nominal Joint Width: As indicated.
 - 4. Movement Capabilities: Class II; refer to Drawings.
- D. Floor-to-Wall, Fire-Resistive Joint System equivalent to, but not limited to, the following:
 - 1. Acceptable UL-Classified Products:

- a. FWD1013, FWD1037, FWD1047, FWD1071 by Hilti.
 - b. FWD1020 & FWD1024 – RectorSeal Flamesafe®.
 - c. FWD1053, FWD0051, FWD1054, FWD1059 – Tremco TREMstop Firestopping.
2. Assembly Rating: Refer to Drawings.
 3. Nominal Joint Width: As indicated.
 4. Movement Capabilities: Class II; refer to Drawings.
- E. Head-of-Wall, Fire-Resistive Joint System equivalent to, but not limited to, the following:
1. Acceptable UL-Classified Products:
 - a. HWD0042, HWD0045, HWD0049, HWD1066, HWD0184, HWD0292, HWD0209, HWD0324, HWD0081, HWD0268, HWD1037, HWD1058, HWD0181 by Hilti.
 - b. HWD0107, HWD0146, HWD0144, HWD1047, HWD1021, HWD1024, HWD0148, HWD0149, HWD0150, HWD-0267, HWD-0299, HWD-257 & HWD-0300– RectorSeal Flamesafe®.
 - c. HWD0017, HWD0092, HWD0251, HWD1072, TL/PV 120-02, TL/PV 120-05, HWD1054, HWD1049, HWD0450, HWD0344 – Tremco TREMstop Firestopping.
 2. Assembly Rating: Refer to Drawings.
 3. Nominal Joint Width: As indicated.
 4. Movement Capabilities: Class II; refer to Drawings.
- F. Bottom-of-Wall, Fire-Resistive Joint Systems equivalent to, but not limited to, the following:
1. Acceptable UL-Classified Products:
 - a. BWS0001c, BWS0002c, BWS0023a, by Hilti.
 - b. FWD0051, FWD1069, FWD0035, FWD0036, FWD1053, FWD1056, FWD1057 – Tremco TREMstop Firestopping.
 2. Assembly Rating: Refer to Drawings.
 3. Nominal Joint Width: As indicated.
 4. Movement Capabilities: Class II; refer to Drawings.
- G. Perimeter Fire-Resistive Joint Systems equivalent to, but not limited to, the following:
1. Acceptable UL Classified Products:
 - a. CWD2026, CWD2027, CEJ127P, CEJ216P, CEJ244P, CEJ245P, CEJ246P, CEJ259P, CEJ260P, CEJ261P, CEJ262P, CEJ263P, CEJ307P, CEJ421P by Hilti.
 - b. CEJ150P, CEJ151P, CEJ152P, CEJ153P, CEJ154P, CEJ-273P, CEJ-274P, CEJ-275P, CEJ-276P, CEJ-296P CEJ-297P, CEJ527P, CEJ528P & CEJ530P – RectorSeal Flamesafe®.
 - c. CWD2043, CWS1016, TL/JS 120-03, TL/PH 120-01, CWD2044, CWD2045, TL/JS 120-04, TL/JS 90-01 – Tremco TREMstop Firestopping.
 2. Assembly Rating: Refer to Drawings.
 3. Nominal Joint Width: As indicated.
 4. Movement Capabilities: Class II; refer to Drawings.

END OF SECTION