SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Provide the requirements of this Section in accordance with requirements of the Contract Documents.

B. Section includes but is not limited to:

1. Silicone joint sealants SE-01, **SE-02**.
2. Nonstaining silicone joint sealants **SE-03**.
3. Urethane joint sealants **SE-04**.
4. Mildew-resistant joint sealants **SE-09**.
5. Butyl joint sealants **SE-08**.
6. Latex joint sealants **SE-06**, **SE-07**.
7. Acoustic joint sealants **SE-10**.
8. Joint sealants backing **JF-01, JF-04**

C. Related Work:

1. Division 04, Section 04 20 00 "Unit Masonry" for masonry control and expansion joint fillers and gaskets.
2. Division 07, Section 07 84 46 "Fire-Resistive Joint Firestopping" for sealing joints in fire-resistance-rated construction.
3. Division 07, Section 07 95 13.13 "Interior Expansion Joint Cover Assemblies" for building expansion joints.
4. Division 07, Section 07 95 13.16 "Exterior Expansion Joint Cover Assemblies" for building expansion joints.
5. Division 07, Section 07 91 00 "Preformed Joint Seals" for preformed compressible foam and precured joint seals.
6. Division 08, Section 08 40 00 “Exterior Enclosure System Requirements” for integrated wall systems.
7. Division 08, Section 08 44 13 "Glazed Aluminum Curtain Walls" for structural and other glazing sealants.
8. Division 08, Section 08 80 00 "Glazing" for glazing sealants.
9. Division 09, Section 09 21 00 "Gypsum Board Assemblies" for sealing joints in sound-rated construction.
10. Division 09, Section 09 30 00 "Tiling" for sealing tile joints.
11. Division 09, Section 09 51 13 "Acoustical Panel Ceilings" for sealing edge moldings at perimeters with acoustical sealant.

1.2 DEFINITIONS

A. Types

1. Type S (single-component) products are those furnished in prepackaged cartridges or other containers in which no jobsite mixing is required.
2. Type M (multi-component) products are those furnished in two or more parts for mixing at the jobsite.

B. Grades:

1. Grade P (pourable) products have sufficient flow to fill joints in horizontal surfaces and remain level and smooth when applied at temperatures as low as 40 deg F (5 deg C).
2. Grade NS (nonsag) products are suitable for installation in joints in vertical surfaces without sagging at temperatures between 40 and 122 deg F (5 and 50 deg C).

C. Use:

1. Use T (Traffic) classifies sealants designed for joints in surfaces subject to pedestrian and vehicular traffic.
2. Use NT (Nontraffic) classifies sealants designed for nontraffic exposures. T
3. Use I (Immersible) classifies sealants designed for immersion in water.

D. Use classifications related to joint substrates are designated as follows:

1. Uses M, G, and A refer to sealants that remain adhered, within given parameters, to various standard specimens including mortar (M), glass (G), and aluminum (A), when tested for cyclic movement and adhesion-in-peel.
2. Use O refers to substrate materials other than M, G, and A.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference Interval: Conduct conference at Project site no later than two weeks before the start of joint sealant installation.

B. Attendees: Meet with Installer, Owner, Architect, and installers of components of the exterior enclosure system.

C. Agenda: Review methods and procedures for installing work related to joint sealants including, but not limited to, the following:

1. Review foreseeable methods and procedures related to sealing joints between substrates, including but not limited to, the following:

    a. Review joint substrates requiring sealant and the condition of each surface, sealant application, flashing details, and other preparatory work.
    b. Review joint sealant requirements as indicated on the drawings and in the specifications and other contract documents.
    c. Review required submittals.
    d. Review potential weather conditions and procedures for addressing unfavorable conditions.

2. Record discussion and furnish copy of recorded discussions to each attendee.

1.4 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

1. Certification by joint sealant manufacturer that sealants, primers, and cleaners required for complete installation comply with local regulations controlling use of volatile organic compounds (VOC).

B. Sustainable Design Submittals:

1. Building Product Disclosure and Optimization - Sourcing of Raw Materials:

    a. Leadership Extraction Practices

1) Extended Producer Responsibility (EPR): Submit documentation indicating that manufacturers have a take back or recycling program for the product purchased.
2) Bio-Based Materials: Meeting the sustainable Agriculture Network's Sustainable Agriculture Standard and tested per ASTM D6866.
3) Wood Products: Certified by Forest Stewardship Council or USGBC approved equivalent.
4) Recycled Content: For products having recycled content, indicate percentages by weight of post-consumer and pre-consumer recycled content.

a) Include statement indicating costs for each product having recycled content.

b. Sourcing of Raw Materials: For products that are required to comply with requirements for regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material.

1) Include statement indicating distance to Project, cost for each regional material and the fraction by weight that is considered regional.

2. Indoor Environmental Quality, Low Emitting Materials: Building Products must be tested and compliant with the California Department of Public-Health (CDPH) Standard Method V1.1-2010, using the applicable exposure scenario.

a. Adhesives and Sealants: For wet applied on site products, submit printed statement showing compliance with the applicable chemical content requirements of SCAQMD Rule 1168, effective July 1, 2005 and rule amendment date of January 7, 2005.
b. Alternative tests for VOC above include ASTM D2369-10; ISO 11890 part 1; ASTM D6886-03; or ISO 11890-2.
c. Methylene Chloride and perchloroethylene may not be added to paints, coating, adhesive or sealants

C. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

D. Samples for Verification: For each kind 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. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

C. Sustainable Design Submittals:

1. Building Product Disclosure and Optimization - Environmental Product Declarations

    a. Submit product specific type III EPDs or Industry wide (generic) EPDs, USGBC approved program declaration or products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope.

2. Building Product Disclosure and Optimization - Material Ingredients

    a. Material Ingredient Reporting: Submit documentation confirming chemical inventory of products to at least 0.1 % (1000pm) with at least one of the following:

        1) Submit published manufacturer inventory of ingredients identified by name and Chemical Abstract Service Registration Number (CASRN)
        2) Submit documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
        3) Submit Declare product label indicating that all ingredients have been disclosed down to 1000 ppm or designated as Red List Free or Declared
        4) Living Product Challenge
        5) Product Lens Certification
        6) USGBC approved program.

    b. Material Ingredient Optimization: Submit documentation confirming chemical inventory of products to at least 0.01 % (100pm) and/or that has a compliant material ingredient optimization report with at least one of the following:

        1) Submit GreenScreen V1.2 Benchmark: Third party report prepared by a licensed GreenScreen List Translator, or a full GreenScreen Assessment.
        2) Submit third-party verified documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
        3) Submit third-party verified Cradle to Cradle v3 Material Health certificate at the Bronze Level or better
        4) Submit third-party verified Declare product label indicating that all ingredients have been disclosed down to 100 ppm
        5) Submit third-party verified documentation that product is Living Product Challenge certified with a Red List Free or LBC Red List Free Declare label.
        6) Submit documentation that product has a manufacturer prepared action plan with material inventory to at least 1000 ppm.

D. Product Certificates: For each kind of joint sealant and accessory, signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use intended.

E. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

F. Product Test Reports: For each kind of joint sealant, based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

G. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:

1. Joint-sealant location and designation.
2. Manufacturer and product name.
3. Type of substrate material.
4. Proposed test.
5. Number of samples required.

H. Preconstruction Testing Reports:

1. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

   a. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
   b. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.

2. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
3. Preconstruction Stain Resistance Testing: Submit results of preconstruction stain resistance testing as specified herein, indicating which joint sealants and substrates combinations resulted in staining or other detrimental conditions. Along with test results, submit sealant manufacturer's letter stating agreement to provide warranty against staining.

I. Post-Construction Testing Reports:

1. Field-Adhesion-Test Reports: For each sealant application tested.

J. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Installer/Applicator Qualifications: Sealant work shall be performed by a firm having 5 years successful experience installing specified materials on projects of comparable size and scope. Installer/Applicator shall be an authorized representative who is trained and approved by manufacturer.

B. Manufacturer's Technical Representative: Do not use joint sealants until the manufacturer has a qualified technical representative at the project site at the start of the work to review conditions of application, verify joint width conditions and to ensure proper installation of his materials.

C. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances and regulations of Federal, State and Municipal authorities having jurisdiction. Obtain necessary approvals from such authorities.

D. Testing Agency Qualifications: Qualified according to ASTM C1021 to conduct the testing indicated.

E. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: Qualified according to ASTM C1021 to conduct the testing indicated.

F. Field Samples: Prior to the Pre-Installation Meeting, provide a field sample for each type of joint sealer system in the building at areas to be designated by the Architect. Samples shall represent the primary types of materials, substrate surfaces, joint size, exposure, and other conditions to be encountered in the Work. Utilize the same materials and installation methods in the sample as required for the final Work. Schedule the installation with allowance for sufficient curing time so that the sample may be examined, and any necessary adjustments made, at least 1 week prior to date scheduled for commencing installation of the Work. When accepted,

sample areas shall serve as the standard for materials, workmanship, and appearance for such Work throughout the project.

1. Examination of Field Samples: As part of the Pre-Installation Meeting, visually examine the samples for staining, dirt pickup, shrinkage, color, general workmanship and appearance. Cut and pull the sealant from each sample joint, and examine for internal bubbles or voids, adhesion, and general compatibility with substrate

G. Mockups: Prior to installing exterior wall systems, apply exterior sealants as part of composite mockup indicated on Mockup Elevations. Incorporate each type of exterior wall construction and finish to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Coordinate with Exterior wall Subcontractor and each of the Subcontractors listed in Summary Paragraph of Section 08 40 00 "Exterior Enclosure System Requirements". Provide materials in this section to create the composite mockup indicated

1. 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.
2. Following full curing, perform sealant pull-out tests as specified in Division 08, Section 08 40 00 "Exterior Enclosure System Requirements".

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Adhesion Testing: Use ASTM C794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Compatibility Testing: Use ASTM C1087 to determine sealant compatibility when in contact with glazing and gasket materials and whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
3. Stain Testing: Use ASTM C1248 to determine stain potential of sealant when in contact with stone and masonry substrates.
4. Submit manufacturer's recommended number of pieces of each type of material, but not less than 8 pieces of each kind of material, including joint substrates, joint-sealant backings, shims, secondary seals and miscellaneous materials.
5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
6. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
7. 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, staining of, and compatibility with joint substrates and other materials matching those submitted.

B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
2. Conduct field tests for each kind of sealant and joint substrate.
3. Notify Architect seven days in advance of dates and times when test joints will be erected.
1. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

a. Coordinate with requirements specified in Division 08, Section 08 40 00 "Exterior Enclosure System Requirements" for sampling.
b. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

1) 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.

2. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
3. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

C. Preconstruction Stain Resistance Testing: Prior to testing of mock-ups, submit fully identified samples of materials that will contact or affect joint sealants to sealant manufacturers, in sizes and quantities as required, for stain testing, as indicated below:

1. Manufacturer shall perform staining tests of sealant systems in accordance with ASTMC510 and ASTM D2203 methods for each joint substrate condition in the Work Submit quantities of each type of contiguous joint substrate material as required by referenced standard and in sizes as required by the sealant manufacturer for testing.
2. Schedule sufficient time for testing and analysis of results to prevent delay in the progress of the Work.

1.8 FIELD CONDITIONS

A. 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 joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.
5. Where joint substrates are irregular, chipped, spalled, or otherwise unsuitable for long term adhesion.

1.9 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.

1.10 WARRANTY

A. Special Installer's Warranty: Installer written 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.

1. Failure includes, but is not limited to, the following:

    a. Failure to maintain airtight or watertight joints.
    b. Adhesive or cohesive failure
    c. Loss of abrasion resistance, stain resistance, weather resistance, or general durability.

2. Warranty Period: 2 years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

1.11 SEQUENCING AND SCHEDULING

A. Schedule installations of joint sealants to occur not less than 21 days nor more than 30 days after completion of waterproofing or sealing of substrates unless otherwise indicated.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, 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.

B. Regional Materials: Provide a minimum of 20 percent of building materials (by cost) that are regionally extracted, processed and manufactured materials within a radius of 100 miles.

C. Responsible Extraction: Corporate Sustainability Reports (CSRs) complying with referenced standards, from raw material supplies with address the following issues:

1. Raw material extraction locations
2. A commitment to long-term ecologically responsible land use.
3. A commitment to reducing environmental harms from extraction and manufacturing processes.
4. A commitment to meeting applicable standards or programs voluntarily that address responsible sourcing criteria.

D. VOC Content: Sealants and sealant primers shall comply with the following:

1. Architectural sealants shall have a VOC content of 250 g/L or less or less when calculated according to 40 CFR 59, Sub part D (EPA Method 24).
2. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
3. Sealants and sealant primers for porous substrates shall have a VOC content of 775 g/L or less.
4. Interior sealant shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

E. Environmental Performance:

1. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Sub part D (EPA Method 24).
2. Acoustical joint sealant shall comply with the testing and product requirement of California Department of Health Services "Standard Practice for the Testing of Volatile Organic Emissions from Indoor Sources Using Environmental Chambers."

F. Liquid-Applied Joint Sealants: Comply with ASTM C920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.

1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

G. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C1248 and have not stained porous joint substrates indicated for Project.

H. 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.

2.2 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide elastomeric joint sealants that are water, ozone, chemical, and UV resistant and will not detrimentally affect joint substrates.

C. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

D. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

E. Low-Emitting Materials:

1. Adhesives and Sealants wet-applied inside the weather-proofing system must meet the VOC general emissions testing criteria of CDPH Standard Method v1.2.

2. All adhesives and sealants wet-applied inside the weather-proofing system must have VOC content in compliance with the applicable VOC limits (g/L) found in tables in Division 01, Section 01 81 13.14 "Sustainable Design Requirements - LEED v4 BD+C."

2.3 SILICONE JOINT SEALANTS

A. Structural Glazing Sealant **SE-01**: Neutral-curing structural silicone joint sealant complying with ASTM C920, and ASTM C1184; Grade NS, Class 25, for Use NT.

1. Products: Subject to compliance with requirements, provide the following systems from one manufacturer:

	Manufacturers	Brand	Shop Use Type M	Field Use Type S	Type M
a.	Dow Corning Corporation	DOWSIL	983	995	121
b.	GE Silicones	UltraGlaze	SSG4600	SSG4000AC	SSG4600
c.	Sika Corporation	Sikasil	SG500	SG 18	SG 500

B. Weather Sealant **SE-02**: Neutral-curing silicone joint sealant complying with ASTM C920, Type S, Grade NS, Class 50, for Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Corning Corporation; DOWSIL 790, 791, or 795.
b. GE Silicones; SilPruf LM SCS2700 or SilPruf SCS2000.
c. Sika Corporation; Sikasil WS290 or Sikasil WS295
d. Pecora Corporation; 890NST.

2.4 NONSTAINING SILICONE JOINT SEALANTS

A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C1248.

B. Stain Resistant Silicone Weather Sealant **SE-03**: Nonstaining, Neutral-curing silicone joint sealant complying with ASTM C920, Type S, Grade NS, Class 50, Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Corning Corporation; 756 SMS.
b. GE Silicones; SilPruf NB SCS9000.
c. Sika Corporation, Sikasil - WS295
d. Pecora Corporation; 895NST.

2.5 MILDEW-RESISTANT SILCONE JOINT SEALANT

A. Mildew-Resistant Silicone Sealant **SE-09**: ASTM C920, Type S, Grade NS, Class 25 or 50, for Use NT.

1. Products: Subject to compliance with requirements, provide one of the followingd:

a. Dow Corning Corporation; 786 Mildew Resistant.
b. GE Silicones; Sanitary SCS1700.
c. Pecora Corporation; 898NST.
d. Sika Corporation, Sikasil GP

2.6 URETHANE JOINT SEALANTS

A. Multicomponent Pourable Self-Leveling Urethane Sealant **SE-04** ASTM C920 with the following characteristics:
   1. Type and Grade: M (multicomponent) and P (pourable).
   2. Class: 25.
   3. Use Related to Exposure: T (traffic).
   4. Uses Related to Joint Substrates: M, A, and, as applicable to joint substrates indicated, O.
   5. Use O Joint Substrates: Concrete and ceramic tile surfaces.
   6. Products:
      a. Pecora Corporation; Urexpan NR-200.
      b. Sika Corporation, Inc.; Sikaflex-2C SL.
      c. Master Buildings Solutions a brand of MBCC Group "Sonolastic SL2".

2.7 LATEX JOINT SEALANTS

A. Latex Joint Sealant **SE-06**: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
   1. Products: Subject to compliance with requirements, provide one of the following :
      a. Master Buildings Solutions a brand of MBCC Group ; Sonolac.
      b. Pecora Corporation; AC-20+.
      c. Tremco Incorporated; Tremflex 834.

B. Acrylic Latex **SE-07**: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Schnee-Morehead, Inc.; Acryl-R Acrylic Sealant.
      b. Tremco Incorporated; Mono 555.

2.8 SOLVENT-RELEASE-CURING JOINT SEALANTS

A. Butyl-Rubber-Based Joint Sealant **SE-08** ASTM C1311.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Bostik, Inc.; Chem-Calk 300.
      b. Pecora Corporation; BC-158.
      c. Tremco Incorporated; Tremco Butyl Sealant.JS-773

2.9 ACOUSTICAL JOINT SEALANTS

A. Acoustical Joint Sealant **SE-10**: Nonsag, paintable, nonstaining elastomeric silicone sealant complying with **ASTM C920** that has a 50% minimum compression and expansion ability, and effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90. Product has flame-spread and smoke developed indexes of less than 25 per ASTM E84
   1. Products: Subject to compliance with requirements, provide the following or comparable ASTM C920 compliant acoustical joint sealant product :
      a. Hilti Lightweight Smoke and Acoustic Sealant CS-S-SA Light.
      ~~b. 3M FireDam Spray 200.~~
      ~~c. Tremco Incorporated, Dymonic 100 DS.~~
      ~~d. STI, AS200 Elastomeric Spray Sealant.~~

2.10 JOINT-SEALANT BACKING

A. General: Provide sealant backings of materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings (Filler Type **JF-01**): ASTM C1330, type indicated below, 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:

1. Bi-cellular Flexible Polyethylene or Polyolefin Foam Rod: Type B, Cylindrical, flexible sealant backings composed of bi-cellular material, for use as gasket or sealing material. Provide one of the following:

    a. "SOF Rod" (Nomaco).
    b. "Titan Foam" (Backer Rod Mfg. Inc)
    c. "FillPro Soft Type Backer Rod (Armacell LLC)
    d. "MasterSeal 921" (Master Buildings Solutions a brand of MBCC Group)

2. Closed Cell Backer Flexible Polyethylene Rod (for horizontal joints susceptible to moisture prior to joint sealing): Type C (closed-cell material with a surface skin for use with cold applied sealants, as a gasket or sealing material. Provide one of the following:

    a. "HBR" (Nomaco).
    b. "MasterSeal 920" (Master Buildings Solutions a brand of MBCC Group).
    c. "Mile High Foam" (Backer Rod Manufacturing, Inc.).
    d. "FilPro Standard Closed Cell Backer Rod (Armacell LLC)

3. Open Cell Backer Rod (for use with moisture curing low modulus, slow curing, high performance silicone sealants): Type C, Type C (closed-cell material with a surface skin for use with cold applied silicone sealants, as a gasket or sealing material. Provide one of the following:

    a. "FillPro Standard Closed Cell Polyethylene Foam Backer Rod" (Armacell LLC)
    b. “Denver Foam" (Backer Rod Manufacturing)
    c. "FilPro Open Cell Backer Rod" (Armacell LLC).

C. Closed Cell Polyethylene (Filler Type **JF-04**): Not less than 3 psi (21 kPa) for 25% compression resistance, highly resistant to petroleum oils and solvents, one of the following:

1. "Everlastic Expand-O-Foam 1380" (Williams Products, Inc.).
2. "Expansion Joint Filler" (Master Buildings Solutions a brand of MBCC Group)
3. "Hydrocell XL" (Fosroc)

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. Provide self-adhesive tape where applicable.

2.11 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 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.

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

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 performance of the Work.

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 after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates 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 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 joint substrates include 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 C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

1. Apply compounds in continuous beads without open joints, voids or air pockets so as to provide a watertight and airtight seal for the entire joint length and to allow optimum sealant movement capability.
2. Apply compounds to the depth and width ratio recommended.

C. Sealant Backings: Where joint filler is used as backup for bulk compounds, install filler continuously to depth and shape required for proper application and performance of products. Install sealant backings of kind 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. Provide watertight and airtight corners and joints.
2. Do not leave gaps between ends of sealant backings.
3. Do not stretch, twist, puncture, or tear sealant backings.
4. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

D. Bond Breaker Tape: Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Sealant Installation: Install sealants using proven techniques that 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.
4. Apply sealants in the depth shown or, if none is shown, apply in accordance with the manufacturer's recommendations and the following general proportions and limitations:

    a. Apply elastomeric sealants in sidewalk, pavement and similar horizontal joints to a depth equal to 75 percent of the joint width, but not less than 3/8 inch and not more than 3/4 inch.
    b. Apply elastomeric sealants, in joints not subject to traffic or other abrasion, to a depth equal to 50 percent of the joint width, but not less than 1/4 inch and not more than 1/2 inch.
    c. Apply non-elastomeric sealants to a depth approximately equal to the joint width.

5. Pour self-leveling compounds in horizontal joints to a level approximately 1/16 inch below adjacent surfaces.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs 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 at locations indicated on Drawings or as directed by Architect according to Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings or as directed by Architect according to Figure 8C in ASTM C 1193.

    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

G. 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 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Coordinate with requirements specified in Division 08, Section 08 40 00 "Exterior Enclosure System Requirements". Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

    a. Perform 10 tests for the first 1000 feet (300 m) of joint length for each kind of sealant and joint substrate.
    b. Perform one test for each 1000 feet (300 m) of joint length thereafter or one test per each floor per elevation.

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 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 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 complies with sealant manufacturer's field-adhesion hand-pull test criteria.

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 material, 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.

B. 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.

1. Provide ‘sealant lot number’ as part of recorded item in the ‘Field-Adhesion-Test’ log.
2. It is a requirement to keep a log of sealant manufacturing date for all sealants used on the project and submit the log at substantial completion.
3. Schedule Sealant tests to prevent delays on site. Coordinate with requirements specified in Division 08, Section 08 40 00 "Exterior Enclosure System Requirements" for independent inspection and testing as well as intervals required for field testing.
4. Prior to installation, verify that sealants used on the project have not exceeded the manufacturer's recommended product shelf life. Do not use sealant with expired dates.

3.5 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.

3.6 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, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

A. General: Fill gaps created between dissimilar materials that adjoin one another and joints below with sealant type specified.

B. Structural Silicone Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces **SE-01**.

1. Joint Locations:

    a. Joints between glass and metal support in structural silicone glazed curtain walls.
    b. Other joints as indicated on Drawings.
2. Joint-Sealant Color: Black.

C. Silicone Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces **SE-02**.

1. Joint Locations:

    a. Weather seals between structurally glazed curtain wall panels.
    b. Weather seals between storefront glazing
    c. Joints between different materials listed above.
    d. Perimeter joints between materials listed above and frames of aluminum framed door frames and louvers.
    e. Control and expansion joints in overhead surfaces.
    f. Other joints as indicated on Drawings.
2. Joint-Sealant Color: Black.

D. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces **SE-03**.

1. Joint Locations:

a. Control and expansion joints in unit masonry.
b. Joints between metal panels.
c. Other joints as indicated on Drawings.

2. Joint Sealant: Silicone, non-staining.
3. Joint Sealant Colors:

a. Metal panels: Grey.
b. Architectural CMU: Beige/brown.

E. Urethane Self-Levelling Joint-Sealant Application: Interior joints in horizontal traffic surfaces, **SE-04**

1. Joint Locations:

a. Construction joints in cast-in-place concrete.
b. Joints between different materials listed above.
c. Exterior sidewalks at ramp level.
d. Other joints as indicated.

2. Joint-Sealant Color: To be later selected by Architect from manufacturer's full color range.

F. Latax Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces **SE-06**.

1. Joint Locations:

a. Perimeter joints between interior wall surfaces and frames of interior door frames, aluminum framed glazing, and elevator entrances.
b. Field-painted vertical and overhead gypsum board surfaces.
c. Other interior locations not indicated otherwise.
d. Other joints as indicated.

2. Joint-Sealant Color: To be later selected by Architect from manufacturer's full color range.

G. Acylic Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces, **SE-07.**

1. Joint Locations:

a. Control and expansion joints on exposed interior surfaces of exterior walls.
b. Perimeter joints of exterior openings where indicated.
c. Tile control and expansion joints.
d. Vertical joints on exposed surfaces of interior unit masonry concrete walls and partitions.
e. Other joints as indicated.

2. Joint-Sealant Color: To be later selected by Architect from manufacturer's full color range.

H. Butyl-Rubber Joint-Sealant Application: Concealed mastics **SE-08**.

1. Joint Locations:

a. Aluminum thresholds.
b. Sill plates.
c. Other joints as indicated on Drawings.

I. Mildew-Resistant Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces **SE-09**

1. Joint Sealant Location:

   a. Joints between plumbing fixtures and adjoining walls, floors, and millwork counters, between backsplash and walls.
   b. Joints between toilet accessories and adjoining walls, floors and counters.
   c. Control and expansion joints in or around surfaces of ceramic tile, solid surfacing materials, and plastic laminate in toilet rooms, showers, locker rooms, bars, and kitchens, and other wet areas subject to moisture and mildew.
   d. Other joints as indicated.

2. Joint-Sealant Color: To be later selected by Architect from manufacturer's full color range.

J. Acoustic Joint-Sealant Application: **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.** ~~Concealed mastics~~ **SE-10**.

1. Joint Locations:

   a. Joints which form parts of acoustical details.
   b. Other joints as indicated on Drawings.

END OF SECTION