

PART 1 GENERAL

1.1 SECTION INCLUDES

- .1 Materials, preparation and application for caulking and sealants.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C920 - 14a Standard Specification for Elastomeric Joint Sealants
- .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 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .4 General Services Administration (GSA) - Federal Specifications (FS)
 - .1 FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.3 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .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.

- .3 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .4 Submit duplicate samples of each type of material and colour.
- .5 Cured samples of exposed sealants for each color where required to match adjacent material.
- .6 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Instructions to include installation instructions for each product used.

1.4 QUALITY ASSURANCE/ MOCK-UP

- .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 Construct mock-up to show location, size, shape and depth of joints complete with back-up material, primer, caulking and sealant.
- .3 Mock-up will be used:
 - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
- .4 Locate where directed.
- .5 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with sealant work.
- .6 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may remain as part of finished Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials in accordance with manufacturer's recommendations.
- .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.6 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard and packaging material for recycling in accordance with Waste Management Plan.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .6 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .7 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Departmental Representative.
- .8 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.
- .9 Fold up metal banding, flatten, and place in designated area for recycling.

1.7 PROJECT
CONDITIONS

- .1 Environmental Limitations: .1Do not proceed with installation of joint sealants under following conditions:
 - .1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.
 - .2 When joint substrates are wet.
- .2 Joint-Width Conditions:
 - .1 Do not proceed with installation of joint

sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

- .3 Joint-Substrate Conditions:
 - .1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 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 Labour Canada.
- .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
- .3 Ventilate area of work as directed by Departmental Representative by use of approved portable supply and exhaust fans.

PART 2 PRODUCTS

2.1 SEALANT MATERIALS

- .1 Sealants and caulking compounds must:
 - .1 Meet or exceed all applicable governmental and industrial safety and performance standards; and
 - .2 Be manufactured and transported in such a manner that all steps of the process, including the disposal of waste products arising there from, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the fisheries Act and the Canadian Environmental Protection Act (CEPA).
- .2 Sealant and caulking compounds must not be formulated or manufactured with: aromatic

solvents, fibrous talc or asbestos, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium, barium or their compounds, except barium sulfate.

- .3 Sealant and caulking compounds must not contain a total of volatile organic compounds (VOCs) in excess of 5% by weight as calculated from records of the amounts of constituents used to make the product;
- .4 Sealant and caulking compounds must be accompanied by detailed instructions for proper application so as to minimize health concerns and maximize performance, and information describing proper disposal methods.
- .5 Caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant shall not be used in air handling units.
- .6 In the selection of the products and materials of this section preference will be given to those with the following characteristics: Water based, water clean-up, non-flammable, low Volatile Organic Compound (VOC) content, manufactured without compounds which contribute to ozone depletion in the upper atmosphere, manufactured without compounds which contribute to smog in the lower atmosphere, does not contain methylene chloride, does not contain chlorinated hydrocarbons.
- .7 The manufacturing process must adhere to Lifecycle Assessment Standards as per ISO 14040/14041 LCA Standards.
- .8 Sealants acceptable for use on this project except CAN/CGSB-19.1 and CAN/CGSB-19.18 must be listed on CGSB Qualified Products List issued by CGSB Qualification Board for Joint Sealants. Where sealants are qualified with primers use only these primers.

2.2 SEALANT
MATERIAL
DESIGNATIONS

- .1 Sealant type 2 - multi component chemical curing sealing compound, paintable, to CAN/CGSB-19.24.
 - .1 Acceptable materials:
 - .1 Dymeric as manufactured by Tremco (Canada) Ltd.

- .2 Sikaflex 2C NS/S1 as manufactured by Sika Construction.
- .3 NP 2 as manufactured by Sonneborn, or an approved alternate.

- .2 Sealant type 4 - Security Sealant: as specified in Section 07 92 10.13.
- .3 Joint Filler: Round closed cell, non-staining, non-absorbent foam, extruded polyethylene shore hardness 20, tensile strength 138-207 KPa oversized 30-50%. For backup to large joints, cavities or voids, use fibreglass wool.
- .4 Bond Breaker: Pressure sensitive polyethylene tape, not bondable to sealant.

2.3 SEALANT SELECTION

- .1 Perimeters of interior frames, as detailed and itemized: Sealant Type 4 to inmate areas, Sealant Type 2 elsewhere.
- .2 Between different materials at interior locations, such as between gypsum board and concrete or concrete block: Sealant type 4 to inmate areas, Sealant type 2 elsewhere.
- .3 Sealant to wet areas: Sealant type 4 to inmate areas, Sealant type 2 elsewhere.

2.4 JOINT CLEANER

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.
- .2 Primer: as recommended by manufacturer.

PART 3 EXECUTION

3.1 Protection

- .1 Protect installed work of other trades from staining or contamination.

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 Cleanup.
 - .1 Clean adjacent surfaces immediately and leave Work neat and clean.
 - .2 Remove excess and droppings, using recommended cleaners as work progresses.
 - .3 Remove masking tape after initial set of sealant.

END OF SECTION

PART 1 GENERAL

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| <u>1.1 SECTION INCLUDES</u> | .1 | Preparing sealant substrate surfaces. |
| | .2 | Placement of joint fillers, backing and sealant. |
| <u>1.2 REFERENCE STANDARDS</u> | .1 | ASTM Standards: |
| | .1 | ASTM C920-14a: Standard Specification for Elastomeric Joint Sealants. |
| <u>1.3 QUALIFICATIONS</u> | .1 | Perform Caulking using parties recognized for ability in the trade, having at least five (5) years proven satisfactory experience, to carry out the work and/or supervise skilled mechanics thoroughly trained and competent in the use of caulking and sealing materials using pressure operated equipment. |
| | .2 | Perform Work in accordance with the sealant manufacturer's requirements for preparation of surfaces and materials installation instructions. |
| <u>1.4 PRODUCT DATA</u> | .1 | Submit product data in accordance with Section 01 33 00. |
| | .2 | Submit duplicate copies of manufacturer's product literature for each type of sealant material specified. |
| <u>1.5 PROTECTION</u> | .1 | If sealant can be damaged before it has cured sufficiently, provide adequate protection. If damaged, remove sealant and renew the application. |
| <u>1.6 DELIVERY / STORAGE</u> | .1 | Deliver all materials and store in originals wrappings and containers with manufacturer's seals and labels intact, and as recommended by the manufacturer of the sealant. |
| | .2 | Maintain containers and labels in undamaged condition. |

1.7 ENVIRONMENTAL
CONDITIONS

- .1 Do not work at temperatures greater or less than those recommended by the manufacturer.
- .2 Maintain air temperature range of 4°C to 27°C in areas to receive sealants, 24 hours before, during application, and until sealants have cured.
- .3 Should it become necessary to apply sealants at temperatures below or above this range, advise the Departmental Representative and consult sealant manufacturer and follow the latter's recommendations.
- .4 Protect all work against damage and disfigurations and work of other trades against soiling and damage arising out of this work. Upon completion, replace and repair all defective work.
- .5 Examine substrate materials, joint voids, and note temperature/humidity conditions. Report unacceptable conditions to the Departmental Representative.
- .6 Commencement of work implies acceptance of conditions.

1.8 SAFETY
REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labeling and provision of material safety data sheets acceptable to Labour Canada and Occupational Health and Safety.
- .2 Product may cause chemical burns on skin if not washed out within 5 minutes or in the eyes if not washed out immediately with water for a period of five minutes.
 - .1 Goggles, gloves and other suitable safety equipment should be used.
 - .2 Over time and over exposure can cause a skin reaction to occur.
 - .3 See manufacturer's Data Sheet before using.
- .3 Ventilate area of work as using acceptable portable supply and exhaust fans.

1.9 COMPATIBILITY

- .1 Ensure that all materials used are compatible.
- .2 Declaration of Materials Compatibility: Submit written declaration stating that sealant materials are compatible with adjacent materials and substrates and are acceptable to the sealant manufacturer. Include a list of materials, suppliers and manufacturers.

1.10 GUARANTEE

- .1 For Work of this Section 07 92 10.13 - Security Sealants, 12 months warranty period prescribed in subsection GC 3.13 of General Conditions "C" is extended to 60 months as described below.
- .2 Provide a written guarantee endorsed and issued in the name of Her Majesty the Queen stating that all sealant and caulking work is guaranteed against leakage, cracking and deterioration, shrinkage, loss of cohesion, loss of adhesion, staining of adjacent surfaces, integral staining or failure to provide intended seal; for a period of five (5) years from date of Substantial Performance of the contract and that any defects will be replaced including related materials at no cost to the Departmental Representative.
- .3 Provide manufacturers guarantee, that its products are of the quality represented in its product literature and package markings and, when applied in accordance with its current specifications and application instructions, will perform as stated in its product literature.
- .4 Include this scope provision within the scope of the Performance Bond.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Security Type Sealant: Epoxy sealant type 4, 2 component. Physical Properties Part A Part B Part A & B Colour - - Colour to match substrate Viscosity 10,000 CPS 200 CPS 7,000 CPS Specific Gravity 1.3 9.7 1.2.
 - .1 Acceptable products:
"AnchorFix-3001" manufactured by Sika; Dynapoxy EP-1200 manufactured

by Pecora;

- .2 Joint Cleaner: Non-corrosive solvent recommended by sealant manufacturer for applicable substrate materials.
- .3 Primer: Non-staining type recommended by sealant manufacturer.
- .4 Joint Filler: Round closed cell, non-staining, non-absorbent foam, extruded polyethylene shore hardness 20, tensile strength 138-207 KPa oversized 30-50%. For backup to large joints, cavities or voids, use fibreglass wool.
- .5 Bond Breaker: Pressure sensitive polyethylene tape, not bondable to sealant.

2.2 COLOURS

- .1 Colours: to match adjacent material, as selected by the Departmental Representative.

PART 3 EXECUTION

3.1 PREPARATION

- .1 Surface Cleaning: Clean all surfaces required to be caulked, removing all loose particles, dust, oil, wax, protective coatings, mould release agents, and the like, using brush, solvents, or acid etching methods.
 - .1 Concrete: Must be sound, free of grease, laitance, etc. Concrete must be dry.
 - .2 Steel: Remove rust, old paints, etc. Solvent cleaners to remove oil, etc.
 - .3 Wood: Must be dry and free of paint, oil, etc.
 - .4 Plastics: Consult sealant manufacturer for written instructions.
- .2 Primer Application: Prior to application of primer where required, test primers for possible yellowing, discolouration, and dirt pick-up when applied over face of porous substrates.
- .3 Following testing apply primers to joints following manufacturer's recommendations.
- .4 When tests indicate discolouration, dirt pick-up and the like on surfaces, take special precautions

when applying, by masking surfaces not required to be primed.

- .5 Ensure that the sealant manufacturer's representative reviews site conditions, joint design and installers qualifications. Report unsatisfactory conditions to the Departmental Representative. Ensure that sealants are compatible with adjoining materials.
- .6 Ensure that the sealant manufacturer's representative checks container labels, random inspect preparation of substrate materials and random test installed work.

3.2 APPLICATION GENERAL

- .1 Apply foam bead to within 10 mm of face of joint.
- .2 Ensure all surfaces are clean. Caulk only when surface temperature is between 4°C and 26°C.
- .3 Apply sealant in accordance with manufacturer's instructions.
- .4 Use pressure gun fitted with suitable nozzle.
- .5 Ensure finished surfaces of sealant are smooth and free from ridges, wrinkles, or foreign matter.
- .6 Prime joints when recommended by manufacturer. Use a brush that will reach all parts of the joints.
- .7 Wire brush loose surfaces (such as brick or masonry).
- .8 Ensure bead is solid, filling entire space between sides and bedding material, and exerting sufficient pressure on sides to obtain maximum bond, by allowing sealant to bulge out in advance of nozzle.

3.3 APPLICATION OF SEALANTS

- .1 Apply sealant in accordance with manufacturer's directions, using a pressure air gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.
- .2 Apply security sealant to all interior joints between dissimilar materials and elsewhere as

required or indicated on the Drawings.

- .3 Joints should be filled to approximately 2/3 full and let set for approximately 4 hours, then fill the remainder. The level of epoxy should be just above the surface. Passing a propane torch over the surface an hour after application will break any bubbles. Excess epoxy can be cut off with a scraper the next day.
- .4 Cold Temperature: Apply only when temperatures are above 0C.
- .5 Provide bond breaker between security sealant and glass. Remove excess bond breaker exposed after sealant has cured.
- .6 Provide bond breaker at radiant heat ceiling panel. Remove excess bond breaker exposed after sealant has cured.
- .7 Joint Design: Fill all spaces that are deeper than width of joint, with approved backup material. Ensure that the backup material fills the joint out to a dimension that is equal to the width of the joint, but in no case less than half the width of the joint.
- .8 Sealant Application: Gun apply sealants through a nozzle opening of such shape and diameter that the full bead of sealant is gunned into the joint, filling the joint completely; to the approval of the Departmental Representative.
- .9 A superficial or skin bead in joints will not be acceptable.
- .10 Tool all beads immediately after application to ensure firm, full contact with the inner faces of the joint. Strike off excess material with tooling stick or knife.
- .11 Upon completion ensure caulking surfaces are smooth, even, free from ridges, wrinkles, air pockets, and embedded foreign matter.
- .12 Joint Finishes: Finish joints in flush surfaces; fill joints full in internal angles, except as otherwise detailed. Use wet tool as required. Avoid the use of face fillet (or angle bead) joints. CONCAVE OR CONVEX JOINTS WILL BE REJECTED.

- .13 Where sharp, exact bead lines are desired, use masking tape. When taping, avoid touching cleaned and primed areas to which sealant is to be applied. Remove masking tape immediately after bead is placed and tooled, to avoid damage to developing surface skin.
- .14 Completely fill void with compound into which they are installed. Remove excess immediately following installation.
- .15 Do not provide security sealant to light switch plates, electrical plug plates and sprinkler heads.

3.4 BREAKER

- .1 Use foam bead as specified, to limit depth of sealant and to act as bond breaker at back of joint (adhesion is not required at back of joint).
- .2 Where depth of joint does not permit the use of foam bead, apply paper masking tape to the back of the joint to act as bond breaker.

3.5 CLEANING

- .1 Promptly as work proceeds remove all excess material or smears from surfaces beyond joint or surface to be caulked, using solvents as recommended by the manufacturer's representative. If sealant or caulking has set up, employ mechanical removal.
- .2 During application, maintain areas of work in clean condition daily removing from the premises and site all rubbish and surplus material.
- .3 Clean immediately soiled non-porous materials.
- .4 On porous surfaces, remove any excess sealant as recommended by manufacturer.
- .5 Sealant manufacturer recommends that equipment must be cleaned after use with Sealant Manufacturers Solvent. Cured material can only be removed by burning.

END OF SECTION