System No. C-AJ-0150
XHEZ.C-AJ-0150
Through-penetration Firestop Systems

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Design/System/Construction/Assembly Usage Disclaimer

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XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

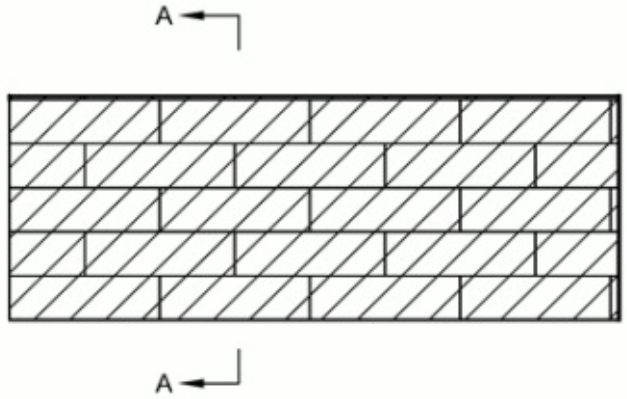
See General Information for Through-penetration Firestop Systems

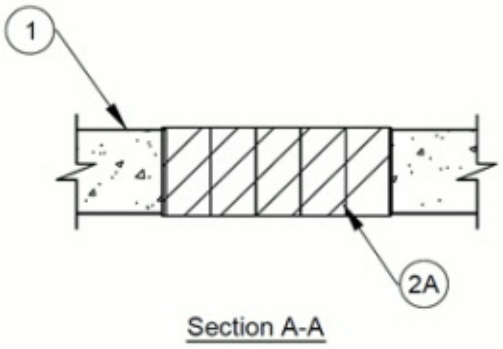
See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-0150

December 02, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 2 Hr	FT Rating — 2 Hr
	FH Rating — 2 Hr
	FTH Rating — 2 Hr





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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max area of opening is 384 $in.^2$ (2477 cm^2) with a max dimension of 32 in. (813 mm).

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

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

A. **Fill, Void or Cavity Material* —** Blocks installed with 5 in. (127 mm) dimension projecting through opening flush with bottom surface of floor or centered in wall. Blocks to be firmly packed to fill the opening area.

ZAPP-ZIMMERMANN GMBH — Fire Protection Block ZZ 260

B. **Fill, Void or Cavity Material* —** (Not shown) — Fill material to be forced between blocks and periphery of opening to the max extent possible on top surface of floor or both surfaces of

wall.

ZAPP-ZIMMERMANN GMBH — Fire Protection Foam ZZ 360, Fire Protection Sealant ZZ 365

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

Last Updated on 2015-12-02

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System No. C-AJ-0151
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Through-penetration Firestop Systems

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XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

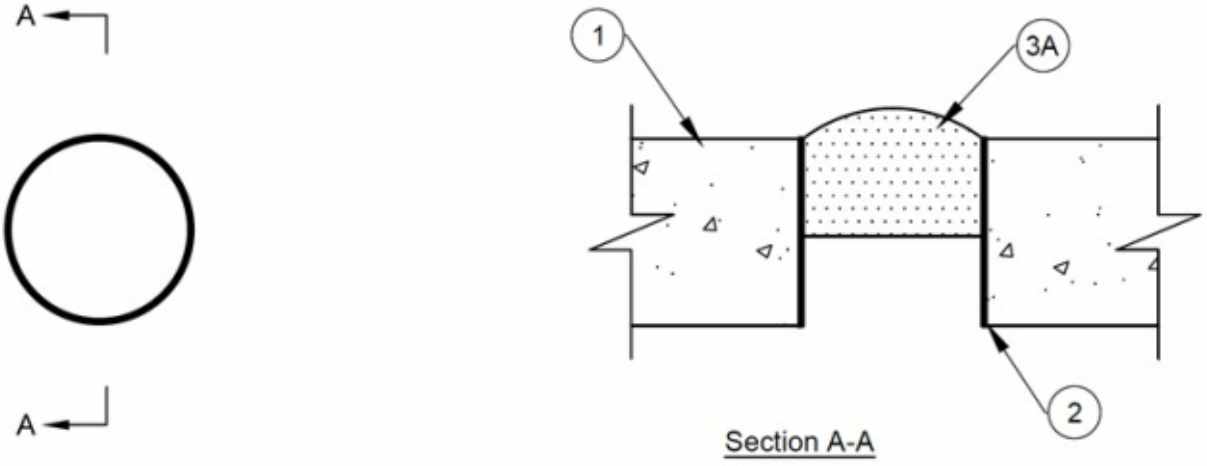
See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-0151

November 23, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 1-1/4 Hr	FT Rating — 1-1/4 Hr
	FH Rating — 2 Hr
	FTH Rating — 1-1/4 Hr



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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diameter of opening is nom, 5 in. (127 mm).

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

2. **Metallic Sleeve —** (Optional) — Nom 2, 2-1/2, 3, 4, 4-1/2 or 5 in. (51, 64, 76, 102, 114 or 127 mm) diameter Schedule 5 (or heavier) steel sleeve or rigid steel conduit or electrical metallic tubing cast or grouted into floor or wall flush with floor or wall surfaces.

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

A. **Fill, Void or Cavity Material* —** Plug sized for the steel sleeve or opening per Table below friction-fitted within the sleeve or opening such that the outer circumference of the dome-shaped plug is flush from the top surface of the floor or from both surfaces of the wall.

Max. Sleeve/Opening Diam in. (mm)	Nom Plug Size, in. (mm) ZZ 160 series
2 (51)	2.5 (65) **
3 (76)	3 (78) **
4 (102)	4 (107)**
4.5 (114)	4.5 (122)**
5 (127)	5 (134)**
** Cut wedge from plug to fit sleeve/opening size. See Zapp Zimmermann GMBH Installation Instructions for specific size of wedge cuts required.	

ZAPP-ZIMMERMANN GMBH — Fire Protection Plug ZZ 160

B. **Fill, Void or Cavity Material* —** (Not shown) — Fill material to maximum extent possible in any voids that may exist within the opening. For plug sizes above 4 in. (102 in.) the fill material shall be forced between the periphery and plug to the max extent possible.

ZAPP-ZIMMERMANN GMBH — Fire Protection Sealant ZZ 365

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

Last Updated on 2015-11-23

System No. C-AJ-1641
XHEZ.C-AJ-1641
Through-penetration Firestop Systems

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XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

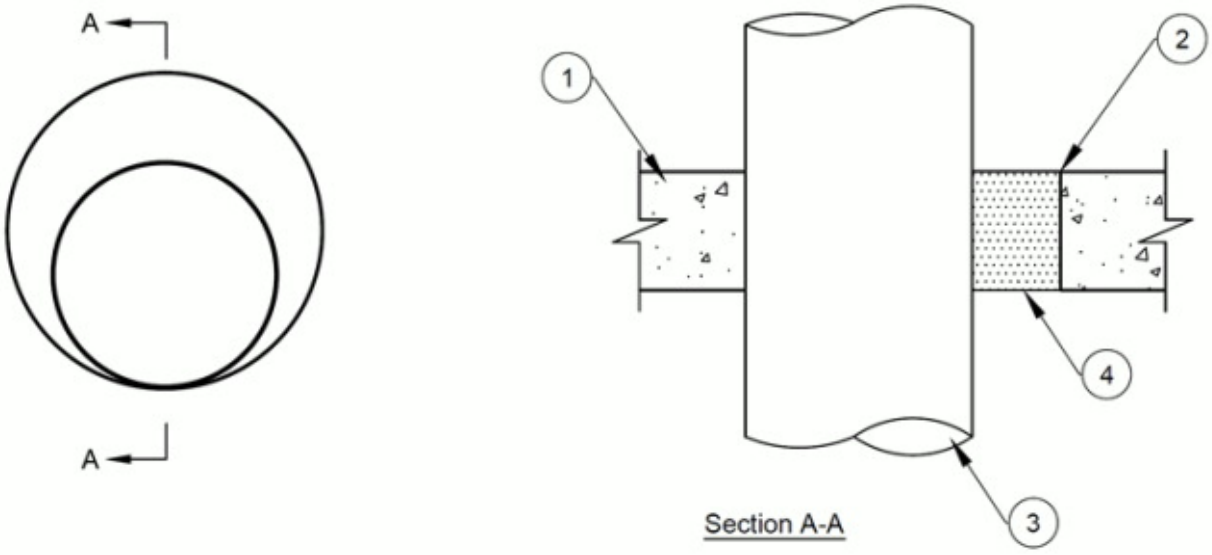
See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-1641

November 23, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 1/2 Hr	FT Rating — 1/2 Hr
	FH Rating — 2 Hr
	FTH Rating — 1/2 Hr



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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 12 in. (305 mm).

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

2. **Metallic Sleeve —** (Optional) — Max 8 in (203 mm) diam Schedule 10 (or heavier) steel pipe cast or grouted into floor or wall flush with floor or wall surfaces.

3. **Through Penetrant —** One metallic pipe, tubing or conduit installed concentrically or eccentrically within the firestop system. The annular space between the pipe, tubing or conduit and the periphery of the opening shall be min 0 in. (point contact) to max 4 in. (102 mm). Pipe, tubing or conduit to be rigidly supported on each side of the floor

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

A. **Steel Pipe —** Nom 8 in. (203 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

B. **Iron Pipe —** Nom 8 in. (203 mm) diam (or smaller) Schedule 10 (or heavier) cast or ductile pipe.

C. **Conduit —** Nom 8 in. (203 mm) diam (or smaller) rigid steel conduit.

D. **Conduit —** Nom 8 in. (203 mm) diam (or smaller) steel electrical metallic conduit.

E. **Copper Pipe —** Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.

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

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

A. **Fill, Void or Cavity Material* —** Min 4-1/2 in. (114 mm) thickness of material to fill opening within the annulus.

ZAPP-ZIMMERMANN GMBH — Fire Protection Foam ZZ 360

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

Last Updated on 2015-11-23

System No. C-AJ-1642
XHEZ.C-AJ-1642
Through-penetration Firestop Systems

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XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

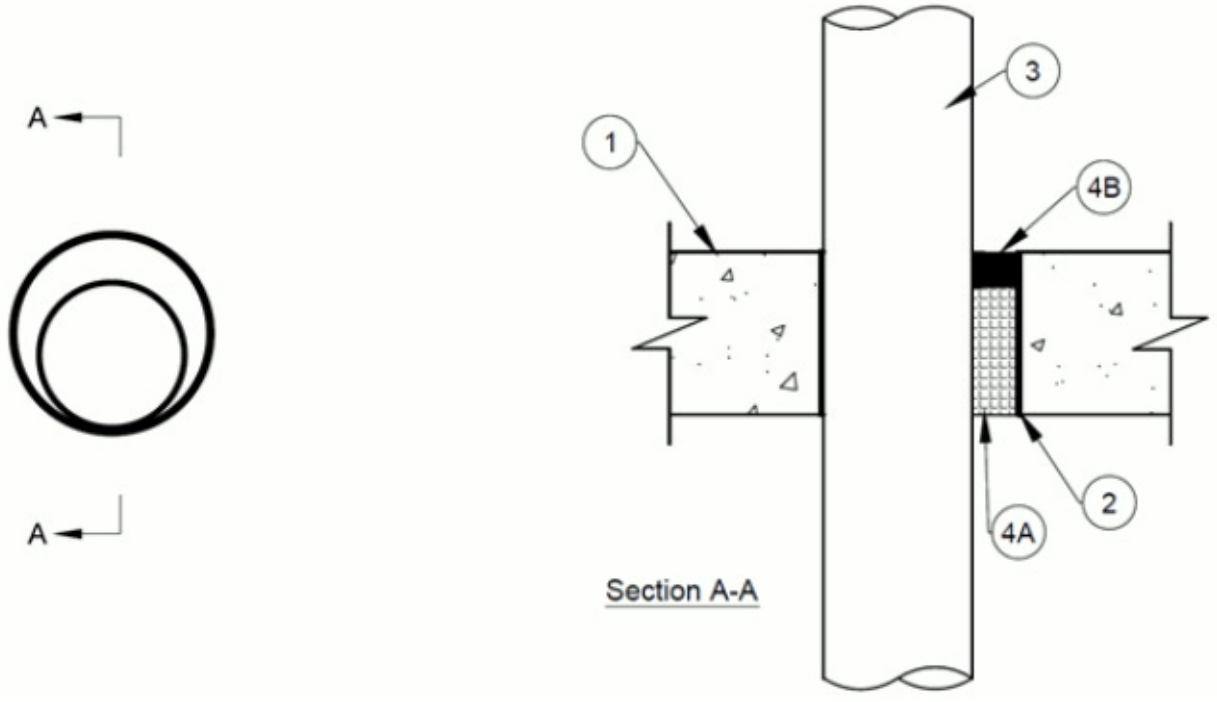
See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-1642

November 23, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 1/4 Hr	FT Rating — 1/4 Hr
	FH Rating — 2 Hr
	FTH Rating — 1/4 Hr



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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Diameter of opening is maximum 5 in (127 mm).

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

2. **Metallic Sleeve (Optional) —** Max 5 in (127 mm) diameter Schedule 5 (or heavier) steel pipe cast or grouted into floor or wall flush with floor or wall surfaces.

3. **Through Penetrant —** One metallic pipe or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe or conduit and periphery of opening shall be min 0 in. (point contact) to max 57 mm (2-1/4 in.). Pipe or conduit to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:

A. **Steel Pipe —** Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

B. **Iron Pipe —** Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) cast or ductile pipe.

C. **Conduit —** Nom 4 in. (102 mm) diam (or smaller) rigid steel conduit.

D. **Conduit —** Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic conduit.

E. **Copper Pipe —** Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.

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

4. **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/m^3) mineral wool batt insulation firmly packed into annulus as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall to accommodate the required thickness of fill material.

B. **Fill, Void or Cavity Material* —** 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 assembly.

ZAPP-ZIMMERMANN GMBH — Fire Protection Sealant ZZ 365

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

Last Updated on 2015-11-23

System No. C-AJ-3329
XHEZ.C-AJ-3329
Through-penetration Firestop Systems

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XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

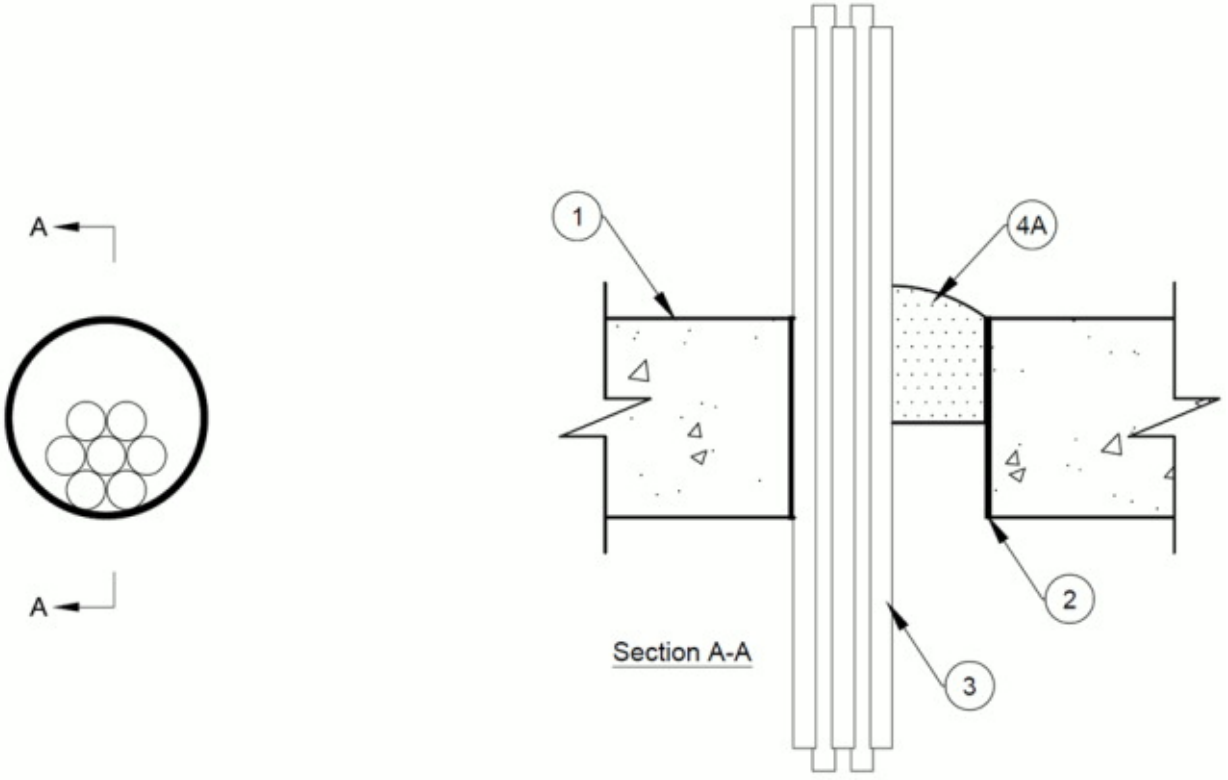
See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-3329

November 23, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 1/2 Hr	FT Rating — 1/2 Hr
	FH Rating — 2 Hr
	FTH Rating — 1/2 Hr



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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diameter of opening is nom 5 in. (127 mm).

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

2. **Metallic Sleeve —** (Optional) — Nom 2, 2-1/2, 3, 4,4-1/2 or 5 in. (51, 64, 76,102, 114 or 127 mm) diameter Schedule 5 (or heavier) steel sleeve or rigid steel conduit or electrical metallic tubing cast or grouted into floor or wall flush with floor or wall surfaces.

3. **Cables —** Aggregate cross-sectional area of bundled cables in opening to be max 60 percent of the cross-sectional area of the opening. Cables to be tightly bundled together and rigidly supported on both sides of the floor or wall assembly. Any combination of the following types and sizes of cables may be used:

A. Max 300 pair No. 24 AWG (or smaller) copper conductor telecommunication cables with polyvinyl chloride (PVC) insulation and jacket.

B. Max 1/C 750 kcmil (or smaller) copper conductor cable with cross-linked polyethylene (XLPE) insulation and jacket.

C. Max 3/C No. 2 AWG copper or aluminum conductor cables with PVC insulation and jacket.

D. Max 7/C No. 12 AWG copper conductor power and control cables with PVC or cross-linked polyethylene (XLPE) insulation and jacket and PVC jacket.

E. Multiple fiber optic communication cables jacketed with PVC and having a max outside diameter of 1/2 in. (13mm).

F. Max 3/C copper conductor No. 10 AWG (or smaller) with bare aluminum ground, PVC insulated steel or aluminum Metal-Clad cable.

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

A. **Fill, Void or Cavity Material* —** Plug sized for the steel sleeve or opening per Table below friction-fitted within the sleeve or opening such that the outer circumference of the dome - shaped plug is flush from the top surface of the floor or from both surfaces of the wall.

Max. Sleeve/Opening Diam in. (mm)	Nom Plug Size, in. (mm) ZZ 160 series
2 (51)	2.5 (65) **
3 (76)	3 (78) **
4 (102)	4 (107)**
4.5 (114)	4.5 (122)**
5 (127)	5 (134)**
** Cut wedge from plug to fit sleeve/opening size. See Zapp Zimmermann Installation Instructions for specific size of wedge cuts required.	

ZAPP-ZIMMERMANN GMBH — Fire Protection Plug ZZ 160

B. **Fill, Void or Cavity Material* —** (Not Shown) — Fill material forced into interstices of cables to max extent possible.

ZAPP-ZIMMERMANN GMBH — Fire Protection Sealant ZZ 365

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System No. C-AJ-3330
XHEZ.C-AJ-3330
Through-penetration Firestop Systems

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XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

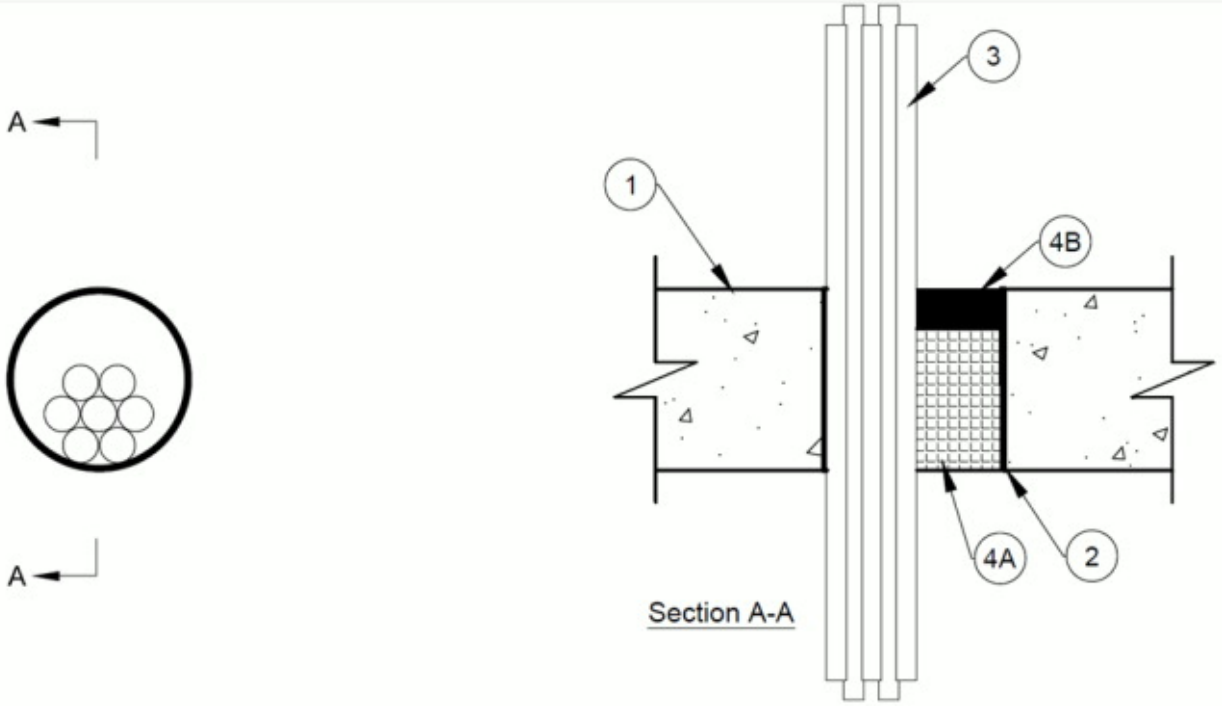
See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-3330

November 23, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 1/2 Hr	FT Rating — 1/2 Hr
	FH Rating — 2 Hr
	FTH Rating — 1/2 Hr



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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max. diameter of opening is nom 4 in. (102 mm).

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

2. **Metallic Sleeve (Optional) —** Nom 4 in.(102 mm) diameter (or smaller) Schedule 5 (or heavier) steel sleeve or rigid steel conduit or electrical metallic tubing cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. **Cables —** Aggregate cross-sectional area of bundled cables in opening to be max 45 percent of the cross-sectional area of the opening. The annular space between the cable bundle and the periphery of the opening or sleeve to be min 0 in. (point contact) to max 1-1/4 in. (32 mm). Cables to be tightly bundled together and rigidly supported on both sides of the floor or wall assembly. Any combination of the following types and sizes of cables may be used:

A. Max 300 pair No. 24 AWG (or smaller) copper conductor telecommunication cables with polyvinyl chloride (PVC) insulation and jacket.

B. Max 1/C 500 kcmil (or smaller) copper conductor cable with cross-linked polyethylene (XLPE) insulation and jacket.

C. Max 3/C No. 2 AWG copper or aluminum conductor cables with PVC insulation and jacket.

D. Max 7/C No. 12 AWG copper conductor power and control cables with PVC or cross-linked polyethylene (XLPE) insulation and jacket and PVC jacket.

E. Multiple fiber optic communication cables jacketed with PVC and having a max outside diameter of 1/2 in. (13 mm).

4. **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/m^3) 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 to accommodate the required thickness of fill material.

B. **Fill, Void or Cavity Material* —** 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 assembly and forced into interstices of cables to max extent possible.

ZAPP-ZIMMERMANN GMBH — Fire Protection Sealant ZZ 365

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Last Updated on 2015-11-23

System No. C-AJ-3331
XHEZ.C-AJ-3331
Through-penetration Firestop Systems

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XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

See General Information for Through-penetration Firestop Systems

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System No. C-AJ-3331

November 23, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 1/2 Hr	FT Rating — 1/2 Hr
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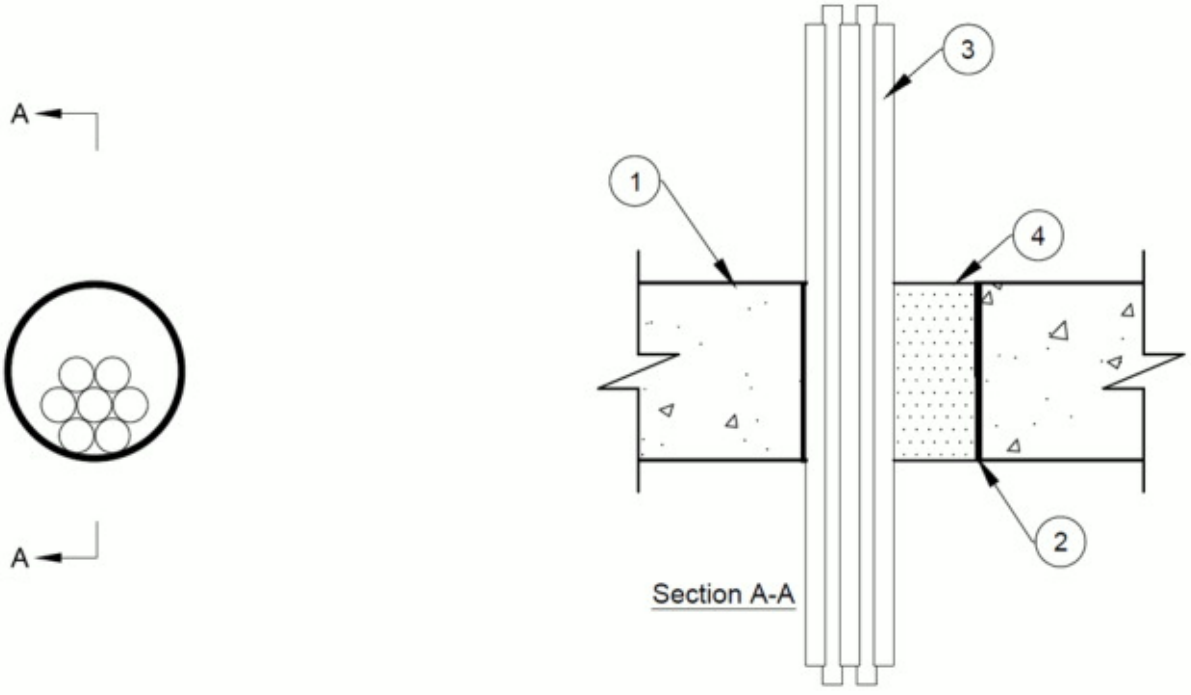

1. **Floor or Wall Assembly —** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600 - 2400 kg/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max Diameter of opening is nom 8 in. (203 mm).

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

2. **Metallic Sleeve (Optional) —** Max 8 in (203 mm) diameter Schedule 10 (or heavier) steel pipe cast or grouted into floor or wall flush with floor or wall surfaces.

3. **Cables —** Aggregate cross-sectional area of bundled cables in opening to be max 45 percent of the cross-sectional area of the opening. The annular space between the cable bundle and the periphery of the opening or sleeve to be min 0 in. (point contact) to max 4 in. (102 mm). Cables to be tightly bundled together and rigidly supported on both sides of the floor or wall assembly. Any combination of the following types and sizes of cables may be used:

A. Max 300 pair No. 24 AWG (or smaller) copper conductor telecommunication cables with polyvinyl chloride (PVC) insulation and jacket.

B. Max 1/C 750 kcmil (or smaller) copper conductor cable with cross-linked polyethylene (XLPE) insulation and jacket.

C. Max 3/C No. 2 AWG copper or aluminum conductor cables with PVC insulation and jacket.

D. Max 7/C No. 12 AWG copper conductor power and control cables with PVC or cross-linked polyethylene (XLPE) insulation and jacket and PVC jacket.

E. Multiple fiber optic communication cables jacketed with PVC and having a max outside diameter of 1/2 in. (13 mm).

F. Max 3/C copper conductor No. 10 AWG (or smaller) with bare aluminum ground, PVC insulated steel or aluminum Metal-Clad cable.

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

A. **Fill, Void or Cavity Material* —** Min 4-1/2 in. (114 mm) thickness of material to fill opening within the annulus.

ZAPP-ZIMMERMANN GMBH — Fire Protection Foam ZZ 360

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Last Updated on 2015-11-23

System No. C-AJ-4104
XHEZ.C-AJ-4104
Through-penetration Firestop Systems

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XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

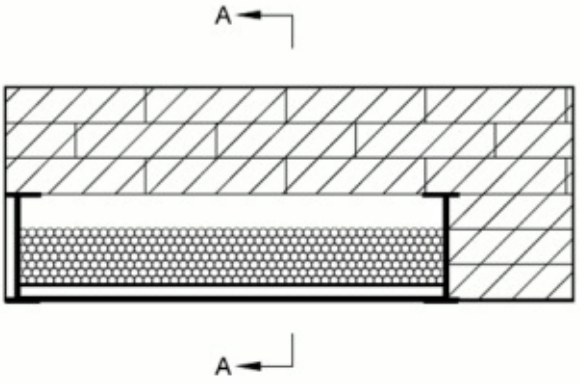
See General Information for Through-penetration Firestop Systems

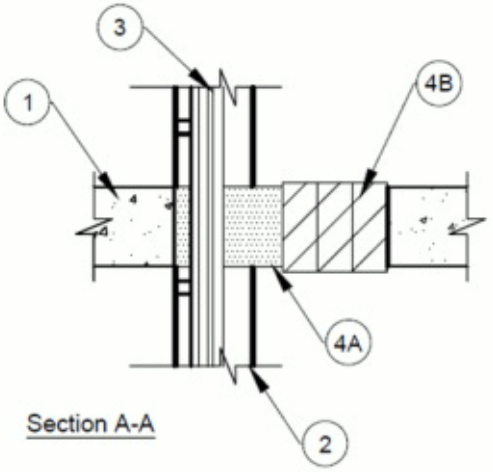
See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-4104

December 01, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 0 or 1 Hr (See Item 2)	FT Rating — 0 or 1 Hr (See Item 2)
	FH Rating — 2 Hr
	FTH Rating — 0 or 1 Hr (See Item 2)





Section A-A

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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max area of opening is 384 $in.^2$ (2477 cm^2) with a max dimension of 32 in. (813 mm).

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

2. **Cable Tray* —** Max 24 in. (610 mm) wide by max 6 in. (152 mm) deep open ladder cable tray with channel-shaped side rails formed of min 0.070 in. (1.8 mm) thick (15 gauge) aluminum or 0.07 in. thick galv steel. Max one cable tray per opening. Cable tray to be rigidly supported on both sides of floor or wall assembly.

The hourly T, FT and FTH Ratings shall 0 hr when a steel cable tray is used.

3. **Cables —** Aggregate cross-sectional area of cables in cable tray not to exceed 50 percent of the cross-sectional area of the cable tray based on a max 5 in. (127 mm) cable loading depth within the tray. Any combination of the following types and sizes of cables may be used:

A. Max 300 pair No. 24 AWG (or smaller) copper conductor telecommunication cables with polyvinyl chloride (PVC) insulation and jacket.

B. Max 1/C 500 kcmil (or smaller) copper conductor cable with cross-linked polyethylene (XLPE) insulation and jacket.

C. Max 3/C No. 2 AWG copper or aluminum conductor cables with PVC insulation and jacket.

D. Max 7/C No. 12 AWG copper conductor power and control cables with PVC or cross-linked polyethylene (XLPE) insulation and jacket and PVC jacket.

E. Multiple fiber optic communication cables jacketed with PVC and having a max outside diameter of 1/2 in. (13 mm).

F. Max No. 18 AWG Type RG/6 coaxial cable with polyvinyl chloride insulation.

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

A. **Fill, Void or Cavity Material* —** Min 4-1/2 in. (114 mm) thickness of fill material to be forced into interstices of cables, between cables and cable tray, and around the periphery of the cables/cable tray. Max area of fill 224 in^2 (1445 cm^2) with a maximum dimension of 32 in. (813 mm). The max vertical annular space to the periphery of the opening or block/foam interface shall be 3-1/2 in (89 mm) and horizontal respectively 8 in. (203 mm). After installation of blocks (Item 4B), fill material to be forced between blocks and periphery of opening to max extent possible from top surface of floor or both surfaces of wall assembly.

ZAPP-ZIMMERMANN GMBH — Fire Protection Foam ZZ 360

B. **Fill, Void or Cavity Material* —** Blocks tightly-packed into the opening to fill annular space between cable tray or foam and periphery of opening. Blocks installed with 5 in. (127 mm) dimension projecting through floor or wall and centered within the opening.

ZAPP-ZIMMERMANN GMBH — Fire Protection Block ZZ 260

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

Last Updated on 2015-12-01

System No. C-AJ-4105
XHEZ.C-AJ-4105
Through-penetration Firestop Systems

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Design/System/Construction/Assembly Usage Disclaimer

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- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

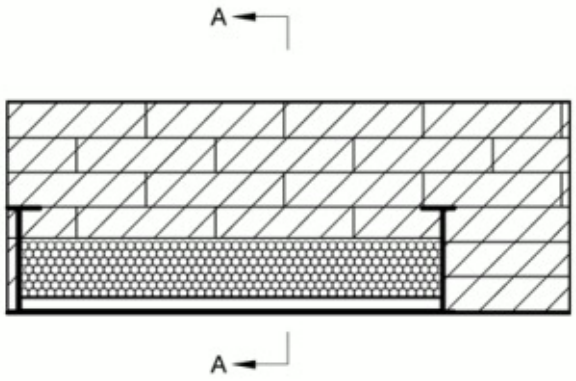
See General Information for Through-penetration Firestop Systems

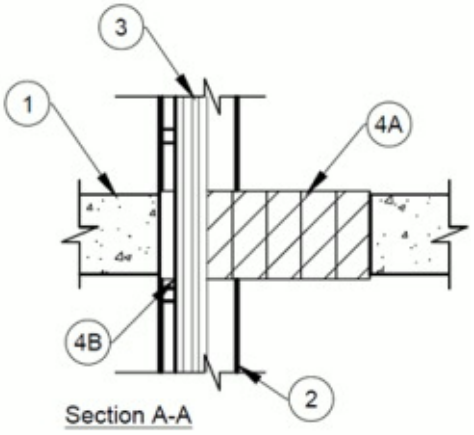
See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-4105

November 23, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 0 Hr	FT Rating — 0 Hr
	FH Rating — 2 Hr
	FTH Rating — 0 Hr





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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max area of opening is 384 in.^{2} (2477 cm^2) with a max dimension of 32 in. (813 mm).

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

2. **Cable Tray* —** Max 24 in. (610 mm) wide by max 6 in. (152 mm) deep open ladder cable tray with channel-shaped side rails formed of min 0.070 in. (1.8 mm) thick (15 gauge) aluminum or 0.07 in. thick galv steel. Max one cable tray per opening. The annular space between the cable tray and the periphery of the opening shall be min 0 in. (point contact) to max 8 in. (203 mm). Cable tray to be rigidly supported on both sides of floor or wall assembly.

3. **Cables —** Aggregate cross-sectional area of cables in cable tray not to exceed 50 percent of the cross-sectional area of the cable tray based on a max 5 in. (127 mm) cable loading depth within the tray. Any combination of the following types and sizes of cables may be used:

A. Max 300 pair No. 24 AWG (or smaller) copper conductor telecommunication cables with polyvinyl chloride (PVC) insulation and jacket.

B. Max 1/C 500 kcmil (or smaller) copper conductor cable with cross-linked polyethylene (XLPE) insulation and jacket.

C. Max 3/C No. 2 AWG copper or aluminum conductor cables with PVC insulation and jacket.

D. Max 7/C No. 12 AWG copper conductor power and control cables with PVC or cross-linked polyethylene (XLPE) insulation and jacket and PVC jacket.

E. Multiple fiber optic communication cables jacketed with PVC and having a max outside diameter of 1/2 in. (13mm).

F. Max No. 18 AWG Type RG/6 coaxial cable with polyvinyl chloride insulation.

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

A. **Fill, Void or Cavity Material* —** Blocks installed with 5 in. (127 mm) dimension projecting through floor or wall and centered within the opening. Blocks to be firmly packed and completely fill the entire opening.

ZAPP-ZIMMERMANN GMBH — Fire Protection Block ZZ 260

B. **Fill, Void or Cavity Material* —** Min 4-1/2 in. (114 mm) thickness of fill material to be forced into interstices of cables, between cables and cable tray and in obvious openings between blocks and between blocks and the periphery of the opening to the max extent possible from top surface of floor assembly or both surfaces of wall assembly.

ZAPP-ZIMMERMANN GMBH — Fire Protection Sealant ZZ 365

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

Last Updated on 2015-11-23

System No. C-AJ-5368
XHEZ.C-AJ-5368
Through-penetration Firestop Systems

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Design/System/Construction/Assembly Usage Disclaimer

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- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

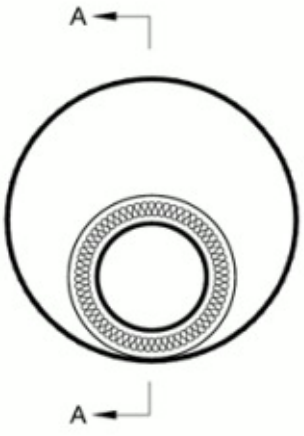
See General Information for Through-penetration Firestop Systems

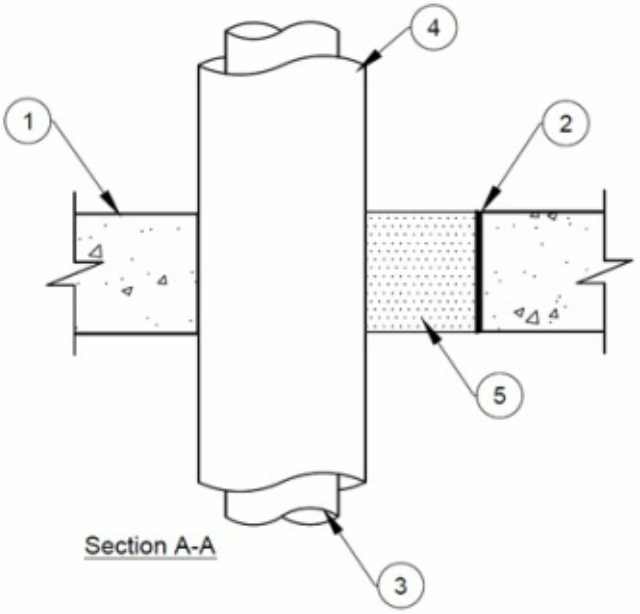
See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-5368

December 03, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 2 Hr (See Item 4)	FT Rating — 2 Hr (See Item 4)
	FH Rating — 2 Hr
	FTH Rating — 2 Hr (See Item 4)





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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 12 in. (305 mm).

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

2. **Metallic Sleeve (Optional) —** Max 8 in (203 mm) diameter Schedule 5 (or heavier) steel pipe cast or grouted into floor or wall flush with floor or wall surfaces.

3. **Through-Penetrant —** One metallic pipe, tubing or conduit installed concentrically or eccentrically within the

firestop system. The annular space between the pipe, tubing or conduit and the periphery of the opening shall be min 0 in. (point contact) to max 4 in. (102 mm). Pipe, tubing or conduit to be rigidly supported on each side of the floor assembly. The following types and sizes of metallic pipes, tubing or conduit may be used:

A. **Steel Pipe —** Nom 8 in. (203 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

B. **Iron Pipe —** Nom 8 in. (203 mm) diam (or smaller) Schedule 10 (or heavier) cast or ductile pipe.

C. **Conduit —** Nom 8 in. (203 mm) diam (or smaller) rigid steel conduit.

D. **Conduit —** Nom 8 in. (203 mm) diam (or smaller) steel electrical metallic conduit.

E. **Copper Pipe —** Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.

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

4. **Pipe Insulation —** The following types of pipe insulation may be used:

A. **Pipe Covering* —** Nom 1 in. (25 mm) or thinner thick hollow cylindrical heavy density (min 3.5 pcf) 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. **The hourly T, FT and FTH Ratings shall not exceed 2 hr with this pipe covering.**

See **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 Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

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

A. **Fill, Void or Cavity Material* —** Min 4-1/2 in. (114 mm) thickness of material to fill within the annulus.

ZAPP-ZIMMERMANN GMBH — Fire Protection Foam ZZ 360

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

Last Updated on 2015-12-03

System No. C-AJ-8233
XHEZ.C-AJ-8233
Through-penetration Firestop Systems

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Design/System/Construction/Assembly Usage Disclaimer

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- Only products which bear UL's Mark are considered Certified.

XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

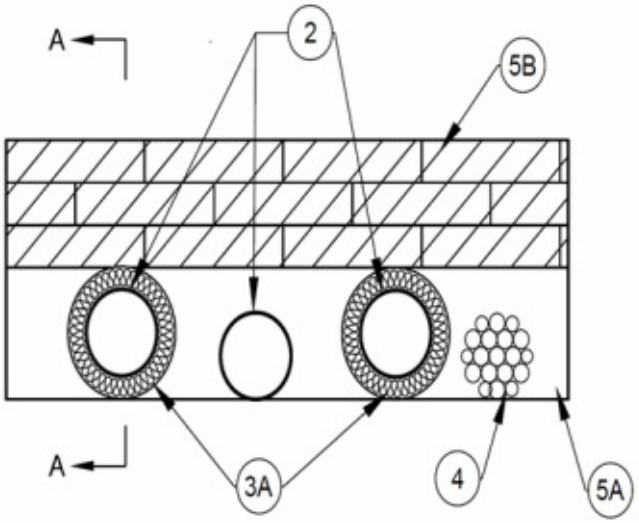
See General Information for Through-penetration Firestop Systems

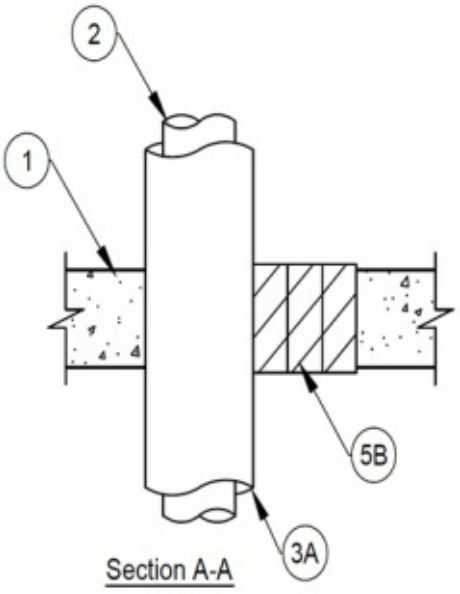
See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-8233

December 01, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 1/4, 1-1/4 and 1-3/4 Hr (See Items 2, 3 and 4)	FT Rating — 1/4, 1-1/4 and 1-3/4 Hr (See Items 2, 3 and 4)
	FH Rating — 2 Hr
	FTH Rating — 1/4, 1-1/4 and 1-3/4 Hr (See Items 2, 3 and 4)





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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max area of opening is 384 in.^{2} (2477 cm^2) with a max dimension of 32 in. (813 mm).

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

2. **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 spacing between the pipes are maintained. The separation between cable bundle, tubes and insulated tubes shall be a min 1 in. (25 mm). Pipes or tubes to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic

pipes or tubes may be used:

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

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

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

D. **Iron Pipe —** Nom 4 in. (102 mm) diam (or smaller) cast or ductile pipe.

E. **Iron Pipe —** Nom 4 in. (102 mm) diam (or smaller) electric metallic tubing (EMT) or steel conduit.

The hourly T, FT and FTH Ratings shall not exceed 1/4 hr when metallic pipe or tubing is used with no pipe insulation.

3. **Pipe Insulation —** (Optional) — The following types of pipe insulation may be used:

A. **Pipe Covering* —** Nom 1 in. (25 mm) or thinner thick hollow cylindrical heavy density (min 3.5 pcf) 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. **The hourly T, FT and FTH Ratings shall not exceed 1-3/4 hr when metallic pipe or tubing is used with this pipe covering.**

See **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 Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

4. **Cables —** Max 4 in. (102 mm) diam tight bundle of cables installed within the opening and rigidly supported on both sides of floor or wall assembly. Cable bundle may be any combination of the following types and sizes of cables:

A. Max 1/C 750 kcmil (or smaller) single copper connector power cable with thermoplastic insulation and polyvinyl chloride (PVC) jacket.

B. Max 300 pair No. 24 AWG (or smaller) 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-linkewd polyethylene (XLPE) insulation and PVC jacket.

D. Multiple fiber optical communication cables jacketed with PVC and having a max outside diam of 1/2 in. (13 mm).

E. Max 3/C copper conductor No. 10 AWG (or smaller) with bare aluminum ground, PVC insulated steel or aluminum **Metal-Clad** cable.

F. Max No. 18 AWG Type RG/6 coaxial cable with polyvinyl chloride insulation.

The hourly T, FT and FTH Ratings shall not exceed 1-1/4 hr when cables are used.

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

A. **Fill, Void or Cavity Material* —** Min 4-1/2 in. (114 mm) thickness of fill material applied between cables and pipes, and around the periphery of the cables/pipes. Max area of fill is 224 in^2 (1445 cm^2) with a maximum dimension of 32 in (813 mm). The max vertical annular space to the periphery of the opening or block / foam interface shall be 3-1/2 in (89 mm) and horizontal respectively 8 in. (203 mm). After installation of blocks (Item 5B), fill material to be forced between blocks and periphery of opening to max extent possible from top surface of floor or both surfaces of wall assembly.

ZAPP-ZIMMERMANN GMBH — Fire Protection Foam ZZ 360

B. **Fill, Void or Cavity Material —** Blocks tightly-packed to fill annular space between penetrants or foam and periphery of opening installed with 5 in. (127 mm) dimension projecting through floor or wall and centered within the opening.

ZAPP-ZIMMERMANN GMBH — Fire Protection Block ZZ 260

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

Last Updated on 2015-12-01

System No. C-AJ-8234
XHEZ.C-AJ-8234
Through-penetration Firestop Systems

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Design/System/Construction/Assembly Usage Disclaimer

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XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

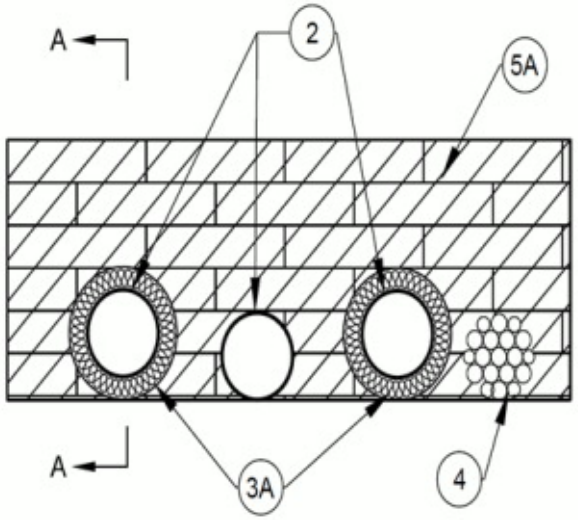
See General Information for Through-penetration Firestop Systems

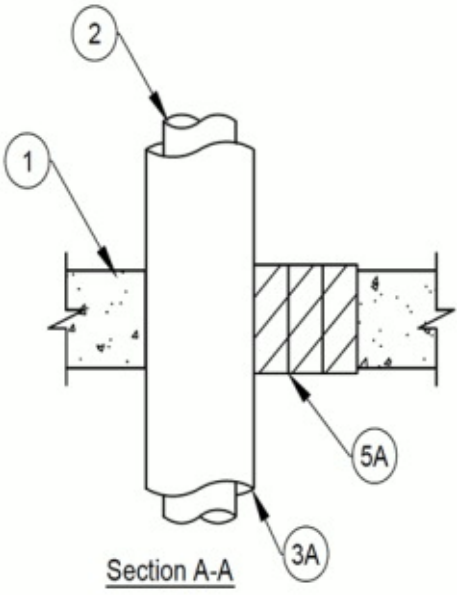
See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-8234

December 01, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 1/4, 1-1/2 and 2 Hr (See Items 2, 3 and 4)	FT Rating — 1/4, 1-1/2 and 2 Hr (See Items 2, 3 and 4)
	FH Rating — 2 Hr
	FTH Rating — 1/4, 1-1/2 and 2 Hr (See Items 2, 3 and 4)





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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max area of opening is 384 $in.^2$ (2477 cm^2) with a max dimension of 32 in. (813 mm).

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

2. **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 spacing between the pipes are maintained. The separation between cable bundle, tubes and insulated tubes shall be a min 1 in. (25 mm) to max 3-1/2 in. (89 mm). The annular space between penetrants and the periphery of opening

shall be a min 0 in. (point contact) to max 7-7/8 in. (200 mm). Pipes or tubes to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubes may be used:

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

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

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

D. **Iron Pipe —** Nom 4 in. (102 mm) diam (or smaller) cast or ductile pipe.

E. **Iron Pipe —** Nom 4 in. (102 mm) diam (or smaller) electric metallic tubing (EMT) or steel conduit.

The hourly T, FT and FTH Ratings shall not exceed 1/4 hr when metallic pipe or tubing is used with no pipe insulation.

3. **Pipe Insulation —** (Optional) — The following types of pipe insulation may be used:

A. **Pipe Covering* —** Nom 1 in. (25 mm) or thinner thick hollow cylindrical heavy density (min 3.5 pcf) 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. **The hourly T, FT and FTH Ratings shall not exceed 2 hr when metallic pipe or tubing is used with this pipe covering.**

See **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 Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

4. **Cables —** Max 4 in. (102 mm) diam tight bundle of cables installed within the opening and rigidly supported on both sides of floor or wall assembly. The space between the cables and periphery of the opening shall range from min 0 in. (point contact) to max 7-7/8 in. (200 mm). Any combination of the following types and sizes of metallic conductor of fiber optic cable may be used:

A. Max 1/C 750 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 and PVC jacket.

D. Multiple fiber optical communication cables jacketed with PVC and having a max outside diam of 1/2 in. (13 mm).

E. Max 3/C copper conductor No. 10 AWG (or smaller) with bare aluminum ground, PVC insulated steel or aluminum metal-clad cable.

F. Max No. 18 AWG Type RG/6 coaxial cable with polyvinyl chloride insulation.

The hourly T, FT and FTH Ratings shall not exceed 1-1/2 hr when cables are used.

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

A. **Fill, Void or Cavity Material* —** Blocks tightly-packed into the opening to fill annular space between penetrants and periphery of opening and installed with 5 in. (127 mm) dimension projecting through floor or wall and centered within the opening.

ZAPP-ZIMMERMANN GMBH — Fire Protection Block ZZ 260

B. **Fill, Void or Cavity Material* —** (Not Shown) — Fill material applied to any voids between and around penetrating items and fire blocks within the opening. Fill material to be applied from top surface of floor or both sides of wall. Fill material to be forced between the periphery and blocks.

ZAPP-ZIMMERMANN GMBH — Fire Protection Sealant ZZ 365

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

Last Updated on 2015-12-01

System No. C-AJ-8235
XHEZ.C-AJ-8235
Through-penetration Firestop Systems

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XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

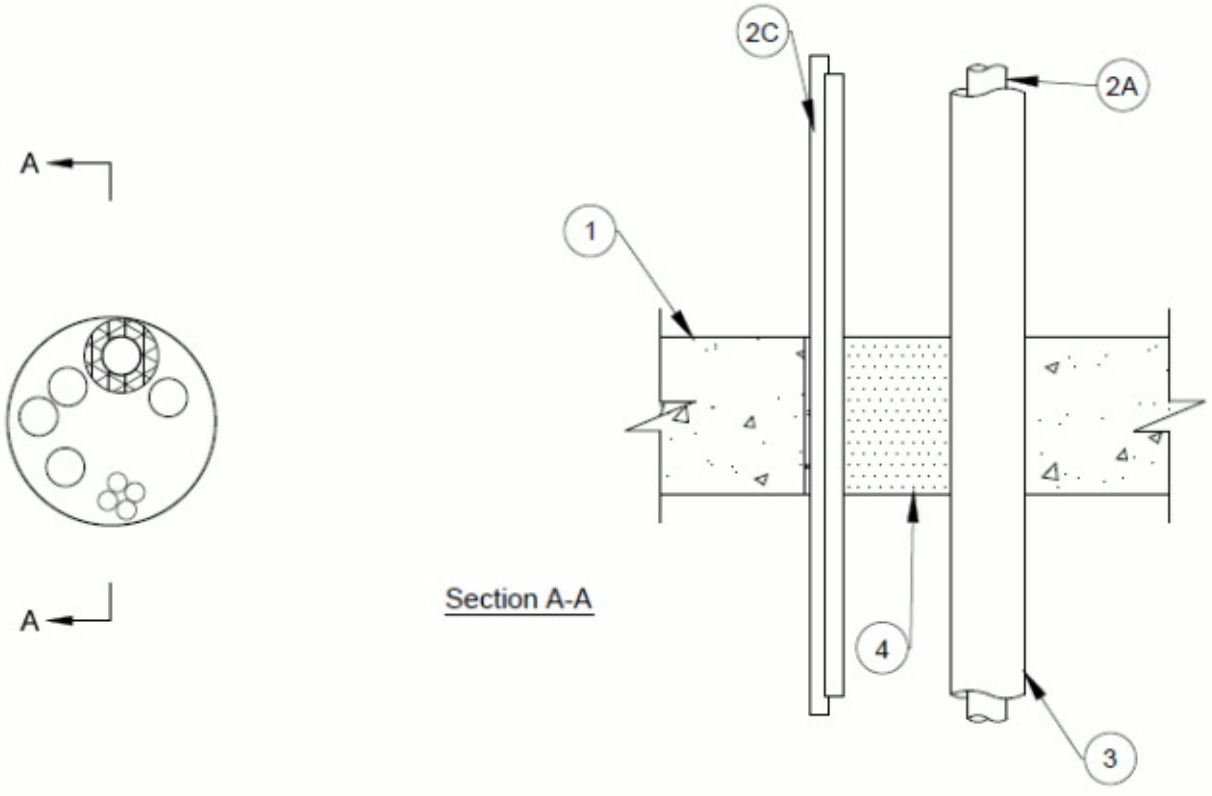
See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-8235

November 23, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 1/4, 3/4 and 2 Hr (See Items 2 and 3)	FT Rating — 1/4, 3/4 and 2 Hr (See Items 2 and 3)
	FH Rating — 2 Hr
	FTH Rating — 1/4, 3/4 and 2 Hr (See Items 2 and 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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 6 in. (0.15 m).

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

2. **Through-Penetrant —** A max of five pipes, conduits or tubes and a max of four cables to be installed within the opening. The space between penetrants and between penetrants and periphery of opening shall be min. 0 in. (point contact) to max 2 in.

Penetrants to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of penetrants may be used:

A. **Metallic Pipes —** A max of four metallic penetrants may be used. The following types and sizes of metallic pipes, conduits or tubing may be used:

A1. **Copper Tubing —** Nom 1 in. (25 mm) diam (or smaller) Type L (or heavier) copper tube.

A2. **Copper Pipe —** Nom 1 in. (25 mm) diam (or smaller) Regular (or heavier) copper pipe.

A3. **Steel Pipe —** Nom 1 in. (25 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.

A4. **Conduit —** Nom 1 in. (25 mm) diameter (or smaller) electrical metallic tubing or steel conduit.

The hourly T, FT and FTH Ratings shall not exceed 1/4 hr when metallic pipe or tubing is used with no pipe insulation.

B. **Nonmetallic Pipes —** (Not Shown) — A max of one nonmetallic pipe or conduit may be used. The following types and sizes of nonmetallic pipes or conduits may be used:

B1. **Polyvinyl Chloride (PVC) Pipe —** Nom 1 in. (25 mm) diameter (or smaller) Schedule 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

B2. **Chlorinated Polyvinyl Chloride (CPVC) Pipe —** Nom 1 in. (25 mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

B3. **Rigid Nonmetallic Conduit —** Nom 1 in. (25 mm) diameter (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).

C. **Cables —** A max of four cables may be used. The following types and sizes of cables may be used:

C1. Max 1/C No. 12 AWG power and control cables.

C2. Max four pair No. 18 AWG (or smaller) thermostat cable with polyvinyl chloride (PVC) insulation and jacket materials.

3. **Pipe Insulation —** (Optional) — The following types of pipe insulation may be used:

A. **Tube Insulation-Plastics+++ —** Nom 1/2 in. (13 mm) thick (or thinner) acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. The hourly T, FT and TH Ratings shall not exceed 3/4 hr when metallic pipe or tubing is used with this tube insulation.

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.

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

A. **Fill, Void or Cavity Material* —** Min 4-1/2 in. (114 mm) thickness of material to fill opening within the annulus.

ZAPP-ZIMMERMANN GMBH — Fire Protection Foam ZZ 360

+++Bearing the UL Recognized Component Marking

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

Last Updated on 2015-11-23

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Through-penetration Firestop Systems

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Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. W-L-0046

December 02, 2015

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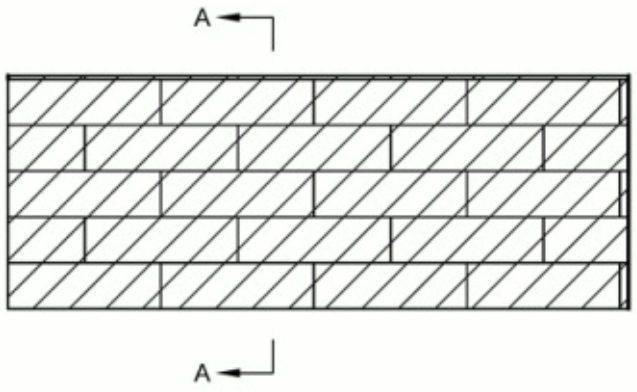
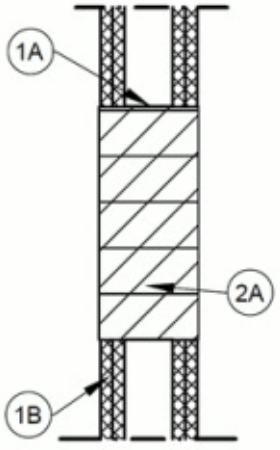
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 2 Hr	FT Rating — 2 Hr
	FH Rating — 2 Hr
	FTH Rating — 2 Hr





Section A-A

1. **Wall Assembly —** The 1 or 2 hr fire rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall incorporate the following construction features:

A. **Studs —** Wall framing shall consist of steel channel studs. Studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. Additional studs shall be installed horizontally to form a rectangular box around the opening (Item 2).

B. **Gypsum Board* —** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max area of opening is 384 in.^{2} (2477 cm^2) with a max dimension of 32 in. (813 mm).

The hourly F and FH Ratings are dependent upon the hourly rating of the wall in which it is installed.

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

A. **Fill, Void or Cavity Material* —** Blocks installed with 5 in. (127 mm) dimension projecting through opening and centered in wall. Blocks to be firmly packed to fill the opening area.

ZAPP-ZIMMERMANN GMBH — Fire Protection Block ZZ 260

B. **Fill, Void or Cavity Material* —** (Not shown) — Fill material to be forced between blocks and periphery of opening to the max extent possible from either surface of wall.

ZAPP-ZIMMERMANN GMBH — Fire Protection Foam ZZ 360

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

Last Updated on 2015-12-02

System No. W-L-4085
XHEZ.W-L-4085
Through-penetration Firestop Systems

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Design/System/Construction/Assembly Usage Disclaimer

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- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

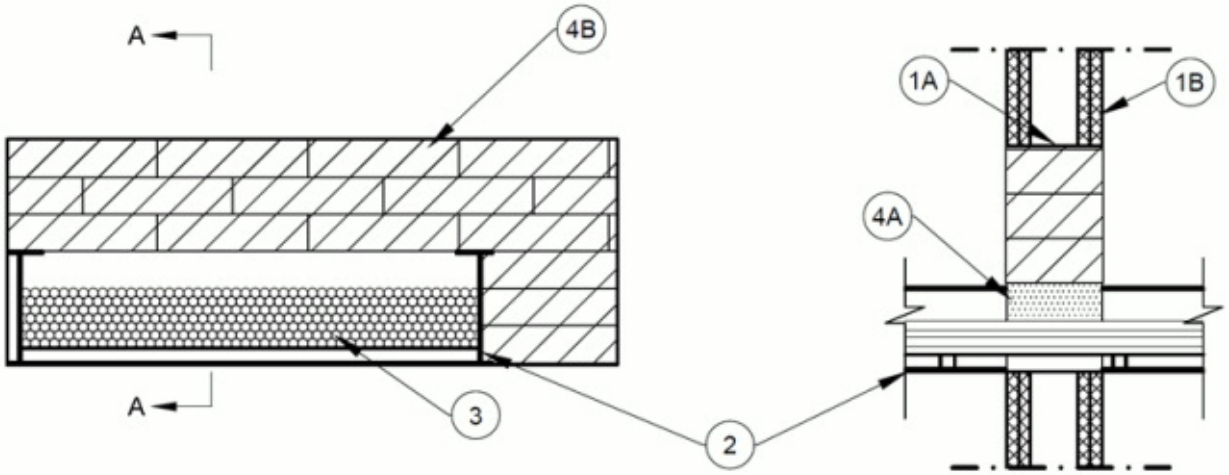
See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. W-L-4085

December 02, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 0 or 1 Hr (See Item 2)	FT Rating — 0 or 1 Hr (See Item 2)
	FH Rating — 2 Hr
	FTH Rating — 0 or 1 Hr (See Item 2)



Section A-A

1. **Wall Assembly —** The 1 or 2 hr fire rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall incorporate the following construction features:

A. **Studs —** Wall framing shall consist of steel channel studs. Studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. Additional studs shall be installed horizontally to form a rectangular box around the opening.

B. **Gypsum Board* —** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max area of opening is 384 in.^{2} (2477 cm^2) with a max dimension of 32 in. (813 mm).

The hourly F and FH Ratings are dependent upon the hourly rating of the wall in which it is installed.

2. **Cable Tray —** Max 24 in. (610 mm) wide by max 6 in. (152 mm) deep open ladder cable tray with channel-shaped side rails formed of min 0.070 in. (1.8 mm) thick (15 gauge) aluminum or 0.07 in. thick galv steel. Max one cable tray per opening. Cable tray to be rigidly supported on both sides of floor or wall assembly.

The hourly T, FT and FTH Ratings shall be 0 hr when a steel cable tray is used.

3. **Cables —** Aggregate cross-sectional area of cables in cable tray not to exceed 50 percent of the cross-sectional area of the cable tray based on a max 5 in. (127 mm) cable loading depth within the tray. Any combination of the following types and sizes of cables may be used:

A. Max 300 pair No. 24 AWG (or smaller) copper conductor telecommunication cables with polyvinyl chloride (PVC) insulation and jacket.

B. Max 1/C 500 kcmil (or smaller) copper conductor cable with cross-linked polyethylene (XLPE) insulation and jacket.

C. Max 3/C No. 2 AWG copper or aluminum conductor cables with PVC insulation and jacket.

D. Max 7/C No. 12 AWG copper conductor power and control cables with PVC or cross-linked polyethylene (XLPE) insulation and jacket and PVC jacket.

E. Multiple fiber optic communication cables jacketed with PVC and having a max outside diameter of 1/2 in. (13mm).

F. Max No. 18 AWG Type RG/6 coaxial cable with polyvinyl chloride insulation.

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

A. **Fill, Void or Cavity Material* —** Min 4-1/2 in. (114 mm) thickness of fill material to be forced into interstices of cables, between cables and cable tray, and around the periphery of the cables / cable tray. Max area of fill 224 in^2 (1445 cm^2) with a maximum dimension of 32 in (813 mm). The max vertical annular space to the periphery of the opening or block/foam interface shall be 3-1/2 in (89 mm) and 8 in. (203 mm) horizontally and vertically respectively. After installation of blocks (Item 4B), fill material to be forced between blocks and periphery of opening to max extent possible from either surface of wall.

ZAPP-ZIMMERMANN GMBH — Fire Protection Foam ZZ 360

B. **Fill, Void or Cavity Material* —** Blocks tightly-packed into the opening to fill annular space between cable tray or foam and periphery of opening. Blocks installed with 5 in. (127 mm) dimension projecting through wall and centered within the opening.

ZAPP-ZIMMERMANN GMBH — Fire Protection Block ZZ 260

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

Last Updated on 2015-12-02