	MEP PENETRATIONS THRU	al deck/steel bar	•
ET	MEP PENETRATIONS THRU	F-E-1004	DESCRIPTION  METAL PIPE THROUGH CONCRETE FLOOR/CEILING ASSEMBLY (1-HR)
	CONCRETE FLOOR/ CEILING ASSEMBLY	F-E-1004 F-E-1018	FLEXIBLE STEEL CONDUIT THROUGH CONCRETE FLOOR/CEILING ASSEMBLY (1-HR)
		F-E-1018	PLASTIC PIPE THROUGH CONCRETE FLOOR/CEILING ASSEMBLY (1-HR)
		F-E-2006	PLASTIC PIPE THROUGH CONCRETE FLOOR/CEILING ASSEMBLY (1-HR)
		F-E-3012	CABLES THROUGH CONCRETE FLOOR/CEILING ASSEMBLY (1-HR)
		F-E-5004	INSULATED (AB/PVC) METAL PIPE THROUGH CONCRETE FLOOR/CEILING ASSEMBLY (1-HR)
		F-E-5013	INSULATED (GLASS-FIBER) METAL PIPE THROUGH CONCRETE FLOOR/CEILING ASSEMBLY (1-HR)
		F-E-7008	STEEL METAL DUCT THROUGH CONCRETE FLOOR/CEILING ASSEMBLY (1-HR)
		F-E-8008	HVAC LINE SETS THROUGH CONCRETE FLOOR/CEILING ASSEMBLY (1-HR)
		C-AJ-1226	METAL PIPE THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-1220	MULTIPLE METAL PIPES THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-1915	PLASTIC PIPE THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-2033	PLASTIC PIPE THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-3283	CABLE BUNDLE THROUGH CONCRETE OR MASONRY (2-HR)
	FLOORS OR WALLS	C-AJ-5090	METAL PIPE WITH AB/PVC INSULATION THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-5091	METAL PIPE WITH GLASS FIBER OR CALCIUM SILICATE INSULATION THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-6042	ELECTRICAL BUSWAY THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-7051	METAL DUCT (WITHOUTH DAMPER) THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-7084	ROUND SHEET METAL DUCT THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-7145	SHEET METAL DUCT WITH GLASS FIBER INSULATION THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-8099	MULTIPLE PENETRATIONS THROUGH CONCRETE OR MASONRY (2-HR)
		W-L-1054	METAL PIPE THROUGH GYPSUM WALL ASSEMBLY (1-HR)
		W-L-1389	MULTIPLE METAL PIPES THROUGH GYPSUM WALL ASSEMBLY (2-HR)
	GYPSUM WALL	W-L-2028	PLASTIC PIPE THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		W-L-2578	X-FR PLASTIC PIPE THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		HI/PF 60-01	PLASTIC PIPE THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		W-L-3334	CABLE BUNDLE THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		W-L-3414	CABLE THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		W-L-5028	METAL PIPE WITH AB/PVC INSULATION THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		W-L-5029	METAL PIPE WITH GLASS FIBER OR CALCIUM SILICATE INSULATION THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		W-L-7042	METAL DUCT (WITHOUT DAMPER) THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		W-L-7155	METAL DUCT THROUGH GYPSUM WALL ASSEMBLY
		W-L-7156	METAL DUCT WITH GLASS FIBER INSULATION THROUGH GYPSUM WALL ASSEMBLY (2-HR)
.	MEMBRANE PENETRATION	CLIV OR CLIV 76	MEMBRANE PENETRATION IN GYPSUM WALL ASSEMBLY (2-HR)
	CONCRETE OR BLOCK WALL	W-J-3215	CABLE BUNDLE (<1") (2-HR)
ET	JOINTS	SYSTEM	DESCRIPTION
5	GYPSUM WALL	CJ-D-0004	TOP OF WALL JOINT: GYPSUM WALL TO NON-RATED ROOF/FLOOR DECK (2-HR)

## **UL FIRE RESISTANCE DIRECTORY NOMENCLATURE**

Through Penetrations First letter represents what is Second letter(s) provide more information Example: CAJ1150 Four digit number describes the penetrating item(s) about the floor or wall: being penetrated C = FLOOR OR WALLPENETRATION F= FLOOR CONCRETE FLOORS WITH A MINIMUM 0000 - 0999 BLANK OPENINGS W = WALLS THICKNESS LESS THAN OR EQUAL TO 5 IN C = FLOORS OR WALLS (COMBINED) 1000-1999 METAL PIPE, CONDUIT OR TUBING CONCRETE FLOORS 5" OR LESS = CONCRETE FLOORS WITH A MINIMUM THICKNESS GREATER THAN 5 IN 2000 - 2999 NON METALLIC PIPE CONDUIT OR TUBING C = FRAMED FLOORS CONCRETE OR MASONRY WALLS 3000 - 3999 CABLES 4000 - 4999 CABLE TRAYS 8" OR LESS 1150 = METAL PIPE, CONDUIT OR TUBING = FOR-CEILING ASSEMBLIES CONSISTING 5000 - 5999 INSULATED PIPES OF CONCRETE WITH MEMBRANE 6000 - 6999 MISCELLANEOUS ELECTRICAL (BUSWAY) PROTECTION CONCRETE OR MASONRY WALLS WITH A 7000 - 7999 MISCELLANEOUS MECHANICAL 8000 - 8999 MIXED PENETRATING ITEMS MINIMUM THICKNESS LESS THAN OR **EQUAL TO 8 IN** 9000 - 9999 RESERVED FOR FUTURE USE = FRAMED WALLS

First letters identify the type of	Second letter(s) provide more	Four digit number describes	Example: HWD0757		
joint:	information about the floor or wall:	the penetrating item(s)			
CJ = CONTINUITY HEAD OF WALL FF = FLOOR TO FLOOR	S NO MOVEMENT (STATIC)	0000 - 0999 LESS THAN OR EQUAL TO 2"	HW = HEAD TO WALL		
WW = WALL TO WALL W = FLOOR TO WALL W = HEAD TO WALL	D = ALLOWS MOVEMENT (DYNAMIC)	1000-1999 GREATER THAN 2" AND LESS THAN OR EQUAL TO 6"	D = ALLOWS MOVEMENT (DYNAMIC)		
BW = BOTTOM OF WALL		2000 - 2999 GREATER THAN 6" AND LESS THAN OR EQUAL TO 12"	0757 = LESS THAN OR EQUAL TO 2"		
		3000 - 3999 GREATER THAN 12" AND LESS THAN OR EQUAL TO 24"			
		4000 - 4999 GREATER THAN 24"			

Notes:

Refer to the following specifications for firestopping. a. 07 84 00 Firestopping b. 07 84 13 Penetration Firestopping c. 07 84 43 Joints Firestopping d. 22 00 00 Plumbing e. 23 00 00 HVAC f. 26 00 00 Electrical g. 27 05 37 Communication Systems

For Quality Control requirements, refer to the Quality Control portion of the specification.

the

S. S.

- 2. Details shown are typical details. Always refer to the listed system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following: Fire Rating (F-Rating)
- Temperature Rating (T-Rating)
- Leakage Rating (L-Rating) Water Rating (W-Rating)
- Annular Space
- Percent Fill
- Type and thickness of fire-rated construction.
- If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable subject to approval by the Authority Having Jurisdiction (AHJ). Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000). Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- References:
- 2017 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2.
- NFPA 101 Life Safety Code

building codes.

- NFPA 70 National Electric Code All governing local and regional
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal or greater to that of
- 6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following
- Warning! Do Not Disturb
- UL System # \* Product(s) used Hourly Rating (F-Rating)
- Installation Date Contractor's Name

7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1).

Current as of November 19, 2017. System details subject to change without notice.

SHEET NAME: Index of Drawings

SHEET NUMBER

JOB NUMBER:

DRAWN:

CHECKED:

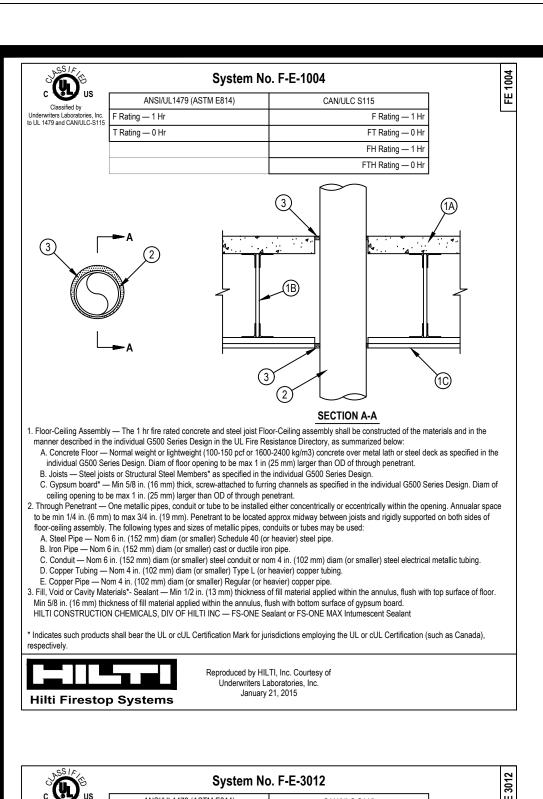
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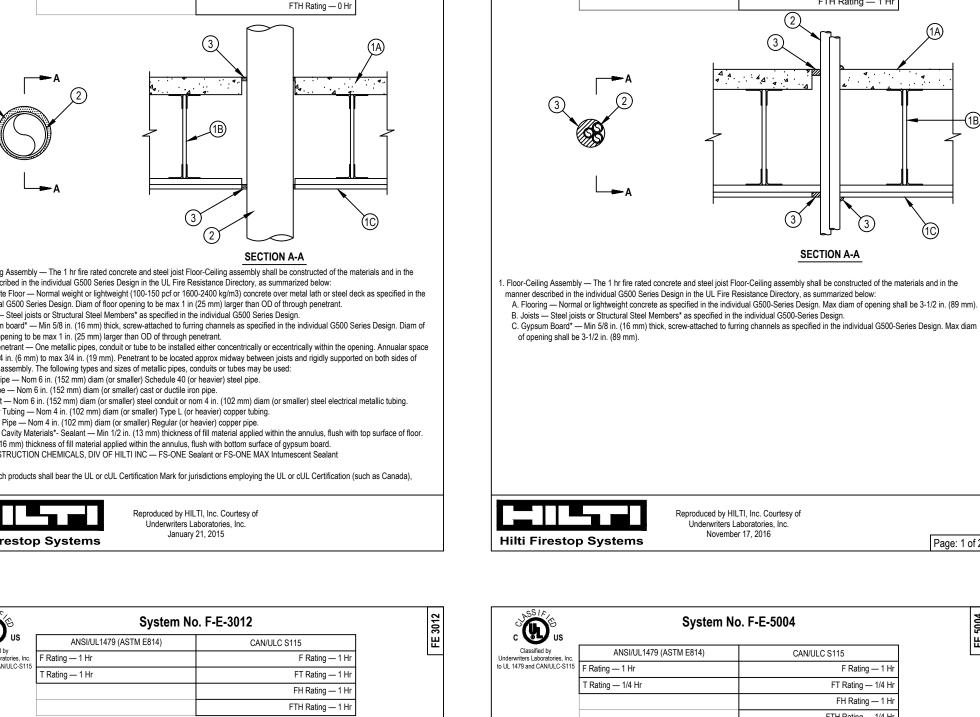
**ISSUE DATE: 07-13-2018** 

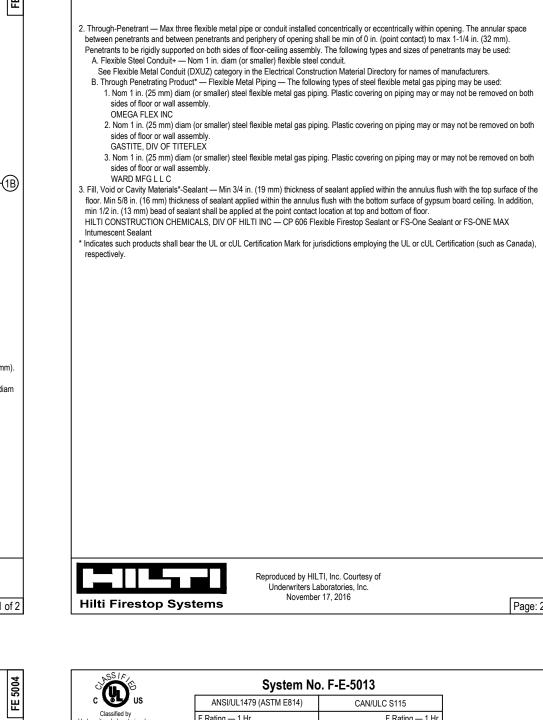
3.0

construction being penetrated.

information. Through Penetration Firestop



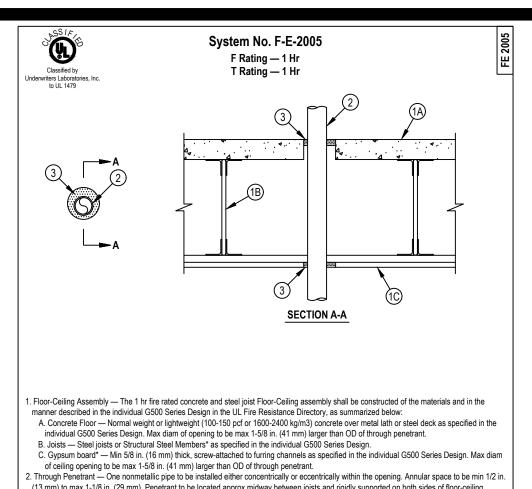


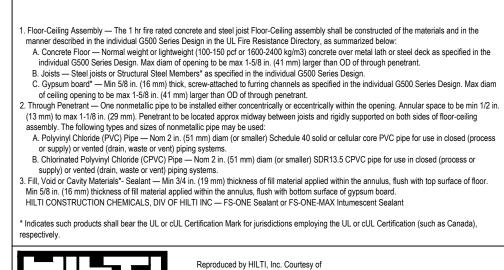


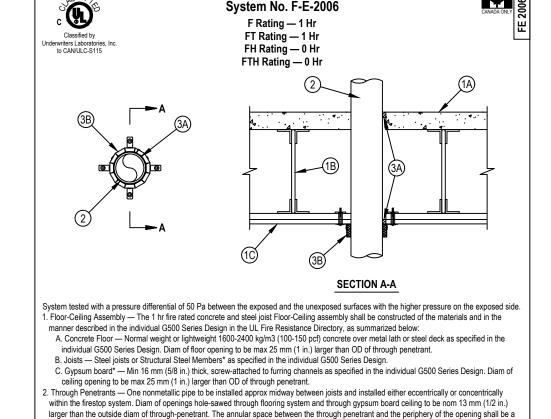
FT Rating — 1 Hi

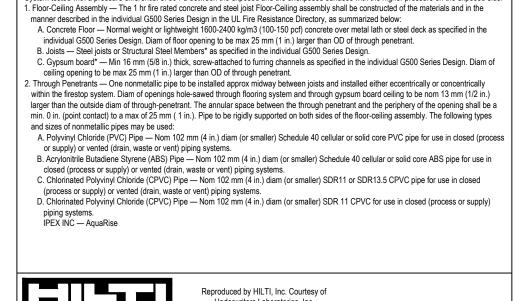
SECTION A-A

System No. F-E-1018





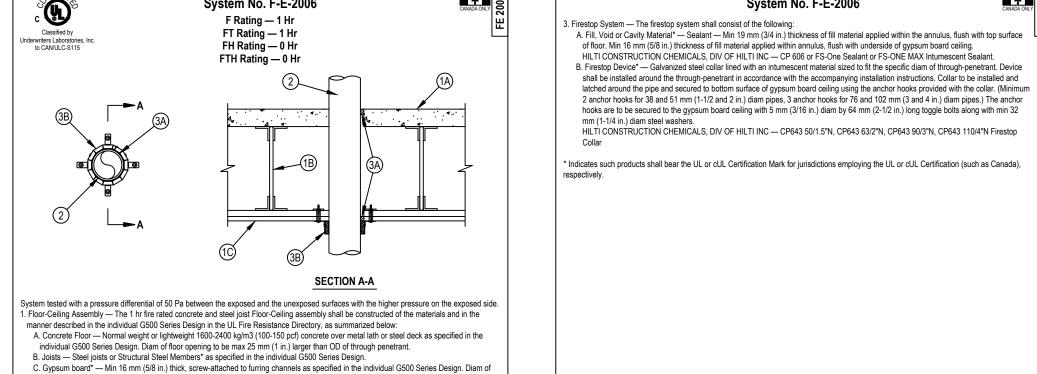


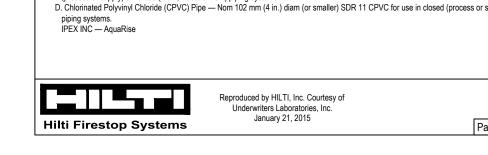


System No. F-E-8008

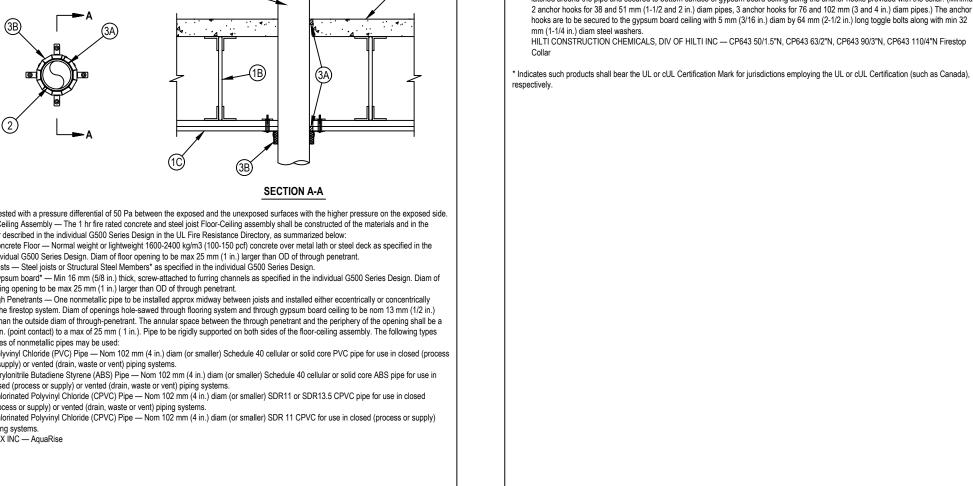
CAN/ULC S115

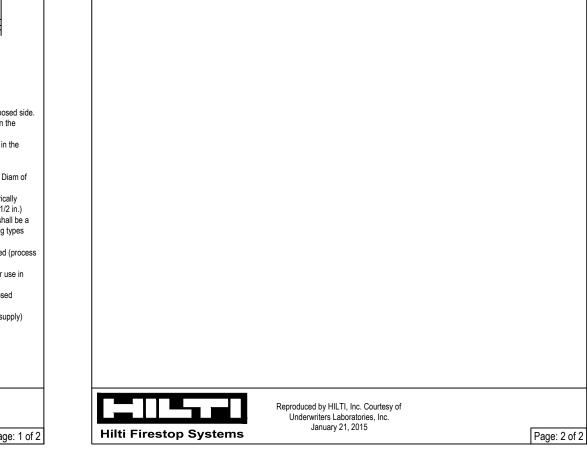
F Rating — 1 F





ANSI/UL1479 (ASTM E814)





System No. F-E-8008 Through Penetrants — One or more pipes, conduits, tubing and cables to be installed concentrically or eccentrically within the opening. The

space between any penetrant, except nonmetallic pipes and uninsulated metallic pipes to be min 0 in. (point contact) to max 1 in. (25 mm).

ubing and cables to be rigidly supported on both sides of floor-ceiling assembly.

A1. Steel Pipe — Nom 3/4 in. (19 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

A3. Copper Tube — Nom 3/4 in. (19 mm) diam (or smaller) Type L (or heavier) copper tube.

A4. Copper Pipe — Nom 3/4 in. (19 mm) diam (or smaller) Regular (or heavier) copper pipe.

D. Cables — Max of two 4 pair No. 18 AWG (or smaller) cable with PVC insulation and jacket materials.

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

sizes of metallic pipes, conduits or tubing may be used:

or supply) or vented (drain, waste or vent) piping system.

or supply) piping systems.

+Bearing the UL Recognized Component Mark

The space between any penetrants and the periphery of the opening shall be min 0 in. (point contact) to max 1 in. (25 mm). Pipes, conduits,

A. Metallic Penetrants — One or more metallic pipes, conduits or tubing to be installed within the firestop system. The following types and

A2. Conduit — Nom 3/4 in. (19 mm) diam (or smaller) steel electrical metallic tubing (EMT) or 3/4 in. (19 mm) diam galv steel conduit.

B. Tube Insulation - Plastics+ — Nom 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. Tube insulation to be installed on one or more of the metallic pipes or tubes (Items 2A1, 2A3 and 2A4).

Component tube insulation material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be

(38 mm) from non-insulated metallic through penetrants. The following types and sizes of metallic pipes may be used: C1. Polyvinyl Chloride (PVC) Pipe — Nom 1-1/4 in. (32 mm) diam (or smaller) Schedule 40 solid core PVC pipe for use in closed (process

2. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 1-1/4 in. (32 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process

Fill, Void or Cavity Materials\* - Sealant — Min ¾ in. (19 mm) thickness of sealant applied within the annulus flush with the top surface of the floor and min 5/8 in. (16 mm) thickness of sealant applied within the annulus flush with the bottom surface of gypsum board. A min ½ in. (6 mm) diameter bead of sealant shall be applied at the penetrant(s)/floor interface and the penetrant(s)/gypsum board interface at point contact

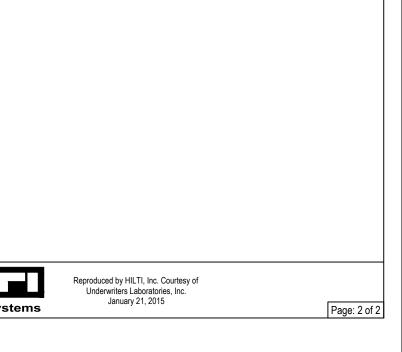
ndicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada),

of floor. Min 16 mm (5/8 in.) thickness of fill material applied within annulus, flush with underside of gypsum board ceiling.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606 or FS-One Sealant or FS-ONE MAX Intumescent Sealant.

B. Firestop Device\* — Galvanized steel collar lined with an intumescent material sized to fit the specific diam of through-penetrant. Device

shall be installed around the through-penetrant in accordance with the accompanying installation instructions. Collar to be installed and



Always refer to the listed system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following: Fire Rating (F-Rating) Temperature Rating (T-Rating)

Refer to the following

a. 07 84 00 Firestopping

d. 22 00 00 Plumbing

f. 26 00 00 Electrical

e. 23 00 00 HVAC

specification.

specifications for firestopping.

b. 07 84 13 Penetration Firestopping

g. 27 05 37 Communication Systems

For Quality Control requirements, refer

to the Quality Control portion of the

2. Details shown are typical details.

c. 07 84 43 Joints Firestopping

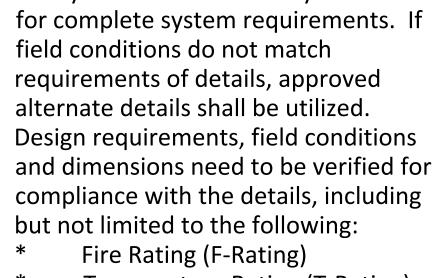
- **Annular Space**

- Type and thickness of fire-rated construction.

If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable subject to approval by the Authority Having Jurisdiction (AHJ). Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000). Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

- 2017 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2.
- NFPA 101 Life Safety Code
- NFPA 70 National Electric Code
- building codes.
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal or greater to that of construction being penetrated.
- All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information.
- Through Penetration Firestop
- **Installation Date**
- protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1).

System details subject to change without notice.

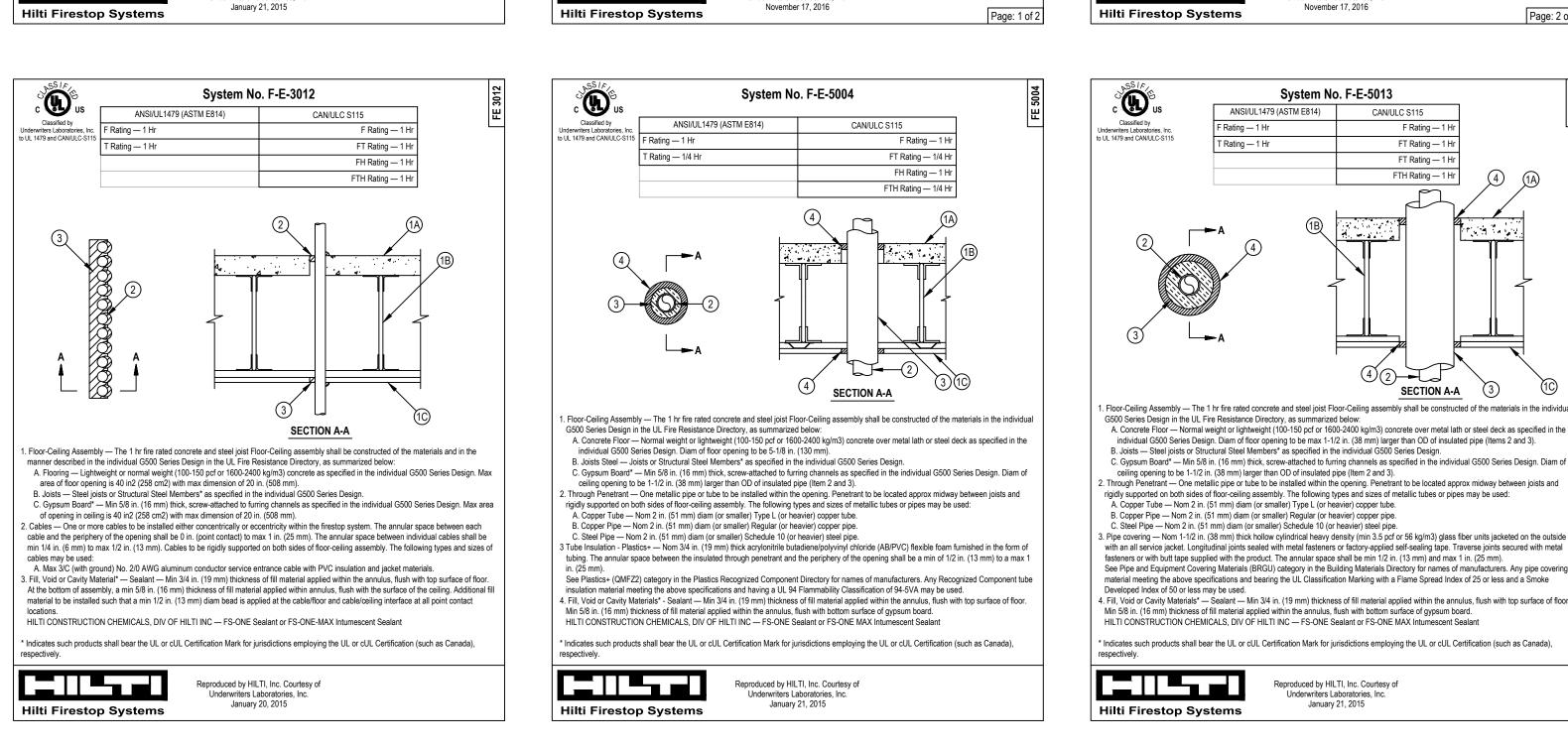


- Leakage Rating (L-Rating)
- Water Rating (W-Rating)
- Percent Fill

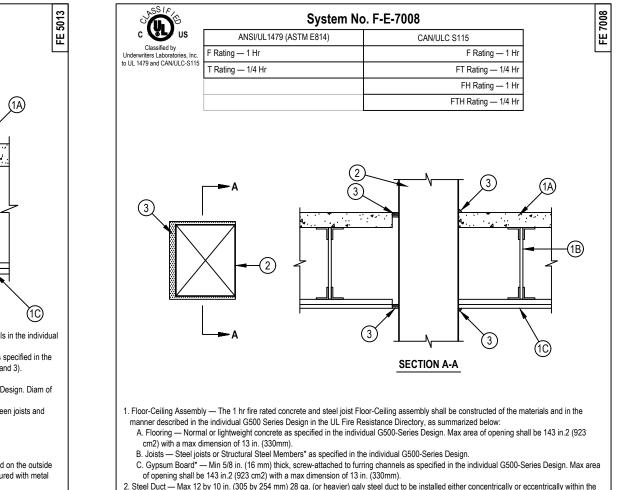
- References:
- All governing local and regional

- UL System # \* Product(s) used
- Contractor's Name

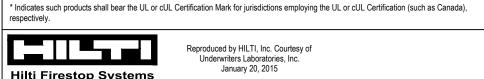
Current as of November 19, 2017.

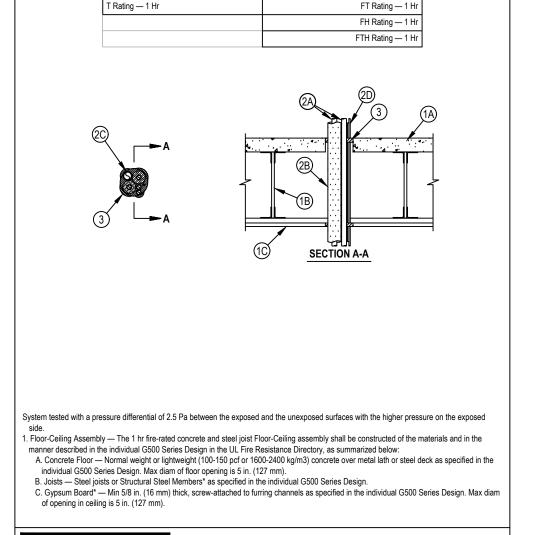


FT Rating — 1





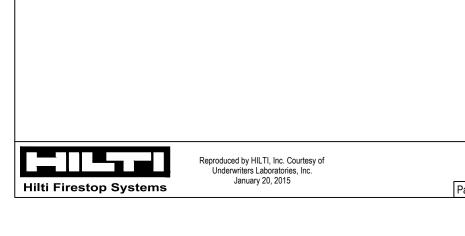




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Hilti Firestop Systems

Underwriters Laboratories, Inc. January 20, 2015



Warning! - Do Not Disturb

Hourly Rating (F-Rating)

For outlet boxes requiring

SHEET NAME: **Commercial - Concrete** Over Metal Deck/ Steel Bar Joist - Concrete Floor/ Ceiling Assembly SHEET NUMBER

**ISSUE DATE: 07-13-2018** 

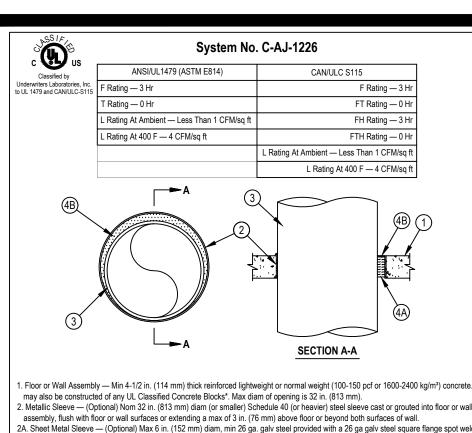
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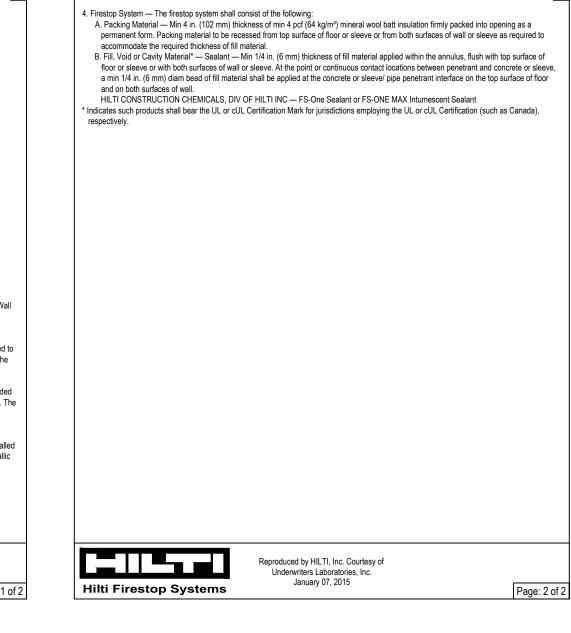
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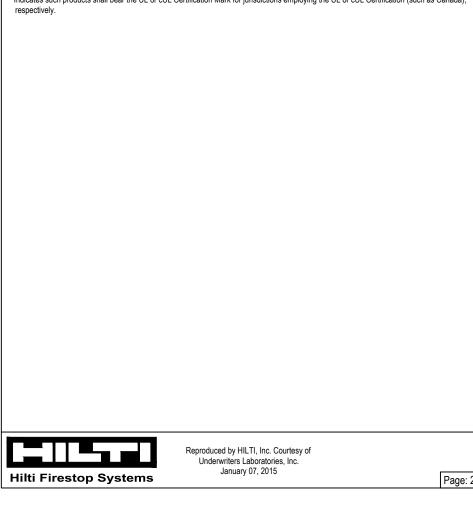
3.1



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 t. Metallic Sleeve — (Optional) Nom 32 in. (813 mm) diam (or smaller) Schedule 40 (or heavier) steel sleeve cast or grouted into floor or wall Sheet Metal Sleeve — (Optional) Max 6 in. (152 mm) diam, min 26 ga. galv steel provided with a 26 ga galv steel square flange spot welded to the sleeve at approx mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. (51 mm) larger than the sleeve diam. The sleeve is to be cast in place and may extend a max of 4 in. (102 mm) below the bottom of the deck and a max of 1 in. (25 mm) above the top B. Sheet Metal Sleeve — (Optional) - Max 12 in. (305 mm) diam, min 24 ga galv steel provided with a 24 ga galv steel square flange spot welder to the sleeve at approx mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. (51 mm) larger than the sleeve diam. The

sleeve is to be cast in place and may extend a max of 4 in. (102 mm) below the bottom of the deck and a max of 1 in. (25 mm) above the top Through-Penetrant — One metallic pipe, tube or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between penetrant and periphery of opening shall be min 0 in. (point contact) to max 1-7/8 in. (48 mm). Penetrant may be installed th continuous point contact. Penetrant to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic penetrants may be used: A. Steel Pipe — Nom 30 in. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe





System No. C-AJ-3283

2. Cables — Within the loading area for the firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled

within the device and rigidly supported on both sides of floor or wall assembly. Any combination of the following types of cables may be used:

A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation

F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).

See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers

H. Through-Penetrating Product\* — Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with o

. Max 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacke

J. Through Penetrating Product\* — Any Cables, Metal-Clad Cable+ or Armored Cable+ currently Classified under the Through Penetrating

. Firestop Device\* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twiste inner fabric smoke seal, flanges and gasket material (not shown). Firestop device to be installed in accordance with the accompanying installation

nstructions. Device slid into floor or wall such that ends project an equal distance from the approximate centerline of the assembly. The annula space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flange(s) that are spun

clockwise onto device threads, over gasket material butting tightly to top side of floor or both sides of wall. In floors, when FS-ONE Sealant is used

nd installed flush with bottom of floor, device flange shall be threaded tightly to bottom side of floor. In floors, device flange to be secured to floor

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 and CP 653 BA 2" Speed Sleeve, CP 653 and CP 653 BA 4" Speed Sleeve . Fill, Void or Cavity Material\* — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the

annulus between fireston device and periphery of opening, flush with ton surface of floor or both sides of wall. As an option, when ES-ONE

Sealant is used, the fill material can be installed flush with bottom of floor. For L Ratings when sealant is used, an additional 1/4 in. (6 mm) bead

of fill material is applied at the device/floor or device/wall interface on top or bottom side of floor or both sides of wall assembly prior to installin

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 618 Firestop Putty, FS-ONE Sealant or FS-ONE MAX Intumescent Sealant.

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

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B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE lacket and insulation.

E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.

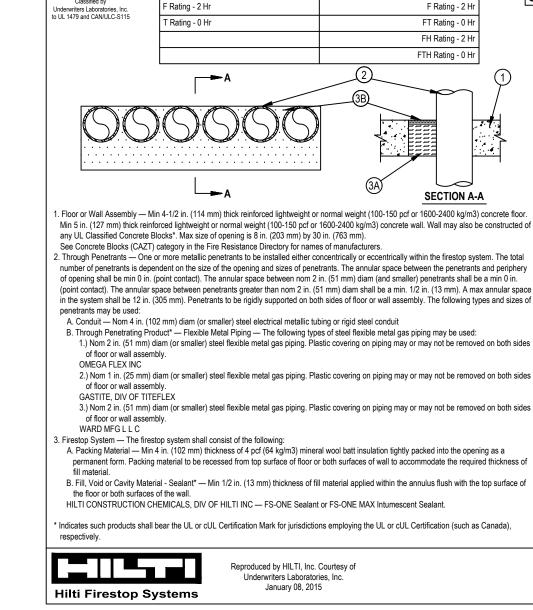
C. Max 4/0 AWG Type RHH ground cable.

K. Max 3/C No 12 AWG MC Cable.

See Table below for L Ratings

D. Max 4 pr No. 22 AWG Cat 6 computer cables.

System No. C-AJ-1226



System No. C-AJ-1513

System No. C-AJ-5090

CAN/ULC S115

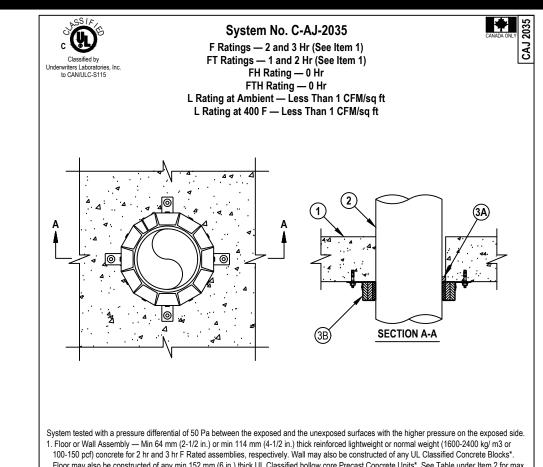
F Ratings — 2 and 3 Hr (See Item 4

FH Ratings — 2 and 3 Hr (See Item

ANSI/UL1479 (ASTM E814)

FH Rating - 2 I

FTH Rating - 0 H



Floor may also be constructed of any min 152 mm (6 in.) thick UL Classified hollow core Precast Concrete Units\*. See Table under Item 2 for max See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufactures. . 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 mm (point contact). See Table below for the max annular space required between pipe and periphery of opening. Pipe to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of nonmetallic pipes may

A. Polyvinyl Chloride (PVC) Pipe — Nom 152 mm (6 in.) 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 152 mm (6 in.) diam (or smaller) SDR11 or SDR13.5 CPVC pipe for use in closed (process or supply) piping systems. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 152 mm (6 in.) diam (or smaller) Schedule 40 solid-core or cellular core ABS pipe for use n closed (process or supply) or vented (drain, waste or vent) piping system

. 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.

2. Metallic Sleeve — (Optional) — Nom 18 in. (457 mm) diam (or smaller) Schedule 10 (or heavier) steel sleeve cast or grouted into floor or wall

. Through Penetrants — One metallic pipe or tubing to be centered within the firestop system. Pipe or tubing to be rigidly supported on both

. Tube Insulation — Plastics+ — Min 1/2 in. (13 mm) to max 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible

foam furnished in the form of tubing. Nom 1 in. (25 mm) thick AB/PVC flexible foam insulation may be used for max 2 hr F and FH Ratings

when max 3 in. (76 mm) diam pipe or tubing is used. The annular space shall be min 1/2 in. (13 mm) to max 12 in. (305 mm). When max

See Plastics+ (QMFZ2) Category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube

A. Packing Material — Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into opening as a

permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the

3. Fill. Void or Cavity Material\* — Sealant — Min 1/4 in. (6 mm) thickness of fill material applied within the annulus, flush with top surface of

floor or with both surfaces of wall. When max annular space exceeds 1-1/2 in. (38 mm) the min thickness of fill material is 1/2 in. (13 mm).

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

insulation material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.

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



Wall may also be constructed of any UL Classified Concrete Blocks\*, Max diam of opening is 18 in, (457 mm).

assembly, flush with floor or wall surfaces or extending a max of 3 in. (76 mm) above floor or beyond both surfaces of wall.

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

sides of floor or wall assembly. The following types and sizes of metallic pipes or tubing may be used:

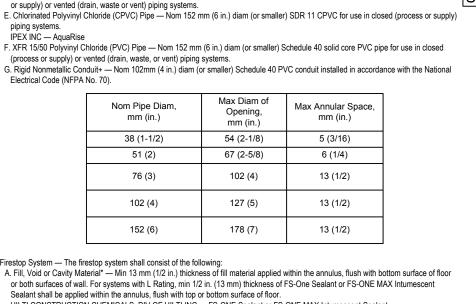
A. Steel Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe

annular space exceeds 1-1/2 in. (38 mm) the F and FH Ratings are 2 hr.

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

B. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper tubing.

. Copper Tubing — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.



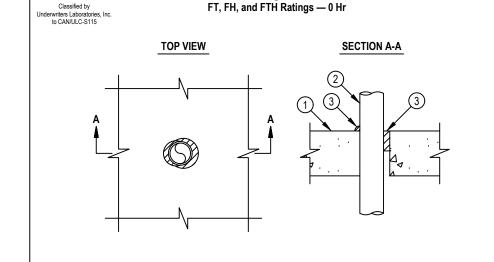
System No. C-AJ-2035

D. Flame Retardant Polypropylene (FRPP) Pipe — Nom 152 mm (6 in.) diam (or smaller) Schedule 40 FRPP pipe for use in closed (process 🛭 🕏

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant B. Firestop Device\* — 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 or both sides of wall using the anchor hooks provided with the collar. (Minimum 2 anchor hooks for 38 and 51 mm (1-1/2 and 2 in.) diam pipes, 3 anchor hooks for 76 and 102 mm (3 and 4 in.) diam pipes, a 4 anchor hooks for 152 mm (6 in.) diam pipes). The anchor hooks are to be secured with 6 mm (1/4 in.) diam by min 32 mm (1-1/4 in.) long steel expansion bolts, or steel Tapcon® concrete screw anchors, in conjunction with min 19 mm (3/4 in.) diam steel washers with or anchor bolt in each anchor hook. As alternates to the anchors specified above, min 4 mm (0.145 in.) diam by 32 mm (1-1/4 in.) long powder actuated fasteners utilizing a 36 mm (1-7/16 in.) diam by 2 mm (1/16 in.) thick steel washer, Hilti 6 mm (1/4 in.) diam by 2 mm 1/4 in.) long KWIK-CON II+ concrete screw anchor, Hilti 6 mm (1/4 in.) diam by 44 mm (1-3/4 in.) long KWIK-BOLT 3 steel expansion anchor or Hilti X-DNI 27 P8 S15 powder actuated floor pin with integral nom 15 mm (9/16 in.) diam washer may be used. HILTLONSTRUCTION CHEMICALS DIV OF HILTLING — CP 643N 50/1 5" CP 643N 63/2" CP 643N 90/3" CP 643N 110/" or CP 643N

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), +Bearing the UL Listing Mark

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Hilti Firestop Systems	January 07, 2015	



System No. C-AJ-2079

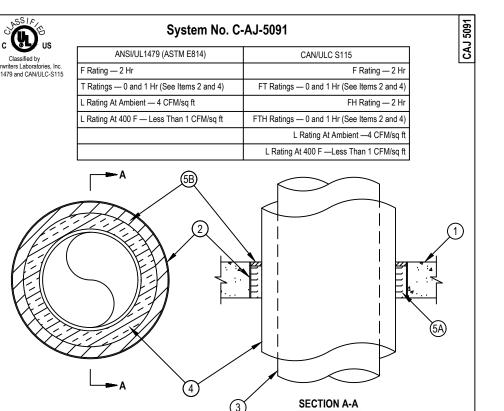
F Rating — 2 Hr

system tested with a pressure differential of 50 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side. . 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 diam of opening is 3 in. (76 mm See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers. . Through Penetrants — One nonmetallic pipe to be installed concentrically or eccentrically within the firestop system. Annular space between pipe and periphery of opening to be min 0 mm (point contact), to max 16 mm (5/8 in.). The following type and sizes of nonmetallic pipe may be used: A. Polyvinyl Chloride (PVC) Pipe — Nom 51 mm (2 in.) diam (or smaller) Schedule 40 cellular core PVC for use in closed (process or supply) or vented (drain\_waste or vent) piping systems

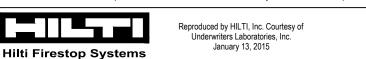
3. Fill. Void or Cavity Material\* - Sealant — Minimum 51 mm (2 in.) thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall. At the point contact location between pipe and concrete, a minimum 13 mm (1/2 in.) diameter bead of fill material shall be applied at the concrete/pipe interface on the top surface of floor and on both surfaces of wall. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

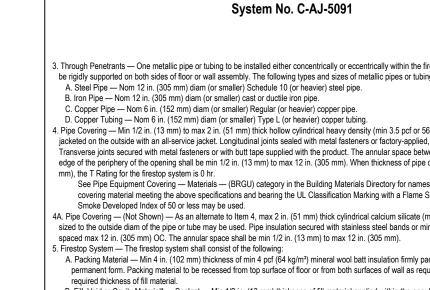
ndicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada),

B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 51 mm (2 in.) drain (or smaller) Schedule 40 for use in closed (process or supply) piping



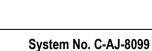
I. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified Concrete Blocks\*. Max diam of opening is 29 in. (737 mm). 2. Metallic Sleeve — (Optional) — Nom 30 in. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces or extending a max of 3 in. (76 mm) above floor or beyond both surfaces of wall. If the steel sleeve extends beyond the top surface of the floor or both surfaces of the wall, the T Rating of the firestop system is 0 hr. 2A. Sheet Metal Sleeve — (Optional) - Max 6 in. (152 mm) diam, min 26 ga galv steel provided with a 26 ga galv steel square flange spot welded to the sleeve at approximately mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in, (51 mm) larger than the sleeve diam The sleeve is to be cast in place flush with bottom surface of floor and may extend a max of 1 in. (25 mm) above the top surface of the floor. 2B. Sheet Metal Sleeve — (Optional) - Max 12 in. (305 mm) diam, min 24 ga galv steel provided with a 24 ga galv steel square flange spot welded to the sleeve at approximately mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in (51 mm) larger than the sleeve diam. The sleeve is to be cast in place flush with bottom surface of floor and may extend a max of 1 in. (25 mm) above the top surface of the floor.





permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the B. Fill, Void or Cavity Material\* — Sealant — Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant or FS-ONE MAX Intumescent Sealant idicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada





1.) Nom 2 in. (51 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly 2.) Nom 1 in. (25 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly 3.) Nom 2 in. (51 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides

of floor or wall assembly. he hourly T Rating is 3/4 hr when a pipe or tube with fiber-glass insulation is used, or 0 hr when a pipe or tube, a pipe or tube with AB/PVC insulation or a cable bundle is used. The T Rating is 0 hr when metallic penetrants without pipe insulation are used. Pipe Insulation — (Optional)—The following types of pipe insulation may be used with metallic penetrants (Items 2A, 2B, 2C, 2D and 2F): pipe Covering\* — Nom 1 in. (25 mm) thick (or thinner) 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. ee 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 Classifica tion Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

See Plastics+++ (QMFZ2) category in the Plastics 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 space between the cables and periphery of the opening shall range from min 2 in, (51 mm) to max 4 in, (102 mm), Any combination of the following types and sizes of metallic conductor of fiber optic cable may be used: A. Max 500 kcmil single copper connector power cable with thermoplastic insulation and polyvinyl chloride (PVC) jacket. B. Max 300 pair No. 24 AWG copper conductor telecommunication cables with PVC insulation and jacket material. C. Max 7/C copper conductor No. 12 AWG multiconductor power and control cables with PVC or cross-linked polyethylene (XLPE) insulation

D. Multiple fiber optical communication cables jacketed with PVC and having a max outside diam of 1/2 in. E. Max 3/C copper conductor No. 12 AWG with bare aluminum ground, PVC insulated steel Metal-Clad cable. Firestop System — The firestop system shall consist of the following: A. Packing Material — Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into 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 Il material. When Precast Concrete Unit floors are used, packing material shall be installed at a thickness equal to the thickness of the floor minus 1/2 in. (13 mm), flush with bottom surface of floor. B. Fill Void or Cavity Materials\* - Sealant - Min 1/2 in. (51 mm) thickness of fill material applied within the annulus. flush with top surface of

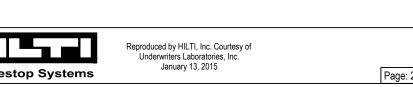
Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada

3. Through Penetrants — One metallic pipe or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubing may be used:

4. Pipe Covering — Min 1/2 in. (13 mm) to max 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. ransverse joints secured with metal fasteners or with butt tape supplied with the product. The annular space between the insulated pipe and the edge of the periphery of the opening shall be min 1/2 in. (13 mm) to max 12 in. (305 mm). When thickness of pipe covering is less than 2 in. (505 mm).

See Pipe 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 A. Pipe Covering — (Not Shown) — As an alternate to Item 4, max 2 in. (51 mm) thick cylindrical calcium silicate (min 14 pcf or 224 kg/m³) units sized to the outside diam of the pipe or tube may be used. Pipe insulation secured with stainless steel bands or min 18 AWG stainless steel wire

A. Packing Material — Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation firmly packed into opening as a



B. Tube Insulation-Plastics+++ — Nom 3/4 in. (19 mm) thick (or thinner) acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam Cables — Max 2 in. (51 mm) diam tight bundle of cables installed within the opening and rigidly supported on both sides of floor or wall assembly.

floor or with both surfaces of wall. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant. -+Bearing the UL Recognized Component Marking

	with a Hilti Firestop Label equipped with
by HILTI, Inc. Courtesy of ters Laboratories, Inc.	a QR code with the following
Page: 2 of 2	information.

Warning! - Do Not Disturb Through Penetration Firestop

Refer to the following

a. 07 84 00 Firestopping

d. 22 00 00 Plumbing

f. 26 00 00 Electrical

e. 23 00 00 HVAC

specification.

specifications for firestopping.

b. 07 84 13 Penetration Firestopping

g. 27 05 37 Communication Systems

For Quality Control requirements, refer

to the Quality Control portion of the

2. Details shown are typical details.

Always refer to the listed system detail

for complete system requirements. If

Design requirements, field conditions

and dimensions need to be verified for

compliance with the details, including

Leakage Rating (L-Rating)

Water Rating (W-Rating)

Temperature Rating (T-Rating)

Type and thickness of fire-rated

If alternate details matching the

field conditions do not match

requirements of details, approved

alternate details shall be utilized.

but not limited to the following:

**Annular Space** 

construction.

field conditions are not available,

manufacturer's engineering judgment

Jurisdiction (AHJ). Contact Hilti Inc. for

drawings are acceptable subject to

alternative systems or Engineering

Firestop Systems Engineering

Volumes 1 & 2.

building codes.

References:

Judgments.

Judgment (800-879-8000). Drawings

shall follow the International Firestop

Council (IFC) Guidelines for Evaluating

Fire Resistance Directory,

NFPA 101 Life Safety Code

5. Firestop System installation must

meet requirements of ASTM E-814 (UL

1479) tested assemblies that provide a

All rated through-penetration

assemblies shall be prominently labeled

fire rating equal or greater to that of

construction being penetrated.

2017 Underwriter's Laboratories

NFPA 70 – National Electric Code

All governing local and regional

approval by the Authority Having

Percent Fill

Fire Rating (F-Rating)

c. 07 84 43 Joints Firestopping

UL System # \* Product(s) used Hourly Rating (F-Rating)

**Installation Date** 

Contractor's Name

For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1).

Current as of November 19, 2017. System details subject to change without notice.

o designer (delete this natural). Any modification to the UL or Intertek Classifical. Details shown are up to For additional informational caboratories Fire Resistance.

JOB NUMBER: DRAWN:

**CHECKED:** 

**ISSUE DATE: 07-13-2018** 

**REVISIONS:** 

SHEET NAME: **Commercial - Concrete** Over Metal Deck/ Steel Bar Joist - Floors or

SHEET NUMBER

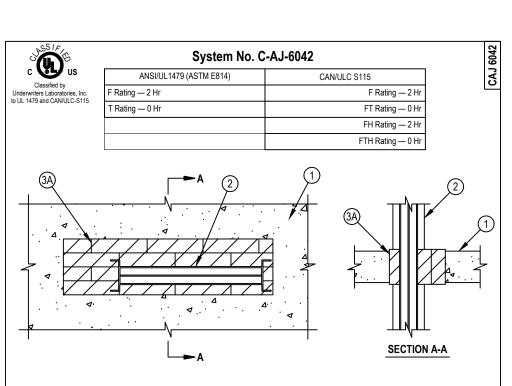
3.2

3. Iron Pipe — Nom 30 in. (762 mm) diam (or smaller) cast or ductile iron pipe. C. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe. D. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing. Conduit - Nom 6 in. (152 mm) diam (or smaller) steel conduit. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) ANSI/UL1479 (ASTM E814) CAN/ULC S115 Ratings — 0 and 1/2 Hr (See Item 2) FT Ratings — 0 and 1/2 Hr (See Item 2 Rating At Ambient — Less Than 1 CFM (See Item FTH Ratings — 0 and 1/2 Hr (See Item 2) Rating At 400 F — Less Than 1 CFM (See Item 2) Rating At Ambient — Less Than 1 CFM (See Item 2) L Rating At 400 F — Less Than 1 CFM (See Item 2

Floor or Wall Assembly — Min 2-1/2 in. (64 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\*. Opening in floor or wall to be max 3 in. (76 mm) diam for 2" device and max 5 in. (127 mm) diam for 4" device. See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers. A. Floor Assembly — (Not Shown) — As an alternate to Item 1, fire-rated unprotected concrete and steel floor assembly may be used. Floor assembly to be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire

sistance Directory and shall include the following construction features: A. Concrete — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. B. Steel Floor and Form Units — Composite or noncomposite max 3 in. (76 mm) deep fluted galy units as specified in the individual Floor-Ceiling design. Opening in floor or wall to be max 3 in. (76 mm) diam for 2" device and max 5 in. (127 mm) diam for 4" device.

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. 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 or wall. Wall may also be constructed of any UL Listed Concrete Blocks\*. Max area of opening is 240 in.2 (1548 mm2) with max dimension of 30 See Concrete Blocks (CAZT) in the UL Fire Resistance Directory for names of manufacturers. Busway — One nom 23 in. (584 mm) wide (or smaller) by 4-1/2 in. (114 mm) deep, or max two nom 11-1/4 in. (286 mm) wide (or smaller) by -1/2 in. (114 mm) deep, "I" shaped aluminum enclosure containing factory mounted aluminum bars rated for 600 V, 4000A or copper bars rate

for 600 V, 5000 A. When two busways are installed, they shall be placed end to end and the annular space between busways shall be min 1/2 in

(13 mm). The annular space between busways and periphery of opening shall be min 1/4 in. (6 mm) to max 5-3/4 in. (146 mm). Busways to be

busways and fire block to fill any voids. This fill material is to be applied from the top surface of the floor assembly or both surfaces of wall

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gidly supported on both sides of floor and wall assembly. The busways shall bear the UL Listing Mark and shall be installed in accordance with ne National Electrical Code, NFPA No. 70. Firestop System — The firestop system shall consist of the following: A. Fill, Void or Cavity Material\* — Fire blocks installed with 5 in. (127 mm) dimension passed through the opening and centered within the thickness of the floor or wall. In concrete block walls, fire block to fill entire thickness of wall opening unless wall is solid filled. Blocks to be firmly packed and completely fill the entire area of opening between and around busways HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-BL Firestop Block B. Fill, Void or Cavity Material\* — (Not Shown) - Fill material to be applied to maximum extent possible within the opening between and around

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Intumescent Sealant or FS-ONE MAX Intumescent Sealant. Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada),

System No. C-AJ-7051 ANSI/UL1479 (ASTM E814 CAN/ULC S115 FT Rating - 1 FH Rating - 3 Hr FTH Rating - 1 HR SECTION A-A

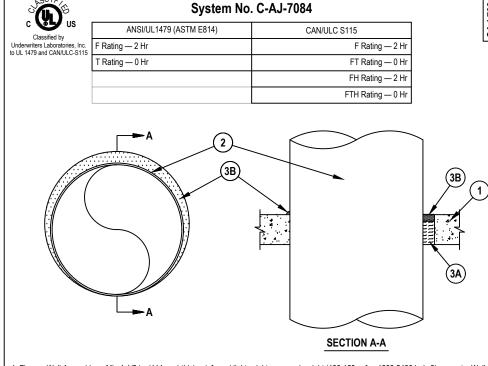
Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor or min 5-1/2 in. (140 mm) thick lightweight on normal weight concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks Max area of opening is 1024 in. sg (6606 cm2) with a max dimension of 32 in. (813 mm). See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacture Steel Duct — Nom 30 by 30 in. (762 by 762 mm) by No. 24 gauge (or heavier) galv steel duct. One steel duct to be positioned within the firestop system. The annular space shall be min 1/4 in. (6 mm) to max 1-3/4 in. (44 mm). Duct to be rigidly supported on both sides of floor or wall . Firestop System — The firestop system shall consist of the following:

A. Packing Materials — Min 3-1/2 in. (89 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into opening as a

permanent form between the bare steel duct and the periphery of the opening. Packing material to be recessed from top surface of floor or both surfaces of wall as required to accommodate the required thickness of fill material. 3. Fill, Void or Cavity Material\* — Sealant — Min 1 in. (25 mm) thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606 Flexible Firestop Sealant, FS-ONE Sealant or FS-ONE MAX Intumescen . Steel Retaining Angle — Nom 2 in. by 2 in. (51 by 51 mm) by No. 16 gauge (or heavier) steel angles attached to all four sides of the steel duct or the top surface or both surfaces of the wall. The angles shall be attached with No. 8 (or larger) steel sheet metal screws spaced max of 1 in. (25

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Hilti Firestop Systems

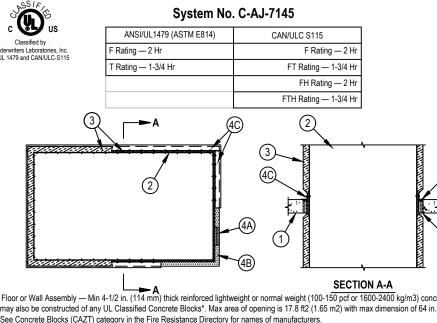


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Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks\*, Max diam of opening is 21-3/4 in, (552 mm). See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers. Through Penetrant — Galv steel duct to be installed concentrically or eccentrically within the firestop system. The annular space between the duct and periphery of opening shall be 0 in. (point contact) and max 1-1/2 in. (38 mm). Duct to be rigidly supported on both sides of wall assemble. A. Spiral Wound HVAC Duct — Nom 20 in. (508 mm) diam (or smaller) No. 24 MSG (or heavier) galv steel spiral wound duct. B. Sheet Metal Duct — Nom 12 in. (305 mm) diam (or smaller) No. 28 MSG (or heavier) galv sheet steel duct.

Firestop System — The firestop system shall consist of the following: A. Packing Material — Min 3-1/2 in. (89 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into 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 B. Fill, Void or Cavity Material\*—Sealant — Min 1 in. (25 mm) thickness of fill material applied within annulus, flush with top surface of floor or both surfaces of wall assembly. At the point contact location between duct and periphery of opening, a min 1/2 in. (13 mm) diam bead of sealant shall be applied at the concrete/duct interface. HILTI CONSTRUCTION CHEMICALS. DIV OF HILTI INC — FS-ONE Sealant, FS-ONE MAX Intumescent Sealant, CP601S Elastomenic irestop Sealant, CP606 Flexible Firestop Sealant, CP 604 Self-Leveling Firestop Sealant, CFS-S SIL GG Sealant or CFS-S SIL SL Sealant. (Note: CP 604 Self-Leveling Firestop Sealant and CFS-S SIL SL Sealant to be used on floor assemblies only.)

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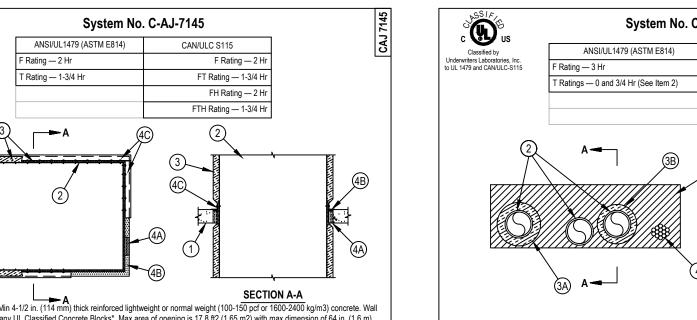


istalled concentrically or eccentrically within the firestop system. The annular space between steel duct and edges of opening shall be min 2 in

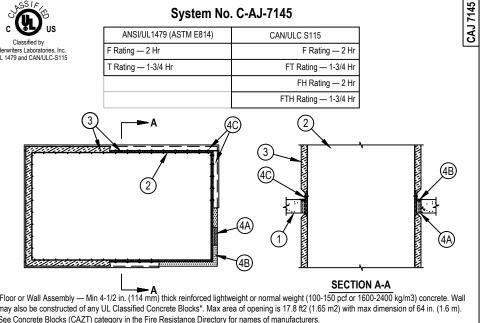
. Firestop System — The firestop system shall consist of the following: recessed from top surface of floor and from both surfaces of wall to accommodate the required thickness of fill material. HILTI CONSTRUCTION CHEMICALS. DIV OF HILTI INC - FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

spaced 1 in. (25 mm) from each end and max 4 in. (102 mm) OC.

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A. Packing Material — Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into annular space su that class fiber blanket insulation on steel duct is compressed to a maximum overall thickness of 1/2 in. (13 mm). Packing material to be B. Fill, Void or Cavity Material\* — Sealant — Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of . Retaining Angles — Min 2 by 2 in. (51 by 51 mm) No. 16 ga (or heavier) galv steel angles. Angles attached to all four sides of steel duct,



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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 opening is 17.8 ft2 (1.65 m2) with max dimension of 64 in. (1.6 m) See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers. . Steel Duct — Max 60 by 36 in. (1524 by 914 mm) steel duct. Steel gauge of duct shall conform with SMACNA requirements. One duct to be (51 mm) to max 6 in, (152 mm) when max duct dimension is 28 in, (711 mm). Otherwise, max annular space is 2-1/2 in, (64 mm), Steel duct to be rigidly supported on both sides of floor or wall assembly. . Batts and Blankets\* — Nom 2 in. (51 mm) thick light density (min 3/4 pcf or 12 kg/m3) glass fiber blanket insulation jacketed on the outside with a foil-scrim-kraft facing. Longitudinal and transverse joints sealed with foil-scrim-kraft tape. Nom annular space between insulated steel duct and periphery of opening to be point contact to max 1/2 in. (13 mm) prior to installation of packing material (Item 4A). When max duct dimension is 28

See Batts and Blankets (BKNV) category in the Building Materials Directory for names of manufacturers. Any batt or blanket meeting the above specifications and bearing the UL Classification Marking with a Flame Spread value of 25 or less and a Smoke Developed value of 50 or less may

through glass fiber blanket insulation, on top surface of floor or on both surfaces of wall with No. 10 (or larger) steel sheet metal screws Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada),

System No. C-AJ-8099 FT Ratings - 0 and 3/4 Hr (See Item FTH Ratings — 0 and 3/4 Hr (See Item

> 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 flo or min 5 in. (127 mm) reinforced lightweight or normal weight concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks\* Floor may also be constructed of any min 6 in. (152 mm) thick UL Classified hollow core Precast Concrete Units\*, Max area of square, rectangular or circular opening is 192 sq in. (1239 cm2) with max dimension of 24 in. (61 cm). When Precast Concrete Unit floors are used, max area of square, rectangular or circular opening is 49 sq in. (316 cm2) with max dimension of 7 in. (17.8 cm) See Concrete Blocks (CAZT) and Precast Concrete Units (CFTV) categories in the Fire Resistance Directory for names of manufacturers. Through-Penetrant — One or more pipes or tubes to be installed within the opening. The total number of through-penetrants is dependent on the size of the opening and 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 and the spacings between the pipes are maintained. The separation between cable bundle tubes and insulated tubes shall be a min 1/2 in. (13 mm) to max 3-1/8 in. (79 mm). The annular space between penetrants and the periphery of opening shall be a min 1/2 in. (13 mm) to max 5 in. 127 mm). Pipes or tubes to be rigidly supported on both sides of floor or wall assembly. Th

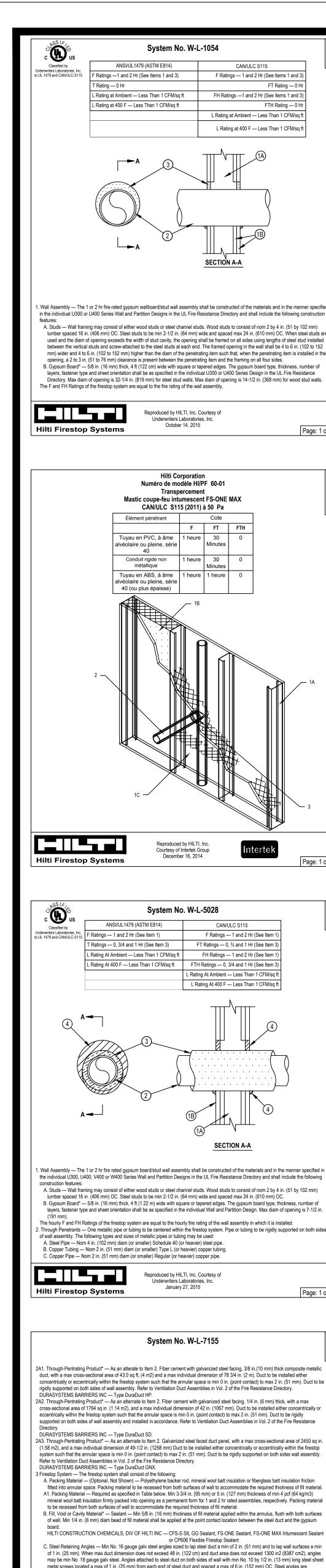
SECTION A-A

A. Copper Tubing — Nom 3 in. (76 mm) diam (or smaller) Type L (or heavier) copper tube B. Copper Pipe — Nom 3 in. (76 mm) diam (or smaller) Regular (or heavier) copper pipe. C. Steel Pipe — Nom 3 in. (76 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe D. Iron Pipe — Nom 3 in. (76 mm) diam (or smaller) cast or ductile iron pipe. E. Conduit — Nom 3 in. (76 mm) diam (or smaller) electric metallic tubing (EMT) or steel conduit. F. Flexible Steel Conduit+ — Nom 1 in. (25 mm) diameter (or smaller) flexible steel conduit. See Flexible Metal Conduit (DXUZ) category in the Electrical Construction Material Directory for names of manufacturers.

following types and sizes of metallic pipes or tubes may be used.

6. Through Penetrating Product\* — Flexible Metal Piping — The following types of steel flexible metal gas piping may be used Reproduced by HILTI, Inc. Courtesy of January 15, 2015

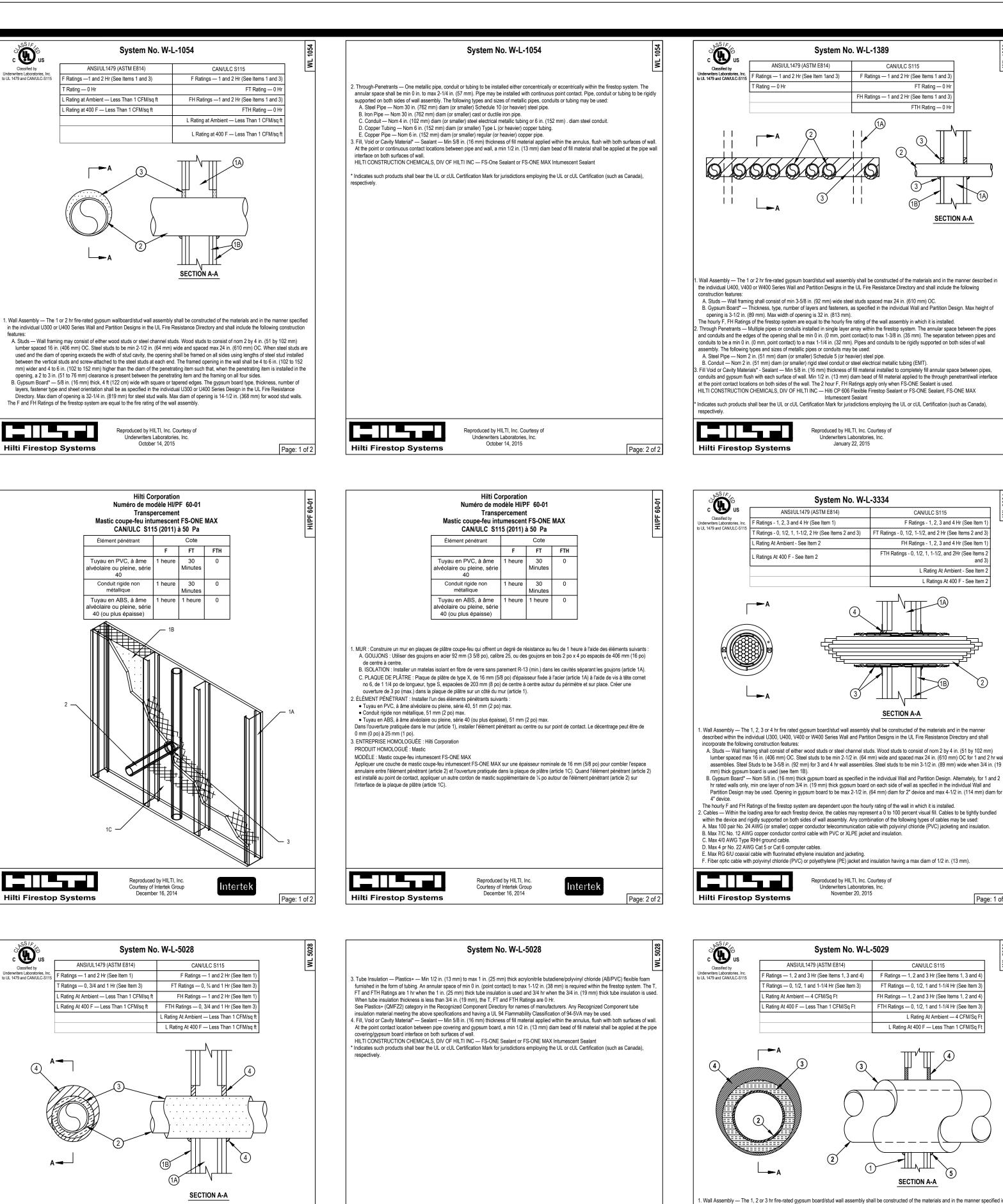
+Bearing the UL Listing Mark



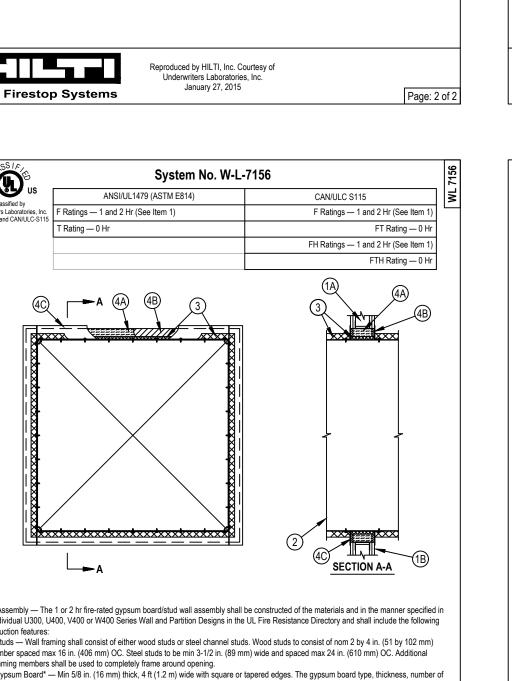
optional for those sides of duct that do not exceed the dimension specified in Table below, dependent on packing material, sealant and

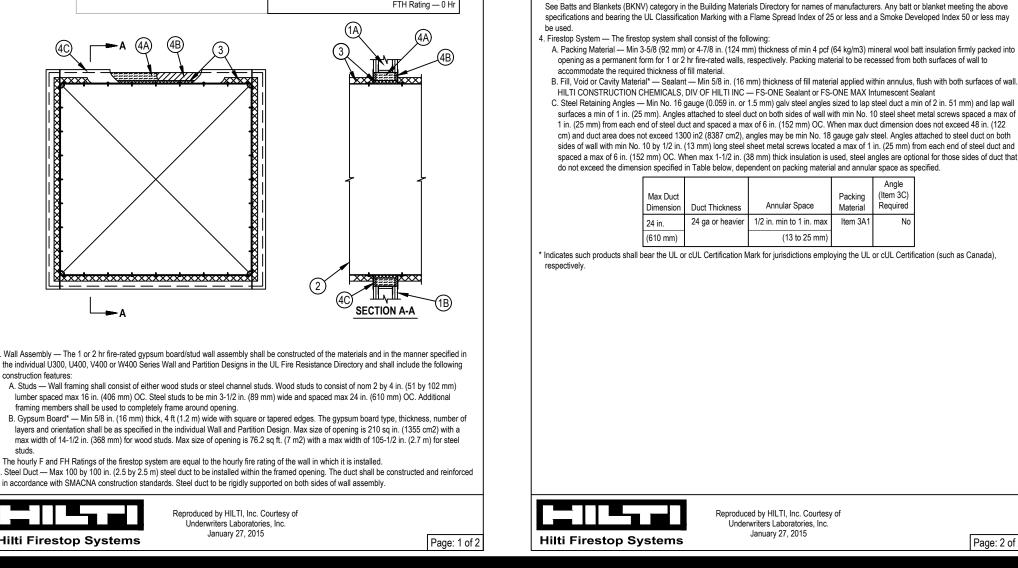
24 ga or heavier 1/2 in. min to 1 in. max I tem 3A1

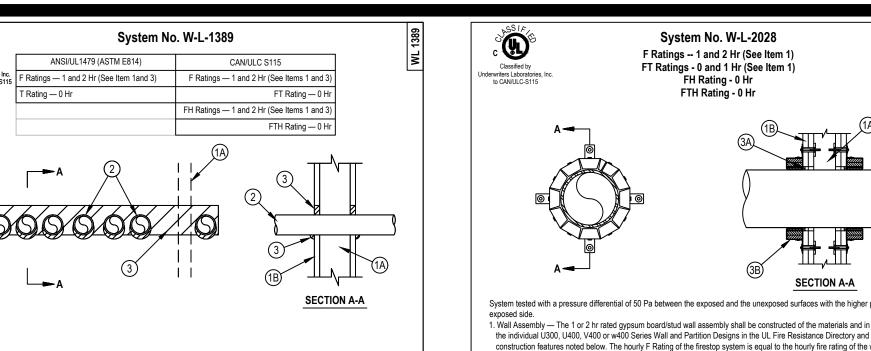
Annular Space Material Required











opening is 3-1/2 in. (89 mm). Max width of opening is 32 in. (813 mm).

System No. W-L-3334

Wall Assembly — The 1, 2, 3 or 4 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner

escribed within the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall

A. Studs — Wall framing shall consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm)

lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC for 1 and 2 hr was

I. Gypsum Board\* — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Alternately, for 1 and

Partition Design may be used. Opening in gypsum board to be max 2-1/2 in. (64 mm) diam for 2" device and max 4-1/2 in. (114 mm) diam for

hr rated walls only, min one layer of nom 3/4 in. (19 mm) thick gypsum board on each side of wall as specified in the individual Wall and

within the device and rigidly supported on both sides of wall assembly. Any combination of the following types of cables may be used:

F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm)

A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation

System No. W-L-5029

the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following

A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm)

lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide for 1 and 2 hr F and FH rating and 3-1/2 in. (89 mm) wide fo

s. Gypsum Board\* — Min 5/8 in. (16 mm) thick with square or tapered edges. The gypsum board type, thickness, number of layers, fastener

Through Penetrants — One metallic pipe or tubing to be installed within the firestop system. Pipe or tubing to be rigidly supported on both sides

C. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing. When the hourly F or FH Rating of the firestop

D. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe. When the hourly F or FH Rating of the firestop

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System No. W-L-7156

B. Batts and Blankets\* — Nom 1-1/2 or 2 in. (38 or 51 mm) thick glass fiber batt or blanket (min 3/4 pcf or 12 kg/m3) jacketed on the outside with

lanket shall be compressed minimum 50% such that the annular space within the firestop system shall be min 1/2 in. (13 mm) to max 2 in. (5

foil-scrim-kraft facing. Longitudinal and transverse joints sealed with aluminum foil tape. During the installation of the fill material, the batt or

type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max diam of opening is 18-5/8 in. (473 mm).

The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.

Rating At 400 F — Less Than 1 CFM/Sq Ft

he hourly F and FH Ratings of the firestop system are dependent upon the hourly rating of the wall in which it is installed

semblies. Steel Studs to be 3-5/8 in. (92 mm) for 3 and 4 hr wall assemblies. Steel studs to be min 3-1/2 in. (89 mm) wide when 3/4 in. (19

T Ratings - 0, 1/2, 1-1/2, and 2 Hr (See Items 2 and

FH Ratings - 1, 2, 3 and 4 Hr (See Item

L Rating At Ambient — 4 CFM/Sq F

L Rating At 400 F — Less Than 1 CFM/Sq

SECTION A-A

L Rating At Ambient - See Item

L Ratings At 400 F - See Item

H Ratings - 0, 1/2, 1, 1-1/2, and 2Hr (See Items 2

ANSI/UL1479 (ASTM E814)

Ratings - 0, 1/2, 1, 1-1/2, 2 Hr (See Items 2 and 3)

Ratings - 1, 2, 3 and 4 Hr (See Item 1

Ratings At 400 F - See Item 2

acorporate the following construction features:

C. Max 4/0 AWG Type RHH ground cable.

D. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.

3 hr F and FH rating and spaced max 24 in. (610 mm) OC

of wall assembly. The following types and sizes of metallic pipes or tubing may be used:

B. Iron Pipe — Nom 12 in. (305 mm) diam (or smaller) cast or ductile iron pipe.

system is 3 hr. the nom diam of copper tube shall not exceed 4 in. (102 mm).

A. Steel Pipe — Nom 12 in. (305 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe

E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.

nm) thick gypsum board is used (see Item 1B).

1. Wall Assembly — The 1 or 2 hr rated gyosum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual Ú300, U400, V400 or w400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the construction features noted below. The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed. The hourly T Rating of the firestop system is 0 hr for 1 hr rated walls and 1 hr for 2 hr rated walls. A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 51 by 102 mm (2 by 4 1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in lumber spaced 406 mm (16 in.) OC. Steel studs to be min 64 mm (2-1/2 in.) wide and spaced max 610 mm (24 in.) OC. the individual U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following A. Studs — Wall framing shall consist of min 3-5/8 in. (92 mm) wide steel studs spaced max 24 in. (610 mm) OC. Through-Penetrants — One nonmetallic pipe to be installed within the firestop system. The annular space between pipe and periphery of B. Gypsum Board\* — Thickness, type, number of layers and fasteners, as specified in the individual Wall and Partition Design. Max height o opening shall be min 0 in. (point contact) to max 13 mm (1/2 in.). Pipe to be rigidly supported on both sides of the wall assembly. The ollowing types and sizes of nonmetallic pipes may be used: The hourly F, FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed A. Polyvinyl Chloride (PVC) Pipe — Nom 152 mm (6 in.) diam (or smaller) Schedule 40 solid-core or cellular core PVC pipe for use in 2. Through Penetrants — Multiple pipes or conduits installed in single layer array within the firestop system. The annular space between the pipes closed (process or supply) or vented (drain, waste or vent) piping system. and conduits and the edges of the opening shall be min 0 in. (0 mm, point contact) to max 1-3/8 in. (35 mm). The separation between pipes and . Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 152 mm (6 in.) diam (or smaller) SDR11 or SDR13.5 CPVC pipe for use in closed conduits to be a min 0 in. (0 mm, point contact) to a max 1-1/4 in. (32 mm). Pipes and conduits to be rigidly supported on both sides of wall (process or supply) or vented (drain, waste or vent) piping systems. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 152 mm (6 in.) diam (or smaller) Schedule 40 solid-core or cellular core ABS pipe assembly. The following types and sizes of metallic pipes or conduits may be used: A. Steel Pipe — Nom 2 in. (51 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe. for use in closed (process or supply) or vented (drain, waste or vent) piping systems. B. Conduit — Nom 2 in. (51 mm) diam (or smaller) rigid steel conduit or steel electrical metallic tubing (EMT). D. Flame Retardant Polypropylene (FRPP) Pipe — Nom 152 mm (6 in.) diam (or smaller) Schedule 40 FRPP pipe for use in closed 3. Fill Void or Cavity Materials\* - Sealant — Min 5/8 in (16 mm) thickness of fill material installed to completely fill annular space between pines. conduits and gypsum flush with each surface of wall. Min 1/2 in. (13 mm) diam bead of fill material applied to the through penetrant/wall interface at the point contact locations on both sides of the wall. The 2 hour F, FH Ratings apply only when FS-ONE Sealant is used. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Hilti CP 606 Flexible Firestop Sealant or FS-ONE Sealant, FS-ONE MAX Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada),

without a jacket under a metal armor.

J. Max 3/C No 12 AWG MC Cable.

Ratings for the firestop system are 0 hr

Bearing the UL Listing Mark

F. Rigid Nonmetallic Conduit+ — Nom 10 Electrical Code (NFPA No. 70).	02mm (4 in.) diam (or smaller) Schedule 40 PVC conduit installed	in accordance with the Nation
	Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.	
Hilti Firestop Systems	January 26, 2015	Page:

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System No. W-L-5029

Pipe Covering\* — Nom 1, 1-1/2 or 2 in. (25, 38 or 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.

are used are 1-1/4 hr for 2 in. (51 mm) thick pipe covering and 0 hr for pipe covering thickness less than 2 in. (51 mm).

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

2 in. (305 mm) OC. When the alternate pipe covering is used, the T and FT Rating shall be as specified in item 3 above.

annular space shall be min 0 in. (point contact) to max 1-1/4 in. (32 mm)."

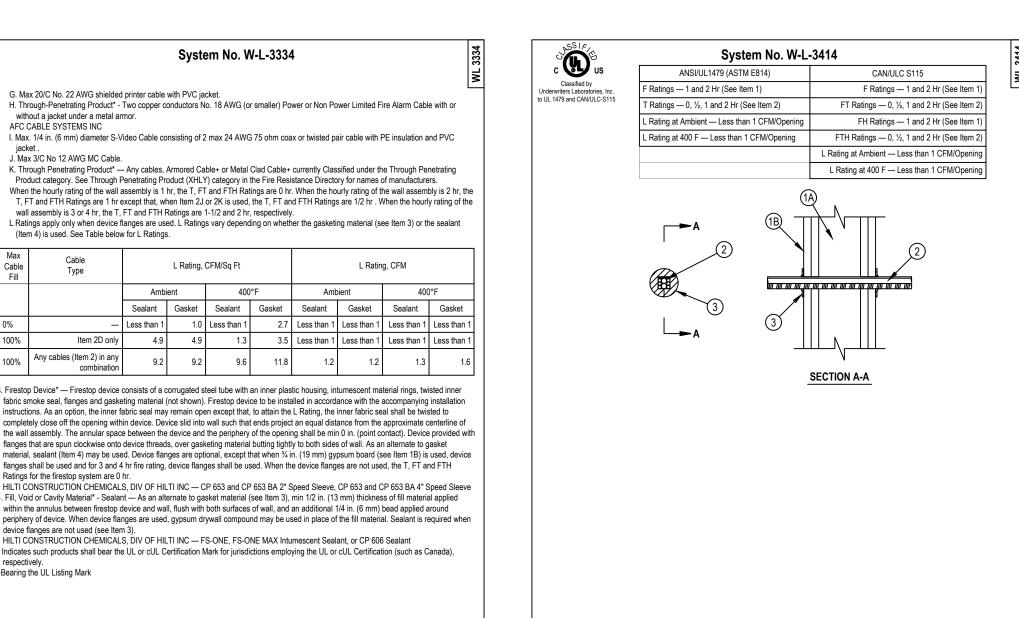
shall be applied at the pipe covering/gypsum board interface on both surfaces of wall.

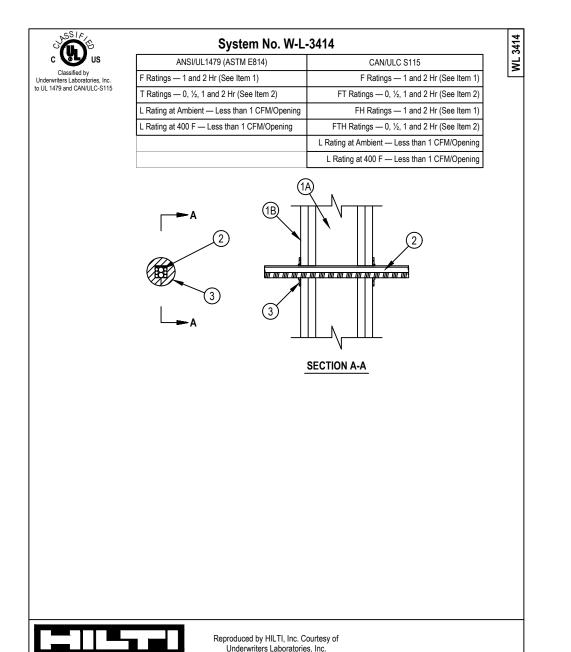
Smoke Developed Index of 50 or less may be used.

Smoke Developed Index of 50 or less may be used.

ransverse joints secured with metal fasteners or with butt tape supplied with the product. For 1 and 2 hr F and FH Ratings, the annular space

petween insulated penetrant and periphery of opening shall be min 0 in. (point contact) to max 1-7/8 in. (48 mm). For 3 hr F and FH Ratings, th





System No. W-L-2028

A. Fill, Void or Cavity Material\* — Sealant — Min 6 mm (1/4 in.) thickness of fill material applied within the annulus, flush with both sides

B. Firestop Device\* — Galvanized steel collar lined with an intumescent material sized to fit the specific diam of through-penetrant. Device

shall be installed around the through-penetrant in accordance with the accompanying installation instructions. Collar to be installed and

mm (6 in.) diam pipes). The anchor hooks are to be secured to the surface of wall with 5 mm (3/16 in.) diam by 64 mm (2-1/2 in.) long toggle bolts along with min 32 mm (1-1/4 in.) steel washers. As an alternate for pipe sizes of nom 4 in. diam or less, min No. 10 by 1-1/2

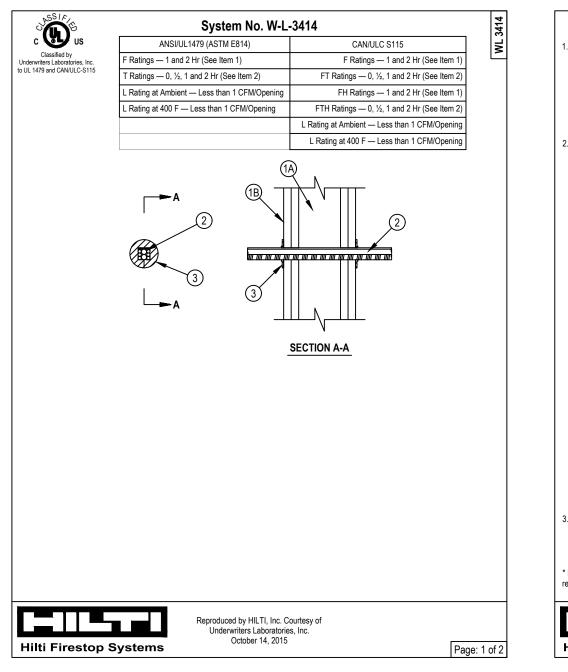
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP 643 63/2"N, CP 643 90/3"N, CP 643 110/4"N, CP 643

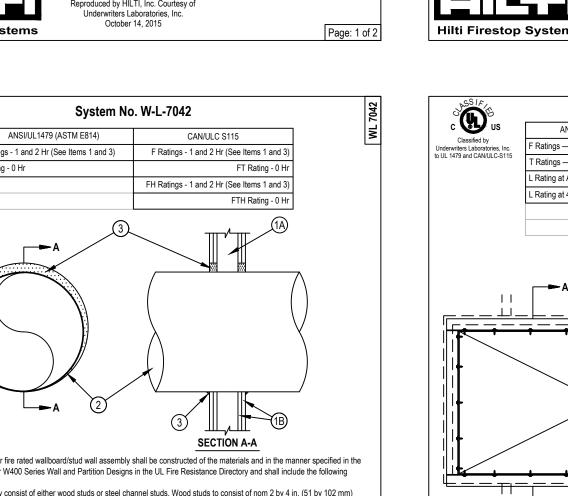
Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada),

latched around the pipe and secured to both sides of the wall using the anchor hooks provided with the collar. (Minimum 2 anchor hooks

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606 or FS-One Sealant or FS-ONE MAX Intumescent Sealant.

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

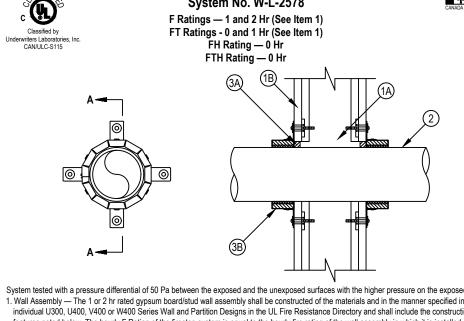




individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced 24 in. (610 mm) OC. B. Gypsum Board\* — For 1 hr assembly, one layer of min 5/8 in. (16 mm) thick wallboard as required in the individual Wall and Partition Desig For 2 hr assembly, two layers of min 5/8 in. (16 mm) thick wallboard as required in the individual Wall and Partition Design. Max diam of opening is 14-1/2 in. (368 mm) for wood stud walls and 21-3/4 in. (552 mm) for steel stud walls. The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed 2. Through Penetrant — Galv steel duct to be installed concentrically or eccentrically within the firestop system. The annular space between the duct and periphery of opening shall be 0 in. (0 mm, point contact) and max 1-1/2 in. (64 mm) Duct to be rigidly supported on both sides of wa A. Spiral Wound HVAC Duct — Nom 20 in. (502 mm) diam (or smaller) No. 24 MSG (or heavier) galv steel spriral wound duct B. Sheet Metal Duct — Nom 12 in. (305 mm) diam (or smaller) No. 28 MSG (or heavier) galv sheet steel duct. 3. Fill, Void or Cavity Material\*—Sealant — Min 5/8 in. (16 mm) and 1-1/4 in. (32 mm) thickness of fill material applied within annulus, flush with bot

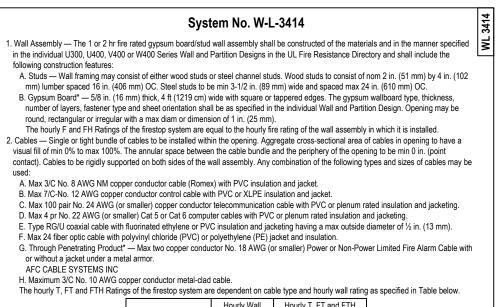
surfaces of wall assembly for 1 or 2 hr rated walls, respectively. At the point contact location between duct and wallboard, a min 1/2 in. (13 mm) diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S Elastomeric Firestop Sealant, FS-ONE Sealant, FS-ONE MAX Intumesor Sealant or CP606 Flexible Firestop Sealant Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada),

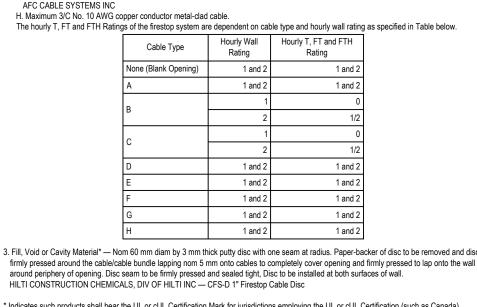
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System tested with a pressure differential of 50 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side. 1. Wall Assembly — The 1 or 2 hr rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the construction features noted below. The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. The hourly FT Rating of the firestop system is 0 hr for 1 hr rated walls and 1 hr for 2 hr rated walls. A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 51 by 102 mm (2 by 4 in. lumber spaced 406 mm (16 in.) OC. Steel studs to be min 89 mm (3-1/2 in.) wide and spaced max 610 mm (24 in.) OC. B. Gypsum Board\* — Nom 16 mm (5/8 in.) thick gypsum board, as specified in the individual Wall and Partition Design. Max diam of opening is . Through-Penetrants — One nonmetallic pipe to be installed within the firestop system. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 13 mm (1/2 in.). Pipe to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes may be used: A. XFR 15/50 Polyvinyl Chloride (PVC) Pipe — Nom 102 mm (4 in.) diam (or smaller) Schedule 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste, or vent) piping systems. Firestop System — The firestop system shall consist of the following: A. Fill, Void or Cavity Material\* — Sealant — Min 13 mm (1/2 in.) thickness of fill material applied within the annulus, flush with both sides of HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant, or FS-ONE MAX Intumescent Sealant, CP 606 Sealant B. Firestop Device\* — Galvanized steel collar lined with an intumescent material sized to fit the specific diam of through-penetrant. Device shall be installed around the through-penetrant in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to both sides of the wall using the anchor hooks provided with the collar. (Minimum 2 anchor hooks for 38 and 51

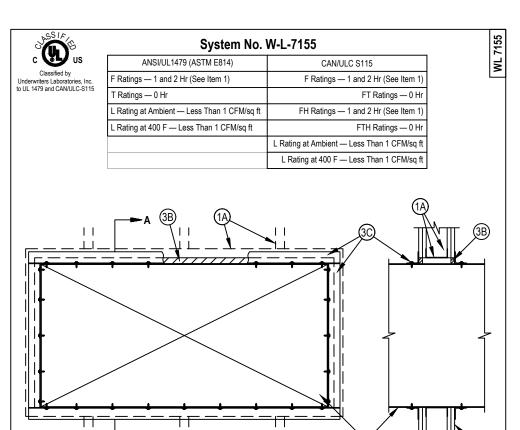
nm (1-1/2 and 2 in.) diam pipes and 3 anchor hooks for 76 and 102 mm (3 and 4 in.) diam pipes). The anchor hooks are to be secured to the surface of wall with 5 mm (3/16 in.) diam by 64 mm (2-1/2 in.) long toggle bolts along with min 32 mm (1-1/4 in.) steel washers. HILTI CONSTRUCTION CHEMICALS, DIV 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 ndicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada





ndicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada),

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Wall Assembly — The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following A. Studs — Wall framing shall consist of min 3-1/2 in. (89 mm) wide steel channel studs spaced max 24 in. (610 mm) OC. Additional steel studs B. Gypsum Board\* — 5/8 in. (16 mm) thick, 4 ft (1.22 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design in the UL Fire Resistance Director Max area of opening is 73.7 sq ft (6.85 m2) with a max dimension of 104 in. (2.64 m). e hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed. . Steel Duct — Max 100 in, by 100 in, (2.5 by 2.5 m) galy steel duct to be installed either concentrically or eccentrically within the firestop system The duct shall be constructed and reinforced in accordance with SMACNA construction standards. The space between the steel duct and

eriphery of opening shall be min 0 in. (point contact) to max 2 in. (51 mm). Steel duct to be rigidly supported on both sides of the wall assemb Reproduced by HILTI, Inc. Courtesy of January 27, 2015

Hourly Rating (F-Rating)

**Installation Date** Contractor's Name

For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as

Current as of November 19, 2017. System details subject to change

Refer to the following specifications for firestopping. a. 07 84 00 Firestopping b. 07 84 13 Penetration Firestopping c. 07 84 43 Joints Firestopping

d. 22 00 00 Plumbing e. 23 00 00 HVAC f. 26 00 00 Electrical g. 27 05 37 Communication Systems

For Quality Control requirements, refer to the Quality Control portion of the specification.

Details shown are typical details. Always refer to the listed system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following: Fire Rating (F-Rating)

Temperature Rating (T-Rating)

Leakage Rating (L-Rating) Water Rating (W-Rating)

**Annular Space** Percent Fill

Type and thickness of fire-rated construction.

If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable subject to approval by the Authority Having Jurisdiction (AHJ). Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000). Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

References:

2017 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2.

NFPA 101 Life Safety Code

NFPA 70 – National Electric Code

All governing local and regional building codes.

5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal or greater to that of construction being penetrated.

All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information.

Warning! - Do Not Disturb Through Penetration Firestop

UL System # \* Product(s) used

classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1).

without notice.

JOB NUMBER: DRAWN: **CHECKED: ISSUE DATE: 07-13-2018 REVISIONS:** 

> SHEET NAME: Commercial - Concrete Over Metal Deck/ Steel **Bar Joist - Gypsum Wall**

SHEET NUMBER

3.3

. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in he individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features: A. Studs — Wall framing shall consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional framing members shall be used to completely frame around opening. 3. Gypsum Board\* — Min 5/8 in. (16 mm) thick. 4 ft (1.2 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers and orientation shall be as specified in the individual Wall and Partition Design. Max size of opening is 210 sq in. (1355 cm2) with a max width of 14-1/2 in. (368 mm) for wood studs. Max size of opening is 76.2 sq ft. (7 m2) with a max width of 105-1/2 in. (2.7 m) for steel The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall in which it is installed. 2. Steel Duct — Max 100 by 100 in. (2.5 by 2.5 m) steel duct to be installed within the framed opening. The duct shall be constructed and reinforced

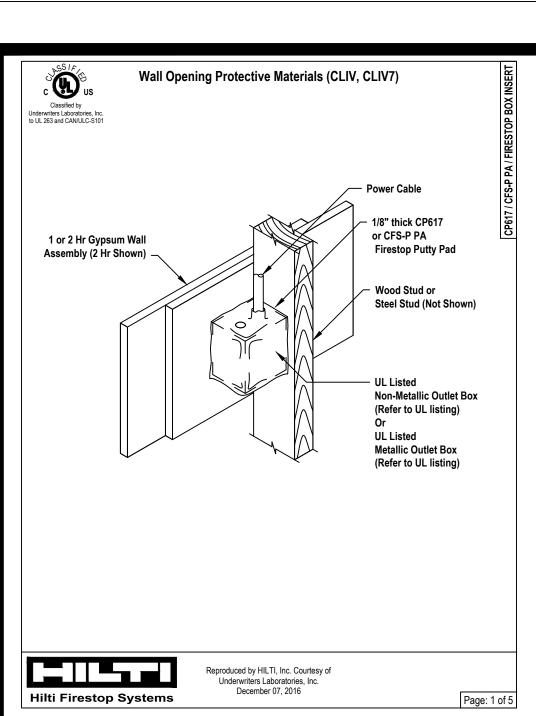
Hilti Firestop Systems

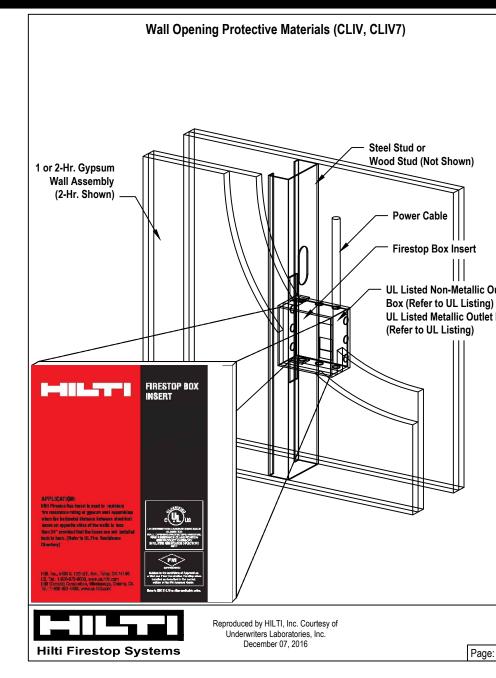
Page: 2 of 2

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See Pipe and Equipment Covering — Materials (BRGU) category in the Building Material Directory for the 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 The hourly T, FT, FTH Ratings of the firestop system are 1/2 hr for 1 hr rated walls and 1 hr for 2 hr rated walls. For 3 hr rated walls, the hourly FT and FTH Ratings when steel and iron pipes are used are 1 hr. For 3 hr rated walls, the hourly T, FT and FTH Ratings when copper penetrants A. Pipe Covering\* — (Not Shown) — As an alternate to Item 3, max 2 in. (51 mm) thick cylindrical calcium silicate (min 14 pcf) units sized to the outside diam of the pipe or tube may be used. Pipe insulation secured with stainless steel bands or min 18 AWG stainless steel wire spaced max See Pipe and Equipment Covering — Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe overing material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a . Fill, Void or Cavity Material\* — Sealant — For 1 and 2 hr F and FH Rating, min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. For 3 hr F and FH Rating, min 1 in. (25 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point contact location between pipe covering and gypsum board, a min 1/2 in. (13 mm) diam bead of fill material Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada),

I. Wall Assembly — The 1 or 2 hr fire rated wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the





Power Cable  Firestop Box Insert  UL Listed Non-Metallic Outlet Box (Refer to UL Listing) or UL Listed Metallic Outlet Box (Refer to UL Listing)  RRESTOP BOX INSERT  RIP Practic Size Insert is made in made	CP 611 Non the boxxi 1/8 is is outli gypy liner covei stee conn CP 616 deviv gypy she desi CP 611 insts stud the gypy CP 616 Carl Ress fram Ress u344 she desi and CP 611 Sey Ress woc box yyp CP 616 Allie Clas wall
Hill Line, AMD A 2 Comit S. Pen, Julian (2014) 6.  If the 180-180 A 2 Comit S. Pen, Julian (2014) 6.  If the 180-180 A 2 Comit S. Pen (2014) 6.  If the 18	walli Parti Putty
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Wall Opening Protective Materials (CLIV, CLIV7)					
CP 617 or CFS-P PA Firestop Putty Pads, for use with flush device UL Listed Metallic Outlet Boxes installed with steel mud rings or UL Listed Nonmetallic Outlet Boxes in framed wall assemblies as specified below. When protective material is used on outlet boxes on both sides of the wall as directed, the horizontal separation between outlet boxes on opposite sides of the wall may be less than 24 in. provided that the boxes are not installed back-to-back (unless otherwise indicated). Installation shall comply with the National Electrical Code (NFPA 70). Min 1/8 in. thick (CP 617) or min 0.2 in. (CFS-P PA) thick moldable putty pads are to be installed to completely cover the exterior surfaces of the outlet box (except for the side of the outlet box against the stud) and conduit fittings/connectors and to completely seal against the stud and gypsum board in the wall cavity unless otherwise noted below. When CFS-P PA is used, the putty pads may be installed with the release liner intact on the outside of the pad with the exception of any overlaps, in which case the liner is to be removed from the bottom layer at the overlap location. The box composition, max device dimensions, hourly rating, type of stud and type of faceplate are specified below.					
CP 617 or CFS-P PA Firestop Putty Pads, for use with max 4 by 4 by max 2-1/8 in. flush device UL Listed Metallic Outlet Boxes installed with steel cover plates in 1 and 2 hr. fire rated gypsum wallboard wall assemblies framed with min 3-1/2 in. deep wood or steel studs and constructed as specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. CP 617 or CFS-P PA Firestop Putty Pads, for use with max 4-11/16 by 4-11/16 by max 2-1/8 in., or max 4-3/8 by 4-7/8 by max 2-1/8 in., flush device UL Listed Metallic Outlet Boxes installed with steel cover plates for use in 1 hr fire rated V446 gypsum board/steel stud or U341 gypsum board/wood stud Wall and Partition Design No. in the Fire Resistance Directory. When U341 wall design is used, wall shall be sheathed with 5/8 in. gypsum board, and glass or mineral fiber batt insulation shall be installed in stud cavities in accordance with U341 design. Boxes may be installed back-to-back.					
CP 617 or CFS-P PÁ Firestop Putty Pads, for use with max 4-11/16 by 4-11/16 by max 2-1/8 in. flush device UL Listed Metallic Outlet Boxes installed with steel cover plates for use in 1 and 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. deep wood or steel studs and constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. Min 0.8 pcf density fiberglass batt insulation is to be installed within the wall cavity required for 1 hr fire rated					

psum board wall assemblies and optional in 2 hr fire rated gypsum wallboard assemblies 617 or CFS-P PA Firestop Putty Pads, for use with max 4 by 3-3/4 by 3 in. deep UL Listed Nonmetallic Outlet Boxes manufactured by Carlon Electrical Products, made from polyvinyl chloride, and bearing a 2 hr rating under the "Outlet Boxes and Fittings Classification for Fire

3 of 5

Wall Opening Protective Materials (CLIV, CLIV7)		Wall Opening Protective Materials (CLIV, CLIV7)				
	P BOX		Box Size	Type of Box and Cover Plate	Hourly Rating	Wall Type
	FIRESTOP		4 x 4 x 2-1/8 in deep	Metallic w/ steel cover plates	I 2-hour I	U300, U400 or V400 - wood or st
with steel cover plates in 1 hr. fire rated gypsum wallboard wall assemblies framed with min 3-1/2 in. deep wood or steel studs and constructed as specified in the individual LI300 LI400 or V400 Spries Wall and Partition Designs in the Fire Resistance Directory. The boxes are installed	A		4 x 4 x 2-1/8 in deep	Metallic w/ plastic cover plates	I 1_hour I	U300, U400 or V400 - wood or st
back to back with 5 in. by 4 in. UL Classified fire block, CP 657 or CFS-BL Firestop Block installed in the cavity between the two boxes.	4-8-		4 x 4 x 1-1/2 in	Metallic w/ plastic cover	1-hour	U300 - wood stu

Refer to the following specifications for firestopping. a. 07 84 00 Firestopping b. 07 84 13 Penetration Firestopping c. 07 84 43 Joints Firestopping d. 22 00 00 Plumbing e. 23 00 00 HVAC f. 26 00 00 Electrical g. 27 05 37 Communication Systems

For Quality Control requirements, refer to the Quality Control portion of the specification.

- 2. Details shown are typical details. Always refer to the listed system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following: Fire Rating (F-Rating)
- Temperature Rating (T-Rating)
- Leakage Rating (L-Rating) Water Rating (W-Rating)
- **Annular Space**
- Percent Fill
- Type and thickness of fire-rated construction.
- If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable subject to approval by the Authority Having Jurisdiction (AHJ). Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000). Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- References:
- 2017 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2.
- NFPA 101 Life Safety Code
- NFPA 70 National Electric Code
- All governing local and regional building codes.
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal or greater to that of construction being penetrated.
- 6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information.
- Through Penetration Firestop

- Installation Date Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories,

Current as of November 19, 2017. System details subject to change without notice.

JOB NUMBER: DRAWN: CHECKED: **ISSUE DATE: 07-13-2018 REVISIONS:** 

S. S.

SHEET NAME:

**Commercial - Concrete** 

SHEET NUMBER

Penetration

3.4

P 617 or CFS-P PA Firestop Putty Pads, for use with max 14 by 4 by max 2-1/2 in. flush device UL Listed Metallic Outlet Boxes installed with steel cover plates in 1 and 2 hr. fire rated gypsum board wall assemblies framed with min 5-1/2 in. deep wood or steel studs for 2 hr fire rated ILTI Firestop Box Insert, for use with max 2 1/8 x 4 x 2 1/8 in. deep UL Listed Metallic Outlet Boxes without internal clamps in 2 hr fire rated walls and min 3-1/2 in. deep wood or steel studs for 1 hr fire rated walls. Walls constructed as specified in the individual U300, U400 or V400 gypsum wallboard wall assemblies framed with min 3 1/2 in. deep wood or steel studs and constructed of materials and in the manner Series Wall and Partition Designs in the Fire Resistance Directory. Stud cavity insulation is required and shall consist of min 5-1/2 in. (2 hr specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. Outlet boxes may be rated walls) or min 3-1/2 in. (1 hr rated walls) thick fiberglass (min 0.8 pcf) or mineral fiber (min 4 pcf). Putty pads shall lap min 1/2 in. onto the installed with steel cover plates. One 1-7/8 x 2-13/16 insert adhered to the interior back wall of the outlet box in accordance with the stud and gypsum board within the stud cavity. When boxes are interconnected by means of electrical metallic tube (EMT) or conduit, a ball of instructions supplied with the product putty pad material shall be used to completely plug the open end of each EMT or conduit within the box. TI Firestop Box Insert, for use with max 4-1/2 x 8-1/2 in. by 1-5/8 in. deep or max 3-3/4 x 5-1/2 in. by 2-1/2 in deep UL Listed Metallic Outlet P 617 or CFS-P PA Firestop Putty Pads, for use with max 4-11/16 by 4-11/16 by max 2-1/8 in. flush device UL Listed Metallic Outlet Boxes Boxes without internal clamps in 1 hr or 2 hr fire rated gypsum wallboard wall assemblies framed with min 3 1/2 in. deep steel or wood studs installed with steel or plastic cover plates for use in 1 and 2 hr fire rated gypsum board wall assemblies framed with min 5-1/2 in. deep steel and constructed of materials and in the manner specified in the individual U400, V400 or U300 Series Wall and Partition Designs in the Fire studs and constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory, as summarized in the Table below. Outlet boxes installed with steel cover plates. Box inserts evenly spaced and Resistance Directory. Putty pads shall lap min 1/2 in. onto the stud and gypsum board within the stud cavity. When boxes are interconnected adhered to the interior back wall of the outlet box in accordance with the instructions supplied with the product. by means of electrical metallic tube (EMT) or conduit, a ball of putty pad material shall be used to completely plug the open end of each EM or conduit within the outlet boxes. Metallic outlet boxes may be provided with steel attachment brackets which offset box min 1/4 in. from stud. When steel attachment brackets are used, putty pad to be affixed to the back and all four sides of the box. 4-1/2 x 8-1/2 x 1-5/8 in CFS-P PA Moldable Putty Pads, for use with max 4-11/16 by 4-11/16 in. by max 2-1/8 in. flush device UL Listed Metallic Outlet Boxes installed U300, U400 or V400 - wood or Two 3-11/16 x 3-3/4 in. inserts \*\* with steel cover plates in 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. deep steel studs and constructed of the materials and in the manner specified in the individual U400 and V400 Series Wall and Partition Designs in the Fire Resistance Directory. An additional 3/4 in. ball of putty pad material shall be used to plug the end of each electrical metallic tube or conduit at its connection to the box. one 1-7/8 x 2-13/16 in. insert FS-P PA Moldable Putty Pads, for use with max 4 by 4 by 2-1/8 in. flush device UL Listed Metallic Outlet Boxes installed with steel or plastic \* - Min 3/4 in. deep plaster rings installed over outlet box. After installation of gypsum board, nom 1/4 in. cover plates in 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in, deep steel studs and constructed of the materials and in the manner specified in the individual U400 and V400 Series Wall and Partition Designs in the Fire Resistance Directory. An additional 3/4 in. thickness of Hilti FS-ONE Sealant or FS-ONE MAX Intumescent Sealant, bearing the UL Classification Marking for Fill, Void or Cavity Materials, applied between the base layer of wallboard and the plaster ring. CFS-P PA Moldable Putty Pads, for use with max 14-1/4 by 4-1/2 by 2-1/2 in. flush device UL Listed Metallic Outlet Boxes installed with stee cover plates in 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. deep steel studs and constructed of the materials and in HILTI Firestop Box Insert , for use with 4-3/8 by 4-7/8 by 2-1/4 in, deep flush device UL Listed Metallic Outlet Boxes without internal clamps in ball of putty pad material shall be used to plug the end of each electrical metallic tube or conduit at its connection to the box. hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. deep wood or steel studs and constructed of the materials and in the HILTI Firestop Box Insert, for use with flush device UL Listed Metallic Outlet Boxes installed with steel mud rings or UL Listed Nonmetallic Outlet manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. One 4-3/8 in. wide Boxes in framed wall assemblies as specified below. When protective material is used on outlet boxes on both sides of the wall as directed, by 4-3/8 in. high insert adhered to the interior back wall of the outlet box in accordance with the installation instructions supplied with the the horizontal separation between outlet boxes on opposite sides of the wall may be less than 24 in. provided that the boxes are not installed product. Smaller sized inserts may be cut and combined to achieve the 4-3/8 in. by 4-3/8 in. coverage and adhered to the interior back wall of back-to-back (unless otherwise indicated). Installation shall comply with the National Electrical Code (NFPA 70). The box composition, max device dimensions, hourly rating, type of stud and type of faceplate are specified below. HILTI Firestop Box Insert, for use with 4-3/8 by 4-7/8 by 2-1/4 in, deep flush device UL Listed Metallic Outlet Boxes without internal clamps in 2 HILTI Firestop Box Insert, for use with max 4-11/16 by 4-11/16 by 2-1/8 in. deep UL Listed Metallic Outlet Boxes without internal clamps in 1 or 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. deep wood or steel studs and constructed of the materials and in the hr fire rated gypsum wallboard wall assemblies framed with min 3-1/2 in, deep wood or steel studs and constructed of materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. One 4-3/8 in. wide manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. Outlet boxes in 1 hr by 4-3/8 in, high insert adhered to the interior back wall of the outlet box in accordance with the installation instructions supplied with the fire rated walls may be installed with plastic or steel cover plates. Outlet boxes in 2 hr fire rated walls shall be installed with steel cover plates. product. Smaller sized inserts may be cut and combined to achieve the 4-3/8 in. by 4-3/8 in. coverage and adhered to the interior back wall of One 4-3/8 by 4-3/8 in, insert adhered to the interior back wall of the outlet box in accordance with the instructions supplied with the product the outlet box. Outlet boxes installed with steel cover plates. Smaller sized inserts may be cut and combined to achieve the 4-3/8 x 4-3/8 in coverage. P 617 or CFS-P PA Firestop Putty Pads and HILTI Firestop Box Inserts, for use with maximum 4 by 4 by 1-1/2 in. (102 by 102 by 38 mm) deep IILTI Firestop Box Insert, for use with max 4 by 4 by 1-1/2 in. deep and 2-1/8 in. deep UL Listed Metallic Outlet Boxes without internal clamps in flush device UL Listed Metallic Outlet Boxes installed with steel mud rings and with steel or plastic faceplates in 1 or 2 hr fire rated gypsum 1 or 2 hr fire rated gypsum wallboard wall assemblies framed with min 3 1/2 in. deep steel or wood studs and constructed of materials and in board wall assemblies constructed with min 3-1/2 in. (89 mm) wide wood or steel studs. When both protective materials are used with outlet the manner specified in the individual U400, V400 or U300 Series Wall and Partition Designs in the Fire Resistance Directory, as summarized boxes on both sides of the wall as directed, the boxes may be installed back-to-back provided that the backs of the boxes are minimum 1/2 in in the Table below. One 3-11/16 by 3-3/4 in. insert adhered to the interior back wall of the outlet box in accordance with the instructions 13 mm) apart and provided that the boxes are not interconnected. Adjoining pieces of moldable putty pads to be overlapped approx 1/2 in. (13 supplied with the product. Smaller sized inserts may be cut and combined to achieve the 3-11/16 x 3-3/4 in coverage. mm) at the seam. An insert pad shall be installed to completely cover the back inside surface of each outlet box.

Warning! - Do Not Disturb UL System # \* Product(s) used Hourly Rating (F-Rating)

Fire Resistance Directory (Volume 1).

Over Metal Deck/ Steel Bar Joist - Membrane

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Refer to the following specifications for firestopping. a. 07 84 00 Firestopping b. 07 84 13 Penetration Firestopping c. 07 84 43 Joints Firestopping d. 22 00 00 Plumbing e. 23 00 00 HVAC f. 26 00 00 Electrical g. 27 05 37 Communication Systems

For Quality Control requirements, refer to the Quality Control portion of the specification.

- 2. Details shown are typical details. Always refer to the listed system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following: Fire Rating (F-Rating)
- Temperature Rating (T-Rating)
- Leakage Rating (L-Rating)
- Water Rating (W-Rating)
- Annular Space
- Percent Fill
- Type and thickness of fire-rated construction.
- If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable subject to approval by the Authority Having Jurisdiction (AHJ). Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000). Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- References:
- 2017 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2.
- NFPA 101 Life Safety Code
- NFPA 70 National Electric Code
- All governing local and regional building codes.
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal or greater to that of construction being penetrated.
- 6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information.
- Warning! Do Not Disturb Through Penetration Firestop
- UL System # \* Product(s) used
- Hourly Rating (F-Rating)
- **Installation Date** Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1).

Current as of November 19, 2017. System details subject to change without notice.

JOB NUMBER: DRAWN: CHECKED:

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**ISSUE DATE: 07-13-2018** 

**REVISIONS:** 

SHEET NAME: **Commercial - Concrete** Over Metal Deck/ Steel
Bar Joist - Concrete or Block Wall

SHEET NUMBER

3.5

A. Steel Floor And Ceiling Runners — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 1B). Flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width. Ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel fasteners or welds spaced max 24 in. (610 mm) OC.
A1. Light Gauge Framing\* — (XHLI) - Slotted Ceiling Runner — As an alternate to the ceiling runner in Item 1A, slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 1B). Slotted ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel fasteners or welds spaced max 24 in. (610 mm) OC. BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS — SLP-TRK

CLARKDIETRICH BUILDING SYSTEMS — Type SLT, SLT-H CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — SDT250, SDT300 MARINO/WARE, DIV OF WARE INDUSTRIES INC — Type SLT

## METAL-LITE INC — The System OLMAR SUPPLY INC — STT250, STT300 SCAFCO STEEL STUD MANUFACTURING CO — Slotted Track

TELLING INDUSTRIES L L C — True-Action Deflection Track A2. Light Gauge Framing\* — (XHLI) - Vertical Deflection Ceiling Runner — When the nom joint width is less than or equal to 3/4 in. (19 mm), vertical deflection ceiling runner may be used as an alternate to the ceiling runners in Items 1A and 1A1. Vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips provided with step bushings for permanent fastening of steel studs. Flanges sized to accommodate steel studs (Item 1B). Vertical deflection ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel fasteners or welds spaced max 24 in. (610 mm) OC. THE STEEL NETWORK INC — VertiTrack VTD250, VTD362, VTD400, VTD600 and VTD800 A3. Light Gauge Framing\* — (XHLI) - Notched Ceiling Runner — As an alternate to the ceiling runners in Items 1A through 1A3, notched ceiling

runners to consist of C-shaped galv steel channel with notched return flanges sized to accommodate steel studs (Item 1B). Notched ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel fasteners or welds spaced max 24 in. (610 mm) OC.
OLMAR SUPPLY INC — Type SCR

B. Studs — Steel studs to be min 3-1/2 in. (69 mm) wide. Studs cut 3/4 in. (19 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. When slotted ceiling runner (Item 1A1) is used, of wall. When vertical deflection ceiling runner (Item 1A2) is used, steel studs secured to slotted vertical deflection clips, through the bushings, with steel screws at midheight of each slot. Stud spacing not to exceed 24 in. (610 mm) OC. C. Gypsum Board\* — (CKNX)- Min 5/8 in. (16 mm) thick gypsum board sheets installed on each side of wall. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a max 1-1/2 in. (38 mm) gap shall be maintained between the top of the gypsum board and the bottom of the steel deck units and the top row of screws shall be installed into the studs 3-1/2 to 4 in. (89 to 102 mm) below the lower surface of the floor or roof. Nonrated Horizontal Assembly — The nonrated horizontal assembly shall be constructed of the materials as described below:

A. Supports (Not Shown) — Structural steel or other members supporting the steel deck.

B. Steel Deck — Max 3 in. (76 mm) deep by min 20 MSG galv steel deck, fluted max 12 in. (305 mm) on center. Welded or mechanically C. Concrete (Not Shown. Optional) — Steel deck may be topped with reinforced concrete. Thickness of concrete may vary. 3. Joint System — Max separation between bottom of steel deck and top of wall assembly at time of installation of joint system is 1-1/2 in. (38 mm). Joint system is designed to accommodate a max 50 percent compression or extension from its installed width. The joint system consists of forming material and a fill material, as follows:

A. Forming Material\* — Nom 4 pcf (64 kg/m3) density mineral wool batt insulation cut approx 25 percent wider than the flutes and with a

length approx equal to the overall thickness of the wall. Multiple pieces stacked on top of each other, as needed, and then compressed 50 percent in thickness and inserted into the flutes of the steel deck above the top of the ceiling runner. The mineral wool batt insulation is to project beyond each side of the ceiling runner, flush with wall surfaces. Additional 1-1/4 in. (32 mm) wide strips of nom 4 pcf (64 kg/m3) mineral wool are compressed 50 percent and tightly packed, cut edge first, into the gap between the top of the gypsum board and bottom of the steel deck on both sides of the wall. ROCK WOOL MANUFACTURING CO — Delta-Board ROXUL INC — SAFE THERMAFIBER INC — Type SAF

A1. Forming Material\*—Plugs — (Optional, Not Shown) Preformed mineral wool plugs, formed to the shape of the fluted floor units, friction fit to completely fill the flutes above the ceiling channel. The plugs shall project beyond each side of the ceiling runner, flush with wall surfaces. Additional forming material, described in Item 3A2, to be used in conjunction with the plugs to fill the gap between the top of gypsum board and bottom of steel deck.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP777 Speed Plugs
A2. Forming Material\* - Strips — (Optional) - Nom 1-1/4 in. (16 or 32 mm) wide precut mineral wool strips. The strips are compressed 50

percent and firmly packed, cut edge first, into the gap between the top of the gypsum board and bottom of the steel deck on both sides of

the wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 767 Speed Strips

B. Fill, Void or Cavity Material\* — Min 1/16 in. (1.6 mm) dry thickness (1/8 in. or 3.2 mm wet thickness) of fill material sprayed or troweled on each side of the wall to completely cover mineral wool forming material and to overlap a min of 1/2 in. (13 mm) onto gypsum board and steel deck on both sides of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-SP WB Firestop Joint Spray

\*Bearing the UL Classification Mark

Page: 2 of 2

- Refer to section 07840 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
- Minimum and maximum Width of Joints
- Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments. References:
- 2017 Underwriter's Laboratories Fire Resistance Directory, Volume 2
  - Intertek Directory of Building **Products**
- All governing local and regional building codes

Current as of November 19, 2017. System details subject to change without notice.

e this note after reading and replace of the these details could result in an applassification or the intended temperature up to date as of February 2015.

The Resistance Directory (volume 2.)"

JOB NUMBER: DRAWN:

ISSUE DATE: 07-13-2018

**REVISIONS:** 

CHECKED:

SHEET NAME: **Commercial - Concrete** Over Metal Deck/ Steel Bar Joist - Gypsum Wall

SHEET NUMBER: