

## SECTION 079200 - JOINT SEALANTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes:

1. Exterior sealants.
2. Interior sealants.
3. Exterior and interior water immersed sealants.
4. Metal lap joint sealants.
5. Threshold and sheet metal bedding sealants.
6. Joint accessories.

- B. Related Sections include the following:

1. Division 4 Section "Unit Masonry" for masonry control and expansion joint fillers and gaskets.
2. Division 8 Section "Glazing" for glazing sealants.
3. Division 9 Section "Gypsum Board Assemblies" for sealing perimeter joints of gypsum board partitions to reduce sound transmission.

#### 1.3 SUBMITTALS

- A. Shop Drawing:

1. Submit a Sealant Schedule, and related details, indicating specific installation and interface between sealants and building materials for each type of joint sealant and joint backing material used in this specification. Use SAME reference designations as indicated in this Specification for preparation of the Joint Sealant Schedule in Part 3.6. Submittals are subject to the requirements of Division 1 Specification Section "Submittals."

- B. Product Data:

1. For each joint-sealant product indicated.

- C. Samples:

1. Submit standard cured color samples and charts for each sealant type illustrating full range of standard and custom colors.

D. Manufacturer's Certificate:

1. Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.
2. For manufacturer's products that include the phrase, "but are not limited to the following," the Contractor shall be responsible to provide certification that the submittal product complies with the specified product. This certification is subject to the requirements of Division 1 Specification Section "Submittals," Part 1, Definitions.

E. Qualifications Data:

1. For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified. Provide SWRI (Sealant, Waterproofing and Restoration Institute) Validation Certificate.

F. Compatibility and Adhesion from sealant manufacturer indicating the following:

1. Building materials forming joint and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
3. Preconstruction Compatibility and Adhesion Field Test for each sealant and building material.

#### 1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

1. Submit recommended inspection intervals.
2. Submit instructions for repairing and replacing failed sealed joints.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project. Provide SWRI (Sealant, Waterproofing and Restoration Institute) Validation Certificate.
- B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
- C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.
- D. Preinstallation Conference: Conduct conference at Project site.

## 1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants or other causes.

## 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
  - 2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F.
  - 3. When joint substrates are wet.
- B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

## 1.8 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Installer's Warranty: Written warranty, signed by Installer agreeing 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.
- C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
  - 1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
  - 2. Disintegration of joint substrates from natural causes exceeding design specifications.

## PART 2 - PRODUCTS

### 2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience for the following sealant types:
1. Multi-component sealants cure by chemical reaction. Cure times are predictable depending on atmospheric temperature. Silicone sealant cure is not affected by temperature, however, frost and moisture at bond line will impair adhesion.
  2. Single component sealants cure by reaction with moisture. Cure times will vary depending on atmospheric humidity and temperature.
  3. Fast cure (FC) sealants provide lesser cure times than corresponding standard cure products. Longer cure times will permit more accumulation of dust and other air-borne contamination on surface of sealant, potentially causing apparent color change.
  4. Sealant Types are M – Multi-Component and S – Single Component.
  5. Sealant Grades are P – Pourable or Self-Leveling used for horizontal traffic joints and NS – Non-Sag or Gunnable used for vertical and non-traffic joints.
  6. Sealant Classes are 25, 50, and 100/50 (extension/compression) representing movement capability in percent of joint width. Joint movement is based on the relative percentage of installed width. Design to a minimum of 4 times anticipated movement to accommodate design tolerances and expected movement based on coefficient of thermal expansion.
  7. Sealant Uses are T – Traffic, NT – Non-Traffic, I – Immersion, M – Mortar, A – Aluminum, and O – Other. Use O includes color anodized aluminum, metals other than aluminum, painted surfaces, brick, stone, tile, and wood for example.
  8. Immersion rated sealant applications require primer.
- B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system 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.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food; provide products that comply with 21 CFR 177.2600.
- E. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range of standard and custom colors.

2.2 URETHANE SEALANT TYPES – For exterior or interior use.

- A. **U1** - Multi-Component, Non-Sag, Urethane: ASTM C920, Type M, Grade NS, Class 50; Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
1. Pecora Corporation; Dynatrol II.
  2. Polymeric Systems, Inc.; PSI-270.
  3. Tremco, Inc.; Dymeric 240 FC.
- B. **U2** - Multi-Component, Traffic-Grade Urethane: ASTM C920, Type M, Grade NS, Class 50; Uses T, Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
1. Polymeric Systems, Inc.; PSI-270
  2. Tremco, Inc.; Dymeric 240 FC.
- C. **U3** - Single-Component, Non-Sag Urethane: ASTM C920, Type S, Grade NS, Class 100/50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
1. Sika Corporation, Construction Products Division; Sikaflex-15LM.
  2. Tremco, Inc.; Dymonic 100
- D. **U4** - Single-Component, Non-Sag Urethane: ASTM C920, Type S, Grade NS, Class 25, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
1. Pecora Corporation; Dynatrol I-XL.
  2. Sika Corporation, Construction Products Division; Sikaflex-1a.
  3. Tremco, Inc.; Dymonic or Fulkem 116.
- E. **U5** - Single-Component, Pourable, Traffic-Grade Urethane: ASTM C920, Type S, Grade P, Class 25, Uses T. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
1. Pecora Corporation; Urexpan NR-201.
  2. Tremco, Inc; Vulkem 45SSL.
  3. Sika Corporation, Construction Products Division; Sikaflex-1CSL.
- F. **U6** - Immersible, Single Component, Pourable, Traffic-Grade Urethane: ASTM C 920, Type S, Grade P, Class 25, Uses T and I. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
1. Sika Corporation, Construction Products Division; Sikaflex-1CSL.
  2. Tremco, Inc.; Vulkem 45 SSL.
- G. **U7** - Immersible, Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C920. Type M, Grade P, Class 25, for Use T and I. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. LymTal International, Inc.; Iso-Flex 880GB.
2. May National Associates, Inc.; Bondaflex PUR 2 SL.
3. Tremco, Inc.; Vulkem 245

2.3 SILICONE SEALANT TYPES – For exterior or interior use.

- A. **S1** - Single-Component, Non-Staining, Non-Sag, Neutral-Curing Silicone: ASTM C920, Type S, Grade NS, Class 50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to the following:
1. Dow Corning Corporation; 756SMS, 791, 795 or 995.
  2. Tremco, Inc.; Spectrem 3.
  3. Pecora Corporation; 864, 895 or 898.
- B. **S2** - Single Component, Non-Sag, Neutral-Curing Silicone: ASTM C920, Type S, Grade NS, Class 100/50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
1. Dow Corning Corporation; 790
  2. Pecora Corporation; 301NS, 311NS.
  3. Tremco, Inc.; Spectrem 1.
- C. **S3** - Single Component, Non-Sag, Neutral-Curing Silicone: ASTM C920, Type S, Grade NS, Class 50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
1. Dow Corning Corporation; 791, 795 or 995.
  2. Pecora Corporation; 864, 895 or 898.
  3. Tremco, Inc.; Spectrem 2, Proglaze SSG.
- D. **S-4** - Single Component, Field-Tintable, Non-Sag, Neutral-Curing Silicone: ASTM C920, Type S, Grade NS, Class 50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
1. Pecora Corporation; 890 FTS.
  2. Tremco, Inc.; Spectrem 4TS.
- E. **S5** - Mildew-resistant, Single Component, Acid-Curing Silicone: ASTM C920, Type S, Grade NS, Class 25, uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
1. BASF Building Systems; Omniplus
  2. Dow Corning Corporation; 786 Mildew Resistant.
  3. Tremco, Inc.; Tremsil 200 Sanitary.

## 2.4 LATEX SEALANT TYPES – For Interior Use Only

- A. **L1** – Acrylic Latex or Siliconized Acrylic Latex, ASTM C834, Type OP, Grade NF. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
1. BASF Building Systems; Sonolac.
  2. Pecora Corporation; AC-20+.
  3. Tremco, Inc.; Tremflex 834.
- B. **L2** - Acoustical Joint Sealant for Exposed and Concealed Joints: ASTM C1311 Manufacturer's standard Non-sag, paintable, no staining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
1. Tremco, Inc.; Acoustical Sealant.
  2. Pecora Corporation; AC-20 FTR, AIS-919.
  3. USG Corporation; SHEETROCK Acoustical Sealant.

## 2.5 SOLVENT-RELEASE-CURING-JOINT SEALANTS:

- A. **B1** - Butyl-Rubber-Based Joint Sealant: ASTM C 1311. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following.
1. Tremco, Inc.; Tremco Butyl Sealant.
  2. Bostik, Inc.; Chem-Calk 300.
  3. Pecora Corporation; BC-158.

## 2.6 PREFORMED JOINT SEALANTS – For exterior or interior applications per manufacturer's standards.

- A. **PF1** - Preformed Silicone Joint Sealants: Manufacturer's standard sealant consisting of procured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:
1. Dow Corning Corporation; 123 Silicone Seal
  2. Pecora Corporation; Sil-Span
  3. Tremco, Inc.; Simple Seal.
- B. **PF2** - Preformed Foam Joint Sealant: Manufacturer's standard preformed, precompressed, open-cell foam sealant manufactured from urethane foam with minimum density of 10 lb/cu.ft. (160 kg/cu.m) and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths indicated; coated on one side with a pressure-sensitive adhesive and covered with protective wrapping. Subject to compliance with

requirements, products that may be incorporated into the Work include, but are not limited to the following:

1. Tremco, Inc.; illbruk illmod 600.
2. EMSEAL Joint Systems, Ltd.; Emseal 25V.
3. School International, Inc.; Sealtite, Sealtite 50N.

## 2.7 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material 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.
- B. Cylindrical Sealant Backings: ASATM C 1330, of type indicated below and size and density to control sealant depth and otherwise contribute to producing optimum sealant performance, paired to the sealant type. List the type on the Sealant Schedule.
  1. **Type C:** Closed-cell material with a surface skin.
  2. **Type O:** Open-cell material.
    - a. Bostik, Inc.
    - b. Pecora Corporation
    - c. Tremco, Inc.

## 2.8 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.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant back materials, free of oil 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.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## 2.9 EXISTING WORK

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



## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, 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 above cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include, but are not limited to, the following:
    - a. Concrete.
    - b. Masonry.
    - c. Unglazed surfaces of ceramic tile.
    - d. Exterior insulation and finish systems.
  - 3. Remove laitance and form-release agents from concrete.
  - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous surfaces include, but are not limited to, the following:
    - a. Metal.
    - b. Glass.
    - c. Porcelain enamel.
    - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or

by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques to comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealant from surfaces adjacent to joints.
  - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  - 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
  - 4. Provide flush joint profile where indicated per Figure 8B in ASTM C1193.
  - 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
    - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.
- G. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:
  - 1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.

2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead ¼ inch (6 mm) inside masking tape.
3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

- H. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping. Do not pull or stretch material. Produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures, apply heat to sealant in compliance with sealant manufacturer's written instructions.
- I. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

### 3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### 3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

### 3.6 JOINT-SEALANT SCHEDULE

Sealant types should be selected from the available listed products in Part 2 of this specification section. These sealants shall be indicated on the submittal schedule, using the same reference designation as indicated in Part 1.3.A. of this specification section.

- A. Exterior or Interior Sealant Joints

1. Applications:
  - a. Control and expansion joints in unit masonry.

- b. Joints between different materials listed above.
    - c. Perimeter joints between materials listed above and frames of doors, windows, storefronts, louvers and similar openings.
    - d. Control and expansion joints in soffits and overhead surfaces.
  - 2. Other exterior joints in vertical surfaces and non-traffic horizontal surfaces for which no other sealant is specified
- B. Metal Lap and Bedding Sealant Joints.
- 1. Applications:
    - a. Concealed lap and hook joints in sheet metal flashing and trim.
    - b. Bedding joints under metal thresholds and saddles.
    - c. Bedding joints between sheet metal flashing and other materials.
- C. Preformed Joint Sealants:
- 1. Applications:
    - a. Control and expansion joints in unit masonry.
    - b. Joints between different materials listed above.
    - c. Perimeter joints between materials listed above and frames of doors, windows, storefronts, louvers and similar openings.
    - d. Control and expansion joints in soffits and overhead surfaces.
    - e. Other exterior joints in vertical surfaces and non-traffic horizontal surfaces for which no other sealant is specified.

END OF SECTION 079200