

1 General

1.1 RELATED REQUIREMENTS

- .1 20 05 00 - Basic Mechanical Materials and Methods.
- .2 26 05 00 - Common Work Results Electrical.

1.2 REFERENCE STANDARDS

- .1 ASTM International (ASTM).
 - .1 ASTM E2174-19, Standard Practice for On-Site Inspection of Installed Fire Stops.
- .2 Underwriters Laboratories of Canada (ULC).
 - .1 CAN/ULC-S115-2018, Standard Method of Fire Tests of Firestop Systems.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit ULC design system for each type of joint and service penetration.
 - .1 Show proposed material, fire rating, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.
 - .2 Where more than one product is acceptable for a component, clearly indicate the product being supplied on this Project.
 - .2 When no ULC or cUL system is available for an application, submit manufacturer's engineered judgement identification number and drawing details. Engineered judgement shall include both project name and contractor's name who will install firestopping system as described in drawing.
 - .3 Submit manufacturer's product data for materials and prefabricated devices. Include manufacturer's printed instructions for installation.
- .3 Samples:
 - .1 Submit duplicate 300 mm x 300 mm or 300 mm long samples, as applicable, of each type firestopping material.

1.4 QUALITY ASSURANCE

- .1 For firestopping applications where no ULC or cUL tested systems exist, submit manufacturer's engineering judgement derived from similar ULC or cUL system design or other tests to local authority having jurisdiction for their review and approval before installation.
- .2 Installer qualifications:
 - .1 Engage an experienced Installer who is certified, licensed, or otherwise qualified by firestopping manufacturer as having necessary training to install manufacturer's products per specified requirements. A supplier's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.
 - .2 Installation Responsibility: assign installation of through-penetration fire stop systems and fire-resistive joint systems in Project to a single sole source firestop specialty contractor.

- .3 The work is to be installed by a contractor with at least one of the following qualifications:
 - .1 FM 4991 Approved Contractor.
 - .2 UL Approved Contractor.
 - .3 Firestopping manufacturer's Accredited Fire Stop Specialty Contractor.
 - .4 Installer shall have not less than three (3) year's experience with fire stop installation.

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 and manufacturer's written instructions.
 - .2 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings.
 - .3 Return damaged/expired products.
- .2 Storage and Protection:
 - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

2 Products

2.1 MATERIALS - GENERAL

- .1 Fire stopping and smoke seal systems: in accordance with ULC S115.
 - .1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases, in compliance with requirements of ULC S115 and not to exceed opening sizes for which they are intended.
 - .2 Firestopping system rating: not less than the fire-resistance rating of surrounding floor and wall assembly.
- .2 Service penetration assemblies: certified by ULC in accordance with ULC S115 and listed in ULC Guide No. 40 U19.
- .3 Service penetration firestopping components: certified by ULC in accordance with ULC S115 and listed in ULC Guide No. 40 U19.13 and ULC Guide No. 40 U19.15 under the Label Service of ULC.

2.2 FIRESTOPPING / SMOKE SEAL MATERIALS

- .1 Mineral wool: ULC listed, semi-rigid, non-combustible, capable of being compressed 75% of original width; precut to required width and depth required, complete with impaling clips for use in horizontal fire separations; product as recommended by Firestopping manufacturer and listed in applicable ULC design.
- .2 Firestopping sealant: ULC listed.
 - .1 Silicone: one-part silicone based, non-sag or self-levelling for floor; movement capabilities minimum 25%.
 - .2 Acrylic: one-part, water-based, flexible to accommodate movement.
 - .3 Colour: firestopping sealant shall be only red.

- .3 Miscellaneous firestopping products:
 - .1 Other products, such as mortar, fire blocks, collars, intumescent sealants and foams, may be used provided such products are ULC listed and are approved by Departmental Representative.
 - .2 At combustible piping, in addition to firestopping sealant, provide intumescent tape and retaining collar.
- .4 Primers: in accordance with manufacturer's recommendation for specific material, substrate, and end use.
- .5 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .6 Damming and backup materials, supports and anchoring devices: to firestopping manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

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 openings to be filled to establish correct thicknesses and installation of materials.
- .2 Remove combustible materials and loose impediment from penetration opening and involved surfaces.
- .3 Ensure that substrates and surfaces are clean, dry and free from oil, grease and other deleterious matter.
- .4 Prepare surfaces in contact with fire stopping materials in accordance with manufacturer's instructions.
- .5 Maintain insulation around pipes and ducts penetrating fire separation.
- .6 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.3 INSTALLATION

- .1 Install fire stopping material and components in accordance with ULC certification and manufacturer's instructions.
- .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 a neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.

- .6 Install identification label at each joint and penetration.

3.4 INSTALLATION LIMITATIONS

- .1 When air or surface temperature is below 5°C, use silicone sealant only. Latex permitted only when temperatures are 5°C or above.

3.5 FIELD QUALITY CONTROL

- .1 Contractor's responsibilities:
 - .1 Examine sealed penetration and joints to ensure proper installation. Ensure each penetration/joint has identification label.
 - .2 Keep areas of work accessible until inspection by applicable code authorities.
 - .3 Perform inspection of firestop systems in accordance with ASTM E2174 or other recognized standard.
 - .4 Perform under this section patching and repairing of new and existing firestopping caused by cutting or penetrating the firestop systems already in-place.
 - .5 Notify Departmental Representative when ready for their site observations and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

3.6 IDENTIFICATION

- .1 Identify each through-penetration and joint location with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction at each installation, and within 150 mm of each joint edge, so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Install identification label on both sides of through-penetrations and joints where possible. Include the following information on labels:
 - .1 Through-penetration systems:
 - .1 The words, in both official languages: "Warning -Through Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage".
 - .2 Contractor's Name, address, and phone number.
 - .3 Through-Penetration firestop system designation of applicable testing and inspecting agency.
 - .4 Date of Installation.
 - .5 Through-Penetration firestop system manufacturer's name.
 - .6 Installer's Name.
 - .2 Joint systems:
 - .1 The words, in both official languages: "Warning -Joint Firestop System - Do Not Disturb. Notify Building Management of Any Damage".
 - .2 Contractor's Name, address, and phone number.
 - .3 Joint firestop system designation of applicable testing and inspecting agency.
 - .4 Date of Installation.
 - .5 Joint firestop system manufacturer's name.
 - .6 Installer's Name.

3.7 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
 - .2 Remove excess materials and debris and clean adjacent surfaces immediately after application.
 - .3 Remove temporary dams after initial set of firestopping and smoke seal materials.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.8 SCHEDULE

- .1 Firestopping and smoke seal at:
 - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
 - .2 Edge of floor slabs at curtain wall.
 - .3 Top of fire-resistance rated masonry and gypsum board partitions.
 - .4 Intersection of fire-resistance rated masonry and gypsum board partitions.
 - .5 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
 - .6 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
 - .7 Openings and sleeves installed for future use through fire separations.
 - .8 Around mechanical and electrical assemblies penetrating fire separations.
- .2 Maintain fire rating of assembly.

END OF SECTION

1 General

1.1 RELATED REQUIREMENTS

- .1 Section 07 84 00 - Firestopping.
- .2 Section 09 30 13 - Ceramic Tiling: caulking control joints.

1.2 REFERENCE STANDARDS

- .1 ASTM International (ASTM).
 - .1 ASTM C834-17, Standard Specification for Latex Sealants.
 - .2 ASTM C920-18, Specification for Elastomeric Joint Sealants.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Manufacturer's product shall describe.
 - .1 Required primers.
 - .2 Sealing compound.
- .3 Submit manufacturer's instructions for each product used.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .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.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Dispose of materials defined as hazardous or toxic waste in designated hazardous waste disposal site.

1.6 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 5°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.

1.7 ENVIRONMENTAL REQUIREMENTS

- .1 Comply with requirements of Globally Harmonized System of Classification and Labelling of Chemicals (GHS) regarding handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Safety Data Sheets (SDS).
- .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

2 Products

2.1 SEALANT MATERIALS

- .1 Sealants and caulking compounds shall:
 - .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 therefrom, 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 contain total VOC content (volatile organic compounds) that do not exceed the requirements of the California South Coast Air Quality Management District (SCAQMD) Rule #1168.
- .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 In the selection of the products and materials of this section preference will be given to those with the following characteristics: Water based, water soluble, 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.

2.2 SEALANT MATERIAL DESIGNATIONS

- .1 Acrylic latex one-part:
 - .1 To ASTM C834, Type OP, Grade -18°.
- .2 Silicones One-Part (Mildew resistant):
 - .1 To ASTM C920, Type S, Grade NS, Class 25; Uses NT, A and O: single component with fungicide.
- .3 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 to 50 %.
 - .2 Bond Breaker Tape.
 - .1 Polyethylene bond breaker tape which will not bond to sealant.

2.3 SEALANT SELECTION AND COLOUR

- .1 Interior:
 - .1 Perimeters of interior frames:
 - .1 Sealant type - one-part acrylic latex.
 - .2 Interior control joints (in masonry, concrete, gypsum board):
 - .1 Sealant type - one part acrylic latex.
 - .3 Joints between different materials:
 - .1 Sealant type: one-part acrylic latex.
 - .4 Perimeter of bath fixtures (e.g. sinks, tubs, waterclosets, basins, vanities):
 - .1 Sealant type - mildew-resistant silicone.
 - .2 Colour: to match fixture.

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.

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 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.

3.6 CLEANING

- .1 Progress 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.

END OF SECTION