SECTION 07 92 00.02

JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. All joint sealer Work as indicated on the Drawings, as required for the completed Work, and as specified herein. This Section includes joint sealants for the following applications:
   1. Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces:
      a. Expansion joints in unit masonry and at relieving angles.
      b. Expansion joints in architectural precast concrete panels.
      c. Joint at perimeter of windows as indicated.
      d. Expansion and other joints in other materials as indicated.
      e. Closed cell expanding foam joint filler

B. The work of this section shall not take place until all paint (as designated by the Authority) has been removed in accordance with Section 02 83 19 - Lead-Safe work Practices.

1.02 REFERENCE STANDARDS

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

C. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

1.03 SUBMITTALS

A. Product Data
   1. Catalog sheets, specifications, and installation instructions for each product specified except miscellaneous materials.

B. Provide schedule for each kind of sealant and location of installation.

C. Samples for Initial Selection:
   1. For general purpose use around windows and at relieving angles. Provide custom colors to match approved mortar sample.
   2. For all other uses: provide Manufacturer’s color charts consisting of strips of cured sealants showing the full range of Manufacturer’s standard colors available for each product exposed to view.

D. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-(13-mm-) wide joints formed between two 6-inch-(150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants

E. Quality Control Submittals
   1. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.
   2. Installer's Qualifications Data: Affidavit required under Quality Assurance Article.
   3. Company Field Advisor Data: Name, business address, and telephone number of Company Field Advisor.
   4. Test Results
      a. Sealant manufacturer’s test reports certifying compatibility with all contiguous materials.
      b. Sealant manufacturer’s test reports certifying that the sealant will not stain contiguous materials.
      c. The results of field adhesion testing.

1.04 QUALITY ASSURANCE

A. Installer's Qualifications
   1. The persons installing the sealants and their supervisor shall be personally experienced in the installation of sealants and shall have been regularly employed by a company engaged in the installation of sealants for a minimum of two years.
   2. Furnish a letter from the sealant manufacturer, stating that the Installer is authorized to install the manufacturer's sealant materials.

B. Container Labels
   1. Include manufacturer's name, trade name of product, kind of material, federal specification number (if applicable), expiration date (if applicable), and packaging date or batch number.

1.05 FIELD CONDITIONS

A. Environmental Requirements
   1. Temperature: Unless otherwise approved or recommended in writing by the sealant manufacturer, do not install sealants at temperatures below 40 degrees F or above 85 degrees F.
   2. Humidity and Moisture: Do not install the Work of this Section under conditions that are detrimental to the application, curing, and performance of the materials.
   3. Ventilation: Provide sufficient ventilation wherever sealants, primers, and other similar materials are installed in enclosed spaces. Follow manufacturer's recommendations.
   4. Do not proceed with installation of joint sealants under the following conditions:
      a. When joint substrates are wet.
      b. Where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
      c. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
      d. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.
         1) Surfaces are frozen.
         2) Surfaces are superheated by the sun.

B. Protection
   1. Protect all surfaces adjacent to sealants with non-staining removable tape or other approved covering to prevent soiling or staining.
   2. Protect all other surfaces in the Work area with tarps, plastic sheets, or other approved covering to prevent defacement from droppings.
   3. Protect any painted surfaces which are not included in the Work from impact or damage.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle joint sealer materials as recommended by the Manufacturer, to protect from damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Dow Corning Corp., Midland, Michigan 48686

B. Pecora Corp., Harleyville, PA

C. Tremco Sealing and Coatings,Wading River, NY 11792

D. Sika Corporation, Lyndhurst, NJ 07071

2.02 JOINT SEALANT APPLICATIONS

A. Type 1 Sealant (for use in vertical and horizontal expansion joints where movement occurs; for general purpose use around windows, door frames, louvers, and other junctures). All exposed locations require Type 1 Sealant.

1. One-part low-medium modulus silicone sealant (plus or minus 50% movement); ASTM C920 classifications type S, grade NS, class 25, uses NT, M, G, and A: General Electric Silpruf, Dow Corning's 791, Pecora's 864, Sonneborn's Omniseal, Tremco Spectrem 2.
    a. Silicones shall meet the following requirements:
        1) ASTM C719 - Low-Medium Modulus (+ or - 50%). Sealants shall not exhibit any cracking or surface degradation after 5000 hours exposure in the Atlas Twin Arc Weatherometer.
        2) ASTM C661 - Shall not incur a durometer increase greater than 10 points.
        3) Sealants shall contain zero parts of toxic isocyanurate ingredients.
2. Provide custom colors for use around window perimeters, to match window frame or masonry, at architectural precast concrete pieces, or other locations as determined by the AOR.
3. Thoroughly clean surfaces on which sealant is to be applied and prime surfaces as recommended by Manufacturer before applying sealant.

B. Type 2 Sealant (use at unexposed locations, as approved).
1. One-component polyurethane sealant; ASTM C920 classifications type S, grade NS, class 25, uses NT, M, and A, Federal Specification TT-S-00230C: Tremco Dymonic, Sikaflex-15LM, Pecora Dynatrol I-XL

2.03 JOINT FILLERS

A. Elastomeric Tubing Sealant Backings: (for precast panel joints not compatible with Silicone Sealants): Neoprene, butyl or EPDM tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.
1. ASTM D 1056, Class SC (oil resistant and medium swell), 2 to 5 psi compression deflection.

B. Expandable Pre-Compressed Joint Filler: M-Seal or approved equal

C. Expanded Polyethylene Joint Filler (for existing joints): Flexible, compressible, closed-cell polyethylene of not less than 10 psi compression deflection (25 percent).

D. Closed-Cell Polyurethane or Closed-Cell Expanded polyethylene Joint Filler
1. Resilient, compressible, semi-rigid; W.R. Meadow's Ceramar; A. C. Horn's Closed Cell Plastic Foam Filler, Code 5401; Sonneborn's Sonoflex F.

E. ASTM D1056, Class RE41 (for masonry joints) where shown on the Drawings.

F. Filler Sealant (for APC Panel Expansion Joints)
1. Polybutylene impregnated compressible polyurethane foam precompressed to 50% of its uncompressed length: "Polytite" by Polytite Manufacturing Corp. and distributed by W.R. Grace Co.

G. Expanding Foam Filler for windows and doors. Provide Zerodraft expandable foam
1. R-value 6.9
    a. Closed-Cell content > 90%
    b. Avg. Flamespread index < 25
    c. Avg. Smoke Development index < 50
    d. Fire-retardant
    e. Absorption Rate 1-3.5%
    f. Spray-in-place application
    g. Propellant - 3% ODP
    h. Blowing Agent: HCHC
    i. Cold-weather application

2.04 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
   1. For primers used on site and within the weatherproofing/waterproof membrane (interior) of the building comply with V.O.C. requirements specified in Section G0 16 00.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
   1. For cleaners used on site and within the weatherproofing/waterproof membrane (interior) of the building comply with V.O.C. requirements specified in Section G0 1600.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

D. Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
   1. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin)], O (open-cell material)] or B (bicellular material with a surface skin, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

E. Bond Breaker Tape
   1. Polyethylene or other plastic tape as recommended by the sealant manufacturer; non-bonding to sealant; self-adhesive where applicable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine all joint surfaces for conditions that may be detrimental to the performance of the completed Work. Do not proceed until satisfactory corrections have been made.

3.02 PREPARATION

A. Clean joint surfaces immediately before installation of sealant and other materials specified in this Section.
   1. Remove all loose materials, dirt, dust, rust, oils and other foreign matter that will impair the performance of materials installed under this Section.
   2. Remove lacquers, protective coatings and similar materials from joint faces with manufacturer's recommended solvents.
   3. Use methods such as grinding, acid etching or other approved and manufacturer's recommended means, if required, to clean the joint surfaces, assuring that the sealant materials will obtain positive and permanent adhesion.

3.03 JOINT BACKING INSTALLATION

A. Install bond breaker tape in relaxed condition as it comes off the roll. Do not stretch the tape. Lap individual lengths.

B. Install backer rod of sufficient size to fill the joint width at all points in a compressed state. Compress backer rod at the widest part of the joint by a minimum of 25 percent. Do not cut or puncture the surface skin of the rod.

3.04 SEALANT INSTALLATION

A. Except as shown or specified otherwise, install sealants in accordance with the manufacturer's printed instructions.

B. Install sealants with ratchet hand gun or other approved mechanical gun. Where gun application is impracticable, install sealant by knife or by pouring, as applicable.

C. Finishing
   1. Tool all vertical, non-sag sealants so as to compress the sealant, eliminating all air voids and providing a neat smoothly finished joint. Provide slightly concave joint surface, unless otherwise indicated or recommended by the manufacturer.
   2. 1. Use tool wetting agents as recommended by the sealant manufacturer.

D. 2. Remove excess foam sealant after it has expanded and dried.

3.05 FIELD QUALITY CONTROL

A. Field Adhesion Testing of Sealants - Test completed elastomeric joints as follows:
   1. Extent of Testing: Test completed elastomeric sealant joints as follows:
      a. Perform 10 tests for the first 1000 feet of joint length for each type of elastomeric sealant and join substrate.
      b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
   2. Test Method - Test joints by hand pull method described below:
      a. Make knife cuts from one side of the joint to
         1) the other, followed by two cuts approximately 2 inches long at sides of joint and meeting cross cut at one end. Place a mark 1 inch from cross-cut end of 2 inch piece.
      b. Use fingers to grasp 2 inch piece of sealant between cross-cut end and 1” mark, pull firmly at a 90 degree angle or more in direction of side cuts while holding a ruler along sides of sealant. Pull sealant out of joint to the distance recommended by the sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension, hold this position for 10 seconds.
      c. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side.
   3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
   4. Inspect tested joints and report on the following:
      a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
      b. Whether sealants filled joint cavities and are free of voids.
      c. Whether sealant dimensions and configurations comply with specified requirements.
   5. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
   6. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
   7. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

B.

3.06 CLEANING

A. Immediately remove misapplied sealant and droppings from metal surfaces with solvents and wiping cloths. On other materials, remove misapplied sealant and droppings by methods and materials recommended in writing by the manufacturer of the sealant material.

B. After sealants are applied and before skin begins to form on sealant, remove all masking and other protection and clean up remaining defacement caused by the Work.

END OF SECTION