

**PART 1 - GENERAL**

- 1.1 RELATED SECTIONS**
- .1 Section 09 21 16 Gypsum Board Assemblies.
  - .2 Section 09 22 16 Non-Structural Metal Framing.
- 1.2 REFERENCES**
- .1 American Society for Testing and Materials International (ASTM)
    - .1 ASTM C 57.8, Type X,, Standard Specification for Rigid Cellular Polystyrene Thermal Insulation.
    - .2 ASTM E 96/E96M-[05], Standard Test Methods for Water Vapour Transmission of Materials.
  - .2 Canadian General Standards Board (CGSB)
    - .1 CGSB 71-GP-24M-77(R1983), Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
  - .3 Underwriters Laboratories of Canada (ULC)
    - .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
    - .2 CAN/ULC-S704-03, Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.
  - .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).
- 1.3 SUBMITTALS**
- .1 Product Data:
    - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
    - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's insulation products and adhesives.
  - .2 Manufacturer's Instructions:
    - .1 Submit manufacturer's installation instructions.
- 1.4 QUALITY ASSURANCE**
- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
  - .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
  - ..3 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

**PART 2 - PRODUCTS**

- 2.1 INSULATION .1 Extruded polystyrene (XPS) : to CAN/ULC-S701.
- .1 Type: 2.
  - .2 Compressive strength: TOD1621; 110 kPa.
  - .3 Thickness: as indicated.
  - .4 Size: 1200 mm x 2400 mm.
  - .5 Edges: shiplapped.
- 2.2 ADHESIVE .1 Adhesive for polystyrene: to CGSB 71-GP-24.
- .1 Type: as recommended by Insulation Manufacturer.
- 2.3 ACCESSORIES .1 Insulation clips: impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self locking type.

**PART 3 - EXECUTION**

- 3.1 MANUFACTURER'S INSTRUCTIONS .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- 3.2 WORKMANSHIP .1 Install insulation after building substrate materials are dry.
- .2 Install insulation to maintain continuity of thermal protection to building elements and spaces.
  - .3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
  - .4 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
  - .5 Offset both vertical and horizontal joints in multiple layer applications.
  - .6 Do not enclose insulation until it has been inspected and approved by Departmental Representative.
- 3.3 EXAMINATION .1 Prior to commencement of work ensure:
- .1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

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| <u>3.4 RIGID<br/>INSULATION<br/>INSTALLATION</u> | .1 | Apply adhesive to polystyrene insulation board in accordance with manufacturer's recommendations.               |
|  | .2 | Imbed insulation boards into vapour barrier type adhesive, applied as specified, prior to skinning of adhesive. |
| <u>3.5 CLEANING</u>                              | .1 | Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.               |

**PART 1 - GENERAL**

- 1.1 RELATED REQUIREMENTS .1 Section 09 22 16 Non-Structural Metal Framing
- 1.2 REFERENCES .1 American Society for Testing and Materials International (ASTM)
- .1 ASTM C 553-02, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
  - .2 ASTM C 665-01e1, Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
  - .3 ASTM C 1320-05, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
- .2 Canadian Gas Association (CGA)
- .1 CAN/CGA-B149.1-05, Natural Gas and Propane Installation Code Handbook.
  - .2 CAN/CGA-B149.2-05, Propane Storage and Handling Code.
- .3 Canadian Standards Association (CSA International)
- .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .4 Underwriters Laboratories of Canada (ULC)
- .1 CAN/ULC-S702-1997, Standard for Mineral Fibre Insulation.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS .1 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Manufacturer's Instructions:
- .1 Submit manufacturer's installation instructions.
- 1.4 QUALITY ASSURANCE .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

**PART 2 - PRODUCTS**

- 2.1 INSULATION .1 Sound Attenuation Batt and blanket mineral fibre: to CAN/ULC S702.
- .1 Type: 1
  - .2 Thickness: as indicated.

**2.2 ACCESSORIES** .1

Insulation clips:

- .1 Impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self locking type.

**PART 3 - EXECUTION****3.1 MANUFACTURER'S INSTRUCTIONS** .1

Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

**3.2 INSULATION INSTALLATION** .1

Install insulation to maintain continuity of sound protection to building elements and spaces.

- .2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.

- .3 Do not compress insulation to fit into spaces.

**3.3 CLEANING** .1

Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**PART 1 - GENERAL**

- 1.1 RELATED REQUIREMENTS .1 Section 09 21 16 Gypsum Board Assemblies  
.2 Section 09 22 16 Non-Structural Metal Framing
- 1.1 RELATED SECTIONS .1 Section 09 21 16 Gypsum Board Assemblies..
- 1.2 REFERENCES .1 Canadian General Standards Board (CGSB)  
.1 CAN/CGSB-51.34-[M86], Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.
- 1.3 SUBMITTALS .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.  
.2 Product Data:  
.1 Submit manufacturer's printed product literature, specifications and datasheet and include:  
.1 Product characteristics.  
.2 Performance criteria.  
.3 Limitations.  
.3 Quality assurance submittals:  
.1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.  
.2 Instructions: submit manufacturer's installation instructions and comply with written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.
- 1.4 QUALITY ASSURANCE .1 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

**PART 2 - PRODUCTS**

- 2.1 SHEET VAPOUR BARRIER .1 Polyethylene film: to CAN/CGSB-51.34, 0.15 mm thick.

- 2.2 ACCESSORIES .1 Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.
- .2 Sealant: compatible with vapour retarder materials, recommended by vapour retarder manufacturer.
- .3 Staples: minimum 6 mm leg.
- .4 Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes.

### **PART 3 - EXECUTION**

- 3.1 INSTALLATION .1 Ensure services are installed and inspected prior to installation of retarder.
- .2 Install sheet vapour retarder on warm side of exterior wall assemblies prior to installation of gypsum board to form continuous retarder.
- .3 Use sheets of largest practical size to minimize joints.
- .4 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.
- 3.2 EXTERIOR SURFACE OPENINGS .1 Cut sheet vapour retarder to form openings and ensure material is lapped and sealed to frame.
- 3.3 PERIMETER SEALS .1 Seal perimeter of sheet vapour barrier as follows:
- .1 Apply continuous bead of sealant to substrate at perimeter of sheets.
  - .2 Lap sheet over sealant and press into sealant bead.
  - .3 Install staples through lapped sheets at sealant bead into wood substrate.
  - .4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.
- 3.4 LAP JOINT SEALS .1 Seal lap joints of sheet vapour barrier as follows:
- .1 Attach first sheet to substrate.
  - .2 Apply continuous bead of sealant over solid backing at joint.
  - .3 Lap adjoining sheet minimum 150 mm and press into sealant bead.
  - .4 Install staples through lapped sheets at sealant bead into wood substrate.
  - .5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.
- 3.5 ELECTRICAL BOXES .1 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:
- .1 [Wrap boxes with film sheet providing minimum 300 mm perimeter lap flange.
  - .2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

3.6 CLEANING .1

Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

**PART 1 - GENERAL**

<u>1.1 SECTION INCLUDES</u>	.1	Materials and installation methods providing primary airvapour barrier materials and assemblies.
	.2	Air/vapour barrier materials to provide continuous seal between components of building envelope and building penetrations.
<u>1.2 RELATED SECTIONS</u>	.1	Section 07 92 10 - Joint Sealing.
<u>1.3 REFERENCES</u>	.1	Canadian General Standards Board (CGSB) .1 CAN/CGSB-19.13M-Latest Edition, Sealing Compound, One Component, Elastomeric Chemical Curing. .2 CAN/CGSB-19.18M-Latest Edition, Sealing Compound, One Component, Silicone Base Solvent Curing. .3 CAN/CGSB-19.24M-Latest Edition, Multi-Component, Chemical Curing Sealing Compound. .4 CGSB 19-GP-14M-Latest Edition, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.
	.2	NBCC 1995; Part 5 - Environmental Separation
	.3	Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.
<u>1.4 SUBMITTALS</u>	.1	Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
	.2	Submit manufacturer's product data sheets in accordance with Section 01 33 00 - Submittal Procedures.
	.3	Submit manufacturer's installation instructions in accordance with Section 01 33 00 - Submittal Procedures.
<u>1.5 QUALITY ASSURANCE</u>	.1	Perform Work in accordance with Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification requirements for materials and installation.
	.2	Perform Work in accordance with National Air Barrier Association - Professional Contractor Quality Assurance Program and requirements for materials and installation.
<u>1.6 MOCK-UP</u>	.1	Construct mock-up in accordance with Section 01 45 00 - Quality Control.
	.2	Mock-up may remain as part of the Work.
	.3	Allow 24 h for inspection of mock-up by Consultant before proceeding with air/vapour barrier Work.

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- 1.7 DELIVERY, STORAGE AND HANDLING
- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
  - .3 Avoid spillage.
  - .4 Clean spills and leave area as it was prior to spill.
- 1.8 SEQUENCING
- .1 Sequence work to permit installation of materials in conjunction with related materials and seals.
- 1.13 WARRANTY
- .1 For sealant and sheet materials the 12 months warranty period.
  - .2 Warranty: Include coverage of installed sealant and sheet materials which fail to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.
- PART 2 - PRODUCTS**
- 2.1 SHEET MATERIALS
- .1 Sheet Seal : Self-Adhesive bitumin laminated to high-density polyethylene film, nominal total thickness of 1 mm.
    - .1 Acceptable material: Blueskin SA.
- 2.2 SEALANTS
- .1 Butyl Sealant: CGSB 19-GP-14M, butyl rubber base, single component, solvent release, non-skinning, Shore "A" Hardness Range of 10 to 30; black .
    - .1 Acceptable material: as recommended by Sheet Steel Manufaacterer.
  - .2 Primer: Recommended by sealant manufacturer.
  - .3 Substrate Cleaner: Non-corrosive type recommended by sealant manufacturer compatible with adjacent materials.
- 2.3 ADHESIVES
- .1 Adhesive : Compatible with sheet seal and substrate, permanently non-curing.
- 2.4 ACCESSORIES
- .1 Thinner and cleaner for Butyl. As recommended by sheet material manufacturer.

**PART 3 - EXECUTION**

- 3.1 EXAMINATION .1 Verify that surfaces and conditions are ready to accept the Work of this section.
- .2 Ensure all surfaces are clean, dry, sound, smooth, continuous and comply with air barrier manufacturer's requirements.
- .3 Report any unsatisfactory conditions to the Consultant in writing.
- .4 Do not start work until deficiencies have been corrected. Commencement of Work implies acceptance of conditions.
- 3.2 PREPARATION .1 Remove loose or foreign matter which might impair adhesion of materials.
- .2 Ensure all substrates are clean of oil or excess dust; all masonry joints struck flush, and open joints filled; and all concrete surfaces free of large voids, spalled areas or sharp protrusions.
- .3 Ensure all substrates are free of surface moisture prior to application of self-adhesive membrane and primer.
- .4 Ensure metal closures are free of sharp edges and burrs.
- .5 Prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.
- 3.3 PROTECTION OF WORK .1 Protect finished Work in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Do not permit adjacent work to damage work of this section.
- .3 Ensure finished Work is protected from climatic conditions.

**PART 1 - GENERAL**

- 1.1 REFERENCES
- .1 The Aluminum Association Inc. (AAI)
    - .1 AAI-Aluminum Sheet Metal Work in Building Construction-Latest Edition.
    - .2 AAI DAF45-Latest Edition, Designation System for Aluminum Finishes.
  - .2 American Society for Testing and Materials International (ASTM)
    - .1 ASTM A 606-Latest Edition, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
    - .2 ASTM A 792/A 792M-Latest Edition, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
  - .3 Canadian Roofing Contractors Association (CRCA)
    - .1 Roofing Specifications Manual 1997.
  - .4 Canadian General Standards Board (CGSB)
    - .1 CAN/CGSB-51.32-Latest Edition, Sheathing, Membrane, Breather Type.
    - .2 CAN/CGSB-93.1-Latest Edition, Sheet Aluminum Alloy, Prefinished, Residential.
  - .5 Canadian Standards Association (CSA International)
    - .1 CSA A123.3-Latest Edition, Asphalt Saturated Organic Roofing Felt.
    - .2 CSA B111-Latest Edition, Wire Nails, Spikes and Staples.
  - .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Product Data:
    - .1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
    - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets.
  - .3 Samples:
    - .1 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, finishes and colours.

**PART 2 - PRODUCTS**

- 2.1 PREFINISHED STEEL SHEET**
- .1 Prefinished steel with factory applied polyvinyl chloride.
    - .1 Class F2S.
    - .2 Custom colour selected by Departmental Representative.
    - .3 Specular gloss: [30] units +/- 5 in accordance with ASTM D 523.
    - .4 Coating thickness: not less than 200 micrometres.
    - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D 822 as follows:
      - .1 Outdoor exposure period 5000 hours.
      - .2 Humidity resistance exposure period 5000 hours.
- 2.2 ACCESSORIES**
- .1 Isolation coating: alkali resistant bituminous paint.
  - .2 Self-adhered roofing underlayment composed of waterproofing materials; aggressive rubberized asphalt adhesive backed by a layer of cross laminated polyethylene.
  - .3 Plastic cement to CAN/CGSB 37.5.
  - .4 Cleats: of same material, and temper as sheet metal, minimum 100 mm wide. Thickness 0.71 mm same as sheet metal being secured.
  - .5 Fasteners: of same material as sheet metal, to CSA B111, ring thread flat head roofing nails of length and thickness suitable for metal flashing application.
  - .6 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
  - .7 Touch-up paint: as recommended by prefinished material manufacturer.
- 2.3 FABRICATION**
- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series details.
  - .2 Fabricate aluminum flashings and other sheet aluminum work in accordance with AAI-Aluminum Sheet Metal Work in Building Construction.
  - .3 Form pieces in 2400 mm maximum lengths.
    - .1 Make allowance for expansion at joints.
  - .4 Hem exposed edges on underside 12 mm.
    - .1 Mitre and seal corners with sealant.
  - .5 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
  - .6 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.4 METAL FLASHINGS .1 Form flashings, copings and fascias to profiles indicated of 0.61 mm thick.

2.5 REGLETS .1 Form recessed reglets of 3 mm thick sheet metal to be built-in masonry work for base flashings as detailed.  
.1 Provide slotted fixing holes and steel/plastic washer fasteners.  
.2 Cover face and ends with plastic tape.

### **PART 3 – EXECUTION**

3.1 MANUFACTURER'S INSTRUCTIONS .1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and data sheets.

3.2 INSTALLATION .1 Install sheet metal work in accordance with CRCA FL series details.  
.2 Use concealed fastenings except where approved before installation.  
.3 Provide underlay under sheet metal.  
.1 Secure in place and lap joints 100 mm.  
.4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs.  
.1 Flash joints using S-lock forming tight fit over hook strips.  
.5 Lock end joints and caulk with sealant.  
.6 Install surface mounted reglets true and level, and caulk top of reglet with sealant.  
.7 Insert metal flashing into reglets to form weather tight junction.  
.8 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Lead wedge flashing securely into joint.  
.9 Caulk flashing at reglet with sealant.

3.3 CLEANING .1 Proceed in accordance with Section 01 74 11 - Cleaning.  
.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.  
.3 Leave work areas clean, free from grease, finger marks and stains.

**PART 1 - GENERAL**

- 1.1 REFERENCES** .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)  
.1 Material Safety Data Sheets (MSDS).
- .2 Underwriter's Laboratories of Canada (ULC)  
.1 ULC-S115-[1995], Fire Tests of Fire stop Systems.
- 1.2 DEFINITIONS** .1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.
- .2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.
- .3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.
- .4 Tightly Fitted; (ref: NBC Part 3.1.9.1.1 and 9.10.9.6.1): penetrating items that are cast in place in buildings of noncombustible construction or have "0" annular space in buildings of combustible construction.  
.1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS** .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:  
.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.  
.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets.
- .3 Shop Drawings:  
.1 Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation.  
.2 Construction details should accurately reflect actual job conditions.
- .4 Quality assurance submittals: submit following:  
.1 Test reports: in accordance with CAN-ULC-S101 for fire endurance and CAN-ULC-S102 for surface burning characteristics.  
.1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.  
.2 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.  
.3 Manufacturer's Field Reports: submit to manufacturer's written reports within [3] days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

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- 1.4 QUALITY ASSURANCE .1 Qualifications:
- .1 Installer: company specializing in fire stopping installations with 5 years documented experience.
- 1.5 DELIVERY, STORAGE AND HANDLING .1 Packing, shipping, handling and unloading:
- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
  - .3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate [brand name], [manufacturer], [ULC markings].
- .2 Storage and Protection:
- .1 Store materials 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.
- PART 2 - PRODUCTS**
- 2.1 MATERIALS .1 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.
- .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN-ULC-S115 and not to exceed opening sizes for which they are intended [and conforming to specified special requirements described in PART 3].
  - .2 Fire stop system rating: 1 hour.
- .2 Service penetration assemblies: systems tested to CAN-ULC-S115.
- .3 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115.
- .4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.
- .6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .10 Sealants for vertical joints: non-sagging.

**PART 3 - EXECUTION**

- 3.1 MANUFACTURER'S INSTRUCTIONS** .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- 3.2 PREPARATION** .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.
- .1 Ensure that substrates and surfaces are clean, dry and frost free.
- .2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
- .3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.
- .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.
- 3.3 INSTALLATION** .1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.
- .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
- .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
- .4 Tool or trowel exposed surfaces to neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.
- 3.4 SEQUENCES OF OPERATION** .1 Proceed with installation only when submittals have been reviewed by Departmental Representative
- .2 Mechanical pipe insulation: certified fire stop system component.
- .1 Ensure pipe insulation installation precedes fire stopping.

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- 3.5 FIELD QUALITY CONTROL .1 Inspections: notify Departmental Representative when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.
- .2 Manufacturer's Field Services:
- .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
  - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
  - .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.
- 3.6 CLEANING .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Remove temporary dams after initial set of fire stopping and smoke seal materials.
- 3.7 SCHEDULE .1 Fire stop and smoke seal at:
- .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
  - .2 Top of fire-resistance rated masonry and gypsum board partitions.
  - .3 Intersection of fire-resistance rated masonry and gypsum board partitions.
  - .4 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
  - .5 Penetrations through fire-resistance rated floor slabs and ceilings.
  - .6 Around mechanical and electrical assemblies penetrating fire separations.
  - .7 Rigid ducts: greater than 129 cm<sup>2</sup> fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

**PART 1 - GENERAL**

- 1.1 SECTION INCLUDES .1 Materials, preparation and application for caulking and sealants.
- 1.2 RELATED SECTIONS .1 Section 01 33 00 - Submittal Procedures.
- 1.3 REFERENCES .1 Canadian General Standards Board (CGSB)  
.1 For interior application - CGSB 19-GP-5M-Latest Edition, Sealing Compound, One Component, Acrylic Base, Solvent Curing  
.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)  
.1 Material Safety Data Sheets (MSDS).
- 1.4 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 manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.  
.1 Instructions to include installation instructions for each product used.
- 1.5 QUALITY ASSURANCE/ MOCK-UP .1 Construct mock-up to show location, size, shape and depth of joint [s] complete with back-up material, primer, caulking and sealant.  
.2 Mock-up will be used:  
.1 To judge workmanship, substrate preparation, operation of equipment and material application.  
.3 Allow 48 hours for inspection of mock-up by Departmental Representative before proceeding with sealant work.  
.4 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may not remain as part of finished Work.

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- 1.6 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.
- 1.7 PROJECT CONDITIONS
- .1 Environmental Limitations:
    - .1 Do 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.

## **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 Where sealants are qualified with primers use only these primers.

- 2.2 SEALANT MATERIAL DESIGNATIONS**
- .1 Acrylic Latex One Part.
    - .1 To CAN/CGSB-19.17.
  - .2 Silicones One Part
    - .1 To CAN/CGSB-19.13.
  - .3 Polysulfide Two Part.
    - .1 Non-Sag to CAN/CGSB-19.24, Type 2, Class B.
  - .4 Acoustical Sealant.
    - .1 To ASTM C 919, ULC tested for return air plenums.
  - .5 Preformed Compressible and Non-Compressible back-up materials.
    - .1 Polyethylene, Urethane, Neoprene or Vinyl Foam.
      - .1 Extruded closed cell foam backer rod.
      - .2 Size: oversize 30%.
- 2.3 SEALANT SELECTION**
- .1 Perimeters of interior frames, as detailed and itemized: Sealant type: Acrylic latex, one part.
  - .2 Exposed interior control joints in drywall: Sealant type: Acrylic Latex, one part.
  - .3 Perimeters of gypsum board partitions, including top and bottom. Sealant type: Acoustical.
  - .4 Perimeters of exterior openings where frames meet exterior façade of building (i.e. brick, block, precast masonry): Sealant type: Polysulfide Two Part.
  - .5 Expansion and control joints in exterior surfaces of poured-in-place concrete walls: Sealant type: Polysulfide Two Part.
  - .6 Expansion and control joints in exterior surfaces of precast, architectural wall panels: Sealant type: Polysulfide Two Part
  - .7 Coping joints and coping-to façade joints: Sealant type: Polysulfide Two Part
- 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.

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- 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.
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