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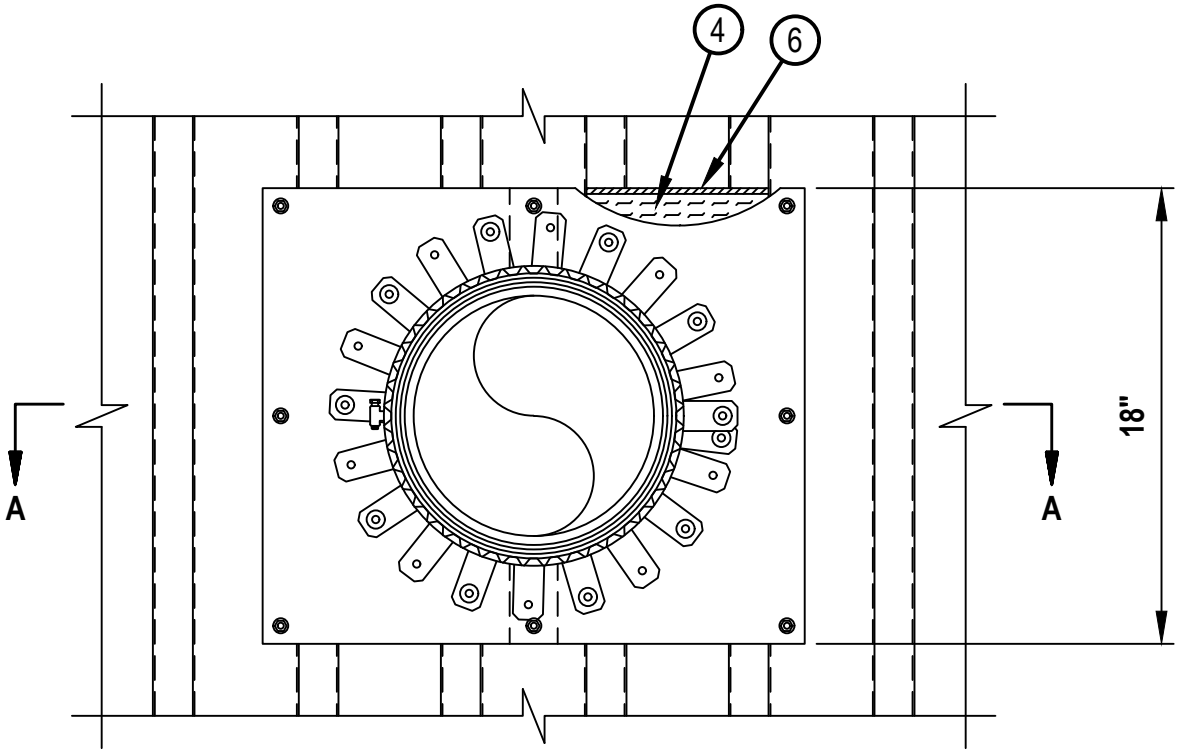
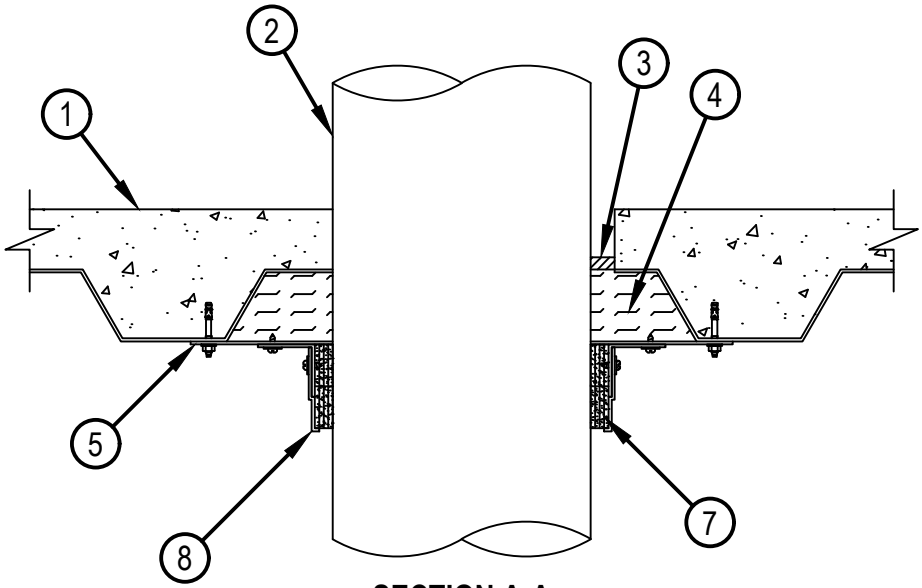
to UL 1479

System No. F-A-2421

ANSI/UL1479 (ASTM E814)
F Rating — 2 Hr
T Rating — 2 Hr



BOTTOM VIEW



SECTION A-A

Hilti Firestop Systems

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November 21, 2024

System No. F-A-2421

1. Floor Assembly —The fire-rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
   A. Normal Weight Concrete —Min 2-1/2 in. (64 mm) thickness of lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete topping as measured over the crests of the steel floor units.
   B. Steel Floor and Form Units* —Composite or noncomposite 3 in. (76 mm) deep fluted galv units as specified in the individual Floor-Ceiling design. Max diam of opening core-drilled through floor assembly is 12 in. (305 mm).
2. Through Penetrants —One nonmetallic pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and periphery of opening shall be min 0 in. (0 mm, point contact) to max 1-7/16 in. (37 mm). Pipe to be rigidly supported on both sides of floor assembly. The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe —Nom 10 in. (254 mm) diam (or smaller) Schedule 40 solid-core or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe —Nom 10 in. (254 mm) diam (or smaller) Schedule 40 CPVC pipe for use in closed (process or supply) piping systems.
3. Fill, Void or Cavity Material* — Sealant —Min 1/2 in. (13 mm) depth of fill material applied around the perimeter of the nonmetallic through-penetration. Sealant is installed recessed 2 in. from the top of the floor assembly, (flush with bottom of the flat portion of the floor assembly or top of the deck flute (Item 1B)) within the annular space.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE MAX Intumescent Sealant
4. Packing Material —Mineral wool batt insulation having min density of 4 pcf (64 kg/m3), firmly packed into flutes of steel floor units above metal plate enclosure (Item 5) to completely fill cavities. When ends of metal plate enclosure perpendicular to floor unit valleys are not bent up to enclose packing material within flutes (see Item 5), packing material to be recessed from ends of plate to accommodate the required thickness of the fill material (Item 6).
5. Metal Plate Enclosure — Min 18 ga steel. Length of plate (transverse to steel floor unit direction) to extend to steel floor unit valley beyond each side of core-drilled hole with a min lap of 1-1/2 in. (38 mm) on the floor unit valley at each end. Both ends of plate perpendicular to floor unit valleys to be cut to permit the ends to be bent upwards 90 degrees to follow the contour of the floor unit, enclosing the packing material (Item 4) within the areas of the flutes. The contoured plate ends shall be such that the gap between the floor unit and the plate ends is no greater than 1/4 in. (6 mm). As an alternate to bending up ends of plate, min 1/4 in. (6 mm) thickness of fill material (Item 6) shall be applied to completely cover the surface of the mineral wool packing material within the flutes of the steel floor units, between the two ends of the metal enclosure plate and the steel floor units. Circular cutout in plate to tightly follow circumference of through penetrant (Item 2) with a maximum ¼" annular space between enclosure plat and penetrating items. Enclosure plate side edges shall extend at least 3 in. (76 mm) from circular cutout on all sides. A slit made in plate to permit installation around the nonmetallic pipe to be located at end of plate beneath floor unit valley nearest to the circular cutout. Plate secured to valleys of floor unit using min 1/4 in. (6 mm) diam by 1-3/4 in. (45 mm) long steel expansion bolts, or equivalent, in conjunction with min 3/4 in. (19 mm) diam steel washers or min 0.145 in. (4 mm) diam by 1-1/4 in. (32 mm) long powder actuated fasteners utilizing a 1-7/16 in. (36 mm) diam by 1/16 in. (2 mm) thick steel washer. As alternates to the anchors specified above, 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 may be used. Fasteners to be located approx 1 in. (25 mm) from edges of plate at each corner, at each plate/valley intersection and at both sides of slit made to permit installation around nonmetallic pipe. Spacing of fasteners no to exceed 10 in. (254 mm) OC.

6. Fill, Void or Cavity Material* — Sealant —Nom 1/2 in. (13 mm) bead of fill material applied around the perimeter of the metal plate enclosure at the interface of the enclosure and steel deck. When ends of metal plate enclosure (Item 5) are not bent up to enclose packing material within flutes, min 1/4 in. (6 mm) thickness of fill material shall be applied to completely cover the surface of the mineral wool packing material within the flutes of the steel floor units, between the two ends of the metal enclosure plate and the steel floor units.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE MAX Intumescent Sealant
7. Fill, Void or Cavity Material*-Wrap Strip —Two stacks of min 1-3/4 in. wide wrap strips, continuously wrapped over the outer circumference of the pipe, covering four times, each layer applied in a single wrap and tightly butted, and held in position using (masking or aluminum) tape, installed flush with bottom surface of the metal plate (Item 5).
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 648E Wrap Strip
8. Steel Collars— Steel collar fabricated from coils of precut min 0.016 in. (1.6 mm) thick (No. 28 gauge) galv steel available from fill material manufacturer. Collar shall be nom 1-3/4 in. (44 mm) deep with 1 in. (25 mm) wide by 2 in. (52 mm) long anchor tabs on 1-3/4 in. (44 mm) centers for securement to the underside of the floor. The opposite side incorporates retainer tabs, 1/2 in. (13 mm) wide by 3/16 in. (4.8 mm) long, pre-bent toward the pipe surface. Collar shall be tightly wrapped over the wrap strip, overlapping min. 2 in (51 mm) at seam and butted against top (previously installed) collar. Collar secured with two sheet metal screws though the overlapping portion of the collar. The length of the sheet metal screws shall not exceed the thickness of the wrap strip. Optional securement to using two No. 8 sheet metal screws to secure the collar at overlap location, a nominal 1/2" stainless steel hose clamp located at the mid height of each collar may be used. A second collar to be wrapped around the second stack of wrap strip with a min 2 in. (51 mm) overlap at the seam. The second collar shall be secured with four sheet metal screws though the overlapping portion of the collar. Anchor tabs of second collar left unbent and every other tab is secured to the first retaining collar with one no. 8 sheet metal screw per tab. Optional securement of the anchor tabs of second collar may be accomplished with one nom 1/2 in. (13mm) wide stainless steel hose clamp secured over anchor tabs at mid-height of first collar. Every other anchor tab of first collar secured to bottom surface of the floor with 1/4 in. (6 mm) diam by 1-1/4 in. (32 mm) long steel expansion bolts in conjunction with steel nuts and 1/4 in. (6 mm) by 1-1/4 in. (32 mm) diam washers, or 1/4 in. (6 mm) diam by 1-7/8 in. (48 mm) long steel concrete screws. Collars to be used at the bottom surface of the floor.

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