

COMMERCIAL BUILDING			
Floor Substrate: Concrete over metal deck/steel bar joist			
SHEET	MEP PENETRATIONS THRU	SYSTEM	DESCRIPTION
3.1	CONCRETE FLOOR/ CEILING ASSEMBLY	F-E-1004	METAL PIPE THROUGH CONCRETE FLOOR/CEILING ASSEMBLY (1-HR)
		F-E-1018	FLEXIBLE STEEL CONDUIT THROUGH CONCRETE FLOOR/CEILING ASSEMBLY (1-HR)
		F-E-2005 (CUL)	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-6004	INSULATED (AB/PVC) METAL PIPE THROUGH CONCRETE FLOOR/CEILING ASSEMBLY (1-HR)
		F-E-6013	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)
3.2	FLOORS OR WALLS	C-AJ-1513	MULTIPLE METAL PIPES THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-2035	PLASTIC PIPE THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-2079	PLASTIC PIPE THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-3283	CABLE BUNDLE THROUGH CONCRETE OR MASONRY (2-HR)
		C-AJ-5090	METAL PIPE WITH AB/PPVC 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 (WITHOUT 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)
3.3	GYPSUM WALL	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)
		W-L-2028	PLASTIC PIPE THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		W-L-2578	X-FR PLASTIC PIPE THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		H/PPF 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-6028	METAL PIPE WITH AB/PPVC INSULATION THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		W-L-6029	METAL PIPE WITH GLASS FIBER OR CALCIUM SILICATE INSULATION THROUGH GYPSUM WALL ASSEMBLY (2-HR)
3.4	MEMBRANE PENETRATION	W-L-7042	METAL DUCT (WITHOUT DAMPER) THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		W-L-7155	METAL DUCT THROUGH GYPSUM WALL ASSEMBLY
3.5	CONCRETE OR BLOCK WALL	W-L-7156	METAL DUCT WITH GLASS FIBER INSULATION THROUGH GYPSUM WALL ASSEMBLY (2-HR)
		CLIV OR CLIV 76	MEMBRANE PENETRATION IN GYPSUM WALL ASSEMBLY (2-HR)
3.6	CONCRETE OR BLOCK WALL	W-J-3215	CABLE BUNDLE (<1") (2-HR)
SHEET	JOINTS	SYSTEM	DESCRIPTION
3.6	GYPSUM WALL	CJD-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 being penetrated F= FLOOR W = WALLS C = FLOORS OR WALLS (COMBINED)	Second letter(s) provide more information about the floor or wall: A = CONCRETE FLOORS WITH A MINIMUM THICKNESS LESS THAN OR EQUAL TO 5 IN B = CONCRETE FLOORS WITH A MINIMUM THICKNESS GREATER THAN 5 IN C = FRAMED FLOORS E = FOR-CEILING ASSEMBLIES CONSISTING OF CONCRETE WITH MEMBRANE PROTECTION J = CONCRETE OR MASONRY WALLS WITH A MINIMUM THICKNESS LESS THAN OR EQUAL TO 8 IN L = FRAMED WALLS	Four digit number describes the penetrating item(s) 0000 - 0999 BLANK OPENINGS 1000- 1999 METAL PIPE, CONDUIT OR TUBING 2000 - 2999 NON METALLIC PIPE CONDUIT OR TUBING 3000 - 3999 CABLES 4000 - 4999 CABLE TRAYS 5000 - 5999 INSULATED PIPES 6000 - 6999 MISCELLANEOUS ELECTRICAL (BUSWAY) 7000 - 7999 MISCELLANEOUS MECHANICAL 8000 - 8999 MIXED PENETRATING ITEMS 9000 - 9999 RESERVED FOR FUTURE USE	Example: CAJ1150 C = FLOOR OR WALLPENETRATION A = CONCRETE FLOORS 5" OR LESS J = CONCRETE OR MASONRY WALLS 8" OR LESS 1150 = METAL PIPE, CONDUIT OR TUBING

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

Notes:

1. 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
* Movement
* Type and thickness of fire-rated construction.

3. 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.

4. 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 System
* 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.

<Notes to designer (delete this note after reading and replace with title block information)>
1. Any modification to these details could result in an application/system not meeting the UL or Intertek Classification or the intended temperature or fire ratings.

2. Details shown are up to date as of February 2015.
3. For additional information on the details, refer to the most current "Underwriter's Laboratories Fire Resistance Directory (volume 2.)"

JOB NUMBER:

DRAWN:

CHECKED:

ISSUE DATE: 07-13-2018

REVISIONS:

SHEET NAME:
Index of Drawings

SHEET NUMBER:

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FE-1018

System No. FE-1018

ANSIUL1479 IASTM E515

CANULC S115

F Rating – 1 Hr

F Rating – 1 Hr

T Rating – 1 Hr

T Rating – 1 Hr

FT Rating – 1 Hr

FTR Rating – 1 Hr

SECTION A-A

1. Floor Ceiling Assembly — The 1 hr rated concrete and steel joist Floor-Ceiling Assembly shall be constructed of the materials and in the manner described in the individual G50S Series Design in the U.L. Fire Resistance Directory, as summarized below:

A. **Flooring** — Normal weight concrete as specified in the individual G50S-Series Design. Max. time of opening shall be 3-1/2 in. (89 mm).

B. **Joints** — Steel plates or Structural Steel Members^a as specified in the individual G50S-Series Design.

C. **Joists** — Joist S115 - 16 mm thick, snow-shedding joisting channels as specified in the individual G50S-Series Design.


D. **Time of opening** shall be 3-1/2 in. (89 mm).

Hilti Firestop Systems

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November 17, 2016

Page | 2 of 2

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System No. FE-C-206 

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

- A. Fill, Urethane Caulk Material — Sealed — Min 18 mm (3/4 in.) thickness of all material applied within the annulus, flush with top surface of floor. Min 18 mm (3/4 in.) thickness of all material applied within annulus, flush with underside of gasket board ceiling.
- HE-110 CONSTRUCTION CHEMICALS, DIV OF HELTINC — CP-250 OF 50 lbs. Drum or FSC-604 Mix, Wetpackment Bagged.
- B. Firestop Device — Galvanized steel collar (with or without internal metal seal) to fit the specific size of through penetrator. Device shall be installed around and through penetrator in accordance with the accompanying installation instructions. Collar to be installed and sealed around the pipe and sealed to either surface of gasket board sealing the anchor bolts provided with the collar. Alternate 2 anchor bolts for 24 and 31 mm (1-1/2 and 2 1/4) diam pipes, 3 anchor bolts for 41 and 102 mm (1 3/4 and 4) diam pipes. The anchor bolts are to be secured to the gasket board sealing with 3 mm (3/16 in.) diam by 102 mm (25/16 in.) long toggle bolts along with min 52 mm (2 1/4 in.) steel wall sleeves.
- HE-110 CONSTRUCTION CHEMICALS, DIV OF HELTINC — CP-663 50L 1/4N, CP-663 50L/2N, CP-663 50L/3N, CP-663 110L/2N Firestop Collar

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

UL

Hilti Firestop Systems

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 Unioncity Lockdowns, Inc.
 January 21, 2015

Page 2 of 2

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System No. F-E-5013

FE-5013

ANULAT FIBERGLASS STRIPS

CANALAT SYSTEM

F Rating – 119

F Rating – 119

T Rating – 119

T Rating – 119

F Rating – 119

F Rating – 119

T Rating – 119

T Rating – 119

F Rating – 119

F Rating – 119

T Rating – 119

T Rating – 119

F Rating – 119

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F Rating – 119

T Rating – 119



UL
Listed
Component
UL Classified
UL Classified
UL Classified

System No. E-F-7008

ANULATED/NOT TESTED R1

CLASSIC 5115

F Rating = 119F

F Rating = 119F

F Rating = 1419F


F Rating = 1419F

F Rating = 1419F

F Rating = 1419F


- 1 Floor-Glazing Assembly – The 1 in the floor-glazing and steel glazing Floor-Glazing Assembly shall be constructed of the materials and in the manner described in the individual CGO Series Design in the U.S. Fire Resistance Directory, as summarized below.
 - a. Rating – Normal or Improved Steel Member as specified in the individual CGO Series Design. Max area of opening shall be 143 in (3 632 cm) with a max dimension of 5 ft x 10 ft.
 - b. Joint – Normal or Improved Steel Member as specified in the individual CGO Series Design.
 - c. Gypsum Board – Max 5/8 in (15.9 mm) FPKA, noncombustible 5/8 in gypsum board as specified in the individual CGO Series Design. Max area of opening shall be 143 in (3 632 cm) with a max dimension of 5 ft x 10 ft.
 - d. Steel Deck – 1/2 in (12.7 mm) 18 in (457 mm) 30 psi or heavier gage sheet steel to be installed either concentrically or eccentrically with the top surface of the floor. Max 5/8 in (15.9 mm) thickness of material applied with the annulus flange with the bottom surface of gypsum board ceiling.
 - e. Fasteners – 1/2 in (12.7 mm) 304 or 316 stainless steel of material applied with the annulus flange with the top surface of the floor. Max 5/8 in (15.9 mm) thickness of material applied with the annulus flange with the bottom surface of gypsum board ceiling.
- 2 FLOOR CONSTRUCTION: Gypsum Board, 5/8 in (15.9 mm) – CP 508, Minimum Thickness: 5/8 in One Sides or 5/8 in One Side, Min. Impenetrable Sides*

* Indicates products should have 1/8 in (3.2 mm) Certification Mark for jurisdiction requiring the 1/8 in (3.2 mm) Certification (such as Canada), including products.



HILLTOP
Systems

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January 20, 2015

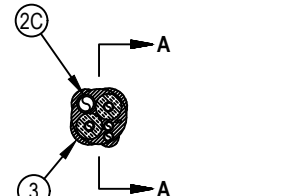
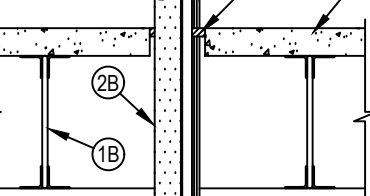


UL Classified
Underwriters Laboratories Inc.
NEMA 3R

System No. F-E-0006

FE-0006

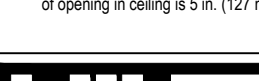
ANSI/NFPA 701(NFPA 261)	CANULC 215
F Rating — 1 hr	F Rating — 1 hr
F Rating — 1 hr	FT Rating — 1 hr
F Rating — 1 hr	F Rating — 1 hr
F Rating — 1 hr	F Rating — 1 hr

System tested with a pressure differential of 2.5 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

1. Floor-Ceiling Assembly — The 1 hr fire-rated concrete and steel (PFR) Floor-Ceiling assembly shall be constructed of the materials and the member described in the individual C000 Series Design in UL or Fire Resistance Directory, as summarized below:

- A. Concrete floor — Normal weight or lightweight (100-165 pc or 1600-2400 kg/m³) concrete over metal deck as specified in the individual C000 Series design. Max. distance of floor spanning is 5.1 m (17 feet).
- B. Joists — Steel joist or Structural Steel Member[®] as specified in the individual C000 Series Design.
- C. Support Beams[®] — Max. 609 mm (19.6 inch) thick, screw-attached to framing channels as specified in the individual C000 Series Design. Max. span of opening is 5.1 m (17 feet).



Hilti Firestop Systems

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January 20, 2015

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Notes:

1. 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
 - * Movement
 - * Type and thickness of fire-rated construction.

3. 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.

4. 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 System
 - * 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.*

1. Any modification to these details could result in an application/system not meeting the UL or Intertek Classification or the intended temperature or fire ratings.

For additional information on the details, refer to the most current "Underwriter's Laboratories Fire Resistance Directory (volume 2)."

- JOB NUMBER:** _____
- DRAWN:** _____
- CHECKED:** _____
- ISSUE DATE:** 07-13-2018
- REVISIONS:** _____
- SHEET NAME:**
Commercial - Concrete
Over Metal Deck/ Steel
Bar Joist - Concrete
Floor/ Ceiling Assembly

System No. CAJ-1226

Model: CAJ-1226
Capacity: 1200 lbs
Weight: 147 lbs (67 kg)
Dimensions: 14 1/2" (368 mm) L x 14 1/2" (368 mm) W x 14 1/2" (368 mm) H

CAJWLC 5119

<p>F Rating – 3 in</p> <p>FT Rating – 3 in</p> <p>Rating At Arcant – Non Then C 1/4" (6.35 mm)</p> <p>Rating At Arcant – 400°F + 1/4" (6.35 mm)</p>	<p>F Rating – 3 in</p> <p>FT Rating – 3 in</p> <p>Rating At Arcant – Non Then C 1/4" (6.35 mm)</p> <p>Rating At Arcant – 400°F + 1/4" (6.35 mm)</p>
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SECTION A-A

1 Floor Wall Assembly – 4 in (102 mm) thick reinforced gypsum or normal weight (100-150 psi or 1000-1400 kg/cm³) concrete. Wall must be above grade and edge of floor to bottom of doors in floor, and depth to be 4 in (102 mm) larger than the doors down. The door is to be placed in floor and welded a max of 4 in (102 mm) down the bottom of the door and a max of 1 in (25 mm) above the top surface of the floor.

2 Middle Shield – Optional Non-Flam (30.3 mm down) or optional (Schedule 40) heavy steel door plate or grade 10 floor or wall assembly. Non-flam with 1/4 in (6.35 mm) of 1/4 in (6.35 mm) down the bottom of the door and a max of 1 in (25 mm) above the top surface of the floor.

3 Shield Steel Shield – Optional Non-Flam (30.3 mm down) or optional (Schedule 40) heavy steel door plate or grade 10 floor or wall assembly. Non-flam with 1/4 in (6.35 mm) of 1/4 in (6.35 mm) down the bottom of the door and a max of 1 in (25 mm) above the top surface of the floor.

4 Middle Shield Steel – Optional Non-Flam (30.3 mm down) or optional (Schedule 40) heavy steel door plate or grade 10 floor or wall assembly. Non-flam with 1/4 in (6.35 mm) of 1/4 in (6.35 mm) down the bottom of the door and a max of 1 in (25 mm) above the top surface of the floor.

5 Top of Floor Assembly – 4 in (102 mm) thick reinforced gypsum or normal weight (100-150 psi or 1000-1400 kg/cm³) concrete. Wall must be above grade and edge of floor to bottom of doors in floor, and depth to be 4 in (102 mm) larger than the doors down. The door is to be placed in floor and welded a max of 4 in (102 mm) down the bottom of the door and a max of 1 in (25 mm) above the top surface of the floor.

6 Middle Shield Steel – Optional Non-Flam (30.3 mm down) or optional (Schedule 40) heavy steel door plate or grade 10 floor or wall assembly. Non-flam with 1/4 in (6.35 mm) of 1/4 in (6.35 mm) down the bottom of the door and a max of 1 in (25 mm) above the top surface of the floor.

7 Through-Penetrator – One metallic pipe, tube or conduit to be installed either vertically or horizontally with the firestop system. The annular space between penetrator and opening of opening shall be 1 in (25 mm) greater than the penetrator hole (1/2 in (12.7 mm) above the penetrator with continuous joint penetrator. Penetrator to be tightly supported to both sides of floor or wall assembly. The following types and sizes of metallic penetrators are acceptable:

- A. Steel Pipe – Non-Flam (30.3 mm down) or optional (Schedule 40) or heavier steel pipe
- B. Non-Flam – Non-Flam (30.3 mm down) or optional (Schedule 40) or heavier steel pipe
- C. Copper Type – Non-Flam (30.3 mm down) or optional (Schedule 40) or heavier steel pipe
- D. Copper Type – Non-Flam (30.3 mm down) or optional (Schedule 40) or heavier steel pipe
- E. Conduit – Non-Flam (30.3 mm down) or optional (Schedule 40) or heavier steel pipe
- F. Conduit – Non-Flam (30.3 mm down) or optional (Schedule 40) or heavier steel pipe

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 January 2007 015

C-AJ 1206

System No. C-AJ-1206


4. **Finest System** — The finest system shall consist of the following:

A. **Finishing Material** — Mix A is 1102 mm thickness of min 4-kg (9-lb) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be secured from top surface of floor or sleeve or from both surfaces of wall or sleeve as required to accommodate the required thickness of all material.

B. **10% Hot-Cure Mortar** — System — Mix 10.1 is 10% thickness of 10% material applied within the recessed. Batt with top surface of floor or sleeve or with both surfaces of wall or sleeve. At the joint or continuous contact locations between precast and concrete or sleeve, a min 10 to 50 mm (3/8 in.) band of 10% material shall be applied at the concrete or sleeve plus precast material on the top surface of floor and on both surfaces of wall.

C. **HELT CONSTRUCTION CHEMICAL DOW GP HELT-INC. — FS-Cure Sulfate or FS-CMG MSA (Nonmetallic Sulfate)**


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



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January 07, 2015

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Classified by
UL Classified by
UL Classified by
UL Classified by

System No. C-AU-079


F Rating – 2 Hr

FT, FH, and FTH Ratings – 0-Hr

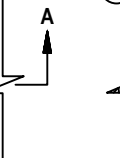


UL
CLASSIFIED

TOP VIEW



SECTION A-A



System tested with a pressure difference of 0.50 Pa between the exposed and the unexposed surfaces with the water pressure on the exposed side.

1. Floor or Wall Assembly – Min 4-in (2 in) (114 mm) thick vertical lightweight or normal weight (100-150 (or 150-200) kg/m³) concrete. Will also be considered if any UL Classified Concrete Block¹. Min. width of opening is 2 in (51 mm).

2. Fire-Resistant Glaze (FRG) – See Section 901.1 for FRG classification and listing. FRG must be applied continuously on essentially every surface of the opening. Annular space between glaze and periphery of opening to be min 1/8 in (3 mm) port condition, to max 1/4 in (6 mm).

3. Polymer Concrete (PC) Ring – Min 1/4 in (6 mm) PC (or cast-in or smaller Schedule 40) wall. One PC to be used in closed (pressure or supply) or vented (exhaust) systems.

4. Polymer Concrete (PC) Ring – Min 1/4 in (6 mm) PC (or cast-in or smaller Schedule 40) wall. One PC to be used in closed (pressure or supply) or vented (exhaust) systems.


5. Cast-In Place Concrete (CIP) – Min 4 in (102 mm) CIP (or cast-in or smaller Schedule 40) wall in closed (pressure or supply) or vented (exhaust) systems.

6. Cast-In Place Concrete (CIP) – Min 4 in (102 mm) CIP (or cast-in or smaller Schedule 40) wall in closed (pressure or supply) or vented (exhaust) systems.

7. Fire-UL or Cavity Method² – Suspend – Minimum 51 mm (2 in) (12 mm) (1/2 in) thickness of FRG applied within the annular space, both top surface of floor and on both surfaces of wall. All ports port condition between pipe and concrete, a minimum 1/32 in (1 mm) (1/2 in) diameter sized of fill material used in the periphery pipe member on the top surface of floor and on both surfaces of wall.


8. ULHT CONSTRUCTION CLASSIFICATION OF UL HT LTR – FG-ORE, Searched of FG-ORE Max. maximum Searched.

¹ Indicates such products that bear the UL or, or Certification Mark for jurisdictions employing the UL or, or Certification (such as Canada), respectively.



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January 9, 2019

[illegible][illegible]

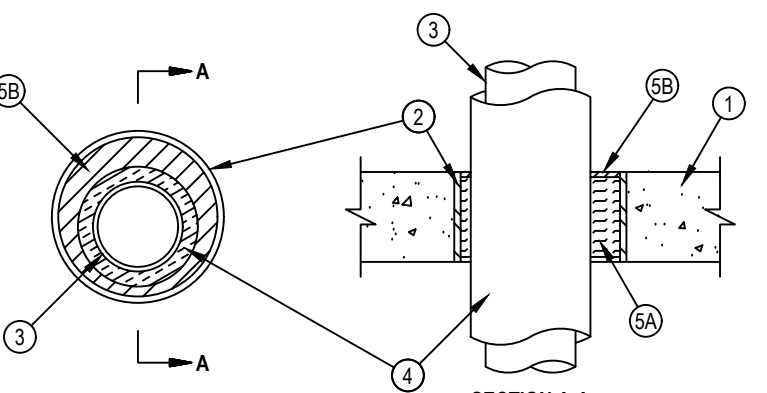


Circle 40 to
Unimark Engineering, Inc.
P.O. Box 10000 • CHICAGO, IL 60610


System No. C-AJ-5090

CAJ 5090

ANSI/MIL STD A325.1/514	CAN/ULC S105
F Ratings — 2 and 3 H (See Item 4)	F Ratings — 2 and 3 H (See Item 4)
T Rating — 3 H	T Rating — 3 H
L Rating At Ambient — 4 C/Mtg 5	Flt Ratings — 2 and 3 H (See Item 4)
F Rating At 400°F — Less Than 1 C/Mtg 5	Flt Rating — 3 H
	L Rating At Ambient — 4 C/Mtg 5
	L Rating At 400°F — Less Than 1 C/Mtg 5



SECTION A-A



Hilti Firestop Systems

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January 14, 2015

Page: 1 of 2

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- Notes:
1. 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
 - * Movement
 - * Type and thickness of fire-rated construction.

3. 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.

4. 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 System
 - * 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.*

to designer (delete this note after reading and replace with title block information)>

1. Any modification to these details could result in an application/system not meeting the UL or Intertek Classification or the intended temperature or fire ratings.
2. Details shown are up to date as of February 2015.

JOB NUMBER:

DRAWN:

CHECKED:

ISSUE DATE: 07-13-2018

REVISIONS:

SHEET NAME: _____

Bar Joist - Floor
Walls

SHEET NUMBER

612

3.3

- Notes:
1. 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
 - * Movement
 - * Type and thickness of fire-rated construction.

3. 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.

4. 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 System
 - * 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.*

<Notes to designer (delete this note after reading and replace with title block information)>

1. Any modification to these details could result in an application/system not meeting the UL or Intertek Classification or the intended temperature or fire ratings.
2. Details shown are up to date as of February 2015.
3. For additional information on the details, refer to the most current "Underwriter's Laboratories Fire Resistance Directory, Volume 2" ^{1W}

JOB NUMBER:

DRAWN:

CHECKED:

ISSUE DATE: 07-13-2018

REVISIONS:

SHEET NAME: _____

Bar Joist - Membrane Penetration

SHEET NUMBER:

1. 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

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
- * Movement
- * Type and thickness of fire-rated construction.

4. 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.

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

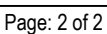
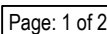
- * Warning! - Do Not Disturb
- * Through Penetration Firestop System
- * UL System # * Product(s) used
- * Hourly Rating (F-Rating)
- * Installation Date
- * Contractor's Name

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

<Notes to designer (delete this note after reading and replace with title block information)>

1. Any modification to these details could result in an application/system not meeting the UL or Intertek Classification or the intended temperature or fire ratings.
2. Details shown are up to date as of February 2015.
3. For additional information on the details, refer to the most current "Underwriter's Laboratories Fire Resistance Directory (volume 2)"

SHEET NUMBER:



3.6