

## **SECTION 07 21 00**

### **INSULATION**

#### **PART 1: GENERAL**

##### **1.01 RELATED DOCUMENTS**

- A. Drawings, Details of Construction and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work specified in this section.

##### **1.02 SUMMARY**

- A. Section includes product specification of the following:
  - 1. Cavity wall insulation used primarily as cavity wall insulation in masonry.
  - 2. Batt insulation used with interior stud wall construction.
  - 3. Expanding foam insulation as shown on drawings.
- B. Installation of insulation specified in other sections:
  - 1. Unit Masonry – Section 04 20 00/04 27 13
  - 2. Carpentry – Section 06 10 53
  - 3. Gypsum Board – Section 09 21 16
  - 4. Acoustical Ceilings – Section 09 51 00
- C. Related work specified in other sections:
  - 1. Polyurethane Foam Insulation – Section 07 21 29

##### **1.03 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Deliver material to the site in unopened packages, with identification labels intact.
- B. Store under water-resistant cover and protect from weather and direct sunlight.
- C. Remove damaged materials from site.

##### **1.04 ENVIRONMENTAL REQUIREMENTS**

- A. Do not install rigid insulation (on vertical surfaces with adhesive) when temperature is below 40° F., during rain or wet weather, or when surfaces are wet.

##### **1.05 SCHEDULING**

- A. Coordinate installation with other trades whose work may be affected or have effect.

## **PART 2: PRODUCTS**

### **2.01 MATERIALS**

- A. Rigid Board Insulation: Rigid closed cell extruded polystyrene thermal board insulation as manufactured by Amoco Foam Products, Diversifoam Products, Dow Chemical, and Owens Corning.
1. Thermal Resistance: Aged R-value per inch of 5 at 75° F mean temperature per ASTM C518.
    - a. Perimeter Insulation and Cavity Wall Insulation:
      - 1) Conforming to ASTM C578-95 type IV.
      - 2) Compressive strength: 25 psi per ASTM C203.
      - 3) Minimum per rating at 2" thickness: .55
- B. Batt Insulation: Unfaced fiberglass batt as manufactured by Certain Teed, Johns Manville, and Owens Corning.
1. Thermal resistance: Minimum R-value of 3.3 per inch per ASTM C518.
  2. Conforming to property requirements of ASTM C665, type 1 and ASTM E136.
- C. Expanding Foam Insulation: Dow Chemical Great Stuff Pro or equal one part polyurethane foam sealant.
1. Conform to ASTM C557-93, D6464, CA25-4 and is UL Class 1 (Flame Spread of 15, Smoke of 20).
  2. Application temperature range of 25°F to 120°F.
  3. Paintable, stainable and sandable.
  4. Acoustical Rating: Sound transmission class rating of 69.
  5. Minimum R.Value of 4 per inch.
- F. Vapor Barriers:
1. Walls: Glass reinforced or laminated polyethylene sheet, minimum perm rating, 0.1 when tested in accordance with ASTM-E96, Procedure A.
    - a. Manufacturers/Products: Fortifiber "Moistop", Rufco SS-300, Glas-Krafat, inc.
    - b. Vapor Barrier Tape: Compatible polyethylene self adhesive tape recommended by vapor barrier manufacturer.
    - c. Adhesive: 100% silicone.
  2. Floors: Meet requirements of ASTM E1745 Class C or A. Provide appropriate type for scheduled finish materials:
    - a. Floor slabs scheduled to receive no flooring covering and low permeance floor coverings or coatings such as VCT, quartz reinforced composition tile, sheet vinyl, PVC, carpet, rubber, urethane, epoxy, and paint:
      - 1). Materials: Meets Class C, 10 mil minimum thickness plastic sheeting, permeance rating per ASTM E96 of 0.03 perms or lower.
      - 2). Manufacturers/Products: Perminator 10 mil by WR Meadows; Stego Wrap Vapor Retarder by Stego Industries; Vaporblock 10 by Raven Industries; Griffolyn 10 mil by Reef Industries.
    - b. Floor slabs scheduled to receive critically moisture sensitive flooring applications such as linoleum, or glue-down wood flooring:
      - 1). Materials: Meets Class A, 15 mil minimum thickness polyolefin geomembrane,
        - a) Water vapor transmission rate per ASTM E96 of 0.008 grains/sf/hr WVTR or lower

- b) Maintain permeance rating of less than 0.01 perms per ASTM F 1249 after mandatory conditioning tests per ASTM E 154 Sections 8, 11, 12 and 13.
- c) Puncture resistance of 2200 grams when tested in accordance with ASTM D 1709.
- d) Tensile strengths of 75 lbf./in. when tested in accordance with ASTM D 882.

2). Manufacturers/Products: Perminator 15 mil by W.R. Meadows; Griffolyn 15 mil by Reef Industries; Stego Wrap (15 mil) by Stego Industries; Vaporblock 15 by Raven-Industries.

3. Vapor Barrier Accessories:

a. Seam tape and vapor proofing mastic conforming to the following property and as recommended by vapor barrier manufacturer:

1) Water Vapor Transmission Rate per ASTM E96 or ASTM F1249: 0.3 perms or lower.

b. Pipe boots constructed from vapor barrier material, pressure sensitive tape and/or mastic per manufacturer's instructions.

D. Sheathing Tape: #8087 construction sheathing tape as manufactured by 3M or equal.

- 1. Construction: Biaxially oriented polypropylene film with acrylic adhesive. 2 13/16" roll width.
- 2. Typical physical properties:

		<b>ASTM Test Method</b>
Adhesion to Steel	24 oz./in. width	D-3330
Adhesion to Tyvek® Housewrap	15 oz./in. width Pulls fibers	D-3330
Adhesion to Polyethylene	10 oz./in. width	D-3330
Tensile Strength	31 lbs./in. width	D-3759
Elongation at Break	150%	D-3759
Tape Thickness	2.9 mils	D-3652
Application Temperature	14 F to 120 F	
Service Temperature	-40 F to 220 F	

**PART 3: EXECUTION**

**3.01 INSTALLATION**

A. Refer to specific specification sections for installation.

**END OF SECTION 07 21 00**



## **SECTION 07 51 15**

### **ROOF PATCHING**

#### **PART 1: GENERAL**

##### **1.01 RELATED DOCUMENTS**

- A. Drawings, Details of Construction and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work specified in this section.
- B. Refer to Section 01 21 00 Allowances for additional requirements.

##### **1.02 SUMMARY**

- A. Maintain existing warranty issued by Firestone mfg. Roofer must be certified by manufacturer to work on warranted roof.
- B. Scope of work includes cutting in and patching of vents, curbs, drains and/or any other miscellaneous work identified on Architectural, Mechanical or Electrical plans.
- C. Provide an EPDM roofing system including insulation.

##### **1.03 SUBMITTALS**

- A. Submit in accordance with Section 01 33 00.
  - 1. Submit roofing contractors letter certifying roof has been inspected and composition of existing roof determined.
  - 2. Submit roofing manufacturer's letter certifying roof has been inspected and existing warranty has been maintained.

##### **1.04 QUALITY ASSURANCE**

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle and store materials in accordance with manufacturer's instructions.
- B. FM Class I, UL Class A, Class 90 wind uplift.

##### **1.05 WARRANTY**

- A. Maintain existing Firestone (mfg) warranty, verify duration of warranty with the Owner.

#### **PART 2: PRODUCTS**

##### **2.01 MATERIALS**

- A. EPDM
  - 1. Insulation (Based and Tapered): Polyisocyanurate insulation faced with a universal fiber glass reinforced facer as approved by roofing manufacturer.
  - 2. EPDM membrane: 60 mil at fully adhered, 45 mil at ballasted.
  - 3. Protection board: ½" high density wood fiberboard with non-asphaltic binders.

4. Provide products for use with specified roofing system including, but not limited to taper primer/wash, bonding cement, lap cement, seam tape, peel and stick tape, flashing, lap caulk, sealing mastic, pourable sealer, prefabricated flashing, termination bar, fasteners / anchors, and pipe boots.

### **PART 3: EXECUTION**

#### **3.01 INSTALLATION**

- A. Inspect substrate and report unsatisfactory conditions in writing. Beginning work means acceptance of substrate. Coordinate installation with other trades, including carpentry, flashing and penetrating work.
- B. Comply with NRCA Roofing and Waterproofing Manual and manufacturer's installation instructions.
- C. Clean, prime and prepare substrate.
- D. Install insulation in one layer with tightly butted joints and neatly fitted around penetrations.
- E. Install walkway protection membrane at locations indicated and where required to provide access to roof mounted equipment.
- F. Restore or replace damaged components. Protect work from damage.

**END OF SECTION 07 51 15**

## **SECTION 07 84 00**

### **FIRESTOPPING**

#### **PART 1 - GENERAL**

##### **1.01 RELATED DOCUMENTS**

- A. Drawings, Details of Construction and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work specified in this section.

##### **1.02 DEFINITIONS**

- A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in, or construction joints between, fire rated wall and floor assemblies.

##### **1.03 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION**

- A. Only tested firestop systems shall be used in specific locations as follows:
  - 1. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.
  - 2. Safing slot gaps between edge of floor slabs and curtain walls.
  - 3. Openings between structurally separate sections of wall or floors.
  - 4. Gaps between the top of walls and ceilings or roof assemblies.
  - 5. Expansion joints in walls and floors.
  - 6. Openings and penetrations in fire-rated partitions or walls containing fire doors.
  - 7. Openings around structural members which penetrate floors or walls.

##### **1.04 RELATED WORK OF OTHER SECTIONS**

- A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:
  - 1. Section 03 30 00 - Cast-In-Place Concrete
  - 2. Section 07 92 00 - Joint Sealers
  - 3. Section 04 20 00 - Masonry Work
  - 4. Section 09 24 /09 23 00 - Lath and Plaster
  - 5. Section 09 21 16 - Gypsum Drywall Systems
  - 6. Division 23 - HVAC
  - 7. Division 21 - Fire Protection
  - 8. Division 22 - Plumbing
  - 9. Division 26 – Electrical
  - 10. Division 27 – Communications
  - 11. Division 28 – Electronic Safety and Security

## 1.05 REFERENCES

- A. Test Requirements: ASTM E 814, "Standard Method of Fire Tests of Through Penetration Fire Stops"
- B. Test Requirements: UL 1479, "Fire Tests of Through-Penetration Firestops"
- C. Test Requirements: UL 2079, "Tests for Fire Resistance of Building Joint Systems"
- D. Underwriters Laboratories (UL) of Northbrook, IL publishes tested systems in their "FIRE RESISTANCE DIRECTORY" that is updated annually.
  - 1. UL Fire Resistance Directory:
    - a. Firestop Devices (XHJI)
    - b. Fire Resistance Ratings (BXRH)
    - c. Through-Penetration Firestop Systems (XHEZ)
    - d. Fill, Voids, or Cavity Material (XHHW)
    - e. Forming Materials (XHKU)
    - f. Joint Systems (XHBN)
    - g. Perimeter Fire Containment Systems (XHDG)
  - 2. Alternate Systems: "Omega Point Laboratories Directory" (updated annually).
- E. Test Requirements: ASTM E 1966, "Standard Test Method for Fire Resistive Joint Systems"
- F. Test Requirements: ASTM E 2307, "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus"
- G. Inspection Requirements: ASTM E 2174, "Standard Practice for On-site Inspection of Installed Fire Stops"
- H. ASTM E 84, "Standard Test Method for Surface Burning Characteristics of Building Materials"
- I. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments
- J. International Building Code as modified by local jurisdiction.
- K. NFPA 101 - Life Safety Code
- L. NFPA 70 - National Electric Code

## 1.06 QUALITY ASSURANCE

- A. A manufacturer's direct representative to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.
- B. Firestop System installation must meet requirements of ASTM E 814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.
- C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.
- D. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.



- E. For those firestop applications that exist for which no UL tested system is available through a manufacturer, an engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment drawings must follow requirements set forth by the International Firestop Council.

#### **1.07 SUBMITTALS**

- A. Submit in accordance with Section 01 33 00.
  - 1. Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of UL firestop systems to be used and manufacturer's installation instructions.
  - 2. Manufacturer's engineering judgment identification number and drawing details when no UL system is available for an application. Engineering judgment must include both project name and contractor's name who will install firestop system as described in the assembly drawing.
  - 3. Material safety data sheets provided with product delivered to job-site.
  - 4. Documentation from manufacturer that all firestopping installations on-site meet their requirements.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.
- B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.
- C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.
- D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.
- E. Do not use damaged or expired materials.

#### **1.09 PROJECT CONDITIONS**

- A. Do not use materials that contain flammable solvents.
- B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
- C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
- D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.
- E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

## **PART 2 - PRODUCTS**

### **2.01 FIRESTOPPING, GENERAL**

- A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
- B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
- C. Firestopping Materials are either “cast-in-place” (integral with concrete placement) or “post installed.” Provide cast-in-place firestop devices prior to concrete placement.

### **2.02 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with through penetration firestop systems (XHEZ), joint systems (XHBN), and perimeter firestop systems (XHDG) listed in Volume 2 of the UL Fire Resistance Directory: Products specified are by Hilti, Inc., Tulsa, Oklahoma, 800-879-8000/www.us.hilti.com
  - 1. Equivalent products by 3M Fire Protection Products 800-328-1687/www.3m.com are acceptable.

### **2.03 MATERIALS**

- A. Use only firestop products that have been UL 1479, ASTM E 814 or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.
- B. L-Rated Systems: Where through-penetration firestop systems are indicated in smoke barriers, provide through-penetration firestop systems with L-ratings of not more than 5.0 cfm/sq. ft. at both ambient temperatures and 400 deg F.
- C. Cast-in place firestop devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and cable bundles penetrating concrete floors, the following products are acceptable:
  - 1. HILTI
    - a. CP 680 Cast-In Place Firestop Device
      - 1) Add Aerator adaptor when used in conjunction with aerator (“sovent”) system.
    - b. CP 682 Cast-In Place Firestop Device for use with noncombustible penetrants
- D. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
  - 1. HILTI
    - a. FS-ONE Intumescent Firestop Sealant
    - b. CP 604 Self-leveling Firestop Sealant
    - c. CP 620 Fire Foam
    - d. CP 606 Flexible Firestop Sealant
    - e. CP 601s Elastomeric Firestop Sealant

- E. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
  - 1. HILTI
    - a. CP 601s Elastomeric Firestop Sealant
    - b. CP 606 Flexible Firestop Sealant
    - c. FS-ONE Intumescent Firestop Sealant
  
- F. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
  - 1. HILTI
    - a. CP 672 Speed Spray
    - b. CP 601s Elastomeric Firestop Sealant
    - c. CP 606 Flexible Firestop Sealant
    - d. CP 604 Self-leveling Firestop Sealant
  
- G. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material.
  - 1. HILTI
    - a. CP 777 Speed Plugs
    - b. CP 767 Speed Strips
  
- H. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
  - 1. HILTI
    - a. FS-ONE Intumescent Firestop Sealant
  
- I. Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:
  - 1. HILTI
    - a. FS-ONE Intumescent Firestop Sealant
    - b. CP 620 Fire Foam
    - c. CP 601s Elastomeric Firestop Sealant
    - d. CP 606 Flexible Firestop Sealant
  
- J. Non-curing, re-penetrable intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:
  - 1. HILTI
    - a. CP 618 Firestop Putty Stick
    - b. CP 658T Firestop Plug
  
- K. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:
  - 1. HILTI
    - a. CP 617 Firestop Putty Pad

- L. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:
  - 1. HILTI
    - a. CP 643N Firestop Collar
    - b. CP 644 Firestop Collar
    - c. CP 645/648 Wrap Strips
  
- M. Materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
  - 1. HILTI
    - a. CP 637 Firestop Mortar
    - b. FS 657 FIRE BLOCK
    - c. CP 620 Fire Foam
    - d. CP 675T Firestop Board
  
- N. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
  - 1. HILTI
    - a. FS 657 FIRE BLOCK
    - b. CP 675T Firestop Board
  
- O. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:
  - 1. HILTI
    - a. CP 672 Speed Spray
    - b. CP 601s Elastomeric Firestop Sealant
    - c. CP 606 Flexible Firestop Sealant
    - d. CP 604 Self-Leveling Firestop Sealant
  
- P. For blank openings made in fire-rated wall or floor assemblies, where future penetration of pipes, conduits, or cables is expected, the following products are acceptable:
  - 1. HILTI
    - a. FS 657 FIRE BLOCK
    - b. CP 658T Firestop Plug
  
- Q. For data and communication penetrations in fire and smoke rated assemblies. (Allows for ease of re-penetration without the use of sealants or caulking.)
  - 1. HILTI
    - a. CP 653 2" Speed Sleeve
    - b. CP 653 4" Speed Sleeve.
  
- R. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.
  
- S. Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction joint assembly.

## T. Identification Labels

1. Pressure-sensitive, self adhesive, preprinted vinyl labels with the following verbiage:
  - a. “Warning: Fireblocking Application – Do Not Disturb. Notify Building Management of Any Damage”
  - b. Installing Contractor’s name, address and phone number.
  - c. Date of installation.
  - d. Fireblocking/Stopping product manufacturer’s name.

## PART 3 - EXECUTION

### 3.01 PREPARATION

- A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
  1. Verify penetrations are properly sized and in suitable condition for application of materials.
  2. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
  3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
  4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
  5. Do not proceed until unsatisfactory conditions have been corrected.

### 3.02 COORDINATION

- A. Coordinate location and proper selection of cast-in-place Firestop Devices with trade responsible for the work. Ensure device is installed before placement of concrete.
- B. Responsible trades to provide adequate spacing of field run pipes to allow for installation of cast-in-place firestop devices without interferences.

### 3.03 INSTALLATION

- A. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory or Omega Point Laboratories Directory.
- B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.
  1. Seal all holes 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 UL 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.
- C. Identification: Install identification labels no greater than 6 feet from penetration or 6 feet on center on continuous firestopping applications.

### **3.04 FIELD QUALITY CONTROL**

- A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.
- C. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.
- D. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.
- E. Manufacturer to inspect sealed penetrations for conformance with appropriate product data information for each contractor installing firestopping on site.

### **3.05 ADJUSTING AND CLEANING**

- A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.
- B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

**END OF SECTION 07 84 00**

## SECTION 07 92 00

### SEALANTS AND CAULKING

#### PART 1: GENERAL

##### 1.01 RELATED DOCUMENTS

- A. Drawings, Details of Construction and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work specified in this section.

##### 1.02 SUMMARY

A. Exterior colored sealants:

1. Joints in masonry.
2. Miscellaneous joints where “sealant” or “caulk/caulking” is indicated on drawings.
3. Joints around mechanical, electrical and architectural penetrations of exterior masonry skin.

B. Interior colored sealants:

1. Note: Sealant on materials to be painted will be installed after painting is completed and shall match paint color. A “sacrificial” backer rod shall be installed prior to painting to protect joints from paint over spray. This backer rod may be pushed into the joint or removed prior to installation of final backer rod and sealant.
2. Interior joints in masonry.
3. Interior joints around hollow metal, including joint between hollow metal and hard surface flooring.
4. Joint between top of masonry, gypsum board, and plaster walls and structure.
5. Miscellaneous joints where “sealants” or “caulk/caulking” is indicated on Drawings.

C. Related work specified in other sections:

1. Sealant for firestopping – Section 07 84 00.
2. Caulking around curtainwall – Division 8.
3. Glazing – Section 08 80 00.
4. Sealants at tilework – Section 09 30 00.
5. Sealing at plumbing fixtures and mechanical penetrations through rated walls – Division 21-25.
6. Sealing of electrical penetrations through rated walls – Divisions 26-28.

##### 1.03 REFERENCES

- A. ASTM C 920 – Specification for Elastomeric Joint Sealants.
- B. ASTM C 1193 – Standard Guide for Use of Joint Sealants.

##### 1.04 SUBMITTALS

- A. Submit in accordance with Section 01 33 00.

- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods including joint design, surface preparation, and application instructions.
  - 4. Submit manufacturer's test reports indicating test results of adhesion and/or compatibility testing of samples of substrates which either come in contact with or are in close proximity to sealants.
- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors or samples of custom color matches for Architect's acceptance.
- D. Samples of Warranty.
- E. Manufacturer's approval of installer.

#### **1.05 QUALITY ASSURANCE**

- A. Applicator Qualifications
  - 1. Company specializing in performing work of this section with minimum three years documented experience, minimum three successfully completed projects of similar scope and complexity, and approved by manufacturer.
  - 2. Designate one individual as project foreman who shall be on site at all times during installation.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept materials on site in manufacturer's unopened original packaging. Inspect for damage.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
  - 1. Store materials in a clean, dry area indoors in accordance with manufacturer's instructions.
  - 2. Store sealants within temperature range in accordance with manufacturer's instructions.
  - 3. Keep containers sealed until ready for use.
  - 4. Do not use materials after manufacturer's use-before date.

#### **1.07 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
  - 1. Do not apply sealants to surfaces that are wet, damp, or contain frost.
  - 2. Do not apply sealants when air or surface temperature is below 40 degrees F.
  - 3. Use caution when applying sealants when air or surface temperature is above 120 degrees F.

#### **1.08 WARRANTY**

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.



- B. Special Manufacturer's Warranty for Exterior Sealants: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants 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: Ten years from date of Substantial Completion.

## **PART 2: PRODUCTS**

### **2.01 EXTERIOR SEALANTS**

- A. Silicone Sealant: Single Component, Nonsag, Neutral-Curing Silicone joint sealant conforming to ASTM C 920, Type S, Grade NS, Class 100/50. Maximum VOC: 98 g/L
1. Manufacturers/product:
    - a. Dow Corning, 790.
    - b. GE/Momentive Performance Materials, SilPruf LM SCS 2700.
    - c. Pecora, 890 or 890 FTS
    - d. Temco Spectrem 1 or Spectrem 4
  2. Colors: Custom colors to match material or finish sealant occurs in.

### **2.02 INTERIOR SEALANTS**

- A. Polyurethane Sealant: Multi-component, high-performance polyurethane sealant conforming to ASTM C 920, Type M, Grade NS, Class 25. Maximum VOC: 25 g/L.
1. Manufacturers/product:
    - a. Pecora, Dynatrol II
    - b. SIKA, SIKAFLEX 2-C
    - c. Sonneborn, Sonolastic NP2
    - d. Tremco, Dymeric 240/240FC
  2. Colors: Custom colors to match material or finish sealant occurs in.

### **2.03 ACCESSORIES**

- A. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- B. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- C. Joint Backing: Round foam rod compatible with sealant; oversized 25 to 50 percent larger than joint width; recommended by sealant manufacturer to suit application.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- E. Masking Tape: Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces.

## **PART 3: EXECUTION**

### **3.01 EXAMINATION**

- A. Inspect joints for compliance with requirements for joint configuration, installation tolerance, and other conditions affecting joint sealant performance. Correct unsatisfactory conditions before proceeding.

### **3.02 PREPARATION**

- A. Prepare joints in accordance with ASTM C 1193 and manufacturer's instructions.
- B. Clean out joints immediately before installing joint sealants (within 1 to 2 hours of sealant application), in accordance with joint sealant manufacturer's recommendations and the following requirements:
  - 1. Remove from joint substrates foreign material which could interfere with adhesion of joint sealant, including paints other than permanent protective coating tested and approved for sealant adhesion and compatibility by sealant manufacturer, oil, grease, waterproofing, water repellants, water dirt, and frost.
  - 2. Clean porous joint substrates using approved methods such as brushing, grinding, blast cleaning, mechanical abrading, and acid washing as appropriate, or a combination of these methods, to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
  - 3. Remove laitance and form-release agents from concrete.
  - 4. Clean metal and other nonporous substrates by using chemical cleaners or other means that neither are harmful to substrates nor leave residues capable of interfering with adhesion of joint sealants.
- C. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to area of joint sealer bond; do not allow spillage or migration onto adjoining surfaces. Allow primer to dry before applying sealant.
- D. Masking Tape: Use masking tape where required to prevent contamination of adjacent surfaces; remove tape immediately after tooling and before sealants begin to cure without disturbing seal.

### **3.03 EXISTING WORK**

- A. Mechanically remove existing sealants.
- B. Clean joint surfaces of residual sealant and other contaminants capable of affecting sealant bond to joint surface by mechanical means.
- C. Allow joint surfaces to dry before installing new sealant.

### **3.04 SEALANT INSTALLATION**

- D. Comply with joint sealant manufacturer's printed installation instructions.
- E. Installation of Sealant Backings:
  - 1. Install joint filler to provide support of sealant during application and at position required to produce the cross-sectional shape and depth of installed sealant relative to joint width that allows optimum sealant movement capability.
    - a. Do not leave gaps between ends of joint fillers.

- b. Do not stretch, twist, puncture, or tear joint fillers.
  - c. Remove fillers which have become wet prior to sealant application and replace with dry materials.
2. Install bond breaker tape when joint depth is too shallow to allow backer rod.

F. Installation of Sealant:

1. Install sealants by proven techniques that result in direct contact with and full wetting of joint substrates by joint sealant, completely filling recesses provided and providing uniform cross-sectional shapes and depths relative to joint widths. Sealant depth to be  $\frac{1}{2}$  the width of the joint and  $\frac{1}{3}$  the width at the center, creating an hourglass shape. Maximum depth of caulk at center to be  $\frac{3}{8}$ ". Air pockets or voids are not acceptable.
2. Immediately after sealant application and prior to the skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or which are not approved by sealant manufacturer.

### 3.05 PROTECTION AND CLEANING

- A. Protect joint sealers, during and after curing, from contamination or damage. Cut out and remove damaged or deteriorated sealers and replace with new materials.
- B. Clean excess sealants or sealant smears adjacent to joints as work progresses.

### 3.06 FIELD QUALITY CONTROL

- A. Perform adhesion tests on exterior sealant in accordance with manufacturer's instructions and ASTM C1193, Method A, Field-Applied Sealant Joint Hand-Pull Tab.
  1. Perform 5 tests for first 1,000 linear feet of applied exterior sealant and 1 test for each 1,000 feet of seal thereafter. If there is less than 1,000 feet, perform 1 test per floor per building elevation minimum.
  2. For sealant applied between dissimilar materials, test both sides of joint.
- B. Sealants failing adhesion test shall be removed, substrates cleaned, sealants re-installed, and re-testing performed.
- C. Maintain test log and submit report to Architect indicating tests, locations, dates, results, and remedial actions.

**END OF SECTION 07 92 00**

