

PART 1 GENERAL1.1 APPLICATION

- .1 Restrict application to only those Non-Combustible penetrants permitted for the construction type required by this project.

1.2 REFERENCES

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .2 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S115-11, Standard Method of Fire Tests of Fire stop Systems. (ULC-S115)
- .3 National Building Code of Canada - 2010 Edition. (NBCC)
- .4 Ontario Building Code - 2012 Edition. (OBC)
- .5 ASTM E2174-14 - Standard Practice for On-Site Inspection of Installed Firestops. (ASTM-E2174)
- .6 ASTM E2393-10a - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers. (ASTM-E2393)

1.3 DEFINITIONS

- .1 Fire Stop System: A system consisting of a material, or combination of materials, installed to maintain the integrity of the fire resistance rating of a fire separation by providing a barrier against the spread of flames, smoke, heat and hot gases through penetrations, blank openings, and construction joints.

1.4 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, finish and limitations.
- .3 Submit copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 00 10 - General Instructions.

- .4 Design Listing and Shop Drawing Submittal
 - .1 Provide a list of each proposed design listing with corresponding service penetration type or joint type in a matrix spreadsheet schedule, indicating floor and/or wall system, their construction and the rating for each. (See "Example Firestop Design Matrix" at the end of this specification)
 - .2 Provide a table of contents at the front of the shop drawing submittal package that identifies all fire stop systems.
- .5 Operation and Maintenance Manual Submittal
 - .1 Provide an operation and maintenance manual with up to date product data, WHMIS MSDS datasheets, matrix spreadsheet and design listings complete with table of contents.

1.5 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: company specializing in fire stopping installations approved by manufacturer and/or with ULC Accreditation.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with 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.
- .2 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.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Asbestos-free materials and systems capable of maintaining an effective barrier against flames, smoke and gases which meet the testing and installation requirements of CAN/ULC-S115 are permitted to be used, so long as they do not exceed the opening sizes for which they are intended, and maintain the required fire resistance rating of their associated assembly.
- .2 Fire stopping materials/systems shall be flexible to allow for movement of building structure and penetrating items without affecting the adhesion or integrity of the system.

- .3 Do not use damaged or expired material.
- .4 Service penetration assemblies: systems tested to CAN/ULC-S115.
- .5 Service penetration fire stop components: certified by test laboratory to CAN/ULC-S115.
- .6 Fire-resistance rating of installed fire stopping assembly in accordance with the National Building Code of Canada or Ontario Building Code, whichever is most stringent.
- .7 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal. Do not use cementitious or rigid seals around penetrations for pipes, ductwork or other mechanical items.
- .8 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .9 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .10 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .11 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.
- .12 Sealants for vertical joints: non-sagging.
- .13 Spray fire stopping:
 - .1 Elastomeric spray:
 - .1 Provide for joint and penetration applications - curtain walls, head of walls, control joints, metallic pipes.
 - .2 Silicone/urethane spray:
 - .1 Provide for curtain walls, joints, concrete floor penetrations or penetrations subject to vibration or movement.
- .14 Sealant fire stopping:
 - .1 Intumescent sealant:
 - .1 Multi-purpose fire stop sealant for commercial and industrial applications. Provide at metallic or non-metallic pipes, cables or cable trays, HVAC ductwork, insulated pipes, multi-service penetrations.
 - .2 Elastomeric sealant:
 - .1 Allows for movement and flexibility. Provide at joint fire stop applications.

- .3 Silicone sealant:
 - .1 Provide at penetrations with high temperatures or movement, cables, slab edge/curtain wall applications, seismic/expansion joints, top of wall joints, conduits.
- .15 Putty fire stopping:
 - .1 Provide at cable penetrations and trays requiring occasional retrofitting and fire stop applications in cold temperatures.
- .16 Mineral wool:
 - .1 Mineral wool is intended for use as a fire stop system component and backing material in listed fire stop systems and designs.
 - .2 Friction fitted into openings, joints, gaps, spaces and voids in fire rated assemblies in conjunction with fire stop sealant.
- .17 Mortar products:
 - .1 Provide at medium to large openings through concrete or masonry floors or walls with a variety of penetrants.
 - .2 Provide at openings containing cable trays, multi-pipe penetrations, insulated pipes, plastic pipes, and cables.
- .18 Fire stop devices:
 - .1 Fire stop sleeves
 - .1 Provide at cable installations through rated and non-rated floors and walls.
 - .2 Intumescent fire stop collars
 - .1 Provide at combustible penetrants such as PVC, PVC Foam Core, CPVC, ABS, and ABS Foam Core plastic piping.
- .19 Specialty Products:
 - .1 Intumescent fire stop pillows
 - .1 Provide at medium to large openings containing cable trays, ducts, or multiple conduits.

PART 3 EXECUTION

3.1 PREPARATION

- .1 Examine the sizes and conditions of voids to be filled to establish the correct requirements for the thicknesses and installation of materials to ensure compliance with the fire stop design listing.
- .2 Ensure that the fire stopping surfaces are clean, dry, frost free, and/or prepared according to manufacturer's instructions.
- .3 Ensure that multi-penetration openings have been framed and boarded out, all around the annular opening as indicated in shop drawings prior to preparing the opening.

- .4 Coordinate with other sub trades to ensure that all pipes, conduit, cable, and other penetrants in fire separations have been installed prior to fire stopping.
- .5 Provide adjacent work areas with drop sheets or other satisfactory coverings for protection in accordance with safe and good work practices.
- .6 Mask where necessary to avoid spillage and over coating onto adjoining surfaces.

3.2 INSTALLATION

- .1 Install fire stop materials and components in accordance with the manufacturer's instructions, and design listings tested as per CAN/ULC-S115.
- .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 Tool or trowel exposed surfaces to neat finish.

3.3 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 Section 01 00 10 - General Instructions.
 - .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 within this subsection.
- .3 Engineering Opinion:
 - .1 For fire stop applications that exist for which no design listed is available, an Engineer's opinion derived from a similar ULC or cUL system design shall be provided and submitted to the local Authority Having Jurisdiction for their review and approval prior to and subsequently following installation.
- .4 The Engineering Opinion shall:
 - .1 Identify the project building permit number and location,
 - .2 Cite the applicable OBC/NBCC references,
 - .3 Provide explanation of why the applicable OBC/NBCC or listing requirements cannot be met,

- .4 Provide detailed product installation instructions, including any limitations regarding durability, long term performance, and/or compatibility with adjacent elements,
 - .5 Demonstrate, on the basis of test data or equivalent documentation how the design provides at least the same level of performance under fire conditions as a listed fire stop system in a similar application,
 - .6 Contain copies of all referenced ULC, cUL or applicable design listings, and
 - .7 Bear the seal and signature of an Engineer licensed in the Province of Ontario.
- .5 The Engineering Opinion shall be inspected on-site by the Engineer or their delegate, and provide professional installation acceptance stamped by the Engineer responsible for the Engineering Opinion.

3.4 INSPECTIONS

- .1 On-site inspections for penetrations shall be performed in accordance with ASTM E2174. Inspection methods shall be one of the following:
- .1 The inspector shall be on site during installation and randomly witness a minimum of 10% of each type of fire stop being installed.
 - .2 The inspector shall conduct a post installation inspection, which shall require destructive type verification of the fire stop and repair of the fire stop. A minimum of 2%, but not less than one, of each type of fire stop shall be inspected per floor or for each area of a floor when a floor is larger than 929 m². An area consists of 929 m² or less.
- .2 On-site inspections for fire resistive joint systems and perimeter fire barriers shall be performed in accordance with ASTM E2393. Inspection methods shall be one of the following:
- .1 The inspector shall be on site during installation and randomly witness a minimum of 5% of total linear feet of each type of fire resistive joint system being installed, or,
 - .2 The inspector shall conduct a post-installation inspection, in accordance with 10.12.2.1(1) through 10.12.2.1(4), except for mechanical systems, which shall be inspected in accordance with 10.12.1.

3.5 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.

3.6 SCHEDULE

- .1 Fire stop and smoke seal should be provided at, but not limited to, the following locations:
- .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
 - .2 Top of fire-resistance rated masonry, concrete and gypsum board partitions.

- .3 Intersection of fire-resistance rated masonry, concrete and gypsum board partitions.
- .4 Control and sway joints in fire-resistance rated masonry, concrete and gypsum board partitions and walls.
- .5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
- .6 Blank openings and sleeves installed for future use through fire separations.
- .7 Around mechanical and electrical assemblies penetrating fire separations.
- .8 Where indicated on working drawings.

3.7 ACCEPTANCE

- .1 A Professional Acceptance Letter shall be provided for fire stop systems installed in accordance with the specifications and inspected according to ASTM Standards E2174 and E2393.



EXAMPLE FIRESTOP DESIGN MATRIX

Job Site:

Job Number:

Date:

System #	FRR	Penetrant	Construction of Rated Assembly	Firestop Material
W-L-1000	1-hour	Metal pipe	Gypsum wall	Name and type
C-AJ-2000	2-hour	PVC pipe	Block wall	Name and type
F-A-8000	2-hour	Multiple metal pipes	Concrete floor	Name and type
Etc...	Etc...	Etc...	Etc...	Etc...

END OF SECTION