Hilti Corporation
Design Number HI/PF 120-07
Through Penetration
FS-ONE MAX Intumescent Firestop Sealant
ASTM E814, UL 1479, CAN/ULC-S115
Rating: See Table 1
Pressure Differential: Positive, 0.01 in. w.g. (2.5 Pa)

TABLE 1. RATINGS

	ASTM E814, UL 1479	CAN/ULC-S115
F-Rating	2 Hr	2 Hr
T-Rating	1/4 Hr	NA
FT-Rating	NA	1/4 Hr
FH-Rating	NA	2 Hr
FTH-Rating	NA	1/4 Hr

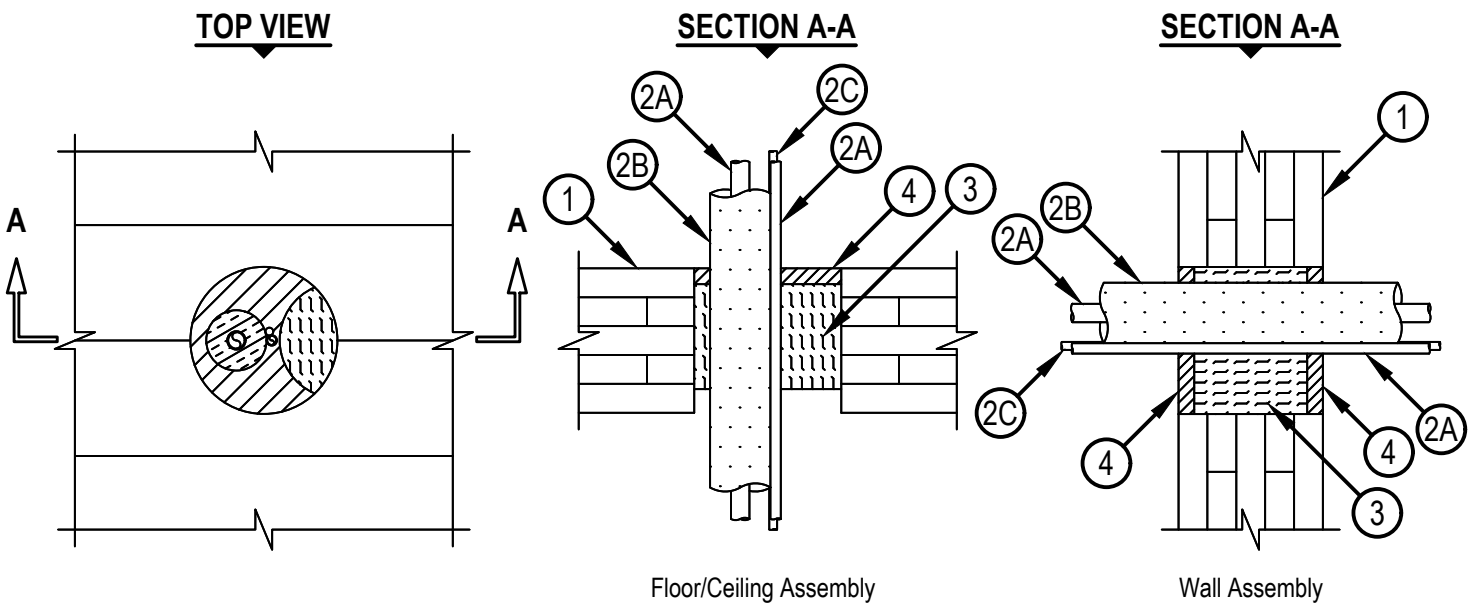

FIGURE 1. THROUGH PENETRATION FIRESTOP SYSTEM

1. **FLOOR/CEILING OR WALL ASSEMBLY** : Use a 2 hour fire-rated floor/ceiling assembly or wall assembly consisting of min. 6-7/8 in. (175 mm) cross-laminated timber (CLT) with a min. 5 plys. Cross-laminated timber (CLT) assembly to be certified in accordance with ANSI/APA PRG 320 (2018 or later). Size of opening through assembly to be a max. 6 in. (152 mm) diameter.

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A. (Optional, Not Shown) GYPSUM BOARD : For floor/ceiling assemblies or for wall assemblies (Item 1), directly applied gypsum board protection may be included with the following requirements:

- One or more layers of min. 1/2 in. (13 mm) thick Type X gypsum board may be directly applied to the bottom of the CLT floor ceiling assembly, or to one or both sides of the CLT wall assembly (Item 1). Each layer of gypsum board is to be attached to the CLT assembly in accordance with local code requirements.

2. PENETRATING ITEM : Install penetrating item centered or offset within the opening. The annular space and offset shall range from min. 1/2 in. (13 mm) to max. 2-9/16 in. (65 mm) within the opening.

A. METALLIC PIPE: Install a max. of two of the following types of pipes or tubes:

- Maximum 1 in. (25 mm) diameter Schedule 10 (or thicker) steel pipe.
- Maximum 1 in. (25 mm) diameter cast or ductile iron pipe
- Maximum 1 in. (25 mm) diameter copper pipe or Tube (Type L or heavier).

B. PIPE INSULATION : A max. of one metallic pipe (Item 2A) may be insulated with max 3/4 in. (19 mm) acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing.

C. CABLE : A max. of one, 4-pair No. 18 AWG (or smaller) thermostat cable with polyvinyl chloride (PVC) insulation and jacket may be installed within the opening.

3. PACKING MATERIAL : Use only packing material bearing an Intertek Certified Label and meeting the following minimum requirements. Install min. 4 pcf (64 kg/m^3) density mineral wool batt insulation in the annular space of the opening in the floor/ceiling or wall assembly (Item 1), tightly packed (compressed min. 33%) around the penetrating item (Item 2) as follows :

- Floor/Ceiling Assembly - Install min. 5 in. (127 mm) thick layer recessed min. 3/4 in. (19 mm) from the top of the CLT floor/ceiling assembly (Item 1). Mineral wool may be recessed a max. 1 in. (25 mm) from bottom of floor/ceiling assembly.

- Wall Assembly - Install min. 5 in. (127 mm) thick layer recessed min. 3/4 in. (19 mm) from both surfaces of the CLT wall assembly (Item 1).

4. FILL, VOID, OR CAVITY MATERIAL : Intumescent Firestop Sealant

CERTIFIED PRODUCT: Hilti Corporation, Penetration Firestopping; FS-ONE MAX Intumescent Firestop Sealant.

- Floor/Ceiling Assembly - Apply min. 3/4 in. (19 mm) thick layer of Hilti FS-ONE MAX Intumescent Firestop Sealant to fill the void left after installing the packing material (Item 3) on the top of the floor/ceiling assembly (Item 1).

- Wall Assembly - Apply min. 3/4 in. (19 mm) thick layer of Hilti FS-ONE MAX Intumescent Firestop Sealant to fill the void left on both sides of the wall assembly (Item 1) after installing the packing material (Item 3).