

Joint Sealants

Section revised and reissued by Addendum 03

## PART 1 - GENERAL

### 1.1 Summary

- .1 Section includes:
  - .1 Joint sealants – exterior building envelope locations.
  - .2 Joint sealants – interior locations.
- .2 Section excludes:
  - .1 Glazing system assembly sealants.
  - .2 Fluid-applied flooring sealants.
  - .3 Mechanical and electrical sealants.
  - .4 Acoustic sealants.

### 1.2 Administrative Requirements

- .1 Conduct a pre-installation meeting in accordance with Section 01 31 19.
  - .1 The following items shall be addressed at the pre-installation meeting:
    - .1 Analysis of the work and weather conditions.
    - .2 Shape factor of the joint.
    - .3 Recommendations for priming joints.
    - .4 Inspection of surfaces and joints.
    - .5 Compatibility of materials.
    - .6 Backing materials.

### 1.3 Submittals

- .1 Submit required submittals in accordance with Section 01 33 00.
- .2 *Product* data sheets:
  - .1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.
  - .2 Submit manufacturer's and *Product* name for each sealant which will be used in the *Work* prior to commencing the *Work*.
  - .3 For *Products* specified to comply with SWR Institute Sealant Validation Program, provide written confirmation from SWRI of *Product* compliance.
- .3 Samples:
  - .1 Submit "wet sample" sealant colour samples for each sealant *Product* and colour.
- .4 Test and evaluation reports:
  - .1 Test sealant in contact with samples of materials to be sealed to verify adhesion will be achieved in accordance with Field Quality Control paragraphs in Section 07 92 00, and no staining of the material will result. Prepare sample joints at the *Place of the Work* of each type of sealant for each joint condition.

## Joint Sealants

Section revised and reissued by Addendum 03

- .1 Submit test results to *Consultant* prior to application of sealants.
- .2 Test sealant in contact with samples of porous materials to be sealed to ensure that no staining of the material will result in accordance with ASTM C1248-22.
- .1 Submit test results to *Consultant* prior to application of sealants.

### 1.4 Closeout Submittals

- .1 Submit closeout submittals in accordance with Section 01 78 00.
  - .1 Include manufacturer's warranties.
- .2 Maintenance instructions:
  - .1 Submit maintenance instructions for all items for incorporation into the operation and maintenance manuals.

### 1.5 Quality Assurance

- .1 Qualifications:
  - .1 *Subcontractor*:
    - .1 Shall have 5 years' experience, minimum, in application of *Products*, systems and assemblies specified.
    - .2 Shall be a member in good standing of the Sealant and Waterproofing Association (SWA).
  - .2 Installer to comply with quality assurance articles referenced in ASTM C1193-16 for installation of joint sealants.
- .2 Mock-up:
  - .1 Submit 2440 mm (96") long sealant joint mock-up. Mock-up to show location, size, shape and depth of joints complete with back-up material, primer, caulking and sealant.
  - .2 Locate where directed by *Consultant*.

### 1.6 Field Conditions

- .1 Conform to sealant manufacturer's specifications and recommendations.
- .2 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, or are below 5° C (40° F).
  - .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.

### 1.7 Warranty

- .1 Warrant work of this section in accordance with Section 01 78 36.

## Joint Sealants

Section revised and reissued by Addendum 03

### .2 Extended warranties:

- .1 For silicone sealants applied to porous substrates, provide *Product* non-stain sealant warranty for period of 20 years, against migrating, bleeding into, or staining abutting materials.
- .2 For exterior exposed silicone sealants, provide 20 year Product material warranty.
- .3 Submit a written warranty for sealant installation specified in this section for a period of 3 years, including materials and application.
- .4 Defective joint sealant installation covered under the warranty shall included but not be limited to, joint leakage, hardening, cracking, crumbling, melting, bubbling, shrinkage, running, sagging, change of colour, loss of adhesion, loss of cohesion and staining of adjoining of adjacent materials on surfaces.

## PART 2 - PRODUCTS

### 2.1 Performance/Design Requirements

- .1 Interior sealants shall have a VOC limit of 50 g/L maximum, unless otherwise specified, and comply with South Coast Air Quality Management District (SCAQMD) Rule 1168, Adhesive and Sealant Applications.
- .2 Joint sealants:
  - .1 Shall perform as air tight and water-tight joints.
  - .2 Defects shall include, but are not limited to:
    - .1 Staining from abutting materials or filler.
    - .2 Migrating, bleeding into, or staining abutting materials.
    - .3 Unsightly surface deformation.
    - .4 Excessive colour change, chalking, or dust pick-up.
    - .5 Failing adhesively or cohesively where maximum elongation is less than 25% of designed width of exposed joints.
    - .6 Hardening to more than 25% over specified hardness.

### 2.2 Acceptable Manufacturers

- .1 Tremco.
- .2 Sika Canada Inc.
- .3 Pecora
- .4 Momentive/GE Silicone.
- .5 Dowsil.

### 2.3 Sealants

- .1 General:
  - .1 Single source responsibility: Obtain joint sealant from a single manufacturer for each joint sealant type.

### Joint Sealants

Section revised and reissued by Addendum 03

- .2 Colours: Sealant colours shall match colours of adjacent materials, as selected and approved by *Consultant*.
  - .1 Colours: shall be selected from manufacturer's full range of colours.
- .3 In accordance with ASTM C920-14 and other requirements indicated for each liquid-applied chemically curing sealant, including those referencing ASTM C920-14 classifications for type, grade, class, and uses.
- .4 For sealants to be applied to porous substrates:
  - .1 Provide products that have undergone testing in accordance with ASTM C1248-22 and have not stained porous joint substrates indicated for *Work*.
- .5 Sealant supplied shall not exude any material(s) which travel into adjacent materials, or travel onto surfaces of adjacent materials; causing damage, or attracting soiling, which becomes apparent during the service life of the building.
- .2 Exterior sealants; joints in vertical and overhead surfaces:
  - .1 Silicone sealant; high performance; 100% inorganic type:
    - .1 Single-component, non-sag, low to medium modulus non-bleed, high-performance silicone joint sealant, in accordance with the following: ASTM C920-14, Type S, Grade NS, Class 50 or greater. SWR Institute Sealant Validation Program.
    - .2 Provide low or medium modulus sealants as recommended by exterior wall cladding manufacturer.
    - .3 Acceptable *Products*:
      - .1 Low modulus:
        - .1 DOWSIL '790'.
        - .2 Momentive 'SCS2700 Silpruf LM.
        - .3 Sika 'Sikasil WS-290'.
        - .4 Tremco, Inc. 'Spectrem 1'.
      - .2 Medium modulus:
        - .1 DOWSIL '795'.
        - .2 Momentive 'SCS 2000 Silpruf'.
        - .3 Sika 'Sikasil WS-295'.
        - .4 Tremco, Inc 'Spectrem 2'.
  - .2 Silicone sealant; high performance; 100% inorganic type; at window perimeters:
    - .1 Single-component, non-sag, medium modulus non-bleed, high-performance silicone joint sealant, in accordance with the following: ASTM C920-14, Type S, Grade NS, Class 50 or greater. SWR Institute Sealant Validation Program.
    - .2 Provide low or medium modulus sealants as recommended by exterior wall cladding manufacturer.
    - .3 Acceptable *Products*:

Joint Sealants

Section revised and reissued by Addendum 03

- .1 Medium modulus:
    - .1 DOWSIL '795'.
    - .2 Momentive 'SCS 2000 Silpruf'.
    - .3 Sika 'Sikasil WS-295'.
    - .4 Tremco, Inc 'Spectrem 2'.
- .3 Interior general sealants:
  - .1 VOC limit: Maximum 50 g/L, unless otherwise indicated.
  - .2 Interior sealant; at joints with painted gypsum board: one-component paintable acrylic in accordance with ASTM C834-10 Type OP; or polyurethane in accordance with ASTM C920-14 Type S, Grade NS, Class 35.
    - .1 Acceptable *Products*:
      - .1 Acrylic sealants:
        - .1 Master Builders Solutions Canada 'MasterSeal NP 520'
        - .2 Tremco, Inc. 'Tremflex 834'.
      - .2 Polyurethane sealants:
        - .1 Sika 'Sikaflex 1A'.
      - .3 Substitutions: in accordance with Section 01 25 00.
  - .3 Interior sealant; gap filler: at movement paintable joints in vertical surfaces: One-component polyurethane sealant in accordance with the following: ASTM C920-14, Type M or S, Grade NS, Class 25.
    - .1 Acceptable *Products*:
      - .1 Master Builders Solutions Canada 'MasterSeal NP100'.
      - .2 Sika 'Sikaflex 15LM'.
      - .3 Substitutions: in accordance with Section 01 25 00.
  - .4 Interior sealant; at movement joints in vertical surfaces: one-component polyurethane sealant in accordance with the following: ASTM C920-14, Type M or S, Grade NS, Class 25.
    - .1 Acceptable *Products*:
      - .1 Master Builders Solutions Canada 'MasterSeal NP1'.
      - .2 Sika 'Sikaflex 15LM'.
      - .3 Tremco, Inc. 'Dymonic 100'.
      - .4 Substitutions: in accordance with Section 01 25 00.
  - .5 Interior sealant; at vertical and trafficable movement joints: one-component low modulus silicone sealant in accordance with the following: ASTM C920-14, Type S, Grade NS, Class 100/50. SWR Institute Sealant Validation Program.
    - .1 Acceptable *Products*:
      - .1 Momentive 'Silpruf LM SCS2700'.

## Joint Sealants

Section revised and reissued by Addendum 03

- .2 Sika 'Sikasil WS-290'.
- .3 Tremco, Inc. 'Spectrem 1'.
- .4 Specialty sealants:
  - .1 Interior sealant; mildew resistant one part silicone sealant; healthcare facilities: in accordance with FDA Regulation No. 21 CFR 177.2600, ASTM C920-14, Type S, Grade NS, Class 25, CAN/CGSB 19.22-M89.
  - .1 Acceptable *Products*:
    - .1 DOWSIL '786'.
    - .2 Substitutions: in accordance with Section 01 25 00.

## 2.4 Accessories

- .1 General: Provide joint sealants, primers, backings, and fillers that are compatible with one another and with joint substrates and other sealants or joint fillers specified and approved for applications indicated under joint sealant scheduled and under conditions of service and application as demonstrated by joint sealant manufacturer based on proven test results and field experience. When incompatible, inform *Consultant* and change to compatible type acceptable to *Consultant*.
- .2 Cylindrical sealant backings: Provide joint backings that meet ASTM C1330-02, Type O (open-cell polyurethane), or Type B (non-absorbent bi-cellular backing materials with surface skin), sized 25 percent or greater than joint opening with proper density to control sealant depth and profile. Follow joint sealant manufacturer's recommendations with backing selections for optimum joint sealant performance, in accordance with the following schedule:
  - .1 Use open cell foam with non-absorbing closed cell skin (Sof-Rod) for vertical joints; round shape for open joints and triangular shape for angular joints.
  - .2 Use closed cell foam for horizontal joints.
- .3 Bond-breaker tape: Polyethylene tape or other approved plastic tape as recommended by joint sealant manufacturer to prevent 3-sided joint adhesion to rigid, inflexible joint fillers or joint surfaces at back of joint where such adhesion would restrict proper sealant movement or result in sealant failure.
- .4 Masking tape: Non-staining, non-absorbent and compatible with joint sealants and adjacent surfaces.
- .5 Sealant primers: Use primers only as recommended by sealant manufacturer where required to enhance adhesion of sealant to specific joint substrates indicated and as determined for use from pre-construction mock-up testing. Select primers in consultation with sealant manufacturer and manufacturer of substrate material which do not have a detrimental effect on sealant adhesion or in-service performance.
- .6 Cleaners for nonporous surfaces:
  - .1 Provide non-staining, chemical cleaners of type which are acceptable to manufacturer of sealant and sealant backing material, which are not harmful to substrates and adjacent nonporous materials, and which do not leave oily residues or otherwise have a detrimental effect on sealant adhesion or in-service performance.

## Joint Sealants

Section revised and reissued by Addendum 03

- .2 Provide cleaner conditioner required for glass and glazed surfaces as recommended by sealant manufacturer.
- .3 Isopropyl alcohol solution: 50% isopropyl alcohol and 50% potable water.

## PART 3 - EXECUTION

### 3.1 Manufacturer's Recommendations

- .1 Unless specified otherwise herein, comply with the recommendations and directions of the manufacturer whose materials are being used in the work of this section.

### 3.2 Preparation

- .1 Protect adjacent work areas and finished surfaces from damage during joint sealant installation.
- .2 Clean and prepare joint surfaces and substrates of substance that could impair the bond of joint sealants immediately before installing joint sealants.
- .3 Provide a dry, dust-free and cleaned substrate for optimum results.
- .4 Clean porous joint surfaces by using heavy-duty brushing, light abrasive, mechanical abrading or combination of these methods to produce a clean, sound surface for optimum bond with joint sealants per manufacturer's recommendations.
- .5 Clean non-porous surfaces using the two-cloth wipe method as referenced in ASTM C1193-16 and outlined by joint sealant manufacturer's written requirements.
- .6 Prepare rusting or scaling surfaces using abrasive cleaning methods as recommended by joint sealant manufacturer prior to joint sealant installation. Remove and neutralize efflorescence, mould, mildew and algae prior to joint sealant installation.
- .7 Prepare finish-coated surfaces per joint sealant manufacturer's specific recommendations.
- .8 Test materials for indications of staining or poor adhesion before any sealing is commenced. Submit reports in writing to *Consultant* of results.

### 3.3 Masking

- .1 Where necessary to prevent contamination or marring surfaces of adjacent materials, mask areas adjacent to joints with masking tape prior to priming or sealing application. Remove tape immediately after joint has been completed and an initial set achieved.

### 3.4 Installation

- .1 Install in accordance with joint sealant manufacturer's installation written requirements for products, primers and applications indicated unless more stringent project-specific instructions or requirements apply.
- .2 Apply joint sealants for continuous waterproof sealant joint protection. Lap vertical joints over horizontal joints as recommended by sealant manufacturer. Comply with installation recommendations in ASTM C1193-16 for use of joint sealants as applicable to each specific sealant installation.

### Joint Sealants

Section revised and reissued by Addendum 03

- .3 Install sealant primers only when recommended by sealant manufacturer and demonstrated at pre-construction tests after joint surface preparation has been completed and when surfaces are verified as clean and dry. Allow any primer installation to completely dry or cure prior to installation of backing or joint sealants. Primer is mandatory for gun applied sealants.
- .4 Install joint sealants using proven techniques that comply with the following and in proper sequence with installation of primers and backings.
  - .1 Using proper joint sealant dispensing equipment, place sealants by pushing sealant beads into opening to fully wet-out joint sealant substrates. Fill sealant joint opening to full and proper configuration.
  - .2 Provide uniform cross-sectional shapes and depths in relation to joint width for optimum sealant movement capability per joint sealant manufacturer's written requirements.
- .5 Joint sealant tooling is required for non-sag joint sealant installations. Immediately after placing fresh sealants and before skinning or curing begins, tool sealants using metal spatulas designed for this purpose in accordance with manufacturer's recommendations. Provide a smooth, uniform sealant finish, eliminating air pockets and ensuring good contact for optimum sealant adhesion within each side of the joint opening.
  - .1 Provide concave joint configuration as indicated per figure 5-A in ASTM C1193-16 unless otherwise indicated.
  - .2 Use tooling agents that are approved in writing by sealant manufacturer and that do not discolour sealants or adjacent surfaces.
  - .3 Remove excess sealant from surfaces adjacent to joint openings using metal spatula, promptly cleaning any sealant residue from adjacent finished surfaces. Remove masking after joint sealant is installed.
- .6 Allow single-component sealants to fully cure before adhesion testing is performed as recommended by joint sealant manufacturer as outlined in Field Quality Control paragraphs in Section 07 92 00.
- .7 Match approved sealant mock-up for colour, finish and overall aesthetics. Remove, refinish or re-install work not in compliance with the *Contract Documents*.
- .8 When surfaces of adjacent materials are to be painted, perform sealant work before these surfaces are painted.
- .9 Check form release agent used on concrete for compatibility with primer and sealant. If they are incompatible inform *Consultant* and change primer and sealant to compatible type, or clean concrete to sealant manufacturer's acceptance.
- .10 Install joint backing material, filler strips, gaskets, bond breakers and similar type material of comparable performance characteristics. Install bond breaker tape or packing over asphalt impregnated fibre board as recommended by sealant manufacturer.
- .11 Where joints are 12.7 mm (1/2") or deeper, insert backing material in continuous uniform compression with setback from finished face of adjoining materials equal to required depth of sealant (width/depth ratio) as specified herein.
- .12 On horizontal traffic surfaces, support joint filler against vertical movement which might result from traffic loads, including foot traffic.



### Joint Sealants

Section revised and reissued by Addendum 03

- .13 Install bond breaker tape in bottom of joints in lieu of sealant backing where proper depth cannot be obtained when backing is installed.
- .14 Maintain correct sealant depth. Sealant depth shall be 1/2 the width of the joint, maximum depth shall be 12.7 mm (1/2"), minimum depth shall be 6 mm (1/4"). Comply with manufacturer's written recommendations.
- .15 Fillet bead sealant joints to be sized to provide proper contact area with substrates, in accordance with manufacturer's written recommendations.
- .16 Apply sealants using pressure-operated guns fitted with suitable nozzles in accordance with manufacturer's directions. Apply sealants in such manner as to ensure good adhesion to sides of joints and to completely fill voids in joints.
- .17 Apply sealants so that surfaces of joints are smooth, full bead, free from ridges, wrinkles, sags, air pockets and embedded impurities. Tool sealant surfaces to produce a smooth surface.
- .18 Install sealant with exterior face of sealant set back 10 mm (3/8") from face of adjacent materials at building movement joints, unless otherwise indicated.
- .19 Do not apply sealants to areas where installation of paints, coatings or flooring is in progress. Apply sealants after such work is complete and fully cured.

### 3.5 Exterior Sealant Schedule

- .1 Include in work of this section joint sealants in exterior assemblies to seal open joints in surfaces exposed to view, and to make building weather-tight, as indicated, and as otherwise specified, except where specified under the work of other sections.
- .2 Exterior sealant work is part of the work of this section. Install sealant to:
  - .1 Perimeters of exterior openings.

### 3.6 Interior Sealant Schedule

- .1 Include in work of this section sealants to seal open joints in surfaces exposed to view, and to make building weather-tight and air-tight, as applicable, as indicated, and as otherwise specified, except where specified under the work of other sections.
- .2 Install sealant to:
  - .1 Movement and control joints on exposed insitu concrete walls.
  - .2 Interior control and expansion joints in floor and wall surfaces.
  - .3 Raked out joints at junctions of masonry with concrete walls and columns, and at intersection of masonry walls and partitions where joint reinforcement is installed.
  - .4 Perimeters of exterior and interior door and window frames.
  - .5 Joints at tops of non-load bearing masonry walls at the underside of insitu concrete.
  - .6 Exposed interior control joints in gypsum board.
  - .7 Millwork junctions with walls.
  - .8 Laboratory casework and floor finishes.
    - .1 Water closets.

## Joint Sealants

Section revised and reissued by Addendum 03

- .2 Janitor sinks.
- .9 Counter/wall junctions at countertops.

### 3.7 Field Quality Control

- .1 Conduct quality control in accordance with Section 01 45 00.
  - .1 Inspection and testing; for exterior sealants only:
    - .1 Field-adhesion testing: Installer to keep daily log of sealant installation recording self-performed field-adhesion test at each elevation of the project and as follows:
      - .1 Record field adhesion testing on digital video camera and submit to Consultant.
      - .2 Document and perform field adhesion testing in accordance with manufacturer's recommended field-adhesion requirements and submit written reports co-signed by sealant manufacturer's representative. Coordinate with Section 01 45 00.
      - .3 Perform 5 field adhesion tests for the first 300 m (1000 lineal feet) and one test in each 300 m (1000 lineal feet) of sealant joint length thereafter. One (1) test per floor height and per elevation is also recommended. When the sealant is used to weatherseal between 2 dissimilar substrates, the sealant adhesion to each side of the joint should be individually tested.
      - .4 Field test joint sealants in accordance with ASTM C1521-19(2020) Destructive Procedure (Method A) and in compliance with manufacturer's specific recommendations.
      - .5 Evaluation: In compliance with joint sealant manufacturer, joint sealants tested and not indicating adhesive failure within the substrates are considered satisfactory results. For joint sealants that fail to adhere to the substrate, clean, re-install and then re-test until satisfactory results are obtained.
  - .2 Manufacturer's field review to be in accordance with Section 01 45 00.
  - .3 Provide manufacturer's field service consisting of periodic site visits by manufacturer or their distributor representative for observation of joint sealant application.

### 3.8 Adjusting and Cleaning

- .1 Remove droppings and clean off excess sealant or sealant residue adjacent to sealant joint installations as the work progresses by methods approved by joint sealant manufacturer before material achieves initial set.
- .2 Do not damage adjacent surfaces with harmful removal techniques and protect finished surfaces beyond those that have been masked.
- .3 Remove and replace damaged joint sealants.
- .4 Remove temporary coverings and masking protection from adjacent work areas upon completion.

Joint Sealants

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Section revised and reissued by Addendum 03

**3.9 Protection**

- .1 Protect installed sealants during and after final curing from damage resulting during construction.

**END OF SECTION**