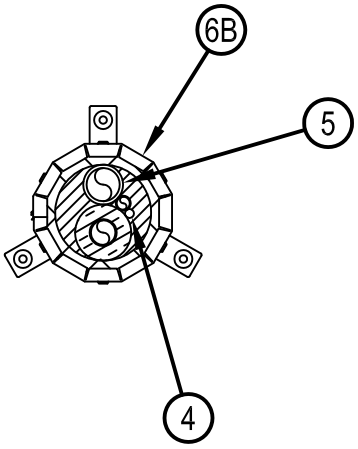
Classified by
Underwriters Laboratories, Inc.
to UL 1479

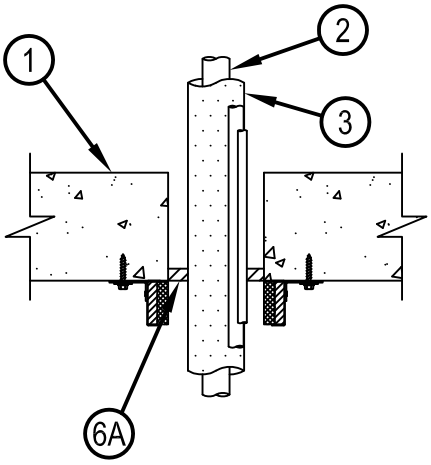
System No. C-AJ-8178

F Rating — 2 Hr

T Ratings — 1/4, 1/2, 1 and 1-3/4 Hr (See Item 2)

CAJ 8178





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 may also be constructed of any min 6 in. (152 mm) thick UL Classified hollow-core Precast Concrete Units*. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 4 in. (102 mm).

   See Concrete Blocks (CAZT) and Precast Concrete Units (CFTV) categories in the Fire Resistance Directory for names of manufacturers.

2. Metallic Penetrants — A max of two pipes, conduits or tubing to be installed within the opening. Of the two pipes, conduits or tubing, only one of the pipes, conduit or tubing shall have a nom diam greater than 1/2 in. (13 mm). The annular space between metallic pipes, conduits or tubing and the periphery of the opening shall be min 1/2 in. (13 mm) to max 1 in. (25 mm). The annular space between metallic penetrating items and the other penetrants shall be min 0 in. (point contact) to max 1 in. (25 mm). Pipes, conduits or tubing to be 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 1 in. (25 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

   B. Iron Pipe — Nom 1 in. (25 mm) diam (or smaller) cast or ductile iron pipe.

   C. Conduit — Nom 1/2 in. (13 mm) diam (or smaller) steel electrical metallic tubing or nom 1/2 in. (13 mm) diam (or smaller) steel conduit.

   D. Copper Tubing — Nom 1 in. (25 mm) diam (or smaller) Type L (or heavier) copper tubing.

   E. Copper Pipe — Nom 1 in. (25 mm) diam (or smaller) Regular (or heavier) copper pipe.

   The T Rating is 1/4 hr when metallic penetrant is used.

3. Tube Insulation - Plastics+ — Nom 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. The tube insulation shall be installed on metallic through penetrants exceeding nom 1/2 in. (13 mm) diam. The annular space between insulated penetrating item and periphery of opening shall be min 0 in. (point contact) to max 1 in. (25 mm). The annular space between insulated penetrating item and the other penetrants shall be a min 0 in. (point contact) to a max 1 in. (25 mm).

   See Plastics+ (QMFZ2) category in the 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.

   The T Rating is 1 hr when insulated metallic pipe or tubing is used

.4. Cables — Max one, 4 pair No. 18 AWG (or smaller) thermostat cable with polyvinyl chloride (PVC) insulation and jacket materials. Cable to be spaced a min 0 in. (point contact) to max 1 in. (25 mm) from the other penetrants. The annular space between the cable and the periphery of the opening shall be a min 1/2 in.(13 mm) to max 1 in. (25 mm). Cable to be rigidly supported on both sides of wall assembly.

The T Rating is 1/2 hr when cable is used

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5. Nonmetallic Penetrant — A max of one nonmetallic pipe to be installed within the opening. The annular space between pipe and periphery of the opening shall be min 0 in. (point contact) to max 1 in. (25 mm). The annular space between nonmetallic penetrating item and the other penetrants shall be min 0 in. (point contact) to max 1 in. (25 mm). Pipes, conduits or tubing to be 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. Polyvinyl Chloride (PVC) Pipe — Nom 1-1/4 in. (32 m) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in vented (drain, waste or vent) or closed (process or supply) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 1-1/4 in. (32 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.

The T Rating is 1-3/4 hr when nonmetallic pipe is used.

6. Firestop System — The firestop system shall consist of the following:
   A. Fill, Void or Cavity Material* - Sealant — Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with bottom surface of concrete floor or both surfaces of wall assembly. Fill material to be forced into interstices of through penetrants to max extent possible.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant
   B. Firestop Device* - Firestop Collar — Firestop collar shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the cable bundle and secured to underside of floor or both sides of wall using the anchor hooks provided with the collar. (Minimum 2 anchor hooks for 1-1/2 and 2 in. (38 and 51 mm) devices and 3 anchor hooks for 3 and 4 in. (76 and 102 mm) devices.) The anchor hooks are to be secured with 1/4 in. (6 mm) diam by 1-3/4 in. (44 mm) long steel expansion type masonry fasteners, 1-1/4 in. (32 mm) long concrete screw anchors, 0.145 in. (3.7 mm) diam by 1-1/4 in. (32 mm) long powder actuated fasteners utilizing a nom 15 mm (9/16 in.) diam steel washer, Hilti 1/4 in. (6 mm) diam by 1-1/4 in. (32 mm) long KWIK-CON II+ concrete screw anchor, Hilti 1/4 in. (6 mm) diam by 1-3/4 in. (44 mm) long KWIK-BOLT 3 steel expansion anchor or Hilti X-DNI 27 P8 S15 powder actuated floor pin with integral nom 9/16 in. (15 mm) diam washer. One fastener shall be located in each anchor hook. See Table below for size of device required for the opening.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP 643 63/2"N, CP 643 90/3"N, CP 643 110/4"N Firestop Collar.

4 (102)	CP 643 110/4"N
3 (76)	CP 643 90/3"N
2 (51)	CP 643 63/2"N
1-1/2 (38)	CP 643 50/1.5"N

* 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 Recognized Component Mark