

**Part 1 GENERAL JOINT SEALING****1.1 RELATED REQUIREMENTS**

- .1 Section 04 21 13 - Brick Masonry
- .2 Section 07 62 00 - Sheet metal flashing and trim
- .3 Section 08 44 13 - Glazed aluminum curtain walls
- .4 Section 08 80 50 - Glazing.
- .5 Section 09 21 16 - Non-structural Metal Framing.

**1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM C919-12, Standard Practice for Use of Sealants in Acoustical Applications.
  - .2 ASTM C920-14a, Standard Specification for Elastomeric Joint Sealants.
  - .3 ASTM C1135-15, Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants.
  - .4 ASTM C1248-08 (2012), Standard Test Method for Staining of Porous Substrate by Joint Sealants.
  - .5 ASTM D217-10, Standard Test Methods for Cone Penetration of Lubricating Grease.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-19.13-M87 Sealing Compound, One-component, Elastomeric, Chemical Curing.
  - .2 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
  - .3 CAN/CGSB-19.21-M87, Sealing and Bedding Compound, Acoustical
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .4 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Manufacturer's product to describe:

- .1 Caulking compound.
  - .2 Primers.
  - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
  - .4 Compressible seams.
- .3 Submit one (1) copy of data sheets required under WHMIS, in accordance with Sections 01 35 29.06 – Health and Safety Requirements.
- .3 Samples:
  - .1 Submit 2 samples of each type of material and colour.
  - .2 As required, for purposes of harmonization with adjacent materials, submit dried samples of sealants to be left visible, for each proposed colour.
- .4 Manufacturer's Instructions:
  - .1 Submit instructions to include installation instructions for each product used.

#### **1.4 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials as specified in Construction Waste Management Plan Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management

#### **1.6 SITE CONDITIONS**

- .1 Ambient Conditions:
  - .1 Proceed with installation of joint sealants only when:
    - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4 degrees C.
    - .2 Joint substrates are dry.
    - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

- .2 Joint-Width Conditions:
  - .1 Proceed with installation of joint sealants only where joint widths are more than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
  - .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

## **1.7 ENVIRONMENTAL REQUIREMENTS**

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Health Canada.
- .2 Departmental Representative will arrange for ventilation system to be operated on maximum outdoor air and exhaust during installation of caulking and sealants. Ventilate area of work as directed Departmental Representative by use of approved portable supply and exhaust fans.

## **Part 2 Products**

### **2.1 SEALANT MATERIALS**

- .1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.
- .2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.
- .3 Where sealants are qualified with primers use only these primers.
- .4 Sealants and caulking should not contain VOCs exceeding 5% by weight as calculated from description of quantity of constituents used to make product.
- .5 In this section, products and materials with following characteristics will be favoured: water-based, water-cleanable, non-flammable, low VOC content, made without compounds contributing to destruction of ozone layer in upper atmosphere, made without compounds contributing to increased smog in lower atmosphere, without methylene chloride content and without chlorinated hydrocarbon content.

### **2.2 SEALANTS – DESCRIPTION**

- .1 Single-component silicone-based sealant: to CAN/CGSB-19.13.
- .2 Sealant for acoustic insulation: to ASTM C919.
- .3 Preformed backing materials, compressible and non-compressible.
  - .1 Polyethylene, urethane, neoprene or vinyl foam units.
    - .1 Extruded cellular foam filling rods.
    - .2 Units oversized by 30% to 50%.
  - .2 Neoprene units.

- .1 Round and full rods, Shore A hardness of 70.
- .3 High-density foam units.
  - .1 Extruded cellular PVC foam units of extruded cellular polyethylene foam, Shore A hardness of 20, tensile strength of 140 to 200 kPa; or of extruded polyolefin foam, density of 32 kg/m<sup>3</sup>; or of neoprene, in dimensions recommended by manufacturer.
- .4 Non-bonding tape.
  - .1 Polyethylene tape not adhering to sealant.
- .5 Type 1 product: Low-module silicone sealant, to ASTM C920 and C1248.
  - .1 Zero flow and subsidence after 20 minutes.
  - .2 Shore A hardness: 15.
  - .3 Tensile strength (ASTM C1135): 0.24 Mpa.
  - .4 Tear strength (ASTM C1135): 0.7 kN/m.
  - .5 Adhesive strength on glass and aluminum: 5.2 kN/m.
  - .6 Joint movement: +100% to -50%.
- .6 Type 2 product: General silicone sealant, to ASTM C920.
  - .1 Zero flow and subsidence after 20 minutes.
  - .2 Loss of adhesion: None.
  - .3 Recovery: 93%.
  - .4 Joint movement: +25%.
- .7 Type 3 product: Silicone latex sealant, to ASTM C834 and CAN/CGSB 19-GP-17M.
  - .1 To CAN/CGSB-19.21 and ASTM D217, non-hardening, non-peelable, non-staining and consistent.
- .8 Type 4 product: Multi-component polyurethane sealant, to ASTM C920, Type M, Grade NS, Class 50.
  - .1 Tensile strength: 2.06 to 2.75 Mpa.
  - .2 Elongation: 550%.
  - .3 Joint movement: +25%.
  - .4 Colour: Grey.

## 2.3 SEALANTS – LOCATIONS

- .1 Perimeter of apertures formed in exterior walls (brick, block or prefabricated masonry unit) with frame contiguous with finishing coat: Type 1 product.
- .2 Control and expansion joints in exterior surfaces of unit masonry walls: sealant type 1.
- .3 Coping joints and coping-to facade joints: sealant type 1.
- .4 Cornice and wash (or horizontal surface joints): sealant type 1.
- .5 Seal interior perimeters of exterior openings as detailed on drawings: sealant type 2.
- .6 Perimeters of interior frames, as detailed and itemized: sealant type 1.
- .7 Visible dividing joints formed in drywall partition structures: Type 3 product.

- .8 Around drywall panels, against metal frames, in concealed position: Type 6 product.
- .9 Sealant for glazing and curtain walls: Type 4 product.

## **2.4 JOINT CLEANER**

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.
- .2 Primer: in accordance with sealant manufacturer's written recommendations.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed Departmental Representative.

### **3.2 SURFACE PREPARATION**

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

### **3.3 PRIMING**

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

### **3.4 BACKUP MATERIAL**

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

**3.5 MIXING**

- .1 Mix materials in strict accordance with sealant manufacturer's instructions.

**3.6 APPLICATION**

- .1 Sealant:
  - .1 Apply sealant in accordance with manufacturer's written instructions.
  - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
  - .3 Apply sealant in continuous beads.
  - .4 Apply sealant using gun with proper size nozzle.
  - .5 Use sufficient pressure to fill voids and joints solid.
  - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
  - .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
  - .8 Remove excess compound promptly as work progresses and upon completion.
- .2 Curing:
  - .1 Cure sealants in accordance with sealant manufacturer's instructions.
  - .2 Do not cover up sealants until proper curing has taken place.

**3.7 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
  - .2 Clean adjacent surfaces immediately.
  - .3 Remove excess and droppings, using recommended cleaners as work progresses.
  - .4 Remove masking tape after initial set of sealant.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**3.8 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by joint sealants installation.

**END OF SECTION**