

Joint Sealants

PART 1 - GENERAL

1.1 Summary

- .1 Section includes:
 - .1 Exterior building sealants.
 - .2 Interior building sealants.

1.2 Administrative Requirements

- .1 Conduct a pre-installation meeting in accordance with Section 01 31 19.
 - .1 Independent inspection and testing company shall attend the pre-installation meeting.
 - .2 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 this section, 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.
 - .1 At EIFS locations: Laboratory test sealant for adhesion in accordance with ASTM C1382-16.
 - .2 Submit test results to *Consultant* prior to application of sealants.

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- .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 C1248-08(2012).
 - .1 Submit test results to *Consultant* prior to application of sealants.

1.4 Quality Assurance

- .1 Qualifications:
 - .1 Installers / applicators: Execute the work of this section only by a *Subcontractor* with minimum 5 years experience in application of *Products*, systems and assemblies specified and with approval and training of *Product* manufacturers, and is a member in good standing of the Sealant and Waterproofing Association. 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.
 - .1 Coordinate sealant mock-up with EIFS mock-up to allow all components and materials to be reviewed together.

1.5 Field Conditions

- .1 Verify substrates and ambient air temperature at the *Place of the Work* before, during and after application to ensure compliance with manufacturer's recommendations. Surfaces shall be frost-free, dust-free, clean and completely dry at time of installation.
- .2 Weather Conditions: In accordance with manufacturer's instructions, do not apply silicone joint sealants in snow, rain, fog or mist, or when such conditions are expected. Allow joint surfaces to attain dry conditions as recommended by manufacturer before sealant application.
- .3 Sealant and substrate materials: Conform to sealant manufacturer's specifications and recommendations. Keep organic sealant materials heated to at least 16°C when working at temperatures below 10°C.

1.6 Extended Warranty

- .1 Warrant work of this section in accordance with Section 01 78 36.
- .2 Repair or replace joint sealants which fail to perform as air tight and water-tight joints; or fail in joint adhesion, cohesion, abrasion resistance, weather resistance, or general durability; or appear to deteriorate or become unserviceable or causing an objectionable appearance resulting from either defective or non-conforming materials and workmanship or in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated.
 - .1 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.

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- .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.

PART 2 - PRODUCTS

2.1 Sealants

.1 General:

- .1 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.
- .2 Comply with ASTM C920-11 and other requirements indicated for each liquid-applied chemically curing sealant, including those referencing ASTM C920-11 classifications for type, grade, class, and uses.
- .3 For sealants to be applied to porous substrates: Provide products that have undergone testing according to ASTM D1248-16 and have not stained porous joint substrates indicated for *Work*.
- .4 Sealant supplied shall not exude any material(s) which travels into adjacent materials, or travels 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 surfaces:

- .1 Sealant: single-component, non-sag, medium modulus non-bleed, high-performance silicone joint sealant, in accordance with the following:
 - .1 Comply with:
 - .1 ASTM C920-11, Type S, Grade NS, Class 50 or greater.
 - .2 CAN/CGSB 19.13-M87.
 - .3 SWR Institute Sealant Validation Program.
 - .2 Acceptable *Products*:
 - .1 Dowsil '791'.
 - .2 Dowsil '795'.
 - .3 Momentive 'Silpruf NB SCS 2000'.
 - .4 Sika 'Sikasil WS-295'.
 - .5 Tremco, Inc. 'Spectrem 1'.
- .2 Sealant: single-component, non-sag, low modulus non-bleed, high-performance silicone joint sealant, in accordance with the following:
 - .1 Comply with:
 - .1 ASTM C920-11, Type S, Grade NS, Class 50 or greater.
 - .2 CAN/CGSB 19.13-M87.
 - .3 SWR Institute Sealant Validation Program.
 - .2 Acceptable *Products*:

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- .1 Dowsil'790'.
 - .2 Momentive 'Silpruf NB SCS2700'.
 - .3 Sika 'Sikasil WS-290'.
 - .4 Tremco, Inc. 'Spectrem 3'.
- .3 Interior general sealants:
- .1 VOC limit: less than 250 g/L.
 - .2 Interior sealant; at joints with painted gypsum board: one-component paintable acrylic or polyurethane sealant in accordance with the following:
 - .1 Comply with:
 - .1 ASTM C834-10.
 - .2 CGSB 19-GP-5M-1984.
 - .2 Acceptable *Products*:
 - .1 Sika 'Sikaflex 1A'.
 - .2 Tremco, Inc. 'Tremflex 834'.
 - .3 Interior sealant; at movement paintable joints in vertical surfaces, no detectible odour: one-component sealant in accordance with the following:
 - .1 Comply with:
 - .1 ASTM C920-11, Type M or S, Grade NS, Class 25
 - .2 CAN/CGSB 19.13-M87.
 - .2 Acceptable *Products*:
 - .1 BASF Building Systems 'Sonolastic 150 VLM'.
 - .2 Sika 'Sikaflex 15LM'.
 - .4 Interior sealant, mildew resistant one part silicone sealant in accordance with the following:
 - .1 Comply with:
 - .1 ASTM C920-11, Type S, Grade NT, Class 25
 - .2 CAN/CGSB 19.22-M89.
 - .2 Acceptable *Products*:
 - .1 BASF Building Systems "OmniPlus";
 - .2 Dow Corning "786"
 - .3 Momentive "Sanitary SCS1700 Sealant"
 - .4 Sika 'Sikasil GP'.
 - .5 Tremco, Inc. "Tremsil 200";

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2.2 Accessories

- .1 General: Supply and install 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.
- .2 Cylindrical sealant backings: Supply and install 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 Use closed cell foam for joints in EIFS cladding systems.
- .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 Supply and install 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.
 - .2 Supply and install cleaner conditioner required for glass and glazed surfaces as recommended by sealant manufacturer.

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.

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- .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 Non-porous surfaces shall be cleaned using the two-cloth wipe method as referenced in ASTM C1193-16 and outlined by joint sealant manufacturer's instruction.
- .6 Rusting or scaling surfaces shall be prepared using abrasive cleaning methods as recommended by joint sealant manufacturer prior to joint sealant installation. Efflorescence, mould, mildew and algae must be removed and neutralized prior to joint sealant installation.
- .7 Coordinate cleaning, priming and installation to avoid contamination of wet, freshly coated or adjacent finished surfaces. 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 Review the complete *Contract Documents* for extent of sealant work required.
- .2 Apply joint sealants for continuous waterproof sealant joint protection. Vertical joints shall be lapped 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.
- .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.
- .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 Install, providing uniform cross-sectional shapes and depths in relation to joint width for optimum sealant movement capability per joint sealant manufacturer's instructions.

Joint Sealants

- .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 this section.
- .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 Verify contact materials are compatible with primer and sealant. When incompatible, inform *Consultant* and change primer and sealant to compatible type acceptable to *Consultant*.
- .10 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.
- .11 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.
- .12 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.
- .13 On horizontal traffic surfaces, support joint filler against vertical movement which might result from traffic loads, including foot traffic.
- .14 Pack joints tightly with sealant backing set at depth specified for sealant. Fill other voids with filler.
- .15 Install bond breaker tape in bottom of joints in lieu of sealant backing where proper depth cannot be obtained when backing is installed.
- .16 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.
- .17 Fillet bead sealant joints to be sized to provide proper contact area with substrates, in accordance with manufacturer's written recommendations.

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- .18 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.
- .19 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.
- .20 Remove droppings and excess sealant as work progresses, before material achieves initial set.
- .21 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.
- .22 Do not apply sealant to finish coats of EIFS cladding (sealant to be applied only to base coat). Apply sealant to completely cured EIFS basecoat material.
- .23 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 Installation at Exterior Insulating Finish Systems

- .1 Sealants shall be applied after EIFS base coat has been applied and prior to application of EIFS finish coat.
- .2 Install sealants at EIFS work to create a drained rain screen system, and in accordance with requirements of EIFS system manufacturer.

3.6 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 where frames/glazing meet exterior facade of building.
 - .2 Movement and control joints in exterior surfaces of insitu concrete and masonry.
 - .3 Exterior joints between masonry and insitu concrete.
 - .4 Exterior EIFS joints within EIFS system and at perimeter of EIFS system where it abuts adjacent materials, sealant, backer rod, and foam sealant system.

3.7 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 Perimeters of exterior and interior door and window frames.
 - .4 Exposed interior control joints in gypsum board.

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- .5 Mildew resistant sealant at wet areas:
 - .1 Perimeter joints of wet fixtures.
 - .2 Counter/wall junctions at countertops.

3.8 Field Quality Control

- .1 Conduct quality control in accordance with Section 01 45 00.
 - .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 Method A, Field-Applied Sealant Joint Hand-Pull Tab, in Appendix X-1 in ASTM C1193-16 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.
 - .1 Provide manufacturer's field service consisting of a minimum of three (3) periodic site visits by manufacturer or their distributor representative for observation of joint sealant application. Written report from the manufacturer or representative is to be issued to the *Consultant* within two (2) business days of visit.

3.9 Adjusting and Cleaning

- .1 Clean off excess sealant or sealant residue adjacent to sealant joint installations as the work progresses by methods approved by joint sealant manufacturer.
- .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.

3.10 Protection

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

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END OF SECTION