



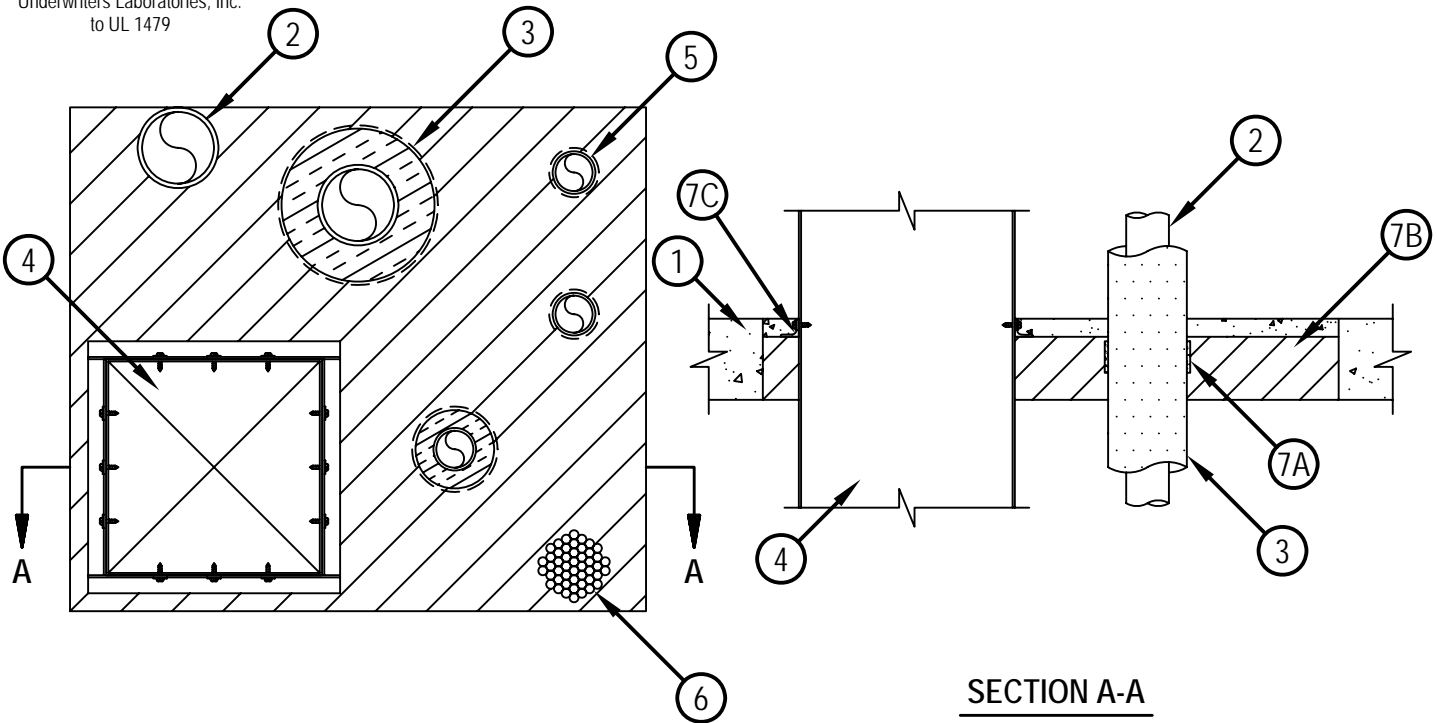
Classified by
Underwriters Laboratories, Inc.
to UL 1479

System No. C-AJ-8177

F Rating — 2 Hr

T Ratings — 0, 1/4, 1-1/2 and 2 Hr (See Items 2, 3, 4, 5 and 6)

CAJ 8177



SECTION A-A

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. Wall may also be constructed of any UL Classified Concrete Blocks*. Max area of 896 sq in. (5781 cm²) with max dimension of 32 in. (813 mm).
See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Metallic Penetrants — One or more metallic pipes, conduits or tubes to be installed within the opening. The min annular space between pipes, conduit or tubing is 1 in. (25 mm). The min annular space between pipes, conduit or tubing and periphery of any single surface of through opening is 0 in. (point contact). Penetrants rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
 - A. Steel Pipe — Nom 8 in. (203 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
 - B. Iron Pipe — Nom 8 in. (203 mm) diam (or smaller) cast or ductile iron pipe.
 - C. Conduit — Nom 4 in. (102 mm) diam (or smaller) rigid steel conduit or nom 4 in. (102 mm) diam (or smaller) electrical metallic tubing (EMT).
 - 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.
 The hourly T Rating for the firestop system is 0 hr when metallic penetrants are used.
3. Pipe Insulation — (Optional) The following types of pipe insulations may be installed on one or more of the metallic pipes or tubes (Items 2A, B and D). When pipe insulation is used, the wrap strip described in Item 7A is also required. Min annular space between insulated penetrants is 4 in. (102 mm). Min annular space between insulated penetrants and periphery of opening is 1/2 in. (13 mm).
 - A. Pipe and Equipment Covering Materials* — Nom 2 in. (51 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. When Item 3A is used, T Rating is 1-1/2 Hr.
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. Tube Insulation-Plastics# — Nom 1 in. (25 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. Tube insulation can be used on metallic pipes or tubes not exceeding nom 2 in. (51 mm) diam. When Item 3B is used, T Rating is 1/2 Hr.
See Plastics (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.



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4. Steel Duct — A maximum of one nom 12 by 12 in. (305 by 305 mm) (or smaller) No. 26 GA (or heavier) steel duct installed within opening. Duct to be spaced min 4-1/2 in. (114 mm) from insulated penetrants and metallic penetrants and min 10 in. (254 mm) from nonmetallic penetrants and cable bundles. Min annular space between steel duct and periphery of opening is 2 in. (51 mm). Steel duct to be rigidly supported on both sides of floor or wall assembly. When steel duct is used, the steel angles described in Item 7C are also required. When steel duct is used, the T Rating is 1/4 hr.
5. Nonmetallic Penetrants — One or more nonmetallic pipes or conduits to be installed within the opening. The min annular space between nonmetallic penetrants and periphery of any single surface of through opening is 0 in. (point contact). Separation between metallic and nonmetallic penetrants is min 8 in. (102 mm). Penetrants rigidly supported on both sides of floor or wall assembly. When nonmetallic penetrant is used, the wrap strip described in Item 7A1 is required except that: (a) when the nom diam of the nonmetallic penetrant exceeds 2 in. (51 mm), the firestop collar described in Item 7A2 is required, and (b) for all ABS and FRPP type penetrants, the firestop collar described in Item 7A2 is required. See Table in Item 7A2 below. The following types and sizes of nonmetallic pipes or conduits may be used:
- A. Polyvinyl Chloride (PVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) solid or cellular core Schedule 40 PVC pipe for use in closed (process or supply) or vented (drain, waste and vent) piping systems.
 - B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) or vented (drain, waste and vent) piping systems.
 - C. Rigid Nonmetallic Conduit+ — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70).
 - D. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
 - E. Flame Retardant Polypropylene (FRPP) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

When Item 5 is used, the T Rating of the firestop system is 2 hr.

6. Cables — Nom 4 in. (102 mm) diam (or smaller) tight bundle of cables. Min annular space between cable bundle and periphery of opening is 1/2 in. (13 mm). Separation between cable bundle and metallic penetrants shall be min 8 in. (203 mm). Separation between cable bundle and insulated penetrants or nonmetallic penetrants shall be min 4 in. (102 mm). Cable bundle rigidly supported on both sides of floor or wall assembly. The following types and sizes of cables may be used:
- A. Max 300 pair - No. 24 AWG copper conductor telephone cable with PVC insulation and jacket.
 - B. Max 500 kcmil single conductor copper power cable with PVC jacket material.
 - C. Max 3/C No. 12 AWG steel clad cables with PVC insulation materials.
 - D. Max 3/C No. 2/0 AWG (or smaller) aluminum conductor SER cables with PVC insulation and jacket.
 - E. Max RG/U coaxial cables with fluorinated ethylene jacket and insulation.

When cables are used, T Rating is 1/4 hr.

7. Firestop System — The firestop system shall consist of the following:
- A. Fill, Void or Cavity Material* - Wrap Strip — Required only for use with each metallic penetrant that is insulated with glass fiber units (Item 3A) or flexible foam tube insulation (Item 3B). One layer of min 3/16 in. (5 mm) thick by 1-3/4 in. (44 mm) wide wrap strip continuously wrapped around the outer circumference of the insulated pipe with ends butted and held in place with integrated tape. Wrap strip to be recessed 1-1/2 in. (38 mm) from bottom surface of floor or both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 648E Wrap Strip
 - A1. Fill, Void or Cavity Material* - Wrap Strip — Required only for use with each nonmetallic penetrant (Item 5) as specified in Table below. One layer of intumescent wrap strip is continuously wrapped around the pipe with ends butted and held in place with integrated tape. Wrap strip to be recessed 1-1/2 in. (38 mm) from bottom surface of floor or both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-S-1.5" US and CP648-S-2" US Wrap Strip



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A2. Firestop Device* — Firestop Collar (Not Shown) — Required for all nonmetallic penetrants (Item 5) exceeding nom 2 in. (51 mm) diam and required for all sizes of ABS and FRPP penetrants as specified in Table below. Firestop collar shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to underside of floor/CP 637 Mortar or both sides of wall/CP 637 Mortar using anchor hooks provided with the collar. Minimum two anchor hooks required for nom 1-1/2 and 2 in. (38 and 51 mm) diam pipes. Minimum three anchor hooks required for nom 3 and 4 in. (76 and 102 mm) diam pipes. The anchor hooks are to be secured with min 1/4 in. (6 mm) diam by min 1-1/4 in. (32 mm) long concrete screw anchors or Hilti 1/4 in. (6 mm) diam by 1-1/4 in. (32 mm) long KWIK-CON II+ concrete screw anchors, utilizing a 1-7/16 in. (37 mm) diam by 1/16 in. (1.6 mm) thick steel washer. Firestop collar shall be sized for the nom diam of the penetrant as shown in Table below. The density of penetrants requiring firestop collars shall not exceed two penetrants with firestop collars per 114 sq in. (735 cm) of opening area.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP 643 63/2"N, CP 643 93/3"N, CP 643 90/4"N Firestop Collar

Penetrant Type from Item 5 Above	Nom Penetrant Diam	Wrap Strip Item 7A1 Required	Firestop Collar Item 7A2 Required
A, B, C	1-1/2 and 2 in.	Yes	May be used as alternate to Item 7A1
A, B, C	3 and 4 in.	No	Yes
D, E	1-1/2, 2, 3 and 4 in.	No	Yes

B. Fill Void or Cavity Material* - Mortar — Min 3-1/2 in. (89 mm) thickness of fill material located flush with bottom surface of floor or both surfaces of wall. Fill material is mixed at a rate of 2.5 parts dry mix to one part water by volume in accordance with the installation instructions supplied with fill material.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 637

C. Steel Retaining Angle — Required for use with steel duct (Item 4). Nom 1 by 1 in. (25 by 25 mm) by No. 18 gauge (or heavier) steel angles attached to all four sides of the steel duct, flush with the top surface of mortar (Item 7C) or flush with mortar on both sides of wall. The angles shall be attached with No. 8 (or larger) steel sheet metal screws spaced max of 2 in. (51 mm) from each end and a max of 3 in. (76 mm) OC.

*Bearing the UL Classification Mark

#Bearing the UL Recognized Components Mark

+Bearing the UL Listing Mark



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