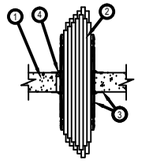
System No. C-AJ-3281

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 3/4 Hr	FT Rating — 3/4 Hr
L Rating At Ambient — Less Than 1 CFM (See Item 2)	FH Rating — 2 Hr
L Rating At 400 F — Less Than 1 CFM (See Item 2)	FTH Rating — 3/4 Hr
	L Rating At Ambient — Less Than 1 CFM (See Item 2)
	L Rating At 400 F — Less Than 1 CFM (See Item 2)



1. Floor or Wall Assembly — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Floor may also be constructed of any min 6 in. thick UL Classified hollow-core Precast Concrete Units*. Opening in floor or wall to be max 3 in. (76 mm) diam for 2" device and max 5 in. (127 mm) diam for 4" device.
   See Concrete Blocks (CAZT) and Precast Concrete Units (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. Cables — Within the loading area for each firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of floor or wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
   AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of two max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket.

See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM/Sq Ft		L Rating, CFM	
		Ambient	400°F	Ambient	400°F
0%	—	1	2	Less than 1	Less than 1
100%	Any cables (Item 2) in any combination	7	7	Less than 1	Less than 1

3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings and tightly twisted inner fabric smoke seal, flanges and gasket material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into floor or wall such that ends project an equal distance from the approximate centerline of the assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, and gasket material butting tightly to both sides of floor or wall. As an alternate to gasket material, sealant (Item 4) may be used.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve

4. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and periphery of opening, flush with top surface of floor or both surfaces of wall, and an additional 1/4 in. (6 mm) bead applied at the device/floor or wall interface on top side of floor or both sides of wall assembly prior to installing flanges.

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

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

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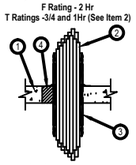
System No. C-AJ-3282

F Rating - 2 Hr
T Ratings -3/4 and 1Hr (See Item 2)



1. Floor or Wall Assembly — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Opening in floor or wall to be max 4 in. (102 mm) diam for 2" device and max 6 in. (152 mm) diam for 4" device.
   See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
1A. Floor Assembly — (Not Shown) - As an alternate to Item 1, fire-rated unprotected concrete and steel floor assembly may be used. Floor assembly to be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. Concrete — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
   B. Steel Floor and Form Units — Composite or noncomposite max 3 in. (76 mm) deep fluted galv units as specified in the individual Floor-Ceiling design. Opening in floor or wall to be max 4 in. (102 mm) diam for 2" device and max 6 in. (152 mm) diam for 4" device.
2. Cables — Within the loading area for each firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of floor or wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
   AFC CABLE SYSTEMS INC
   I. Max. ¼" (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket.
   The T Rating for the firestop system is 3/4 hr except that for blank openings with no cables, the T Rating is 1 hr.
3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasketing material (not shown, optional). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into floor or wall such that ends project an equal distance from the approximate centerline of the assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flange(s) that are spun clockwise onto device threads, over gasketing material butting tightly to top side of floor or both sides of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* – Mortar — Min 2-1/2 in. (64 mm) thickness of fill material applied within the annulus between firestop device and periphery of opening, flush with bottom surface of floor or both surfaces of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 637 Firestop Mortar

*Bearing the UL Classification Mark

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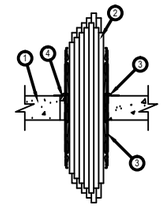
System No. C-AJ-3283

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
L Rating At Ambient — Less Than 1 CFM (See Item 2)	FH Rating — 2 Hr
L Rating At 400 F — Less Than 1 CFM (See Item 2)	FTH Rating — 1/2 Hr
	L Rating At Ambient — Less Than 1 CFM (See Item 2)
	L Rating At 400 F — Less Than 1 CFM (See Item 2)



1. Floor or Wall Assembly — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Opening in floor or wall to be max 3 in. (76 mm) diam for 2" device and max 5 in. (127 mm) diam for 4" device.
   See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
1A. Floor Assembly — (Not Shown) - As an alternate to Item 1, fire-rated unprotected concrete and steel floor assembly may be used. Floor assembly to be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. Concrete — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
   B. Steel Floor and Form Units — Composite or noncomposite max 3 in. (76 mm) deep fluted galv units as specified in the individual Floor-Ceiling design. Opening in floor or wall to be max 4 in. (102 mm) diam for 2" device and max 6 in. (152 mm) diam for 4" device.
2. Cables — Within the loading area for the firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of floor or wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
   AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket.
   See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM/Sq Ft		L Rating, CFM	
		Ambient	400°F	Ambient	400°F
0%	—	1	2	Less than 1	Less than 1
100%	Any cables (Item 2) in any combination	7	7	Less than 1	Less than 1

3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasket material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into floor or wall such that ends project an equal distance from the approximate centerline of the assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flange(s) that are spun clockwise onto device threads, over gasket material butting tightly to top side of floor or both sides of wall. In floors, when FS-ONE Sealant is used and installed flush with bottom of floor, device flange shall be threaded tightly to bottom side of floor. In floors, device flange to be secured to floor with min two 1-1/4 in. (32 mm) long steel masonry screws or anchors. As an alternate to gasket material, sealant (Item 4) may be used.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve

4. Fill, Void or Cavity Material* — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and periphery of opening, flush with top surface of floor or both sides of wall. As an option, when FS-ONE Sealant is used, the fill material can be installed flush with bottom of floor. For L Ratings when sealant is used, an additional 1/4 in. (6 mm) bead of fill material is applied at the device/floor or device/wall interface on top or bottom side of floor or both sides of wall assembly prior to installing flanges.

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

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

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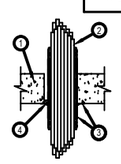
System No. C-AJ-3284

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 3 Hr	F Rating — 3 Hr
T Rating — 1/2 Hr	FT Rating — 1/2 Hr
L Rating At Ambient — Less Than 1 CFM (See Item 2)	FH Rating — 3 Hr
L Rating At 400 F — Less Than 1 CFM (See Item 2)	FTH Rating — 1/2 Hr
	L Rating At Ambient — Less Than 1 CFM (See Item 2)
	L Rating At 400 F — Less Than 1 CFM (See Item 2)



1. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Floor may also be constructed of any min 6 in. thick UL Classified hollow-core Precast Concrete Units*. Opening in floor or wall to be max 3 in. (76 mm) diam for 2" device and max 5 in. (127 mm) diam for 4" device.
   See Concrete Blocks (CAZT) and Precast Concrete Units (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. Cables — Within the loading area for each firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of floor or wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
   AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket.
   See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM/Sq Ft		L Rating, CFM	
		Ambient	400°F	Ambient	400°F
0%	—	1	2	Less than 1	Less than 1
100%	Any cables (Item 2) in any combination	7	7	Less than 1	Less than 1

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System No. C-AJ-3284 (Cont.)

3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasket material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into floor or wall such that ends project an equal distance from the approximate centerline of the assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flange(s) that are spun clockwise onto device threads, over gasket material butting tightly to bottom side of floor or both sides of wall. In floors, device flange to be secured to floor with min two 1-1/4 in. (32 mm) long masonry screws or anchors. As an alternate to gasket material, sealant (Item 4) may be used.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve

4. Fill, Void or Cavity Material* — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of FS-ONE Sealant or min 1 in. (25 mm) thickness of CP 618 Putty applied within the annulus between firestop device and periphery of opening, flush with bottom surface of floor or both sides of wall. For L Rating when sealant or putty is used, an additional 1/4 in. (6 mm) bead of fill material shall be applied at the device/floor or device/wall interface on bottom side of floor or both sides of wall assembly prior to installing flange(s).

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

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

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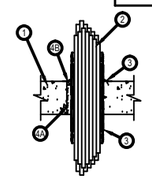
System No. C-AJ-3285

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 3 Hr	F Rating — 3 Hr
T Ratings — 1, 1-1/2 and 3 Hr (See Item 2)	FT Ratings — 1, 1-1/2 and 3 Hr (See Item 2)
L Rating At Ambient — Less Than 1 CFM (See Items 2 and 4)	FH Rating — 3 Hr
L Rating At 400 F — Less Than 1 CFM (See Items 2 and 4)	FTH Ratings — 1, 1-1/2 and 3 Hr (See Item 2)
	L Rating At Ambient — Less Than 1 CFM (See Items 2 and 4)
	L Rating At 400 F — Less Than 1 CFM (See Items 2 and 4)



1. Floor or Wall Assembly — Reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Min 4-1/2 in. (114 mm) thick floors and min 5 in. (127mm) thick walls. Wall may also be constructed of any UL Classified Concrete Blocks*. Floor may also be constructed of any min 6 in. (152 mm) thick UL Classified hollow-core Precast Concrete Units*. Opening in floor or wall to be max 3 in. (76 mm) diam for 2 in. (51 mm) device and max 5 in. (127 mm) diam for 4 in. (102 mm) device.
   See Concrete Blocks (CAZT) and Precast Concrete Units (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. Cables — Within the loading area for each firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of floor or wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max four pair No. 22 AWG Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
   AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of two max No. 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket.
   The hourly T, FT and FTH Ratings for blank opening (no cables) are 3 hr. The hourly T, FT and FTH Ratings for opening with cables are 1-1/2 hr except that, when cable type 2A, 2B, 2C, 2E or 2H is used, the T, FT and FTH Ratings are 1 hr. See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM/Sq Ft		L Rating, CFM	
		Ambient	400°F	Ambient	400°F
0%	—	3	2	Less than 1	Less than 1
100%	Any cables (Item 2) in any combination	7	7	Less than 1	Less than 1

3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasket material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into floor or wall such that ends project an equal distance from the approximate centerline of the assembly. As an option, in floors, steel sleeve of device may be installed flush with bottom of floor. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flange(s) that are spun clockwise onto device threads, over gasket material butting tightly to top side of floor or both sides of wall. In floors, when one device flange is used, device flange to be secured to floor with min two 1-1/4 in. (32 mm) long masonry screws or anchors. As an alternate to gasket material, sealant (Item 4B) may be used.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve

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/m3) mineral wool batt insulation firmly packed into annular space between firestop device and opening as a permanent form. Packing material to be installed flush with bottom of floor and 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* — Sealant — As an alternate to gasket material (see Item 3), 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. For L Ratings when sealant is used, an additional 1/4 in. (6 mm) bead of fill material is required at the device/floor or device/wall interface on top side of floor or both sides of wall assembly prior to installing flange(s).
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S Sealant, CP604 Sealant, CP 606 Sealant, CFS-S SIL GG, CFS-S SIL SL (floors only), FS-ONE Sealant or FS-ONE MAX Intumescent Sealant.

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

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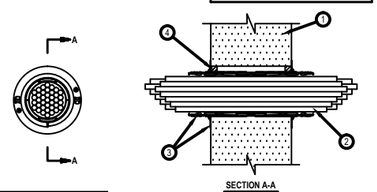
System No. W-J-3168

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Ratings — 0, 1/2 and 1 Hr (See Item 2)	FT Ratings — 0, 1/2 and 1 Hr (See Item 2)
L Rating At Ambient — (See Items 2 and 4)	FH Rating — 2 Hr
L Ratings At 400 F — (See Items 2 and 4)	FTH Ratings — 0, 1/2 and 1 Hr (See Item 2)
	L Rating At Ambient — (See Items 2 and 4)
	L Ratings At 400 F — (See Items 2 and 4)



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System No. W-J-3168 (Cont.)

1. Wall Assembly — Min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Opening in wall to be max 3 in. (76 mm) diam for 2" device and max 5 in. (127 mm) diam for 4" device.
   See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Cables — Within the loading area for each firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
   AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of two max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket.
   The T, FT and FTH Ratings are 1 hr except that, when Item 2J or 2K is used, the T, FT and FTH Ratings are 1/2 hr .
   L Ratings vary depending on whether the gasketing material (see Item 3) or the sealant (Item 4) is used. See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM/Sq Ft				L Rating, CFM			
		Ambient		400°F		Ambient		400°F	
		Sealant	Gasket	Sealant	Gasket	Sealant	Gasket	Sealant	Gasket
0%	—	Less than 1	1.0	Less than 1	2.7	Less than 1	Less than 1	Less than 1	Less than 1
100%	Item 2D only	4.9	4.9	1.3	3.5	Less than 1	Less than 1	Less than 1	Less than 1
100%	Any cables (Item 2) in any combination	9.2	9.2	9.6	11.8	1.2	1.2	1.2	1.6

3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. As an option, the inner fabric seal may remain open except that, to attain the L Rating, the inner fabric seal shall be twisted to completely close off the opening within device. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device flanges are to be secured to wall with min two 1-1/4 in. (32 mm) long masonry screws or anchors. As an alternate to gasket material, fill material (Item 4) may be used.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* — As an alternate to gasket material (see Item 3), min 5/8 in. (16 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall. When sealant is used, for L Rating, apply an additional 1/4 in. (6 mm) bead of FS-ONE or CP 606 at the device/wall interface on both sides of wall prior to installing flanges.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant, FS-ONE MAX Intumescent Sealant, CP 606 Sealant or CP 618 Putty

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

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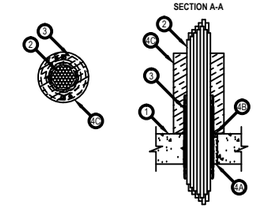
System No. C-AJ-3298

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 2 Hr	FT Rating — 2 Hr
L Rating At Ambient — Less Than 1 CFM (See Item 2)	FH Rating — 2 Hr
L Rating At 400 F — Less Than 1 CFM (See Item 2)	FTH Rating — 2 Hr
	L Rating At Ambient — Less Than 1 CFM (See Item 2)
	L Rating At 400 F — Less Than 1 CFM (See Item 2)



1. Floor or Wall Assembly — Reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Min 4-1/2 in. (114 mm) thick floors and min 5 in. (127mm) thick walls. Wall may also be constructed of any UL Classified Concrete Blocks*. Floor may also be constructed of any min 6 in. thick UL Classified hollow-core Precast Concrete Units*. Opening in floor or wall to be max 3 in. (76 mm) diam for 2 in. (51 mm) device and max 5 in. (127 mm) diam for 4 in. (102 mm) device.
   See Concrete Blocks (CAZT) and Precast Concrete Units (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. Cables — Within the loading area for each firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of floor or wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* — Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
   AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket.
   See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM/Sq Ft		L Rating, CFM	
		Ambient	400°F	Ambient	400°F
0%	—	1	2	Less than 1	Less than 1
100%	Any cables (Item 2) in any combination	7	7	Less than 1	Less than 1

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Notes:

1. *Refer to section 16055 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.*
2. *Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following: * Minimum and maximum Width of Joints * Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.*
3. *If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.*
4. *References:*
   - *2013 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 to that of construction being penetrated.*
6. *All rated through-penetration assemblies shall be prominently labeled with the following information:*
   - *ATTENTION: Fire Rated Assembly*
   - *UL System # * Product(s) used*
   - *Hourly Rating (F-Rating)*
   - *Installation Date*
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.)*

<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:

REVISIONS:

TYPICAL CP 653 SPEED SLEEVE DETAILS

SHEET NAME:

SHEET NUMBER:

CP 653 1.4

System No. C-AJ-3298 (Cont.)

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

3. Firestop Device* ** — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasket material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into floor or wall such that ends project an equal distance from the approximate centerline of the assembly. As an option, in floors, steel sleeve of device may be installed flush with bottom of floor. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact) to max 1/2 in. (13 mm). Device provided with flange(s) that are spun clockwise onto device threads, over gasket material butting tightly to top side of floor or both sides of floor or wall. In floors, when one device flange is used, device flange to be secured to floor with min two 1-1/4 in. (32 mm) long masonry screws or anchors. As an alternate to gasketing material, sealant (Item 4B) may be used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
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/m3) mineral wool batt insulation firmly packed into annular space between firestop device and opening as a permanent form. Packing material to be installed flush with bottom of floor and 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* – Sealant — As an alternate to gasketing material (see Item 3), 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. For L Ratings when sealant is used, an additional 1/4 in. (6 mm) bead of fill material shall be applied at the device/floor or device/wall interface on top side of floor or both sides of wall assembly prior to installing flange(s).
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606 Sealant, FS-ONE Sealant or FS-ONE MAX Intumescent Sealant.
C. Cable Wrap Materials* — Nom 1-1/2 in. or 2 in. (38 or 51 mm) thick blanket, faced on one side or two with a foil facing. The cables shall be wrapped with one layer of cable wrap. Cable wrap is to extend a minimum of 12 in. (305 mm) from top surface of floor or both sides of wall assembly. The ends are to be tightly butted together and taped. The exposed edges of the faced blankets are taped with 4 in. (102 mm) wide pressure-sensitive aluminum foil tape.
THERMAL CERAMICS INC — FireMaster FastWrap XL
UNIFRAX I L L C — FireWrap Duct Insulation or FyreWrap 1.5 Duct Insulation

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

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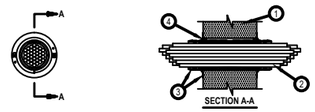
System No. W-J-3167

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 2, 3 and 4 Hr (See Item 1)	F Ratings — 2, 3 and 4 Hr (See Item 1)
T Ratings — 0, 1/2, 1-1/2 and 2 Hr (See Items 2 and 3)	FT Ratings — 1/2, 1, 1-1/2, and 2 Hr (See Items 2 and 3)
L Rating At Ambient — See Item 2	FH Ratings — 2, 3, or 4 Hr (See Item 1)
L Ratings At 400 F — See Item 2	FTH Ratings — 1/2, 1, 1-1/2, and 2 Hr (See Items 2 and 3)
	L Rating At Ambient — (See Item 2)
	L Ratings At 400 F — (See Item 2)



1. Wall Assembly — Min 5 in. (127 mm) thick for 2 hr wall assembly, min 5-5/8 in. (142 mm) thick for 3 hr wall assembly, min 6-1/2 in. (167 mm) thick for 4 hr wall assembly, reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Opening in wall to be 2-1/2 in. (64 mm) diam for 2" device and max 4-1/2 in. (114 mm) diam for 4" device. See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Cables — Within the loading area for each firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of wall assembly. Any combination of the following types of cables may be used:
A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
C. Max 4/0 AWG Type RHH ground cable.
D. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
AFC CABLE SYSTEMS INC
I. Max 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket. When the hourly rating of the wall assembly is 2 hr, the T, FT and FTH Ratings are 1 hr except that, when Item 2J or 2K is used, the T, FT and FTH Ratings are 1/2 hr . When the hourly rating of the wall assembly is 3 or 4 hr, the T, FT and FTH Ratings are 1-1/2 and 2 hr, respectively. L Ratings apply only when device flanges are used. L Ratings vary depending on whether the gasketing material (see Item 3) or the sealant (Item 4) is used. See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM/Sq Ft				L Rating, CFM			
		Ambient		400°F		Ambient		400°F	
		Sealant	Gasket	Sealant	Gasket	Sealant	Gasket	Sealant	Gasket
0%	—	Less than 1	1.0	Less than 1	2.7	Less than 1	Less than 1	Less than 1	Less than 1
100%	Item 2D only	4.9	4.9	1.3	3.5	Less than 1	Less than 1	Less than 1	Less than 1
100%	Any cables (Item 2) in any combination	9.2	9.2	9.6	11.8	1.2	1.2	1.3	1.6

3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. As an option, the inner fabric seal may remain open except that, to attain the L Rating, the inner fabric seal shall be twisted to completely close off the opening within device. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, over gasketing material , butting tightly to both sides of wall. Device flanges are optional except for 3 and 4 hr fire rating, flanges are required. When the device flanges are not used, the T, FT and FTH Ratings for the firestop system are 0 hr. For blank opening (no cables), the T, FT and FTH Ratings for the firestop system are 2, 3 or 4 hr only when the device flanges are used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall. and an additional 1/4 in. (6 mm) bead applied around periphery of device. Sealant is required when device flanges are not used (see Item 3).
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE or FS-ONE MAX Intumescent Sealant, or CP 606 Sealant

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

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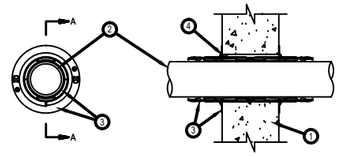
System No. W-J-1215

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 3/4 Hr	FT Rating — 3/4 Hr
	FH Rating — 2 Hr
	FTH Rating — 3/4 Hr



1. Wall Assembly — Min 5-5/8 in. (143 mm) reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Opening in wall to be 2-1/2 in. (64 mm) diam for nominal 2 in. (51 mm) firestop device and 4 1/2 in. (114 mm) diam for nominal 4 in. (102 mm) firestop device.
See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Through Penetrant — One metallic pipe, conduit or tubing to be installed concentrically within the firestop system. Pipe, conduit or tubing to be rigidly supported on both sides of the wall assembly. The following types and sizes of metallic pipes, conduits and tubes may be used:
A. Steel Pipe — Nom 3 in. (76 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
B. Iron Pipe — Nom 3 in. (76 mm) diam (or smaller) cast or ductile iron pipe.
C. Conduit — Nom 3 in. (76 mm) diam (or smaller) rigid steel conduit or steel electrical metallic tubing (EMT).
3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. As an alternate to gasket material, sealant (Item 4) may be used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall. An additional 1/4 in. (6 mm) bead shall be applied around periphery of device on each side of wall prior to securing device flanges.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606 Sealant, FS-ONE Sealant or FS-ONE MAX Intumescent Sealant.

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

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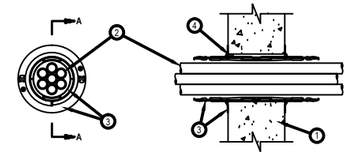
System No. W-J-2229

Classified by Underwriters Laboratories, Inc. to UL 1479

F Rating — 2 Hr
T Rating — 1/4 Hr



1. Wall Assembly — Min 5-5/8 in. (143 mm) reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Opening in wall to be 2-1/2 in. (64 mm) diam for nominal 2 in. (51 mm) firestop device and 4 1/2 in. (114 mm) diam for nominal 4 in. (102 mm) firestop device.
See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Cross Linked Polyethylene (PEX) Tubing — Nom 1 in. diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Within the loading area for each firestop device, the PEX tubes may represent a 0 to 100 percent visual fill. Tubing to be tightly bundled within the device and rigidly supported on both sides of wall assembly.
3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. As an alternate to gasket material, sealant (Item 4) may be used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall. An additional 1/4 in. (6 mm) bead shall be applied around periphery of device on each side of wall prior to securing device flanges.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606 or FS-ONE Sealant or FS-ONE MAX Intumescent Sealant.

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

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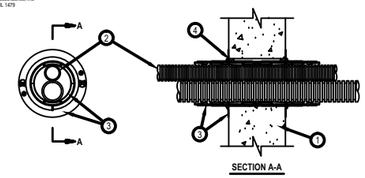
System No. W-J-2230

Classified by Underwriters Laboratories, Inc. to UL 1479

F Rating — 2 Hr
T Rating — 0 Hr



1. Wall Assembly — Min 5-5/8 in. (143 mm) reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Opening in wall to be 2-1/2 in. (64 mm) diam for nominal 2 in. (51 mm) firestop device and 4 1/2 in. (114 mm) diam for nominal 4 in. (102 mm) firestop device.
See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Through Penetrant — Nom 2 in. (51 mm) diam (or smaller) Electrical Nonmetallic Tubing+ formed from polyvinyl chloride (PVC) and installed in accordance with the National Electrical Code (NFPA No. 70). One or more tubes to be installed within the firestop system. Tubing to be rigidly supported on both sides of wall.
See Electrical Nonmetallic Tubing (FKHU) category in the Electrical Construction Materials Directory for names of manufacturers.
3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. As an alternate to gasketing material, sealant (Item 4) may be used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall. An additional 1/4 in. (6 mm) bead shall be applied around periphery of device on each side of wall prior to securing device flanges.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606 or FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

+Bearing the UL Listing Mark

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

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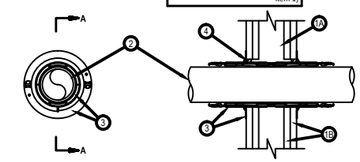
System No. W-L-1441

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

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



1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, 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 either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Opening in gypsum board to be 2-1/2 in. (64 mm) diam for nominal 2 in. (51 mm) firestop device and 4 1/2 in. (114 mm) diam for nominal 4 in. (102 mm) firestop device.
The hourly F, FH Ratings of the firestop system is dependent upon the hourly rating of the wall in which it is installed. The hourly T, FT, FTH Ratings of the firestop system are ½ hr for 1 hr rated walls and ¾ hr for 2 hr rated walls.
2. Through Penetrant — One metallic pipe, conduit or tubing to be installed concentrically within the firestop system. Pipe, conduit or tubing to be rigidly supported on both sides of the wall assembly. The following types and sizes of metallic pipes, conduits and tubes may be used:
A. Steel Pipe — Nom 3 in. (76 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
B. Iron Pipe — Nom 3 in. (76 mm) diam (or smaller) cast or ductile iron pipe.
C. Conduit — Nom 3 in. (76 mm) diam (or smaller) rigid steel conduit or steel electrical metallic tubing (EMT).
3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. For blank devices, flanges shall be secured to gypsum wall with min two 1-1/2 in. (38 mm) long drywall screws. As an alternate to gasket material, sealant (Item 4) may be used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall. An additional 1/4 in. (6 mm) bead shall be applied around periphery of device on each side of wall prior to securing device flanges.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606, FS-ONE Sealant or FS-ONE MAX Intumescent Sealant
* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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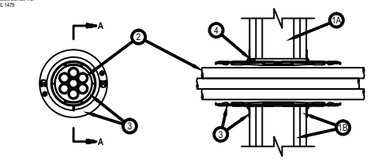
System No. W-L-2537

Classified by Underwriters Laboratories, Inc. to UL 1479

F Ratings — 1 and 2 Hr (See Item 1)
T Ratings — 0 and 1/4 Hr (See Item 1)



1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, 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 either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Opening in gypsum board to be 2-1/2 in. (64 mm) diam for nominal 2 in. (51 mm) firestop device and 4 1/2 in. (114 mm) diam for nominal 4 in. (102 mm) firestop device.
The hourly F Rating of the firestop system is dependent upon the hourly rating of the wall in which it is installed. The hourly T Rating of the firestop system is 0 hr in 1 hr fire rated walls and 1/4 hr in 2 hr fire rated walls.
2. Cross Linked Polyethylene (PEX) Tubing — Nom 1 in. diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Within the loading area for each firestop device, the PEX tubes may represent a 0 to 100 percent visual fill. Tubing to be tightly bundled within the device and rigidly supported on both sides of wall assembly.
3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. As an alternate to gasketing material, sealant (Item 4) may be used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall. An additional 1/4 in. (6 mm) bead shall be applied around periphery of device on each side of wall prior to securing device flanges.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606 or FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

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

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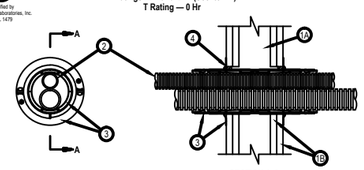
System No. W-L-2538

Classified by Underwriters Laboratories, Inc. to UL 1479

F Ratings — 1 and 2 Hr (See Item 1)
T Rating — 0 Hr



1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, 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 either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Opening in gypsum board to be 2-1/2 in. (64 mm) diam for nominal 2 in. (51 mm) firestop device and 4 1/2 in. (114 mm) diam for nominal 4 in. (102 mm) firestop device.
The hourly F Rating of the firestop system is dependent upon the hourly rating of the wall in which it is installed.
2. Through Penetrant — Nom 2 in. (51 mm) diam (or smaller) Electrical Nonmetallic Tubing+ formed from polyvinyl chloride (PVC) and installed in accordance with the National Electrical Code (NFPA No. 70). One or more tubes to be installed within the firestop system. Tubing to be rigidly supported on both sides of wall.
See Electrical Nonmetallic Tubing (FKHU) category in the Electrical Construction Materials Directory for names of manufacturers.

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System No. W-L-2538 (Cont.)

Classified by Underwriters Laboratories, Inc. to UL 1479

3. Firestop Device* ** — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. As an alternate to gasket material, sealant (Item 4) may be used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall. An additional 1/4 in. (6 mm) bead shall be applied around periphery of device on each side of wall prior to securing device flanges.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606 or FS-ONE Sealant or FS-ONE MAX Intumescent Sealant
•Bearing the UL Listing Mark
* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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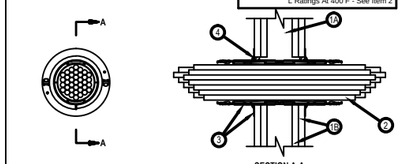
System No. W-L-3334

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1, 2, 3 and 4 Hr (See Item 1)	F Ratings - 1, 2, 3 and 4 Hr (See Item 1)
T Ratings - 0, 1/2, 1, 1-1/2, 2 Hr (See Items 2 and 3)	FT Ratings - 0, 1/2, 1-1/2, and 2 Hr (See Items 2 and 3)
L Rating At Ambient - See Item 2	FH Ratings - 1, 2, 3 and 4 Hr (See Item 1)
L Ratings At 400 F - See Item 2	FTH Ratings - 0, 1/2, 1, 1-1/2, and 2Hr (See Items 2 and 3)
	L Rating At Ambient - See Item 2
	L Ratings At 400 F - See Item 2



1. Wall Assembly — The 1, 2, 3 or 4 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, 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 either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC for 1 and 2 hr wall assemblies. Steel Studs to be 3-5/8 in. (92 mm) for 3 and 4 hr wall assemblies. Steel studs to be min 3-1/2 in. (89 mm) wide when 3/4 in. (19 mm) thick gypsum board is used (see Item 1B).
B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Alternately, for 1 and 2 hr rated walls only, min one layer of nom 3/4 in. (19 mm) thick gypsum board on each side of wall as specified in the individual Wall and Partition Design may be used. Opening in gypsum board to be max 2-1/2 in. (64 mm) diam for 2" device and max 4-1/2 in. (114 mm) diam for 4" device.
The hourly F and FH Ratings of the firestop system are dependent upon the hourly rating of the wall in which it is installed.
2. Cables — Within the loading area for each firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of wall assembly. Any combination of the following types of cables may be used:
A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
C. Max 4/0 AWG Type RHH ground cable.
D. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
AFC CABLE SYSTEMS INC
I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket .
J. Max 3/C No 12 AWG MC Cable.
K. Through Penetrating Product* — Any cables, Armored Cable+ or Metal Clad Cable+ currently Classified under the Through Penetrating Product category. See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.
When the hourly rating of the wall assembly is 1 hr, the T, FT and FTH Ratings are 0 hr. When the hourly rating of the wall assembly is 2 hr, the T, FT and FTH Ratings are 1 hr except that, when Item 2J or 2K is used, the T, FT and FTH Ratings are 1/2 hr . When the hourly rating of the wall assembly is 3 or 4 hr, the T, FT and FTH Ratings are 1-1/2 and 2 hr, respectively.
L Ratings apply only when device flanges are used. L Ratings vary depending on whether the gasketing material (see Item 3) or the sealant (Item 4) is used. See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM/Sq Ft				L Rating, CFM			
		Ambient		400°F		Ambient		400°F	
		Sealant	Gasket	Sealant	Gasket	Sealant	Gasket	Sealant	Gasket
0%	—	Less than 1	1.0	Less than 1	2.7	Less than 1	Less than 1	Less than 1	Less than 1
100%	Item 2D only	4.9	4.9	1.3	3.5	Less than 1	Less than 1	Less than 1	Less than 1
100%	Any cables (Item 2) in any combination	9.2	9.2	9.6	11.8	1.2	1.2	1.3	1.6

3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. As an option, the inner fabric seal may remain open except that, to attain the L Rating, the inner fabric seal shall be twisted to completely close off the opening within device. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. As an alternate to gasket material, sealant (Item 4) may be used. Device flanges are optional, except that when ½ in. (19 mm) gypsum board (see Item 1B) is used, device flanges shall be used and for 3 and 4 hr fire rating, device flanges shall be used. When the device flanges are not used, the T, FT and FTH Ratings for the firestop system are 0 hr.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall. and an additional 1/4 in. (6 mm) bead applied around periphery of device. When device flanges are used, gypsum drywall compound may be used in place of the fill material. Sealant is required when device flanges are not used (see Item 3).
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE, FS-ONE MAX Intumescent Sealant, or CP 606 Sealant
* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.
•Bearing the UL Listing Mark

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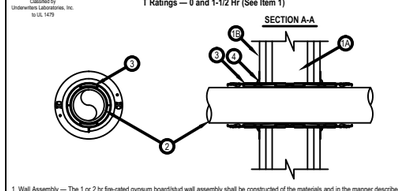
System No. W-L-2541

Classified by Underwriters Laboratories, Inc. to UL 1479

F Ratings — 1 and 2 Hr (See Item 1)
T Ratings — 0 and 1-1/2 Hr (See Item 1)



1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, 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 either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Opening in gypsum board to be 2-1/2 in. (64 mm) diam for nominal 2 in. (51 mm) firestop device and 4 1/2 in. (114 mm) diam for nominal 4 in. (102 mm) firestop device.
The F Rating of the firestop system is dependent upon the hourly rating of the wall in which it is installed. The T Rating of the firestop system is 0 and 1-1/2 hr for 1 and 2 hr rated walls, respectively.

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Notes:

1. *Refer to section 16055 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.*
2. *Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following: * Minimum and maximum Width of Joints * Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.*
3. *If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Drawings shall follow the International Firestop Council (IFC) Guidelines for Eva

System No. W-L-2541 (Cont.)

Classified by Underwriters Laboratories, Inc. to UL 1479

2. Through Penetrants — One nonmetallic pipe or conduit to be centered within the firestop system. Pipe to be rigidly supported on both sides of wall. The following types and sizes of pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste, or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 3 in. (76 mm) diam (or smaller) Schedule 40 or SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings and tightly twisted inner fabric smoke seal. Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, butting tightly to both sides of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* - Sealant — Min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall. An additional 1/4 in. (6 mm) bead shall be applied around periphery of device on each side of wall prior to securing device flanges.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606, FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

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

Hilti Firestop Systems

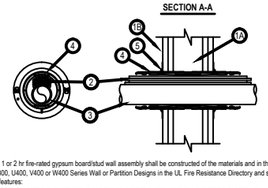
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 28, 2015

System No. W-L-8086

Classified by Underwriters Laboratories, Inc. to UL 1479 and CANULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 1 and 2 Hr (See Item 1)	F Rating — 1 and 2 Hr (See Item 1)
T Rating — 0 , 1/2 and 1 (See Items 2 and 3)	FT Rating — 0 , 1/2 and 1 (See Items 2 and 3)
	FH Rating — 1 and 2 Hr (See Item 1)
	FTH Rating — 0, 1/2 and 1 (See Items 2 and 3)

SECTION A-A



1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, U400, V400 or W400 Series Wall or Partition Designs in the UL Fire Resistance Directory and shall incorporate the following construction features:
   A. Studs — Wall framing shall consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Opening in gypsum board to be max 2-1/2 in. (64 mm) diam for 2" device and max 4-1/2 in. (114 mm) diam for 4" device.

   The F, FH Ratings of the firestop system are dependent upon the hourly rating of the wall in which it is installed.
2. Cables — Within the loading area for each firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* — Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
      AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket.
   J. Max 3/C No 12 AWG MC Cable.
   K. Through Penetrating Product* — Any cables, Armored Cable+ or Metal Clad Cable+ currently Classified under the Through Penetrating Product category. See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.

   For openings with cables, the T, FT, FTH Ratings are 0 hr for 1 hr rated wall assemblies. For 2 hr rated wall assemblies, the T, FT, FTH Ratings are 1 hr (see Item 3 and 4 also).
3. Metallic Penetrants — One pipe or tube to be installed in opening. The following types and sizes of through penetrants may be used:
   A. Steel Pipe — Nom 2 in. (51 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. Iron Pipe — Nom 2 in. (51 mm) diam (or smaller) cast or ductile iron pipe.
   C. Copper Pipe — Nom 2 in. (51 mm) diam (or smaller) Regular (or heavier) copper pipe.
   D. Copper Tube — Nom 2 in. (51 mm) diam (or smaller) Type L (or heavier) copper tube.
   E. Conduit — Nom 2 in. (51 mm) diam (or smaller) steel conduit, nom 2 in. (51 mm) diam (or smaller) steel electrical metallic tubing (EMT), or nom 1 in. (25 mm) diam (or smaller) flexible steel conduit.

   For openings with metallic penetrants the hourly T, FT, FTH Ratings are 1/2 hr.
4. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. As an alternate to gasket material, sealant (Item 5) may be used.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
5. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall, and an additional 1/4 in. (6 mm) bead applied around periphery of device.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE, FS-ONE MAX Intumescent Sealant or CP 606 Sealant

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

Hilti Firestop Systems

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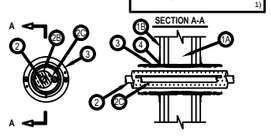
System No. W-L-8085

Classified by Underwriters Laboratories, Inc. to UL 1479 and CANULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 1 and 2 Hr (See Item 1)	F Rating — 1 and 2 Hr (See Item 1)
T Rating — 0 and 3/4 Hr (See Item 1)	FT Rating — 0 and 3/4 Hr (See Item 1)
	FH Rating — 1 and 2 Hr (See Item 1)
	FTH Rating — 0 and 3/4 Hr (See Item 1)



1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, U400 or V400 Series Wall or Partition Designs in the UL Fire Resistance Directory and shall incorporate the following construction features:
   A. Studs — Wall framing shall consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Opening in gypsum board to be max 2-1/2 in. (64 mm) diam for 2" device and max 4-1/2 in. (114 mm) diam for 4" device.

   The F, FH Ratings of the firestop system are dependent upon the hourly rating of the wall in which it is installed.
2. Cables — Within the loading area for each firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
      AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket .
   J. Max 3/C No 12 AWG MC Cable.
   K. Through Penetrating Product* — Any cables, Armored Cable+ or Metal Clad Cable+ currently Classified under the Through Penetrating Product category. See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.

   When the hourly rating of the wall assembly is 1 hr, the T, FT and FTH Ratings are 0 hr. When the hourly rating of the wall assembly is 2 hr, the T, FT and FTH Ratings are 1 hr except that, when Item 2J or 2K is used, the T, FT and FTH Ratings are 1/2 hr
   L Ratings vary depending on whether the gasketing material (see Item 3) or the sealant (Item 4) is used. See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM/Sq Ft				L Rating, CFM			
		Ambient		400°F		Ambient		400°F	
		Sealant	Gasket	Sealant	Gasket	Sealant	Gasket	Sealant	Gasket
0%	---	Less than 1	1.0	Less than 1	2.7	Less than 1	Less than 1	Less than 1	Less than 1
100%	Item 2D only	4.9	4.9	1.3	3.5	Less than 1	Less than 1	Less than 1	Less than 1
100%	Any cables (Item 2) in any combination	9.2	9.2	9.6	11.8	1.2	1.2	1.3	1.6

3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. As an option, the inner fabric seal may remain open except that, to attain the L Rating, the inner fabric seal shall be twisted to completely close off the opening within device. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device flanges are to be secured to wall with min two 1-1/2 in. (38 mm) long drywall screws except that for blank devices, minimum four screws shall be used. . As an alternate to gasket material, fill material (Item 4) may be used.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* — As an alternate to gasket material (see Item 3), min 5/8 in. (16 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall. When sealant is used, for L Ratings, apply an additional 1/4 in. (6 mm) bead of FS-ONE or CP 606 at the device/wall interface on both sides of wall prior to installing flanges.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant, FS-ONE MAX Intumescent Sealant, CP 606 Sealant or CP 618 Putty

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

Hilti Firestop Systems

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System No. W-L-8085 (Cont.)

Classified by Underwriters Laboratories, Inc. to UL 1479 and CANULC-S115

2B. Tube Insulation - Plasticsil* — Nom 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. The tube insulation may be installed on one max 1 in. (25 mm) diam pipe or tube in each AC line set. The space between the insulated and uninsulated pipes or tubes within each AC line set shall be 0 in. (point contact).
   See Plasticsil (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation meeting the above specifications and having a UL 94 Flammability Classification of 94five/A may be used.
2C. Cable — One 4 pair No. 18 AWG (or smaller) thermostat cable with polyvinyl chloride (PVC) insulation and jacket materials may be installed with each AC line set.
3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, tightly twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. As an alternate to gasket material, sealant (Item 4) may be used.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall, and an additional 1/4 in. (6 mm) bead applied around periphery of device.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606, FS-ONE Sealant or FS-ONE MAX Intumescent Sealant or CP 606 Sealant

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

Hilti Firestop Systems

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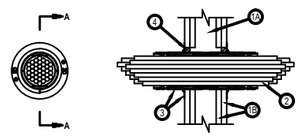
System No. W-L-3335

Classified by Underwriters Laboratories, Inc. to UL 1479 and CANULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 0, 1/2 and 1 Hr (See Item 2)	FT Ratings - 0, 1/2 and 1 Hr (See Item 2)
L Rating At Ambient -See Items 2 and 4	FH Ratings - 1 and 2 Hr (See Item 1)
L Ratings At 400 F - See Items 2 and 4	FTH Ratings - 0, 1/2 and 1 Hr (See Item 2)
	L Rating At Ambient -See Items 2 and 4
	L Ratings At 400 F - See Items 2 and 4



1. Wall Assembly — The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, 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 either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide when 3/4 in. (19 mm) thick gypsum board is used (see Item 1B).
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Alternately, min one layer of nom 3/4 in. (19 mm) thick gypsum board on each side of wall as specified in the individual Wall and Partition Design may be used. Opening in gypsum board to be max 3 in. (76 mm) diam for 2" device and max 5 in. (127 mm) diam for 4" device.

   The hourly F and FH Ratings of the firestop system are dependent upon the hourly rating of the wall in which it is installed.
2. Cables — Within the loading area for each firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
      AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket .
   J. Max 3/C No 12 AWG MC Cable.
   K. Through Penetrating Product* — Any cables, Armored Cable+ or Metal Clad Cable+ currently Classified under the Through Penetrating Product category. See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.

   When the hourly rating of the wall assembly is 1 hr, the T, FT and FTH Ratings are 0 hr. When the hourly rating of the wall assembly is 2 hr, the T, FT and FTH Ratings are 1 hr except that, when Item 2J or 2K is used, the T, FT and FTH Ratings are 1/2 hr
   L Ratings vary depending on whether the gasketing material (see Item 3) or the sealant (Item 4) is used. See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM Per Device			
		Ambient		400°F	
		Sealant	Gasket	Sealant	Gasket
0%	---	Less than 1	Less than 1	Less than 1	Less than 1
100%	Item 2D only	Less than 1	Less than 1	Less than 1	Less than 1
100%	Any cables (Item 2) in any combination	1.2	1.2	1.3	1.6

3. Firestop System — The firestop system shall consist of the following:
   A. Firestop Device* — Maximum five firestop devices grouped in two row configuration as depicted. The individual openings in the wall for each device are spaced min 2-7/16 in. (62 mm) apart such that the device flanges of adjacent devices are no closer than point contact. Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. As an option, the inner fabric seal may remain open except that, for all blank devices (no cables), the inner fabric seal shall be twisted to completely close the device. In addition, to attain the L Rating, the inner fabric seal must also be twisted to completely close the opening within each device. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. The annular space between each device and the periphery of the opening shall be nom 0 in. (point contact). Device flanges are to be secured to wall with min two 1-1/4 in. (32 mm) long masonry screws or anchors.
      As an alternate to gasket material, sealant (Item 3B) may be used.
      HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
   A1. Firestop Device* — Same as Item A above except maximum four firestop devices grouped in one row as depicted. The individual openings in the wall for each device are spaced min 1-7/16 in. (36.5 mm) apart. Device flanges may overlap one another. As an option, the inner fabric seal may remain open except that, to attain the L Rating, the inner fabric seal shall be twisted to completely close off the opening within each device.
      HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
   B. Fill, Void or Cavity Material* — As an alternate to gasket material (see Item 3A), min 1/4 in. (6 mm) bead of fill material applied around periphery of each device to wall interface on both sides of wall prior to installing device flanges.
      HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606 or FS-ONE Sealant or FS-ONE MAX Intumescent Sealant.

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

Hilti Firestop Systems

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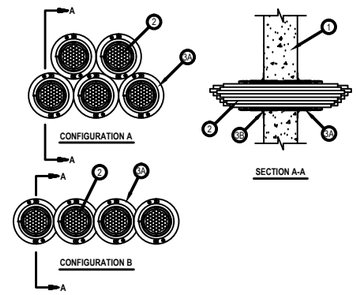
System No. W-J-3189

Classified by Underwriters Laboratories, Inc. to UL 1479 and CANULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Ratings - 1/2 and 1-1/2 Hr (See Item 2)	FT Ratings - 1/2 and 1-1/2 Hr (See Item 2)
L Rating At Ambient - 1.2 and Less Than 1 CFM per Device (See Items 2, 3A and 3A1)	FH Rating - 2 Hr
L Ratings At 400 F - 1.3, 1.6 and Less Than 1 CFM per Device (See Items 2, 3A and 3A1)	FTH Ratings - 1/2 and 1-1/2 Hr (See Item 2)
	L Rating At Ambient - Less Than 1.2 and CFM per Device(See Items 2, 3A and 3A1)
	L Ratings At 400 F - 1.3, 1.6 and Less Than 1 CFM per Device (See Items 2, 3A and 3A1)



1. Wall Assembly — Minimum 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks*. Maximum five individual openings may be provided (see Item 3A). Diam of opening for each firestop device shall not exceed 4-1/2 in. (114 mm) and shall be sized to the OD of the firestop device.
   See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Cables — The aggregate cross-sectional area of cables in firestop devices to be min 0 percent (blank) to max 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of wall assembly. Any combination of the following types and sizes of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
      AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket .
   J. Max 3/C No 12 AWG MC Cable.
   K. Through Penetrating Product* — Any cables, Armored Cable+ or Metal Clad Cable+ currently Classified under the Through Penetrating Product category. See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.

   For openings with cables, the T, FT and FTH Ratings are 1/2 hr. For blank opening (no cables), the T, FT and FTH Ratings are 1-1/2 hr.
   L Ratings vary depending on whether the gasketing material (see Item 3) or the sealant (Item 4) is used. See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM Per Device			
		Ambient		400°F	
		Sealant	Gasket	Sealant	Gasket
0%	---	Less than 1	Less than 1	Less than 1	Less than 1
100%	Item 2D only	Less than 1	Less than 1	Less than 1	Less than 1
100%	Any cables (Item 2) in any combination	1.2	1.2	1.3	1.6

3. Firestop System — The firestop system shall consist of the following:
   A. Firestop Device* — Maximum five firestop devices grouped in two row configuration as depicted. The individual openings in the wall for each device are spaced min 2-7/16 in. (62 mm) apart such that the device flanges of adjacent devices are no closer than point contact. Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. As an option, the inner fabric seal may remain open except that, for all blank devices (no cables), the inner fabric seal shall be twisted to completely close the device. In addition, to attain the L Rating, the inner fabric seal must also be twisted to completely close the opening within each device. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. The annular space between each device and the periphery of the opening shall be nom 0 in. (point contact). Device flanges are to be secured to wall with min two 1-1/4 in. (32 mm) long masonry screws or anchors.
      As an alternate to gasket material, sealant (Item 3B) may be used.
      HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
   A1. Firestop Device* — Same as Item A above except maximum four firestop devices grouped in one row as depicted. The individual openings in the wall for each device are spaced min 1-7/16 in. (36.5 mm) apart. Device flanges may overlap one another. As an option, the inner fabric seal may remain open except that, to attain the L Rating, the inner fabric seal shall be twisted to completely close off the opening within each device.
      HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
   B. Fill, Void or Cavity Material* — As an alternate to gasket material (see Item 3A), min 1/4 in. (6 mm) bead of fill material applied around periphery of each device to wall interface on both sides of wall prior to installing device flanges.
      HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606, FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

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

Hilti Firestop Systems

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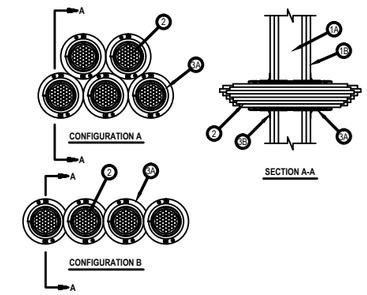
System No. W-L-3384

Classified by Underwriters Laboratories, Inc. to UL 1479 and CANULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1/2 and 1 Hr (See Item 2)	FT Ratings - 1/2 and 1 Hr (See Item 2)
L Rating At Ambient - 1.2 and Less Than 1 CFM per Device (See Items 2, 3A and 3A1)	FH Ratings - 1 and 2 Hr (See Item 1)
L Ratings At 400 F - 1.3, 1.6 and Less Than 1 CFM per Device (See Items 2, 3A and 3A1)	FTH Ratings - 1/2 and 1 Hr (See Item 2)
	L Rating At Ambient - 1.2 and Less Than 1 CFM per Device (See Items 2, 3A and 3A1)
	L Ratings At 400 F - 1.3, 1.6 and Less Than 1 CFM per Device (See Items 2, 3A and 3A1)



1. Wall Assembly — The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing shall consist of steel channel studs. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced 24 in. (610 mm) OC.
   B. Gypsum Board* — The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U400, V400 or W400 Series Designs in the UL Fire Resistance Directory. Maximum five individual openings may be provided (see Item 3A). Diam of opening for each firestop device shall not exceed 4-1/2 in. (114 mm) and shall be sized to the OD of the firestop device.

   The hourly F and FH Ratings of the firestop system are equal to the hourly rating of the wall assembly in which it is installed.
2. Cables — The aggregate cross-sectional area of cables in firestop device to be min 0 percent (blank) to max 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of wall assembly. Any combination of the following types and sizes of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
      AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket .
   J. Max 3/C No 12 AWG MC Cable.
   K. Through Penetrating Product* — Any cables, Armored Cable+ or Metal Clad Cable+ currently Classified under the Through Penetrating Product category. See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.

   For opening with cables, the T, FT and FTH Ratings are 1/2 hr. For blank opening (no cables), when the hourly rating of the wall assembly is 2 hr, the T, FT and FTH Ratings are 1 hr. For blank opening (no cables), when the hourly rating of the wall assembly is 1 hr, the T, FT and FTH Ratings are 1/2 hr.
   L Ratings vary depending on whether the gasketing material (see Item 3) or the sealant (Item 4) is used. See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM			
		Ambient		400 F	
		Sealant	Gasket	Sealant	Gasket
0%	---	Less than 1	Less than 1	Less than 1	Less than 1
100%	Item 2D only	Less than 1	Less than 1	Less than 1	Less than 1
100%	Any cables (Item2) in any combination	1.2	1.2	1.3	1.6

3. Firestop System — The firestop system shall consist of the following:
   A. Firestop Device* — Maximum five firestop devices grouped in two row configuration as depicted (Configuration A). The individual openings in the wall for each device are spaced min 2-7/16 in. (62 mm) apart such that the device flanges of adjacent devices are no closer than point contact. Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. As an option, the inner fabric seal within each device may remain open except that, for all blank devices (no cables), the inner fabric seal shall be twisted to completely close the device. In addition, to attain the L Rating, the inner fabric seal must also be twisted to completely close the opening within each device. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. The annular space between each device and the periphery of the opening shall be nom 0 in. (point contact). Device flanges are to be secured to wall with min two 1-1/2 in. (38 mm) long drywall screws. As an alternate to gasket material, sealant (Item 3B) may be used.
      HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
   A1. Firestop Device* — Same as Item A above except maximum four firestop devices grouped in one row as depicted (Configuration B). The individual openings in the wall for each device are spaced min 1-7/16 in. (36.5 mm) apart. Device flanges may overlap one another. As an option, the inner fabric seal may remain open except that, to attain the L Rating, the inner fabric seal shall be twisted to completely close off the opening within each device.
      HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 2" Speed Sleeve and CP 653 4" Speed Sleeve
   B. Fill, Void or Cavity Material* — As an alternate to gasket material (see Item 3A), min 1/4 in. (6 mm) bead of fill material applied around periphery of each device to wall interface on both sides of wall prior to installing device flanges.
      HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606, FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

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

Hilti Firestop Systems

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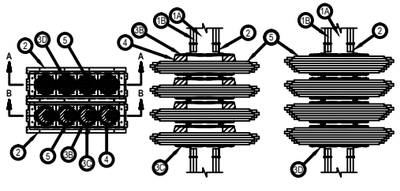
Notes:

1. *Refer to section 16055 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.*
2. *Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following: * Minimum and maximum Width of Joints * Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.*
3. *If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable.

System No. W-L-3395

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Items 1 and 2)	F Ratings - 1 and 2 Hr (See Items 1 and 2)
T Rating - 1/4 Hr	FT Rating - 1/4 Hr
L Rating At Ambient - See Item 5	FH Ratings - 1 and 2 Hr (See Items 1 and 2)
L Rating At 400F - See Item 5	FTH Ratings - 1/4 Hr
	L Rating At Ambient - See Item 5
	L Rating At 400F - See Item 5



1. Wall Assembly — The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within 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. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Maximum size of opening in gypsum board is dependent on the mounting of the gangplate firestop device (Item 2). Openings for gangplates that are surface mounted to the gypsum board may be oriented vertically or horizontally. Openings for gangplates that are stud mounted direct to the wall studs prior to gypsum board layers are oriented horizontally. Maximum opening sizes are specified in Table below.

FIRESTOP DEVICE (Item 2)	MAXIMUM OPENING SIZE GANGPLATE MOUNTING			
	SURFACE MOUNTED		STUD MOUNTED	
24" PLATE :				
SINGLE	20-1/2" x 5-1/2" x 140)	(521	23" x 6-3/4" 171)	(584 x
DOUBLE (STACKED)	20-1/2" x 13-1/4" x 337)	(521	23" x 14-1/4" 362)	(584 x
16" PLATE :				
SINGLE	15" x 5-1/2" x 140)	(381	15-3/16" x 6-3/4" x 171)	(386
DOUBLE (STACKED)	15" x 13-1/4" x 337)	(381	15-3/16" x 14-1/4" x 362)	(386

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

2. Firestop Device* — The firestop device consists of a steel plate sandwich construction with three (16" device size) or four (24" device size) circular opening ports which are each nom 4 in. (102 mm) diam. The firestop device is intended to be oriented vertically or horizontally and mounted to the face of the opening on both sides of wall. The 16" and 24" firestop devices when oriented horizontally are attached to the 16 in. (406 mm) and 24 in. (610 mm), respectively, center to center spaced wall studs at each side of opening, over the gypsum board. As an option, up to two devices may be installed adjacent to each other with a nom 13/16 in. (2 cm) overlap to protect larger sized openings (see Item 1B, double device). As an option, single and double 16" and 24" gang plates may be attached directly against the studs prior to installation of the gypsum board layers. When 16" gang plate is installed horizontally in 24" stud cavity, attachment of plate to wall studs is optional. As an option, two devices may be installed end to end in adjacent stud cavities, over the gypsum board layers or directly attached to the wall studs when installed in accordance with the Hilti Installation Instructions and min one layer of gypsum board each side of wall is continuous across the two stud cavities. Each device shall be secured to gypsum board with min No. 10 by 1-1/2 in. (38 mm) steel drywall screws through prepunched holes around periphery of steel device plates; min three (16" gang plate) or four (24" gang plate) screws are used at each long dimension and three screws at each end. When device is secured direct to studs prior to installation of gypsum board layers, the fasteners along each long dimension of opening are spaced max 2-1/2 in. (64 mm) from corners and max 6 in. (152 mm) on center unless otherwise noted in Hilti Installation Instructions. Min screw length is 3/4 in. (19 mm) where device is secured direct to studs and at the overlapping plate to plate joint for double devices. The device shall be installed in accordance with the accompanying installation instructions. When the hourly rating of the wall assembly is 1 hr, blank gang plates (no cables) may be installed vertically or horizontally for single gang plate openings only, and double gang plates are limited to installation horizontally with fasteners at ends of plates penetrating into wall studs.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-SL GP 16" and 24" Firestop Gangplate
3. Firestop Device — Within each circular opening port of the CFS-SL GP firestop gang plates (Item 2), one of the following firestop devices shall be installed. Any combination of these firestop devices may be used within each gang plate.
   3A. Firestop Device* — Rectangular steel plate designed to close port openings with no penetrants. Plate is field installed in accordance with Hilti Installation Instructions. Flanges of gang plate over port opening are removed by loosening GP nuts, the steel plate cap installed with prepunched holes aligned with GP fasteners, and the flanges of GP then reinstalled and nuts reinstalled to tighten the plates in position.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-SL GP CAP Firestop Gangplate CAP
   3B. Firestop Device* — Firestop device consists of a corrugated steel tube. The device flanges are removed by spinning counterclockwise and are not used. Device tube slid into gang plate port opening and centered within wall such that ends of device tube project an approximate equal distance from the gang plate on each side of wall. The two integral screws within the flange of the gang plate port at each side of wall are tightened to firmly bear against the device sleeve to retain it in position. Device is designed to allow installation before or after the cable penetrants (if employed) are in place. Device is used in combination with the firestop plugs described in Item 4.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-SL RK 4" Firestop Sleeve
   3C. Firestop Device* — Firestop device consists of a corrugated steel tube. The device flanges are removed by spinning counterclockwise and are not used. Device tube slid into gang plate port opening and centered within wall such that ends of device tube project an approximate equal distance from the gang plate on each side of wall. The two integral screws within the flange of the gang plate port at each side of wall are tightened to firmly bear against the device sleeve to retain it in position. Device is used in combination with the firestop plugs described in Item 4.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-SL SK 4" Firestop Retrofit Sleeve
   3D. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings and twisted inner fabric smoke seal. The device flanges are to be spun counterclockwise and removed since they are not used. Device tube slid into gang plate port opening and centered within wall such that ends of device tube project an approximate equal distance from the gang plate on each side of wall. The two integral screws within the flange of the gang plate port at each side of wall are tightened to firmly bear against the device sleeve to retain it in position. The inner fabric seal shall be twisted to completely close off any unused opening within the device.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 4" Speed Sleeve
4. Fill, Void or Cavity Material* - Plug — Plugs are required to be used with the CFS-SL RK and SK firestop devices (Items 3B and 3C). Nom 4" diam plug friction fit within the device sleeve flush with each end of the device on both sides of wall. Plug cut to fit around the cable bundle (if used) and installed tightly within the device sleeve.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-PL Firestop Plug 4"
5. Cables — Within the loading area for each firestop device (Items 3B through 3D), a tightly bundled cable may be installed. The aggregate cross-sectional area of cables shall be min 0 to max 60 percent fill for each CFS-SL RK and CFS-SL SK firestop device (Items 3B and 3C). For the CP 653 Speed Sleeve firestop device (Item 3D), the cables can be used for a 0 to 100 percent visual fill. Cables to be rigidly supported on both sides of wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 3/C No 12 AWG MC Cable.
The L Ratings are dependent on the type and number of devices within the gang plate and the cable type and fill. For devices with cable bundle, the cable bundle shall be nominally centered within the device to attain the L Ratings. The L Ratings in CFM per GP device (Table 1) and in CFM per ft2 of opening (Table 2) are specified below:

Table 1 - CFM per CFS-SL GP Gangplate Device at Ambient and 400F

	TYPE AND NUMBER OF DEVICES IN CFS-SL GP (CAP - ITEM 3A; DEVICES - ANY COMBINATION OF ITEMS 3B THROUGH 3D EXCEPT AS NOTED)				
	CAP(S) ONLY	CAP(S) AND ONE DEVICE	CAP(S) AND TWO DEVICES	CAP (OPT) AND THREE DEVICES	FOUR DEVICES
BLANK OPENING (NO CABLES) :	LESS THAN 1	1	2	2.5	3.5
OPENINGS WITH ANY COMBINATION OF ITEM 5 CABLES FOR MAX 33% AGGREGATE FILL IN DEVICE TYPES 3B AND 3C, AND/OR MAX 100% VISUAL CABLE FILL IN DEVICE TYPE 3D	-	2	4	6	8
	CAP(S) ONLY	CAP(S) AND ONE CP 653 DEVICE (ITEM 3D)	CAP(S) AND TWO CP 653 DEVICES (ITEM 3D)	CAP (OPT) AND THREE CP 653 DEVICES (ITEM 3D)	FOUR CP 653 DEVICES (ITEM 3D)
OPENINGS WITH MAX 100% VISUAL CABLE FILL WITH CABLE TYPE 5D ONLY AND CP 653 ONLY	-	1.5	3	4	5.5

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August 27, 2013

System No. W-L-3395 (Cont.)

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

Table 2 - CFM per FT2 of Opening at Ambient and 400F

	TYPE AND NUMBER OF DEVICES IN CFS-SL GP (CAP - ITEM 3A; DEVICES - ANY COMBINATION OF ITEMS 3B THROUGH 3D EXCEPT AS NOTED)				
	CAP(S) ONLY	CAP(S) AND ONE DEVICE	CAP(S) AND TWO DEVICES	CAP (OPT) AND THREE DEVICES	FOUR DEVICES
BLANK OPENING (NO CABLES) :	1.2	1.3	2.6	3.2	4.5
OPENINGS WITH ANY COMBINATION OF ITEM 5 CABLES FOR MAX 33% AGGREGATE FILL IN DEVICE TYPES 3B AND 3C, AND/OR MAX 100% VISUAL CABLE FILL IN DEVICE TYPE 3D	-	2.6	5.1	7.7	10.2
	CAP(S) ONLY	CAP(S) AND ONE CP 653 DEVICE (ITEM 3D)	CAP(S) AND TWO CP 653 DEVICES (ITEM 3D)	CAP (OPT) AND THREE CP 653 DEVICES (ITEM 3D)	FOUR CP 653 DEVICES (ITEM 3D)
OPENINGS WITH MAX 100% VISUAL CABLE FILL WITH CABLE TYPE 5D ONLY AND CP 653 ONLY	-	1.9	3.8	5.1	7.0

*Bearing the UL Classification Mark

Hilti Firestop Systems
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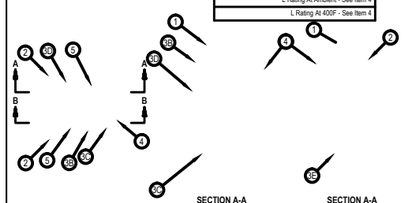
August 27, 2013

System No. W-J-3200

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 2 Hr	F Ratings - 2 Hr
T Rating - 1/4 Hr	FT Rating - 1/4 Hr
L Rating At Ambient - See Item 4	FH Ratings - 2 Hr
L Rating At 400F - See Item 4	FTH Ratings - 1/4 Hr
	L Rating At Ambient - See Item 4
	L Rating At 400F - See Item 4



1. Wall Assembly — Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Maximum opening sizes are specified in Table below. Opening may be oriented vertically or horizontally.

FIRESTOP DEVICE	MAXIMUM OPENING SIZE
24" PLATE :	
SINGLE	5-1/2" x 20-1/2"
DOUBLE (STACKED)	13-1/4" x 20-1/2"
16" PLATE :	
SINGLE	5-1/2" x 15"
DOUBLE (STACKED)	13-1/4" x 15"

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

2. Firestop Device* — The firestop device consists of a steel plate sandwich construction with three (16" device size) or four (24" device size) circular opening ports which are each nom 4 in. (102 mm) diam. The firestop device is intended to be oriented vertically or horizontally and mounted to the face of the opening on both sides of wall. As an option, up to two devices may be installed adjacent to each other with a nom 13/16 in. (2 cm) overlap to protect larger sized openings (see Item 1 for double device). Each device shall be secured to wall with min 1-1/2 in. (38 mm) long masonry screws or anchors through prepunched holes around periphery of steel device plates; min three (16" gang plate) or four (24" gang plate) fasteners are used at each long dimension and three fasteners at each end. For double plate installations, four min No. 10 by 3/4 in. (19 mm) steel screws are used to secure the plate to plate joint through prepunched holes in the plate. The device shall be installed in accordance with the accompanying installation instructions.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-SL GP 16" and 24" Firestop Gangplate
3. Firestop Device — Within each circular opening port of the CFS-SL GP firestop gang plates (Item 2), one of the following firestop devices shall be installed. Any combination of these firestop devices may be used within each gang plate.
   3A. Firestop Device* — (Not Shown) Rectangular steel plate designed to close port openings with no penetrants. Plate is field installed in accordance with Hilti Installation Instructions. Flanges of gang plate over port opening are removed by loosening GP nuts, the steel plate cap installed with prepunched holes aligned with GP fasteners, and the flanges of GP then reinstalled and nuts reinstalled to tighten the plates in position.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-SL GP CAP Firestop Gangplate CAP
   3B. Firestop Device* — Firestop device consists of a corrugated steel tube. The device flanges are removed by spinning counterclockwise and are not used. Device tube slid into gang plate port opening and centered within wall such that ends of device tube project an approximate equal distance from the gang plate on each side of wall. The two integral screws within the flange of the gang plate port at each side of wall are tightened to firmly bear against the device sleeve to retain it in position. Device is designed to allow installation before or after the cable penetrants (if employed) are in place. Device is used in combination with the firestop plugs described in Item 3D.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-SL RK 4" Firestop Sleeve
   3C. Firestop Device* — Firestop device consists of a corrugated steel tube. The device flanges are removed by spinning counterclockwise and are not used. Device tube slid into gang plate port opening and centered within wall such that ends of device tube project an approximate equal distance from the gang plate on each side of wall. The two integral screws within the flange of the gang plate port at each side of wall are tightened to firmly bear against the device sleeve to retain it in position. Device is used in combination with the firestop plugs described in Item 3D.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-SL SK 4" Firestop Sleeve
   3D. Fill, Void or Cavity Material* - Plug — Plugs are required to be used with the CFS-SL RK and SK firestop devices (Items 3B and 3C). Nom 4" diam plug friction fit within the device sleeve flush with each end of the device on both sides of wall. Plug cut to fit around the cable bundle (if used) and installed tightly within the device sleeve.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-PL Firestop Plug 4"
   3E. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings and twisted inner fabric smoke seal. The device flanges are to be spun counterclockwise and removed since they are not used. Device tube slid into gang plate port opening and centered within wall such that ends of device tube project an approximate equal distance from the gang plate on each side of wall. The two integral screws within the flange of the gang plate port at each side of wall are tightened to firmly bear against the device sleeve to retain it in position. The inner fabric seal shall be twisted to completely close off any unused opening within the device.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 4" Speed Sleeve
4. Cables — Within the loading area for each firestop device (Items 3B through 3E), a tightly bundled cable may be installed. The aggregate cross-sectional area of cables shall be min 0 to max 60 percent fill for each CFS-SL RK and CFS-SL SK firestop device (Items 3B and 3C). For the CP 653 Speed Sleeve firestop device (Item 3E), the cables can be used for a 0 to 100 percent visual fill. Cables to be rigidly supported on both sides of wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 3/C No 12 AWG MC Cable.
The L Ratings are dependent on the type and number of devices within the gang plate and the cable type and fill. For devices with cable bundle, the cable bundle shall be nominally centered within the device to attain the L Ratings. The L Ratings in CFM per GP device (Table 1) and in CFM per ft2 of opening (Table 2) are specified below:

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January 25, 2013

System No. W-J-3200 (Cont.)

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

Table 1 - CFM per CFS-SL GP Gangplate Device at Ambient and 400F

	TYPE AND NUMBER OF DEVICES IN CFS-SL GP (CAP - ITEM 3A; DEVICES - ANY COMBINATION OF ITEMS 3B THROUGH 3D EXCEPT AS NOTED)				
	CAP(S) ONLY	CAP(S) AND ONE DEVICE	CAP(S) AND TWO DEVICES	CAP (OPT) AND THREE DEVICES	FOUR DEVICES
BLANK OPENING (NO CABLES) :	LESS THAN 1	1	2	2.5	3.5
OPENINGS WITH ANY COMBINATION OF ITEM 5 CABLES FOR MAX 33% AGGREGATE FILL IN DEVICE TYPES 3B AND 3C, AND/OR MAX 100% VISUAL CABLE FILL IN DEVICE TYPE 3D	-	2	4	6	8
	CAP(S) ONLY	CAP(S) AND ONE CP 653 DEVICE (ITEM 3D)	CAP(S) AND TWO CP 653 DEVICES (ITEM 3D)	CAP (OPT) AND THREE CP 653 DEVICES (ITEM 3D)	FOUR CP 653 DEVICES (ITEM 3D)
OPENINGS WITH MAX 100% VISUAL CABLE FILL WITH CABLE TYPE 5D ONLY AND CP 653 ONLY	-	1.9	3.8	5.1	7.0

Table 2 - CFM per FT2 of Opening at Ambient and 400F

	TYPE AND NUMBER OF DEVICES IN CFS-SL GP (CAP - ITEM 3A; DEVICES - ANY COMBINATION OF ITEMS 3B THROUGH 3D EXCEPT AS NOTED)				
	CAP(S) ONLY	CAP(S) AND ONE DEVICE	CAP(S) AND TWO DEVICES	CAP (OPT) AND THREE DEVICES	FOUR DEVICES
BLANK OPENING (NO CABLES) :	1.2	1.3	2.6	3.2	4.5
OPENINGS WITH ANY COMBINATION OF ITEM 5 CABLES FOR MAX 33% AGGREGATE FILL IN DEVICE TYPES 3B AND 3C, AND/OR MAX 100% VISUAL CABLE FILL IN DEVICE TYPE 3D	-	2.6	5.1	7.7	10.2
	CAP(S) ONLY	CAP(S) AND ONE CP 653 DEVICE (ITEM 3D)	CAP(S) AND TWO CP 653 DEVICES (ITEM 3D)	CAP (OPT) AND THREE CP 653 DEVICES (ITEM 3D)	FOUR CP 653 DEVICES (ITEM 3D)
OPENINGS WITH MAX 100% VISUAL CABLE FILL WITH CABLE TYPE 5D ONLY AND CP 653 ONLY	-	1.5	3	4	5.5

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January 25, 2013

Notes:

1. *Refer to section 16055 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.*
2. *Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following: * Minimum and maximum Width of Joints * Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.*
3. *If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.*
4. *References:*
   - *2013 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 to that of construction being penetrated.*
6. *All rated through-penetration assemblies shall be prominently labeled with the following information:*
   - *ATTENTION: Fire Rated Assembly*
   - *UL System # * Product(s) used*
   - *Hourly Rating (F-Rating)*
   - *Installation Date*
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.)*

<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:

REVISIONS:

TYPICAL CP 653 SPEED SLEEVE DETAILS

SHEET NAME:

SHEET NUMBER:

CP 653 4.4