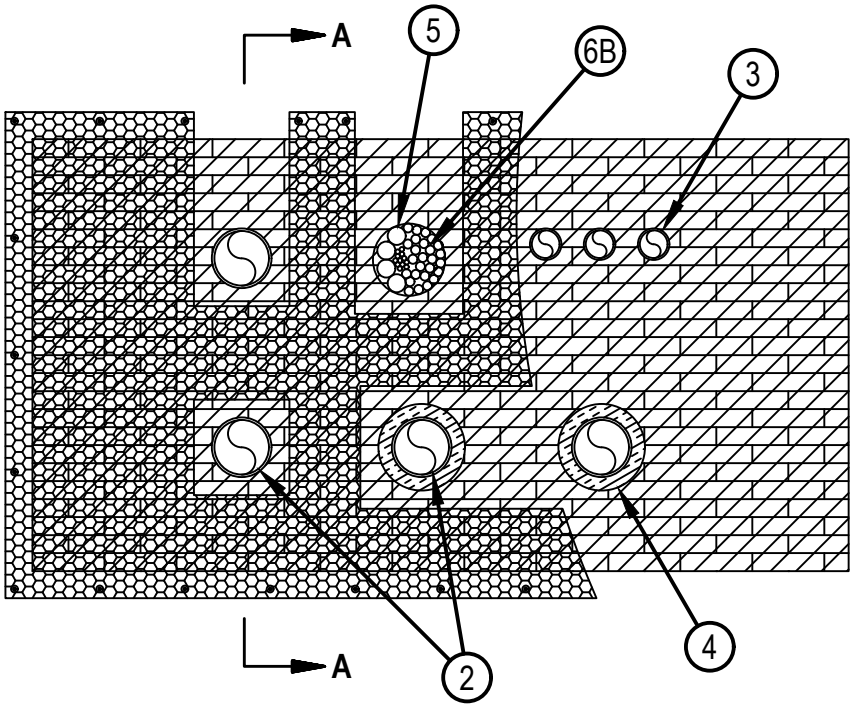
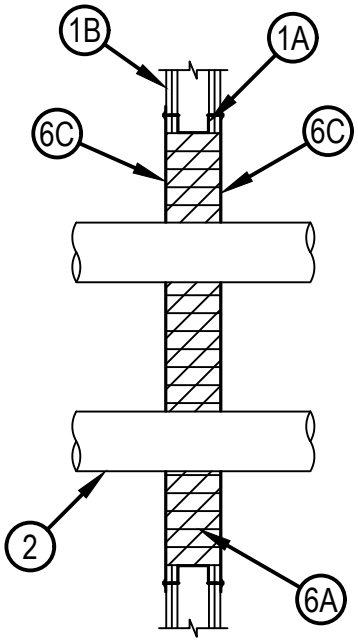
Classified by
Underwriters Laboratories, Inc.
to UL 1479 and CAN/ULC-S115

System No. W-L-8087

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 1 and 2 Hr (See Item 1)	F Ratings — 1 and 2 Hr (See Item 1)
T Rating — 0 Hr	FT Rating — 0 Hr
L Rating At Ambient — 5 CFM/sq ft (See Item 6B)	FH Ratings — 1 and 2 Hr (See Item 1)
L Rating At 400 F — 2 CFM/sq ft (See Item 6B)	FTH Rating — 0 Hr
	L Rating At Ambient — 5 CFM/sq ft (See Item 6B)
	L Rating At 400 F — 2 CFM/sq ft (See Item 6B)





SECTION A-A

System tested with a pressure differential of 2.5 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400, 400 or W400Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Steel studs to be min 2-1/2 in. (64 mm) wide and spaced 24 in. (610 mm) OC. Additional studs installed to completely frame the opening.
   B. Gypsum Board* — Thickness, type, number of layers, orientation and fasteners shall be as specified in the individual Wall and Partition Design. Max area of opening is 1152 in2 (7432 cm2) with a max dim of 48 in. (1219 mm).
   The F and FH Ratings of the firestop system are equal to the rating of the wall assembly in which it is installed.

2. Metallic Penetrants — One or more metal pipes, conduits or tubing may be installed within the through opening. The space between pipes, conduits or tubing shall be min 0 in. (point contact) to max 26 in. (660 mm). The space between pipes, conduits or tubing and periphery of opening shall be min 1 in. (25 mm) to max 26 in. (660 mm). Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
   A. Steel Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. Iron Pipe — Nom 6 in. (152 mm) diam (or smaller) cast or ductile iron pipe.
   C. Conduit — Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit, nom 4 in. (102 mm) diam (or smaller) electrical metallic tubing (EMT) or nom 1 in. (25 mm) diam (or smaller) flexible steel conduit.
   D. Copper Pipe or Tube — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe or Type L (or heavier) copper tube.
3. Non-Metallic Penetrants — One or more non-metallic penetrants may be installed within the through opening. Penetrants to be rigidly supported on both sides of wall assembly. The following types and sizes of non-metallic penetrants may be used:
   A. Polyvinyl Chloride (CPVC) Pipe — Max 2 in. (51 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply). The space between pipes or conduits shall be min 1-1/2 in. (38 mm) to max 26 in. (660 mm). The space between pipes or conduits and periphery of opening shall be min 1-1/2 in. (38 mm) to max 26 in. (660 mm).
   B. Rigid Nonmetallic Conduit (RNC)+ — Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70). The space between pipes or conduits shall be min 1-1/2 in. (38 mm) to max 26 in. (660 mm). The space between pipes or conduits and periphery of opening shall be min 1-1/2 in. (38 mm) to max 26 in. (660 mm).
   C. Optical Fiber/Communication Cable Raceways+ — Nom 2 in. (51 mm) diam (or smaller) optical fiber raceway, formed from polyvinyl chloride (PVC). Raceway to be installed in accordance with the National Electrical Code (NFPA No. 70). The annular space between the raceway and the periphery of the opening shall be minimum 2 in. (51 mm) to max 26 in. (660 mm). The minimum space between adjacent penetrants shall be 3-1/2 in. (89 mm).
   See Optical Fiber/Communication Cable Raceways (QAZM) category in the Electrical Construction Materials Directory for names of manufacturers.
4. Pipe Insulation — (Optional) — Pipe insulation may be installed on one or more of the metallic pipes or tubes (Items 2A, 2B and 2D). When pipe insulation is used, min space between insulated metallic penetrant and bare metallic pipes, conduits and tubing shall be min 1-1/2 in. (38 mm) and min space to periphery of opening shall be 1 in. (25 mm). The following types of pipe insulations may be used:
   A. Pipe and Equipment Covering Materials* — Max 1-1/2 in. (38 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 56 kg/m3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product.
   See Pipe and Equipment Covering Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
   B. Pipe and Equipment Covering Materials* — Max 1-1/2 or 2 in. (38 or 51 mm) thick hollow cylindrical calcium silicate, min 10 or 14 pcf (160 or 224 kg/m3) respectively, units sized to the outside diam of the pipe or tube. Pipe insulation secured with stainless steel bands or with min No. 18 AWG stainless steel wire spaced max 6 in. (152 mm) from each face of wall and spaced max 12 in. (305 mm) OC.
   C. Tube Insulation-Plastics+++ — Max 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the foarm of tubing. This pipe insulation may be installed on metallic pipes or tubes (Items 2A, 2B and 2D) not exceeding nom 2 in. (51 mm) diam.
   See Plastics+++ (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.

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5. Cables — (Optional) — Maximum eight 3 in. (76 mm) diam (or smaller) tight bundle of cables installed within the opening and rigidly supported on both surfaces of wall. The space between the cables and periphery of the opening shall be min 1-3/16 in. (30 mm) to 26 in. (660 mm). The space between cables bundles and/or other penetrants shall be min 1-1/2 in. (38 mm) to max 26 in. (660 mm). Any combination of the following types and sizes of cables may be used:
   A. 1/C 750 kcmil (or smaller) power cable with EPR polyvinyl chloride (PVC) insulation and jacket.
   B. 300 pair - No. 24 AWG telephone cable with PVC insulation and jacket.
   C. 24 fiber optic cable with PVC outer and subunit jacket.
   D. 3/C No. 12 AWG copper conductor Metal Clad+ cable with PVC insulation.
   E. 7/C No. 12 AWG with polyvinyl chloride (PVC) or cross-linked polyethylene (XLPE) insulation and jacket.
   F. Type R GU/59 coaxial cable with PVC outer jacket.
   G. 4 pair 22 AWG Cat 5 or Cat 6 data cable.
   H. Max 3/C No. 2/0 AWG (or smaller) copper conductor PVC jacketed aluminum clad or steel clad TECK 90 cable.
   I. Through Penetrating Product* — Any cables, Armored Cable+ or Metal Clad Cable+ currently Classified under the Through Penetrating Product category.
   See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.
   J. Max 500 kcmil single copper or aluminum conductor power cable with thermoplastic insulation and polyvinyl chloride (PVC) jacket.
   K. Multiple fiber optical communication cables jacketed with PVC and having a max outside diam of 1/2 in.
   L. Max 3/C No. 12 AWG steel clad cable with copper conductors and PVC insulation material.
   M. Max 4C/750 kcmil (or smaller) aluminum or copper conductor metal clad cable with aluminum or steel armor, with or without PVC jacket.
   6. Firestop System — The firestop system shall consist of the following:
   A. Fill, Void or Cavity Material* — Fire Blocks — For walls incorporating max 3-5/8 in. (92 mm) steel studs, fire block installed with 5 in. (127 mm) dimension projecting through and centered in opening. For walls constructed of larger steel studs, fire block installed with long dimension passing through and centered in opening. Blocks may or may not be cut flush with both surfaces of wall. When multiple layers of gypsum board are used, blocks may be recessed max 1/2 in. (13 mm) from surface of wall. Block firmly packed in opening. Either one or a combination of the block types specified below may be used.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-BL Firestop Block
   B. Fill, Void or Cavity Material* — Fill material to be forced into interstices of cables, and in any voids/openings between blocks, around penetrants, and between blocks and periphery of opening to the maximum extent possible on both surfaces of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE MAX Intumescent Sealant, CP618 Firestop Putty Stick, CP 660 Firestop Foam or CP 620 Fire Foam. Note: CP 618, CP 620, and CP 660 not suitable for CPVC (Item 3A). (Note: L Ratings apply only when FS-ONE MAX Intumescent Sealant is used.)
   C. Wire Mesh — When the annular space exceeds 4 in. (102 mm) between penetrants and/or to the periphery of the opening, max 2 by 2 in. (51 by 51 mm) wire fencing shall be used to keep the blocks in place. The wire fencing shall be fabricated from min No. 16 SWG (0.060 in. or 1.5 mm) galv steel wire. The wire is cut to fit the contour of the penetrating item with a min 3 in. (76 mm) lap beyond the periphery of the opening. Wire fencing secured to both surfaces of the wall assembly by means of 1/4 in. (6 mm) diam steel hollow wall anchors and 1/4 in. (6 mm) by 1-1/2 in. (38 mm) diam fender washers spaced max 8 in. (203 mm) OC, or attached to steel studs with steel screws and 1-7/16 in. (36 mm) diam steel washers spaced max 6 in. (152 mm) OC. The joints within the wire mesh shall overlap a min of 2 in. (51 mm) and be secured together by means of No. 16 AWG steel wire spaced 8 in. (203 mm) OC.

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

+ Bearing the UL Listing Mark