



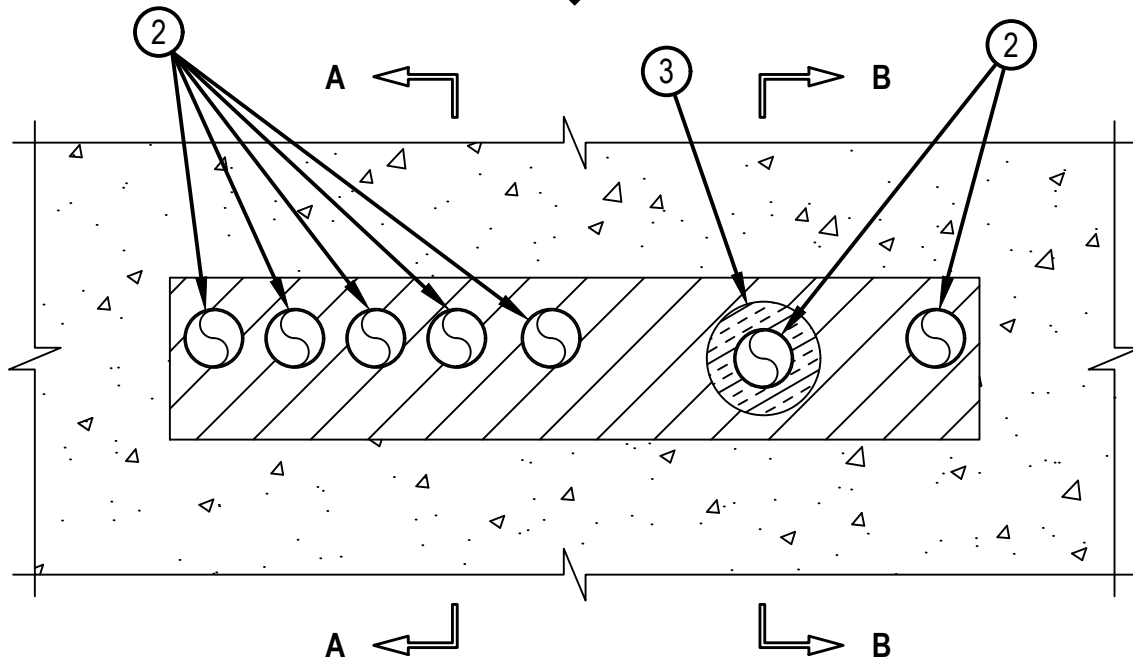
Classified by
Underwriters Laboratories, Inc.
to UL 1479 and CAN/ULC-S115

System No. C-AJ-8333

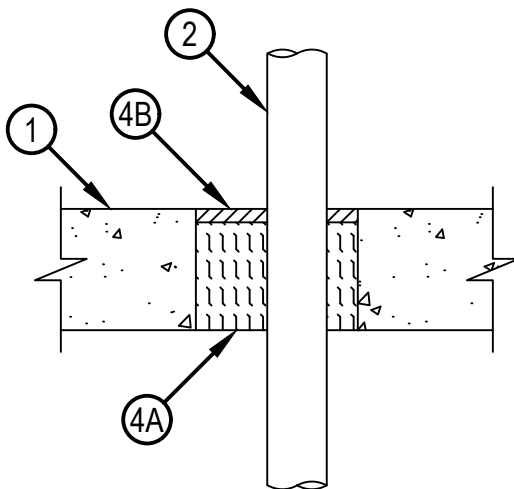
CAJ 8333

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Ratings — 1/2, 1-1/4, or 2 hour (See Items 2 and 3)	FT Ratings — 1/2, 1-1/4, or 2 hour (See Items 2 and 3)
	FH Rating — 2 Hr
	FTH Ratings — 1/2, 1-1/4 or 2 hour (See Items 2 and 3)

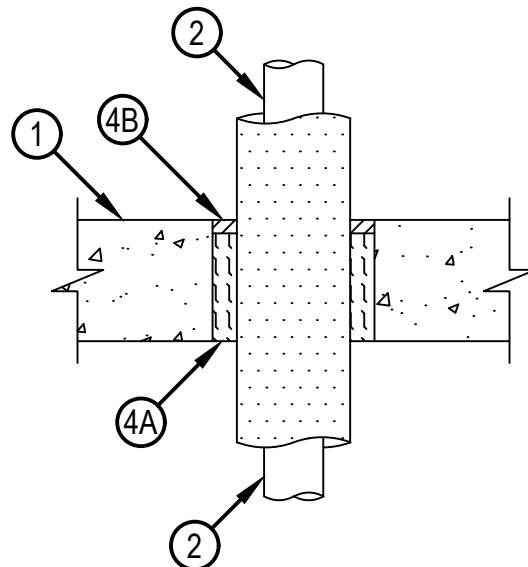
TOP VIEW



SECTION A-A



SECTION B-B



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. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete floor. Min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks*. Max area of square, rectangular, or circular opening is 160 in². (1032 cm²) with a max dimension of 32 in. (1219 mm).

See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Through-Penetrants — One or more penetrants may be installed within the opening. The total number of through-penetrants is dependent on the size of the opening and the types and sizes of the penetrants. Any combination of the penetrants described below may be used provided that the following parameters relative to the annular spaces are maintained. The annular space between penetrants and the edge of the opening shall be min 1/2 in. (13mm) to max 5 in. (127 mm). The annular space between rigid nonmetallic penetrants shall be min 1/2 in. (13mm). The annular space between PVC, CPVC, and RNC penetrants (Items 2B1, 2B2, and 2B3) shall be min 1/2 in. (13mm). The annular space between PVC, CPVC, and RNC penetrants (Items 2B1, 2B2, and 2B3) and steel conduit shall be min 1 in. (25mm). The annular space between PEX, PP-R, PP-RCT, and PP penetrants (Items 2B4, 2B5, 2B6, 2B7, 2B8, and 2B9) shall be min 2 in. (51mm). The annular space between vented PVC pipe and steel conduit shall be min 2 in. (51mm). The annular space between PEX, PP-R, PP-RCT, and PP penetrants (Items 2B4, 2B5, 2B6, 2B7, 2B8, and 2B9) and other penetrants shall be min 2 in. (51mm). Penetrants to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of penetrants may be used.

A. Metallic Penetrants — The following types of metallic penetrants may be used:

1. Conduit — Nom 2 in. (51 mm) diam (or smaller) rigid steel conduit or electrical metal tubing (EMT)
2. Steel Pipe — Nom 2 in. (51 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
3. Stainless Steel Pipe — Nom 2 in. (51 mm) diam (or smaller) Schedule 10 (or heavier) stainless steel pipe.
4. Copper Tubing — Nom 1-1/2 in. (38 mm) diam (or smaller) Type L (or heavier) copper tube.

When any of the above metallic penetrants are used, the T, FT, and FTH Ratings are limited to 1-1/4 hr.

B. Nonmetallic Penetrants — The following nonmetallic pipes may be used:

1. Polyvinyl Chloride (PVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) Schedule 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
2. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
3. Rigid Nonmetallic Conduit (RNC) — Nom 2 in. (51 mm) diam (or smaller) (Schedule 40) PVC conduit installed in accordance with Article 347 of the National Electric Code (NFPA No. 70).
4. Crosslinked Polyethylene (PEX) Tubing — Nom 2 in. (51 mm) diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems.
5. Polypropylene (PP-R) Pipe — Nom 2 in. (63 mm OD) (or smaller) Aquatherm Greenpipe SDR 7.4 or 11 for use in closed (process or supply) piping systems.
6. Polypropylene (PP-RCT) Pipe — Nom 2 in. (63 mm OD) (or smaller) Aquatherm Bluepipe SDR 9, 11 or 17.6 for use in closed (process or supply) piping systems.
7. Polypropylene (PP-RCT) Pipe — Nom 2 in. (63 mm OD) (or smaller) Nupi Americas Niron pipe SDR 7.3, 11 or 17 for use in closed (process or supply) piping systems.
8. Polypropylene (PP-RCT) Pipe — Nom 2 in. (63 mm OD) (or smaller) Aquatechnik NA Fusion-Tech pipe SDR 7.4, 11 or 17.6 for use in closed (process or supply) piping systems.
9. Polypropylene (PP) Pipe — Nom 2 in. (63 mm OD) (or smaller) Uponor pipe SDR 9 or 11 for use in closed (process or supply) piping systems.

When any of the above nonmetallic penetrants are used in closed (process or supply) systems, the T, FT, and FTH Ratings are 2 hr. When any of the above nonmetallic penetrants are used in vented (drain, waste or vent) systems, the T, FT, and FTH Ratings are limited to 1/2 hr.



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3. Pipe Insulation — (Required for Item 2A3- copper tube (Optional for use with Items 2A2, 2B1, 2B2, 2B6, 2B7, 2B8 only) - Pipes and tubes may be provided with the following type of pipecoverings:

A. Pipe Covering* — Nom 1 in. (25 mm) thick (or thinner) hollow cylindrical heavy density 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 material 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.

If the pipe covering is used on the metallic and/or nonmetallic penetrants, the T, FT, and FTH Ratings are 2 Hr.

4. Firestop System — The firestop system shall consist of the following:

A. Packing Material — Min 4 in. (102 mm) thickness of 4 pcf (64 kg/m³) mineral wool batt insulation tightly packed into the opening as a permanent form. Packing material to be recessed from top surface of floor or both surfaces of wall to accommodate the required thickness of fill material.

B. Fill, Void or Cavity Material - Sealant* — Min 1/2 in. (13 mm) thickness of fill material applied within the annulus flush with the top surface of the floor or both surfaces of the wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE MAX Intumescent Sealant.

++Bearing the UL Listing Mark

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



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