

## SECTION 07 92 00

### JOINT SEALANTS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Section Includes:

1. Preparation of interior and exterior joint substrate surfaces.
2. Install sealers, primers, bond breakers, and fillers as required.
3. Install interior and exterior joint sealants.

##### 1.2 REFERENCES

###### A. American Society for Testing and Materials:

1. ASTM C 834: Specification for Latex Sealants.
2. ASTM C 920: Specification for Elastomeric Joint Sealants.
3. ASTM C 1087: Test Method for Determining Compatibility of Liquid Applied Sealants with Accessories Used in Structural Glazing Systems.
4. ASTM C 1193: Guide for Use of Joint Sealants.
5. ASTM C 1311: Specification for Solvent Release Sealants.
6. ASTM C 1330: Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.
7. ASTM C 1521: Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.

##### 1.3 SYSTEM DESCRIPTION

###### A. Design Requirements:

1. Exterior: Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and air tight continuous seals without causing staining or deterioration of joint substrates.
2. Interior: Provide joint sealants that have been produced and installed to maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.

##### 1.4 ACTION SUBMITTALS

- ###### A. Product Data: Submit manufacturer's product data, specifications, recommendations and instructions for surface preparation, sealant and backing installation, and related materials.

- B. Samples: Submit standard color charts for selection; furnish samples of custom colors as applicable.
- C. Joint-Sealant Schedule: Include the following information, using same "Type" designations indicated in Specifications:
  - 1. Joint-sealant application and substrate.
  - 2. Joint-sealant manufacturer and product name.
  - 3. Joint-sealant formulation.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
  - 1. Materials forming each joint substrate and joint-sealant backings have been tested for compatibility and adhesion with each joint sealant.
  - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- B. Field-Adhesion-Test Reports: For each sealant application tested.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Provide documentation of minimum three years experience approved by sealant manufacturer.
- B. Pre-Installation Meeting: Prior to installation of sealant, meet at project site to review material selections, joint preparations, installation procedures and coordination with other trades. Meeting shall include the sealant Installer, Contractor, Manufacturer's representative, and representatives of other trades or subcontractors affected by sealant installation. Examine sample installations which have been prepared and determine and record whether everyone present is in agreement that the proposed installations are likely to perform as required. Notify Architect prior to meeting as to time, place and date of meeting.

#### 1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
  - 1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
  - 2. Submit not fewer than four pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
  - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.

4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching, identically, those submitted.

#### 1.8 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 period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's recommendation to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

#### 1.9 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
  1. When ambient and substrate conditions are outside limits permitted by joint sealant manufacturer or below 40 deg. F.
  2. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  3. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.
  4. When joint substrates are wet.

#### 1.10 WARRANTY

- A. Exterior Sealants:
  1. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
    - a. Warranty Period: Five years from date of Substantial Completion.
  2. Special Manufacturer's Warranty for Silicone Sealants: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
    - a. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - - PRODUCTS

2.1 MANUFACTURERS

- A. Substitutions: Comply with Section 01 25 00.

2.2 SEALING AND CAULKING MATERIALS

A. Polyurethane Sealant - Type No. 1:

1. One-component, non-sag, low modulus, moisture curing, polyurethane joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT, M, A, and O.
2. Acceptable Products:
  - a. Dymonic 100 by Tremco.
  - b. MasterSeal NP 100 by Sika.
  - c. Dynatrol I-XL by Pecora.
  - d. Sikaflex 15LM by Sika.

B. Polyurethane Sealant - Type No. 2:

1. Multi-component, non-sag, low-modulus, chemically curing, modified polyurethane joint sealant; ASTM C 920, Type M, Grade NS, Class 25, Use NT, M, A, and O.
2. Acceptable Products:
  - a. MasterSeal NP 2 by Sika. 25
  - b. Dynatrol II by Pecora. 50
  - c. Sikaflex 2cNS EZ Mix by Sika. 50

C. Polyurethane Sealant - Type No. 3:

1. One-component, low-modulus, moisture curing, cold applied, elastomeric, self-leveling, pourable, horizontal grade polyurethane joint sealant; ASTM C 920, Type S, Grade P, Class 25, Use T, M.
2. Acceptable Products:
  - a. Vulkem 45SSL by Tremco.
  - b. Sikaflex 1c SL by Sika.
  - c. MasterSeal SL 1 by Sika.
  - d. Urexpan NR-201 by Pecora.

D. Polyurethane Sealant Type - Type No. 4:

1. Multi-component, non-sag, chemically curing, cold applied, elastomeric, traffic grade, polyurethane joint sealant exceeding 1 percent slope; ASTM C 920, Type M, Grade P, Class 25, Use T.
2. Acceptable Products:
  - a. MasterSeal SL 2 by Sika.
  - b. Vulkem 445SSL by Tremco.
  - c. DynaTrol II-SG by Pecora.
  - d. Sikaflex 2c NS TG by Sika.

- E. Polyurethane Sealant - Type No. 5:
1. Two-component, chemically curing, cold applied, elastomeric, horizontal grade, self-leveling, fuel resistant polyurethane joint sealant; ASTM C 920, Type M, Grade P, Class 25, Use T.
  2. Acceptable Products:
    - a. MasterSeal CR 125 by Sika.
    - b. Urexpam NR-200 by Pecora.
    - c. Sikaflex 2c SL by Sika.
- F. Polyurethane Sealant - Type No. 6:
1. One-component, moisture curing, non-sag, polyurethane joint sealants, suitable for continuous immersion in water; ASTM C920, Type S, Grade NS, Class 25/50, Use NT, M, A, O and I.
  2. Acceptable Product:
    - a. Vulkem 116 by Tremco.
    - b. MasterSeal NP 1 by Sika.
- G. Acrylic Latex Sealant - Type No. 7:
1. One-component, fungicidal, readily paintable acrylic latex caulk; ASTM C 834.
  2. Acceptable Products:
    - a. Tremflex 834 Acrylic Latex by Tremco.
    - b. NP 520 by Sika.
    - c. AC-20 + Silicone by Pecora.
    - d. RCS20 by General Electric Sealants.
- H. Silicone Sealant - Type No. 8:
1. One-component, moisture cured, non-staining, silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT, G, M, A, and O.
  2. Acceptable Products:
    - a. DOWSIL 756 SM by Dow Corning 50.
    - b. Silpruf SCS9000 NB by GE Momentive.
    - c. Spectrem 3 and Spectrem 4-TS by Tremco.
    - d. 864 NST by Pecora.
    - e. Sikasil WS-295 by Sika.
- I. Silicone Sealant Type - No. 9:
1. One-component, low-modulus, moisture cured, elastomeric, silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Use NT, A, G, M, and O.
  2. Acceptable Products:
    - a. DOWSIL 790 by Dow Corning.
    - b. Silpruf SCS2700 LM by GE Momentive.
    - c. Spectrem-1 by Tremco.
    - d. 890NST or 890FST by Pecora.
    - e. Sikasil WS-290 by Sika.

- J. Silicone Sealant - Type No. 10:
1. One-component, medium modulus, moisture cured, elastomeric silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT, A, G, M and O.
  2. Acceptable Products:
    - a. DOWSIL 795 by Dow Corning.
    - b. Silpruf SCS2000 by GE Momentive.
    - c. Spectrem 2 or Spectrem 3 by Tremco.
    - d. 895NST by Pecora.
    - e. Sikasil WS-295 by Sika.
- K. Silicone Sealant - Type No. 11:
1. One-component, moisture cured, fungicidal, silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT, A, G, and O.
  2. Acceptable Products:
    - a. DOWSIL 786 by Dow Corning.
    - b. SCS1700 by GE Momentive.
    - c. TremSil 200 by Tremco.
    - d. 898NST by Pecora.
    - e. Sikasil GP by Sika.
- L. Polysulfide Sealant - Type No. 12:
1. Multi-component, chemically cured, polysulfide joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use T, G, M, A, and O.
  2. Acceptable Products:
    - a. Synthacalk GC 2+ by Pecora.
    - b. Deck-O-Seal One Step by W. R. Meadows, Inc.
- M. Butyl - Type No. 13:
1. Butyl rubber polymer sealant one-component, non-sag; ASTM C 1311(FS TT-S-001657).
  2. Acceptable Products:
    - a. BC-158 by Pecora.
    - b. Butakauk by Sika.
- N. Silyl-Terminated Polyether (STPE) Sealant - Type No. 14:
1. Single-component, low-modulus, moisture cured, elastomeric, silyl-terminated polyether joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT, A, G, M and O.
  2. Acceptable Products:
    - a. SCS7000 by GE Momentive.
    - b. DynaTrol I-XL Tru-White by Pecora Corporation.
    - c. MasterSeal NP 150 by Sika.
- O. Silicone Sealant - Type No. 15:

1. Single-component, moisture cured, silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT, A, G, M and O.
2. Acceptable Products:
  - a. DOWSIL 758 by Dow Corning
  - b. Elemax 5000 Liquid Flashing by GE Momentive.

## 2.3 ACCESSORIES

- A. Joint Cleaner: Non-corrosive type recommended by sealant manufacturer, compatible with joint forming materials.
- B. Primer: Non-staining type recommended by sealant manufacturer to suit application and substrate materials.
- C. Backer Rod:
  1. ASTM C 1330, Type C (closed-cell material with a surface skin), or Type 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.
  2. Acceptable Products:
    - a. Backer Rod Manufacturing; Mile High Foam.
    - b. Sika; Soft Backer Rod.
    - c. Nomaco; Sof Rod.
    - d. Ethafoam SB, Dow Chemical.
- D. Precompressed Joint Sealer:
  1. Precompressed bitumen impregnated foam; when exposed to air expands in size; size as recommended by manufacturer for joint condition and width; black color.
  2. Acceptable Products:
    - a. Backerseal by Emseal Corporation.
    - b. 600 by Will-Seal.
- E. Bond Breaker: Pressure sensitive adhesive polyethylene tape recommended by sealant manufacturer to suit application.
- F. Masking Tape: Pressure sensitive adhesive paper tape.
- G. Sealant Tape:
  1. Compressible adhesive-cohesive tape of cross-linked butyl polyisobutylene rubber that accommodates variations and movement, sized as necessary to allow for joint movement of  $\pm 25$  percent.
  2. Acceptable Products:
    - a. 440 by Tremco.
    - b. Extru-Seal by Pecora.
    - c. PTI-606 by Protective Treatments, Inc., Division of Prosoco

- H. Expansion Joint Filler:
  - 1. Closed cell polyethylene compatible with sealant.
  - 2. Asphalt impregnated fiberboard not acceptable.
  - 3. Acceptable Product: Sonofoam Closed Cell Backer-Rod by Sonneborn.

## 2.4 MIXING

- A. Mix components in accordance with manufacturer's recommendations.

## PART 3 - - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints to be sealed for construction defects which could adversely affect execution of Work.
- B. Ensure that concrete has cured 28 days minimum before commencing sealing operations.
- C. Compressible Fillers: Verify actual width of each type joint to be sealed against indicated joint width to ensure compliance with specified percentage of compression required.
- D. Determine in conjunction with sealant manufacturer's representative if adhesion testing is necessary prior to application of materials. Submit letter of certification from sealant manufacturer accepting substrate conditions for sealant.

### 3.2 PREPARATION

- A. Clean joint surfaces using joint cleaner as necessary, free of dust, dirt, oil, grease, rust, lacquers, laitance, release agents, liquid water repellent, moisture or other matter which might adversely affect adhesion of sealants. Immediately after cleaning, wipe all joint surfaces with a clean dry cloth to remove any cleaner residue.
- B. 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 after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
- C. Etch concrete, masonry and plaster joint surfaces to remove excess alkalinity. Etch with 5 percent solution of muriatic acid. Neutralize with dilute ammonia solution. Rinse thoroughly with water and allow to dry.
- D. Steel Surfaces: Scrape and wire brush to remove loose mill scale. Remove dirt, oil or grease by solvent cleaning. Wipe surfaces with lintless paper towels.
- E. Aluminum Surfaces:

1. Clean off temporary protective coatings.
  2. When masking tape is used for a protective cover, remove tape just prior to applying sealant.
- F. Roughen joint surfaces on non-porous materials. Rub with fine abrasive cloth or wool to produce a dull sheen.
- G. Mask areas adjacent to joints as necessary.
- H. Apply primer as recommended by manufacturer. Do not allow primer or sealants to spill or migrate onto adjoining surfaces.

### 3.3 APPLICATION

- A. Install sealant materials in accordance with manufacturer's instructions.
- B. Install backing material in joints using blunt instrument to avoid puncturing.
- C. Install sealant backing to form joint depth of 50 percent of joint width, minimum of 1/4" deep.
1. Do not leave gaps between ends of sealant backings.
  2. Do not stretch, twist, puncture, or tear sealant backings.
  3. Do not braid smaller diameter sealant backings to create larger ones.
  4. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Apply sealant in joints using pressure gun with nozzle cut to fit joint width.
- E. Deposit sealant in uniform, continuous bead.
- F. Tool joints to required configuration within manufacturer's recommended setting time.
- G. If masking materials are used, remove immediately after tooling.

### 3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Representative:
1. No sealants may be used unless a qualified representative is present at start up of work to advise installer of proper procedures and precautions for use of materials and to check installation.
  2. Contractor shall give manufacturer notice one week prior to start-up that his presence will be required, to ensure proper installation of his materials.
- B. Field-Adhesion Testing: Engage a qualified testing agency to field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed and cured sealant joints as follows:
    - a. Perform five tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.

- b. Perform 1 test for each 1000 feet of joint length thereafter.
  2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
    - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
  3. Inspect tested joints and report on the following:
    - a. Whether sealants filled joint cavities and are free of voids.
    - b. Whether sealant dimensions and configurations comply with specified requirements.
    - c. 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 kind of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
  4. 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.
  5. 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.
- C. Evaluation of Field-Adhesion 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.

### 3.5 CLEANING

- A. Remove excess materials adjacent to joints as Work progresses to eliminate evidence of spillage or damage to adjacent surfaces.
- B. Remove and replace improperly sealed joints.
- C. Clean or replace materials or surfaces that are damaged by sealing operations.

### 3.6 SCHEDULE OF SEALANTS AND CAULKS

- A. All sealants to be used on or in contact with the roofing system shall be recommended for use by the roofing system manufacturer or directly approved for use in the scope of Section 07 54 00 "Thermoplastic Membrane Roofing."
- B. Unless indicated otherwise, all exterior building joints subject to dynamic movement, not exposed to foot or vehicular traffic: Sealant Type No. 9.

- C. Stone, masonry, EIFS, architectural precast concrete, and metal panel substrates, for non-staining and low dirt pick-up applications subject to moisture, movement, and not exposed to foot or vehicular traffic: Sealant Type No. 8.
- D. Interior building joints subject to dynamic movement, not exposed to foot or vehicular traffic: Sealant Type No. or 2.
- E. Interior and exterior horizontal joints subject to foot and vehicular traffic: Sealant Type No. 3 or 4.
- F. Unexposed Windows Joints: Sealant Type No. 10 or 12.
- G. Interior horizontal and vertical joints not subject to movement or traffic, subject to moisture: Sealant Type No. 7 or 11.
- H. Thresholds – Exterior: Sealant Type 12 or 13.
- I. Underwater sealants in continuous immersion sealant: Sealant Type 6.
- J. Exterior building joints subject to dynamic movement, not exposed to foot or vehicular traffic, which must be painted to match adjacent wall surfaces after installation: Sealant Type No. 14.
- K. Exterior building joints in direct contact with air barrier materials: Sealant Type No. 15.

### 3.7 COLOR SCHEDULE

- A. Curtain Wall and Storefronts: Custom color as selected by Architect.
- B. Other Exposed Locations: Manufacturer's standard color line as selected by Architect.
- C. Non-exposed Locations: Manufacturer's standard.

END OF SECTION

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