SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 DESCRIPTION:

Section covers all sealant and caulking materials and their application, wherever required for complete installation of building materials or systems.

1.2 RELATED WORK:

A. Sealing of site work concrete paving: Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.

B. Masonry control and expansion joint: Section 04 20 00, UNIT MASONRY.

C. Firestopping penetrations: Section 07 84 00, FIRESTOPPING.

D. Mechanical Work: Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING Section 23 05 11, COMMON WORK RESULTS FOR HVAC.

1.3 QUALITY CONTROL:

A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Product Testing: Obtain test results from a qualified testing agency based on testing current sealant formulations within a 12-month period.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.
2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920, and where applicable, to other standard test methods.
3. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

D. VOC: Acrylic latex and Silicon sealants shall have less than 50g/l VOC content.

E. Mockups: Before installing joint sealants, apply elastomeric sealants as follows to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution:

1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this section.

1.4 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's installation instructions for each product used.

C. Cured samples of exposed sealants for each color where required to match adjacent material.

D. Manufacturer's Literature and Data:

1. Caulking compound
2. Primers
3. Sealing compound, each type, including compatibility when different sealants are in contact with each other.

1.5 PROJECT CONDITIONS:

A. Environmental Limitations:

1. Do not proceed with installation of joint sealants under following conditions:
   a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 °C (40 °F).
   b. When joint substrates are wet.

B. Joint-Width Conditions:

1. 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:

1. Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.6 DELIVERY, HANDLING, AND STORAGE:

A. Deliver materials in manufacturers' original unopened containers, with brand names, date of manufacture, shelf life, and material designation clearly marked thereon.

B. Carefully handle and store to prevent inclusion of foreign materials.

C. Do not subject to sustained temperatures exceeding 5° C (40° F) or less than 32° C (90° F).

1.7 DEFINITIONS:

A. Definitions of terms in accordance with ASTM C717 and as specified.

B. Back-up Rod: A type of sealant backing.

C. Bond Breakers: A type of sealant backing.

D. Filler: A sealant backing used behind a back-up rod.

1.8 WARRANTY:

A. Warranty exterior sealing against leaks, adhesion, and cohesive failure, and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be extended to two years.

B. General Warranty: Special warranty specified in this Article shall not deprive Government of other rights Government may have under other provisions of Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of Contract Documents.

1.9 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American Society for Testing and Materials (ASTM):

C509-06.....Elastomeric Cellular Preformed Gasket and Sealing Material.

C612-04.....Mineral Fiber Block and Board Thermal Insulation.

C717-07.....Standard Terminology of Building Seals and Sealants.

C834-05.....Latex Sealants.

C919-02.....Use of Sealants in Acoustical Applications.

C920-05.....Elastomeric Joint Sealants.

C1021-08.....Laboratories Engaged in Testing of Building Sealants.

C1193-05.....Standard Guide for Use of Joint Sealants.

C1330-02 (R2007).....Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

D1056-07.....Specification for Flexible Cellular Materials—Sponge or Expanded Rubber.

E84-08.....Surface Burning Characteristics of Building Materials.

C. Sealant, Waterproofing and Restoration Institute (SWRI).

PART 2 - PRODUCTS

2.1 SEALANTS:

A. S-1:

1. ASTM C920, polyurethane or polysulfide.
2. Type M.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 20-40

B. S-4:

1. ASTM C920 polyurethane or polysulfide.
2. Type S.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 25-40.

C. S-6:

1. ASTM C920, silicone, neutral cure.
2. Type S.
3. Class: Joint movement range of plus 100 percent to minus 50 percent.
4. Grade NS.
5. Shore A hardness of 15-20.
6. Minimum elongation of 1200 percent.

D. S-9:

1. ASTM C920 silicone.
2. Type S.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 25-30.
6. Non-yellowing, mildew resistant.

2.2 CAULKING COMPOUND:

A. C-1: ASTM C834, acrylic latex.

B. C-2: One component acoustical caulking, non drying, non hardening, synthetic rubber.

2.3 COLOR:

A. Sealants used with exposed masonry shall match color of mortar joints.

B. Sealants used with unpainted concrete shall match color of adjacent concrete.

C. For other locations color of sealants shall be as selected by Architect or light gray or aluminum, unless specified otherwise.

D. Caulking shall be light gray or white, unless specified otherwise.

2.4 JOINT SEALANT BACKING:

A. General: 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.

B. Cylindrical Sealant Backings: ASTM C1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

1. Type C: Closed-cell material with a surface skin.

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 32° C (minus 26° F). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.5 FILLER:

A. Mineral fiber board: ASTM C612, Class 1.

B. Thickness same as joint width.

C. Depth to fill void completely behind back-up rod.

2.6 PRIMER:

A. As recommended by manufacturer of caulking or sealant material.

B. Stain free type.

2.7 CLEANERS-NON POUROUS SURFACES:

Chemical cleaners acceptable to manufacturer of sealants and sealant backing material, free of oily residues and other substances capable of staining or harming joint substrates and adjacent non-porous surfaces and formulated to promote adhesion of sealant and substrates.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Inspect substrate surface for bond breaker contamination and unsound materials at adherent faces of sealant.

B. Coordinate for repair and resolution of unsound substrate materials.

C. Inspect for uniform joint widths and that dimensions are within tolerance established by sealant manufacturer.

3.2 PREPARATIONS:

A. Prepare joints in accordance with manufacturer's instructions and SWRI.

B. Clean surfaces of joint to receive caulking or sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.

1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.

2. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:

   a. Concrete.

   b. Masonry.

   c. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.

4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

   a. Metal.

   b. Glass.

   c. Porcelain enamel.

   d. Glazed surfaces of ceramic tile.

C. Do not cut or damage joint edges.

D. Apply masking tape to face of surfaces adjacent to joints before applying primers, caulking, or sealing compounds.

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.

E. Apply primer to sides of joints wherever required by compound manufacturer's printed instructions.

1. Apply primer prior to installation of back-up rod or bond breaker tape.
2. Use brush or other approved means that will reach all parts of joints.

F. Take all necessary steps to prevent three sided adhesion of sealants.

3.3 BACKING INSTALLATION:

A. Install back-up material, to form joints enclosed on three sides as required for specified depth of sealant.

B. Where deep joints occur, install filler to fill space behind the back-up rod and position the rod at proper depth.

C. Cut fillers installed by others to proper depth for installation of back-up rod and sealants.

D. Install back-up rod, without puncturing the material, to a uniform depth, within plus or minus 3 mm (1/8 inch) for sealant depths specified.

E. Where space for back-up rod does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.

F. Take all necessary steps to prevent three sided adhesion of sealants.

3.4 SEALANT DEPTHS AND GEOMETRY:

A. At widths up to 6 mm (1/4 inch), sealant depth equal to width.

B. At widths over 6 mm (1/4 inch), sealant depth 1/2 of width up to 13 mm (1/2 inch) maximum depth at center of joint with sealant thickness at center of joint approximately 1/2 of depth at adhesion surface.

3.5 INSTALLATION:

A. General:

1. Apply sealants and caulking only when ambient temperature is between 5° C and 38° C (40° and 100° F).
2. Do not use polysulfide base sealants where sealant may be exposed to fumes from bituminous materials, or where water vapor in continuous contact with cementitious materials may be present.
3. Do not use sealant type listed by manufacture as not suitable for use in locations specified.
4. Apply caulking and sealing compound in accordance with manufacturer's printed instructions.
5. Avoid dropping or smearing compound on adjacent surfaces.
6. Fill joints solidly with compound and finish compound smooth.
7. Tool joints to concave surface unless shown or specified otherwise.
8. Finish paving or floor joints flush unless joint is otherwise detailed.
9. Apply compounds with nozzle size to fit joint width.
10. Test sealants for compatibility with each other and substrate. Use only compatible sealant.

B. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise.

C. Where gypsum board partitions are of sound rated, fire rated, or smoke barrier construction, follow requirements of ASTM C919 only to seal all cut-outs and intersections with the adjoining construction unless specified otherwise.

1. Apply a 6 mm (1/4 inch) minimum bead of sealant each side of runners (tracks), including those used at partition intersections with dissimilar wall construction.
2. Coordinate with application of gypsum board to install sealant immediately prior to application of gypsum board.
3. Partition intersections: Seal edges of face layer of gypsum board abutting intersecting partitions, before taping and finishing or application of veneer plaster-joint reinforcing.
4. Openings: Apply a 6 mm (1/4 inch) bead of sealant around all cut-outs to seal openings of electrical boxes, ducts, pipes and similar penetrations. To seal electrical boxes, seal sides and backs.

5. Control Joints: Before control joints are installed, apply sealant in back of control joint to reduce flanking path for sound through control joint.

3.6 FIELD QUALITY CONTROL:

A. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field log.

B. Repair sealants pulled not properly installed by applying new sealants following same procedures used to originally seal joints. Ensure that original sealant surfaces are clean and new sealant contacts original sealant.

C. 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.

3.7 CLEANING:

A. Fresh compound accidentally smeared on adjoining surfaces: Scrape off immediately and rub clean with a solvent as recommended by the caulking or sealant manufacturer.

B. After filling and finishing joints, remove masking tape.

C. Leave adjacent surfaces in a clean and unstained condition.

3.8 LOCATIONS:

A. Exterior Building Joints, Horizontal and Vertical:

1. Metal to Metal: Type S-1.
2. Metal to Masonry or Stone: Type S-1
3. Masonry to Masonry or Stone: Type S-1
4. Threshold Setting Bed: Type S-1, , S-4
5. Masonry Expansion and Control Joints: Type S-6
6. Wood to Masonry: Type S-1

B. Metal Reglets and Flashings:

1. Flashings to Wall: Type S-6
2. Metal to Metal: Type S-6

C. Sanitary Joints:

1. Walls to Plumbing Fixtures: Type S-9
2. Counter Tops to Walls: Type S-9
3. Pipe Penetrations: Type S-9

D. Horizontal Traffic Joints:

1. Concrete Paving, Unit Pavers: Type S-11 or S-12

E. High Temperature Joints over 204 degrees C (400 degrees F):

1. Exhaust Pipes, Flues, Breech Stacks: Type S-7 or S-8

F. Interior Caulking:

1. Typical Narrow Joint 6 mm, (1/4 inch) or less at Walls and Adjacent Components: Types C-1, C-2.
2. Perimeter of Doors, Windows, Access Panels which Adjoin Concrete or Masonry Surfaces: Types C-1, C-2.
3. Joints at Masonry Walls and Columns, Piers, Concrete Walls or Exterior Walls: Types C-1, C-2 and ~~C-3~~.
4. Perimeter of Plaster or Gypsum Wallboard Walls: Types C-1, C-2.
5. Exposed Isolation Joints at Top of Full Height Walls: Types C-1, C-2 and.
6. Exposed Acoustical Joint at Sound Rated Partitions Type C-2.
7. Concealed Acoustic Sealant Type S-4, C-1, C-2 and.

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