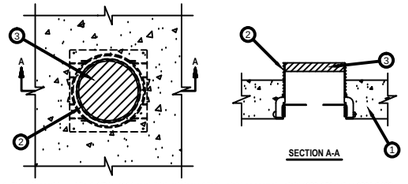
System No. F-A-0006

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



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete. When CP618 Firestop Putty Stick is used with the 2, 2.5 or 4 in. devices, the hourly T Rating is 3 Hr. When the 6 in. device is used, the hourly T Rating is 2-1/2 Hr. When mineral wool insulation is used within the firestop devices, the hourly T Rating is 0 Hr for 4 and 6 in. devices and 3 hr for 2, 2.5 and 3 in. devices.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-160/6"N, CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6"
3. Fill, Void or Cavity Material* - Putty — Min 1 in. (25 mm) thickness of fill material applied within annulus flush with top surface of device.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 618 Firestop Putty Stick
3A. Packing Material (Not Shown) — As an alternate to item 3, min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool insulation firmly packed to the fullest extent possible within annulus flush with top surface of device.
*Bearing the UL Classification Mark

Hilti Firestop Systems

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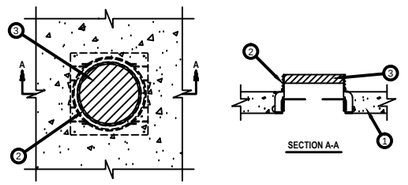
December 13, 2006

System No. F-A-0005

F Rating — 2 Hr
T Rating — 1 Hr



1. Floor Assembly — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly — (Optional - Not Shown)—The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
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 non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-110/4"N, CP 682-110/4", CP680 -75/2.5"N, CP 682-75/2.5", CP 680-M 2", CP 680-M 3", CP 680-M 4", CP 680-P 2", CP 680-P 3", CP 680-P 4"
3. Fill, Void or Cavity Material*—Putty — Min 1 in. (25 mm) thickness of fill material applied within device flush with top surface of device.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 618 Firestop Putty Stick
*Bearing the UL Classification Mark

Hilti Firestop Systems

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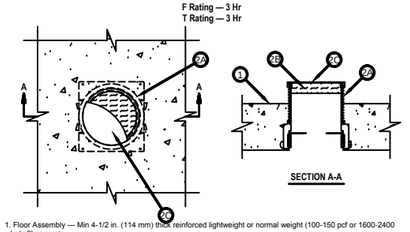
December 13, 2006

System No. F-A-0014

F Rating — 3 Hr
T Rating — 3 Hr



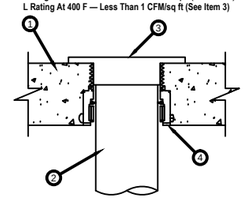
1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Steel Floor Unit/ Floor Assembly — (Not Shown)- As an alternate to Item 1, the floor assembly may consist of a fluted steel floor unit/ concrete floor assembly. The floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Designs in the Fire Resistance Directory and shall include the following construction features:
A. Steel Floor and Form Units* — Composite or non-composite 1-1/2 in. to 3 in. (38 to 76 mm) deep fluted galv steel units as specified in the individual Floor-Ceiling Design.
B. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete, as measured from the top plane of the floor units.
2. Firestop System — The firestop system shall consist of the following:
A. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the floor.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-110/4"N, CP 682-110/4", CP680 -75/2.5"N, CP 682-75/2.5", CP 680-M 2", CP 680-M 3", CP 680-M 4", CP 680-P 2", CP 680-P 3", CP 680-P 4"
B. Packing Material — Min 1 in. (25 mm) thickness of min 4 pcf mineral wool batt insulation firmly packed within the top of device (Item 2A), flush with the top surface of the device.
C. Firestop Device* - Firestop Device Cap — For CP 680N and 682 devices, plastic cap screwed to firestop device in three places with 3/8 in. long screws. The CP 680-M and -P devices are provided with a plastic cap that is threaded onto top of device.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-10/4"N Cap, CP 682-110/4" Cap, CP 680 -75/2.5"N Cap, CP 682-75/2.5" Cap, CP 680-M 2, 3 and 4" Caps, CP 680-P 2, 3 and 4" Caps
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
December 13, 2006

System No. F-A-2071

F Rating — 3 Hr
T Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/sq ft (See Item 3)
L Rating At 400 F — Less Than 1 CFM/sq ft (See Item 3)



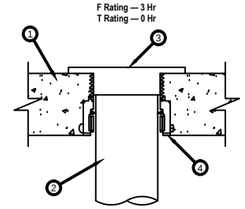
1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf) concrete.
1A. Floor Assembly — (Optional - Not Shown)-The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions. Device to be cut flush with top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP680-110/4"N, CP 680-P 4"
3. Closet Flange — Polyvinyl chloride (PVC) or acrylonitrile butadiene styrene (ABS) closet stub sized to accommodate drain pipe. Closet flange installed over drain piping within top of Firestop Device with flange secured to concrete floor with 1/4 in. (6 mm) diameter steel expansion bolts in conjunction with steel nuts and 3/4 in. (19 mm) diameter steel washers. L Rating applies only to CP 680-P device.
4. Drain Piping — Nom 4 in. (102 mm) diam Schedule 40 cellular or solid core polyvinyl chloride (PVC) or acrylonitrile butadiene styrene (ABS) drain piping and fittings.
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
January 09, 2008

System No. F-A-2072

F Rating — 3 Hr
T Rating — 0 Hr



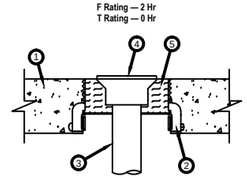
1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly — (Optional - Not Shown)-The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop System — Firestop Device*-Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions. Device to be cut flush with top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2-1/2"N, CP 680-110/4"N, CP 680-160/6"N Cast-In Firestop Device, CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6"
3. Drain Piping — Nom 2 in. (51 mm) diam Schedule 40 cellular or solid core polyvinyl chloride (PVC).
4. Shower Drain Fitting — Polyvinyl chloride (PVC) shower fitting sized to accommodate drain pipe.
5. Packing Material — Min 4 pcf (64 kg/m3) mineral wool batt insulation tightly packed into the device flush with the top surface of the floor. Packing material is optional when CP680-75/2-1/2"N or CP 680-P 2" is employed for item 2.
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
December 13, 2006

System No. F-A-2093

F Rating — 2 Hr
T Rating — 0 Hr



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly — (Optional - Not Shown)-The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop System — The firestop system shall consist of the following:
A. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-160/6"N, CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6"
2A. Firestop Device* - Water Barrier Module — (Optional, Not Shown) - Applies to nom 2", 3", 4" and 6" water barrier modules used in combination with the CP 680-P 2", CP 680-P 3", CP 680-P 4"and CP 680-6" devices, respectively, and supplied by device manufacturer. Module is threaded onto top of device. W Rating applies only when water barrier module is used nom diam of penetrant equals size of device.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Water Barrier Module
2B. Firestop Device* — (Optional. Not shown) - Alternate to Water Barrier Module (Item 2A). Top Seal Plug for use with CP 680-P 2" device installed in accordance with the manufacturer's instructions. W Rating applies only to the IPS Top Seal Plug with nom 2 in. (51 mm) diam penetrants.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — IPS Top Seal Plugs
3. Through Penetrants — One nonmetallic pipe or conduit to be installed within the firestop system. Pipe or conduit to be rigidly supported on both sides of floor-ceiling assembly. For W Rating with Water Barrier Module, pipe shall be installed from bottom of device. The following types and sizes of nonmetallic pipes or conduits may be used:
A. Acryonitrile Butadiene Styrene (ABS) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 cellular or solid core pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
B. Fire Retardant Polypropylene (FRPP) Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems
The firestop device and nonmetallic penetrant shall be sized as follows:

Nom Pipe Diameter	Firestop Device
1-1/2 in. to 2 in. (38 to 51 mm)	CP 680-75/2.5"N CP 680-P 2"
3 in. (76 mm)	CP 680-P 3"
4 in. (102 mm)	CP 680-110/4"N CP 680-P 4"
6 in. (152 mm)	CP 680-160/6"N CP 680-P 6"

++ L Rating applies only to CP 680-P devices. L Rating applies only when the nom diam of pipe equals size of device (2 in. diam pipe in 2" device etc.) L Rating does not apply to CP 680N devices.
*Bearing the UL Classification Mark

Hilti Firestop Systems

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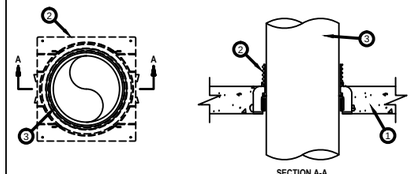
February 27, 2008

System No. F-A-2065

F Rating — 2 Hr
T Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/sq ft (See Item 4)
L Rating At 400 F — Less Than 1 CFM/sq ft (See Item 4)
W Rating — Class 1 (See Items 2A and 3)



1. Floor Assembly — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly - (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
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 non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-160/6"N, CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6"
2A. Firestop Device* - Water Barrier Module — (Optional, Not Shown) - Applies to nom 2", 3", 4" and 6" water barrier modules used in combination with the CP 680-P 2", CP 680-P 3", CP 680-P 4" and CP 680-P 6" devices, respectively, and supplied by device manufacturer. Module is threaded onto top of device. W Rating applies only when water barrier module is used nom diam of penetrant equals size of device.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Water Barrier Module
2B. Firestop Device* — (Optional. Not shown) - Alternate to Water Barrier Module (Item 2A). Top Seal Plug for use with CP 680-P 2" device installed in accordance with the manufacturer's instructions. W Rating applies only to the IPS Top Seal Plug with nom 2 in. (51 mm) diam penetrants.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — IPS Top Seal Plugs
3. Through Penetrants — One nonmetallic pipe or conduit to be installed within the firestop system. Pipe or conduit to be rigidly supported on both sides of floor-ceiling assembly. For W Rating with Water Barrier Module, pipe shall be installed from bottom of device. The following types and sizes of nonmetallic pipes or conduits may be used:
A. Acryonitrile Butadiene Styrene (ABS) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 cellular or solid core pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
B. Fire Retardant Polypropylene (FRPP) Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems
The firestop device and nonmetallic penetrant shall be sized as follows:

Nom Pipe Diameter	Firestop Device
1-1/2 in. to 2 in. (38 to 51 mm)	CP 680-75/2.5"N CP 680-P 2"
3 in. (76 mm)	CP 680-P 3"
4 in. (102 mm)	CP 680-110/4"N CP 680-P 4"
6 in. (152 mm)	CP 680-160/6"N CP 680-P 6"

++ L Rating applies only to CP 680-P devices. L Rating applies only when the nom diam of pipe equals size of device (2 in. diam pipe in 2" device etc.) L Rating does not apply to CP 680N devices.
*Bearing the UL Classification Mark

Hilti Firestop Systems

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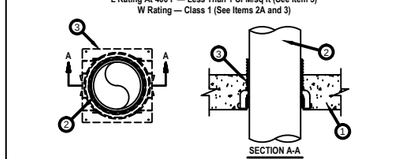
February 27, 2008

System No. F-A-2066

F Rating — 3 Hr
T Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/sq ft (See Item 3)
L Rating At 400 F — Less Than 1 CFM/sq ft (See Item 3)
W Rating — Class 1 (See Items 2A and 3)



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly - (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-160/6"N, CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6"
2A. Firestop Device* - Water Barrier Module — (Optional, Not Shown) - Applies to nom 2", 3", 4" and 6" water barrier modules used in combination with the CP 680-P 2", CP 680-P 3", CP 680-P 4"and CP 680-6" devices, respectively, and supplied by device manufacturer. Module is threaded onto top of device. W Rating applies only when water barrier module is used nom diam of penetrant equals size of device.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Water Barrier Module
2B. Firestop Device* — (Optional. Not shown) - Alternate to Water Barrier Module (Item 2A). Top Seal Plug for use with CP 680-P 2" device installed in accordance with the manufacturer's instructions. W Rating applies only to the IPS Top Seal Plug with nom 2 in. (51 mm) diam penetrants.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — IPS Top Seal Plugs
3. Through Penetrants — One nonmetallic pipe or conduit to be installed within the firestop system. Pipe or conduit to be rigidly supported on both sides of floor-ceiling assembly. For W Rating with Water Barrier Module, pipe shall be installed from bottom of device. The following types and sizes of nonmetallic pipes or conduits may be used:
A. Acryonitrile Butadiene Styrene (ABS) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 cellular or solid core pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
B. Fire Retardant Polypropylene (FRPP) Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. The firestop device and nonmetallic penetrant shall be

Nom Pipe Diameter	Firestop Device
2 in. (51 mm)	CP 680-75/2.5"N CP 680-P 2"
3 in. (76 mm)	CP 680-P 3"
3 in. to 4 in. (76 to 102 mm)	CP 680-110/4"N CP 680-P 4"
6 in.	CP 680-160/6"N CP 680-P 6"

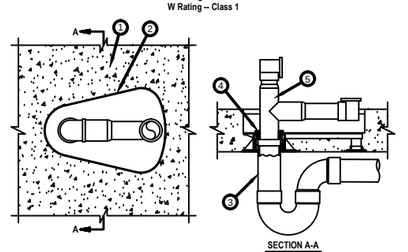
++ L Rating applies only to CP 680-P devices. L Rating applies only when the nom diam of pipe equals size of device (2 in. diam pipe in 2" device etc.) L Rating does not apply to CP 680N devices.
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
February 27, 2008

System No. F-A-2094

F Rating — 3 Hr
T Rating — 3/4 Hr
W Rating — Class 1



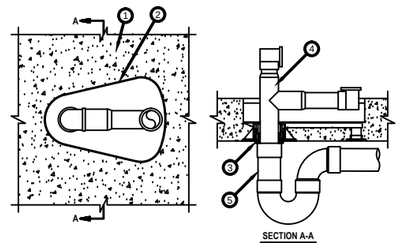
1. Floor Assembly — Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete.
2. Firestop Device*- Tub Box — Nom 8-1/2 by 12 by 2 in. deep acrylonitrile butadiene styrene (ABS) tub box with adjustable legs and intumescent coupling. Cast in place firestop device attached to form and permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions. Min concrete thickness of 2 in. shall be maintained below tub box.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- CP 681 Tub Box Kit
3. Drain Piping -- Nom 2 in. diam Schedule 40 polyvinyl chloride (PVC) cemented together and cemented within the device. Drain piping rigidly supported away from tub box with suitable hangers.
3A. Alternate Drain Piping -- (Optional - Not Shown) - Nom 2 in. diam PVC pipe cemented within device. Cast iron P trap secured to PVC pipe with a compression coupling. Drain piping rigidly supported away from tub box with suitable hangers.
4. Tub Box Seal -- Elastomeric tub box seal (supplied with tub box kit) sized to accommodate 1-1/2 in. PVC waste/overflow fitting. Seal seated from top within device coupling.
5. Waste/Overflow Fitting -- Nom 1-1/2 in. diam Schedule 40 or thin wall polyvinyl chloride (PVC) waste/overflow fitting.
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
February 24, 2006

System No. F-A-2095

F Rating -- 3 Hr
T Rating -- 3/4 Hr



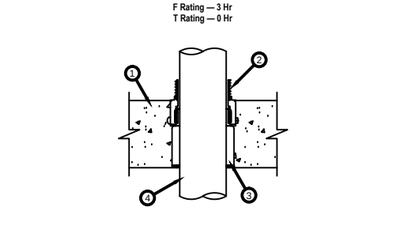
1. Floor Assembly -- Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete.
2. Firestop Device* - Tub Box -- Nom 8-1/2 by 12 by 2 in. deep acrylonitrile butadiene styrene (ABS) tub box with adjustable legs and intumescent coupling. Cast in place firestop device attached to form and permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions. Min concrete thickness of 2 in. shall be maintained below tub box.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- CP 681 Tub Box Kit
3. Tub Box Seal -- Elastomeric tub box seal (supplied with tub box kit) sized to accommodate 1-1/2 in. PVC waste/overflow fitting. Seal seated from bottom within device coupling.
4. Waste/Overflow Fitting -- Nom 1-1/2 in. diam Schedule 40 or thin wall polyvinyl chloride (PVC) waste/overflow fitting installed through device coupling and seal.
5. Drain Piping -- Nom 2 in. diam Schedule 40 polyvinyl chloride (PVC) cemented together and secured to waste/overflow fitting with a compression coupling. Drain piping rigidly supported away from tub box with suitable hangers.
5A. Alternate Drain Piping -- (Optional - Not Shown) - Cast iron P trap secured to PVC waste/overflow fitting with a compression coupling. Drain piping rigidly supported away from tub box with suitable hangers.
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
July 24, 2002

System No. F-B-2013

F Rating — 3 Hr
T Rating — 0 Hr



1. Floor Assembly — Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete floor assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680N-110/4", CP 680-P 4"
3. Aerator Adapter — Nom 3-1/2 in. (89 mm) deep for CP 680N-110/4", or nom 3 in. (76 mm) deep for CP 680-P 4", cast-in-place adapter mechanically fastened to the device in accordance with the manufacturer's installation instructions, and fastened to form prior to placement of the concrete.
4. Through Penetrants — One non-metallic pipe to be installed concentrically within the firestop device. Pipe to be rigidly supported on both sides of floor assembly. The following types of pipe may be used:
A. Polyvinyl Chloride (PVC) — Nom 4 in. (102 mm) diam Schedule 40 solid or cellular core PVC pipe.
5. Aerator Fitting — (Not Shown) Nom 4 in. (102 mm) diam cast iron aerator fitting. Fitting shall not penetrate the firestop device.
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
December 14, 2006

Notes:

1. *Refer to section 15084 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, Volume 2*
   - ** NFPA 101 Life Safety 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-penetrations shall be prominently labeled with the following information:*
   - ** ATTENTION: Fire Rated Assembly*
   - ** UL System #*
   - ** Product(s) used*
   - ** Hourly Rating (F-Rating)*
   - ** Installation Date*

<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 FIRESTOP DETAILS

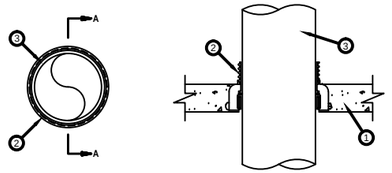
SHEET NAME:

SHEET NUMBER:

CAST-IN COMBUSTIBLE 1.4

System No. F-A-2053

F Rating — 2 Hr
T Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/sq ft (See Item 3)
L Rating At 400 F — Less Than 1 CFM/sq ft (See Item 3)
W Rating — Class 1 (See Items 3, 4 and 4A)



1. Floor Assembly — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly - (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
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 non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions. The 3, 4 and 6 in. devices may extend a max 2 in. (51 mm) above the top surface of the concrete. The max extension above the slab for the 2 and 2.5 in. devices is not restricted.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-160/6"N, CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6"
3. Through Penetrants — One nonmetallic pipe or conduit to be installed within the firestop system. Pipe or conduit to be rigidly supported on both sides of floor assembly. For W Rating with Water Barrier Module, pipe shall be installed from bottom of device. The following types and sizes of nonmetallic pipes or conduits may be used:
A. Polyvinyl Chloride (PVC) Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 solid or cellular 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 6 in. (152 mm) diam (or smaller) SDR11 or SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
C. Rigid Nonmetallic Conduit+ — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).
The firestop devices and nonmetallic penetrants shall be sized as follows:

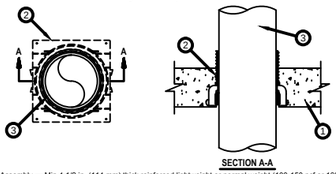
Nom Pipe Diameter	Firestop Device
1/2 in. to 2 in. (19 mm to 51 mm)	CP 680-75/2.5"N CP 680-P 2"
3 in. (76 mm)	CP 680-P 3"
3 in. to 4 in. (76 mm to 102 mm)	CP 680-110/4"N CP 680-P 4"
6 in. (152 mm)	CP 680-160/6"N CP 680-P 6"

++ L Rating applies only to CP 680-P devices and only when the nom diam of pipe equals size of device (2 in. diam pipe in 2" device etc.) L Rating does not apply to CP 680N devices.
4. Firestop Device* — (Not shown) -Top seal plug for use with CP 680-75/2.5"N devices and nom pipe or conduit sizes 3/4 in. (19 mm) to 2 in. (51 mm), installed in accordance with the manufacturer's instructions. The top seal plug is optional for nom 1-1/2 in. (38 mm) pipes and conduits. Top seal plugs are required for all pipes and conduits less than nom 1-1/2 in. (38 mm). W Rating applies only when the CPS or IPS Top Seal Plugs are used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CPS and IPS Top Seal Plugs
4A. Firestop Device* - Water Barrier Module — (Optional, Not Shown) - Applies to nom 2", 3" and 4" water barrier modules used in combination with the CP 680-P 2", CP 680-P 3" and CP 680-P 4" devices, respectively, and supplied by device manufacturer. Module is threaded onto top of device. W Rating applies only when water barrier module is used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Water Barrier Module
*Bearing the UL Classification Mark
+Bearing the UL Listing Mark

Hilti Firestop Systems

System No. F-A-2054

F Rating — 3 Hr
T Ratings — 0 and 3 Hr (See Item 3)
L Rating At Ambient — Less Than 1 CFM/sq ft (See Item 3)
L Rating At 400 F — Less Than 1 CFM/sq ft (See Item 3)
W Rating — Class 1 (See Items 3, 4 and 4A)



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly - (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions. The devices may extend a max 2 in. (51 mm) above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-160/6"N, CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6"
3. Through Penetrants — One nonmetallic pipe or conduit to be installed within the firestop system. Pipe or conduit to be rigidly supported on both sides of floor assembly. For W Rating with Water Barrier Module, pipe shall be installed from bottom of device. The following types and sizes of nonmetallic pipes or conduits may be used:
A. Polyvinyl Chloride (PVC) Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Pipe-Nom 6 in. (152 mm) diam (or smaller) SDR11 or SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
C. Rigid Nonmetallic Conduit+ — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).
The firestop devices and nonmetallic penetrants shall be sized as follows:

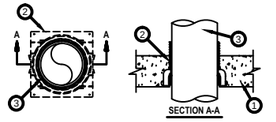
Nom Pipe Diameter	Firestop Device	T Rating-Hr
1/2 in. to 2 in. (19 mm to 51 mm)	CP 680-75/2.5"N CP 680-P 2"	3
3 in. (76 mm)	CP 680-110/4"N CP 680-P 3", CP 680-P 4"	0 and 3+
4 in. (102 mm)	CP 680-110/4"N CP 680-P 4"	3
6 in. (152 mm)	CP 680-160/6"N CP 680-P 6"	0

+3 hr T Rating applies when CP 680-P 3" and CP 680-P 4" devices are used. 3 hr T Rating also applied when CP 680-110/4"N device is used provided that min 4 in. (102 mm) thickness of nom 4 pcf (64 kg.m3) mineral wool batt insulation tightly packed within annulus between pipe and wall of CP 680-110/4"N device.
++ L Rating applies only to CP 680-P devices and only when the nom diam of pipe equals size of device (2 in. diam pipe in 2" device etc.) L Rating does not apply to CP 680N devices.
4. Firestop Device* — Top seal plug for use with CP 680-P 2" device installed in accordance with the manufacturer's instructions. The Top Seal Plug is optional for nom 1-1/2 in. (38 mm) pipes and conduits. Top Seal Plugs are required for all pipes and conduits less than nom 1-1/2 in. (38 mm). W Rating applies only to the IPS Top Seal Plug and nom 2 in. diam penetrants and CPS Top Seal Plug for nom ½ to 2 in. (13 to 51 mm) diam penetrants.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — IPS and CPS Top Seal Plugs
4A. Firestop Device* - Water Barrier Module — (Optional, Not Shown) - Alternate to Top Seal Plug (Item 4) Applies to nom 2", 3", 4" and 6" water barrier modules used in combination with the CP 680-P 2", CP 680-P 3", CP 680-P 4" and CP 680-P 6" devices, respectively, and supplied by device manufacturer. Module is threaded onto top of device. W Rating applies only when water barrier module is used and nom diam of penetrant equals size of device.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Water Barrier Module
*Bearing the UL Classification Mark
+Bearing the UL Listing Mark

Hilti Firestop Systems

System No. F-A-2092

F Rating — 2 Hr
T Ratings — 0 and 2 Hr (See Item 3)
L Rating At Ambient — Less Than 1 CFM/sq ft (See Item 3)
L Rating At 400 F — Less Than 1 CFM/sq ft (See Item 3)
W Rating — Class 1 (See Items 2A and 3)



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly - (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-160/6"N, CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6"
2A. Firestop Device* - Water Barrier Module — (Optional, Not Shown) - Applies to nom 2", 3", 4" and 6" water barrier modules used in combination with the CP 680-P 2", CP 680-P 3", CP 680-P 4"and CP 680-P 6" devices, respectively, and supplied by device manufacturer. Module is threaded onto top of device. W Rating applies only when water barrier module is used and nom diam of penetrant equals size of device.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Water Barrier Module
2B. Firestop Device* — (Optional, Not shown) - Alternate to Water Barrier Module (Item 2A). Top seal plug for use with CP 680-P 2" device installed in accordance with the manufacturer's instructions. The Top Seal Plug is optional for nom 1-1/2 in. (38 mm) pipes. Top Seal Plugs are required for all pipes less than nom 1-1/2 in. (38 mm). W Rating applies only to the IPS Top Seal Plug and nom 2 in. diam penetrants and CPS Top Seal Plug for nom ½ to 2 in. (13 to 51 mm) diam penetrants.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CPS and IPS Top Seal Plugs
3. Through Penetrants — One nonmetallic pipe or conduit to be installed within the firestop system. Pipe or conduit to be rigidly supported on both sides of floor-ceiling assembly. For W Rating with Water Barrier Module (Item 2A), pipe shall be installed from bottom of device. The following types and sizes of nonmetallic pipes or conduits may be used:
A. Polyvinyl Chloride (PVC) Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 solid or cellular 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 6 in. (152 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.

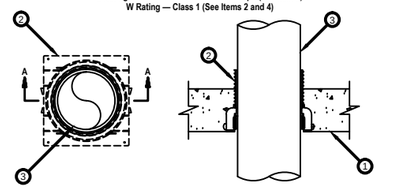
Nom Pipe Diameter	Firestop Device	T Rating-Hr
1-1/2 in. to 2 in. (38 to 51 mm)	CP 680N-75/2.5" CP 680-P 2"	2
3 in. (76 mm)	CP 680N-110/4" CP 680-P 4"	0
3 in. (76 mm)	CP 680-P 3"	2
4 in. (102 mm)	CP 680N-110/4" CP 680-P 4"	2
6 in. (152 mm)	CP 680N-160/6" CP 680-P 6"	0

When pipe diameters other than those shown in the above table are used, pipes shall be installed in conjunction with Item 4 and the T Ratings are 0 hr.
++ L Rating applies only to CP 680-P devices and only when the nom diam of pipe equals size of device (2 in. diam pipe in 2" device etc.) L Rating does not apply to CP 680N devices.
4. Packing Material — (Not Shown) When pipe sizes are less than those shown in the above table, a 4 in. (102 mm) thickness of 4 pcf (64 kg/m3) mineral wool insulation shall be firmly packed to the fullest extent possible within annulus flush with top surface of device.
*Bearing the UL Classification Mark

Hilti Firestop Systems

System No. F-A-2141

F Rating — 2 Hr
T Ratings — 0 and 2 Hr (See Item 2)
L Rating At Ambient — Less Than 1 CFM/sq ft (See Item 2)
L Rating At 400 F — Less Than 1 CFM/sq ft (See Item 2)
W Rating — Class 1 (See Items 2 and 4)



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly - (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete topping as measured over the top plane of the steel floor units.
B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Through Penetrants — One nonmetallic pipe to be installed within the firestop system. Pipe to be rigidly supported on both sides of floor assembly. For W Rating with Water Barrier Module (Item 4), pipe shall be installed from bottom of device. The following types and sizes of nonmetallic pipes may be used:
A. Fire Retardant Polypropylene (FFPP) Pipe — Nom 2, 3, 4 or 6 in. (51, 76, 102 or 152 mm) diam Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. The T Rating is 0 Hr for FRPP pipe.
B. Polyvinylidene Fluoride (PVDF) Pipe — Nom 2 or 4 in. (51 or 102 mm) diam SDR 32.5 PVDF pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system. The T Rating is 2 Hr for nom 2 in. diam PVDF pipe and 0 Hr for nom 4 in. diam PVDF pipe.
C. Polypropylene (PP) Pipe — Nom 4 in. (102 mm) diam Schedule 40 PP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. The T Rating is 0 Hr for PP pipe.
D. Acrynitrile Butadiene Styrene (ABS) Pipe — Nom 2, 3 or 4 in. (51, 76 or 102 mm) diam Schedule 40 cellular or solid core pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. The T Rating is 0 Hr for ABS pipe.
The firestop device and nonmetallic penetrant shall be sized as follows:

Nom Pipe Diameter	Firestop Device
2 in. (51 mm)	CP 680-75/2.5"N, CP 680-P 2"
3 in. (76 mm)	CP 680-P 3"
3 to 4 in. (76 and 102 mm)	CP 680-110/4"N, CP 680-P 4"
6 in. (152 mm)	CP 680-160/6"N, CP 680-P 6"

++ L Rating applies only to CP 680-P devices. For L Rating, the nom diam of pipe shall equal size of device (2 in. diam pipe in 2" device etc.) L Rating does not apply to CP 680N devices.
3. Firestop Device — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-160/6"N, CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6"
4. Firestop Device* - Water Barrier Module — (Optional, Not Shown) - Applies to nom 2", 3", 4" and 6" water barrier modules used in combination with the CP 680-P 2", CP 680-P 3", CP 680-P 4" and CP 680-P 6" devices, respectively, and supplied by device manufacturer. Module is threaded onto top of device. W Rating applies only when water barrier module is used and nom diam of penetrant equals size of device.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Water Barrier Module
4A. Firestop Device* — (Optional. Not shown) - Alternate to Water Barrier Module (Item 4). Top Seal Plug for use with CP 680-P 2" device installed in accordance with the manufacturer's instructions. W Rating applies only to the IPS Top Seal Plug with nom 2 in. (51 mm) diam penetrants and CPS Top Seal Plug for nom ½ in. (13 mm) to 2 in. (51 mm) diam penetrants.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CPS and IPS Top Seal Plugs
*Bearing the UL Classification Mark

Hilti Firestop Systems

Notes:

1. *Refer to section 15084 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, Volume 2*
   - ** NFPA 101 Life Safety 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-penetrations shall be prominently labeled with the following information:*
   - ** ATTENTION: Fire Rated Assembly*
   - ** UL System #*
   - ** Product(s) used*
   - ** Hourly Rating (F-Rating)*
   - ** Installation Date*

<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 FIRESTOP DETAILS

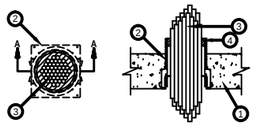
SHEET NAME:

SHEET NUMBER:

CAST-IN COMBUSTIBLE 2.4

System No. F-A-3007

F Rating — 3 Hr
T Ratings — 0, 1/4, 1/2 Hr (See Items 3 and 4)



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly - (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement in accordance with accompanying installation instructions.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-160/6"N, CP682-72/2.5", CP682-110/4", CP 680-M 2", CP 680-M 3", CP 680-M 4", CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6"
3. Cables — Cables to be rigidly supported on both sides of the assembly. Any combination of the following types and sizes of copper conductor cables may be used:
A. Max 1/C 750 kcmil (or smaller) copper conductor cable with polyvinyl chloride (PVC) insulation and jacket.
B. Max 7/C No. 12 AWG with polyvinyl chloride (PVC) insulation and jacket.
C. Max 300 pair No. 24 AWG telephone cable with PVC insulation and jacket.
D. Multiple fiber optical communication cable jacketed with PVC and having a max OD of 1/2 in. (13 mm).
E. Max 3/C No. 12 AWG with ground with polyvinyl chloride jacketed steel clad Type MC cable.
The firestop device and max cable bundle diameter shall be sized as follows:

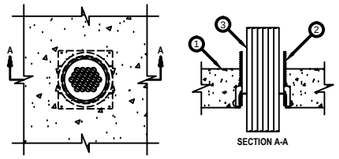
Max Bundle Diameter	Firestop Device	T Rating-Hr
2 in. (51 mm)	CP 680-75/2.5"N, CP 682-75/2.5" CP 680-M 2", CP 680-P 2"	1/4
3 in. (76 mm)	CP 680-75/2.5"N, CP 682-75/2.5" CP 680-M 3", CP 680-P 3"	1/2
4-1/2 in. (114 mm)	CP 680-110/4"N, CP 682-110/4" CP 680-M 4", CP 680-P 4"	1/2
6-1/2 in. (165 mm)	CP 680-160/6"N CP 680-P 6"	0

4. Fill, Void or Cavity Material* - Putty — Min 1 in.(25 mm) thickness of fill material applied within annulus flush with top surface of device. Fill material is optional for 2-1/2 (64 mm) diam (or larger) cable bundle installed in 3 in. device and 3 in. (76 mm) diam (or larger) cable bundle installed in 4 in. device and 2 in. (51 mm) diam (or larger) cable bundle installed in 2 in. or 2.5 in. device. The T Rating for the firestop system is 1/4 hr when fill material or packing material (Item 4 or 4A) is not used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 618 Firestop Putty Stick
4A. Packing Material (Not Shown) — As an alternate to Item 4, min 2 in. thickness of min 4 pcf (64 kg/m3) mineral wool insulation firmly packed to the fullest extent possible within annulus flush with top surface of device.
*Bearing the UL Classification Mark

Hilti Firestop Systems

System No. F-A-2142

F Rating — 2 Hr
T Ratings — 0 and 2 Hr (See Item 3)



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly — (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series Floor-Ceiling Designs in the UL Fire Resistance Directory and as summarized below:
A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete topping as measured over top of steel floor units.
B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-P 2", CP 680-P 3", CP 680-P 4"
3. Through Penetrants — One nom 4 in. (102 mm) diam (or smaller) tight bundle of nom 1/2 in. (13 mm) diam (or smaller) SDR 9 crosslinked polyethylene (PEX) tubes for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Tubes to be rigidly supported on both sides of floor assembly.
The firestop device and penetrant shall be sized as follows:

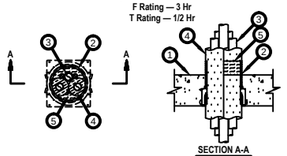
Nom Bundle Diameter *	Firestop Device	T Rating-Hr
2 in. (51 mm)	CP 680-P 2"	2
2-1/2 in. (64 mm)	CP 680N-75/2.5"	2
3 in. (76 mm)	CP 680-P 3"	2
4 in. (102 mm)	CP 680N-110/4" CP 680-P 4"	2

* - When bundle diameters smaller than those shown in the table are used, bundles shall be installed in conjunction with Item 4 and the T Ratings are 0 hr.
4. Packing Material — (Not Shown) When bundle sizes are less than those shown in the above table, min 4 pcf (64 kg/m3) mineral wool insulation shall be firmly packed to the fullest extent possible within the device flush with top surface of device.
*Bearing the UL Classification Mark

Hilti Firestop Systems

System No. F-A-8016

F Rating — 3 Hr
T Rating — 1/2 Hr

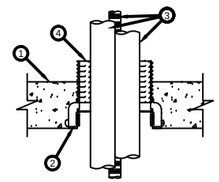


1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Steel Floor Unit/ Floor Assembly — (Not Shown)- As an alternate to Item 1, the floor assembly may consist of a fluted steel floor unit/ concrete floor assembly. The floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Design in the Fire Resistance Directory and shall include the following construction features:
A. Steel Floor and Form Units* — Composite or non-composite 1-1/2 in. to 3 in. (38 to 76 mm) deep fluted galv steel units as specified in the individual Floor-Ceiling Design.
B. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete, as measured from the top plane of the floor units.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete floor assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-110/4"N, CP 682-110/4", CP 680-M 3", CP 680-M 4", CP 680-P 3", CP 680-P 4"
3. Through Penetrants — Pipes, tubing or cable to be bundled within the device. The annular space between penetrants and the device is min 0 in. to max 3/4 in. (19 mm). Penetrants to be rigidly supported on both sides of floor assembly. The following types and sizes of penetrants may be used.
3A. Metallic Pipes — A max of four pipes or tubes installed within the device. Of the four metallic penetrants, a max of two may have a nom diam greater than 1/2 in. (13 mm). The following types and sizes of metallic pipes, conduits or tubing may be used:
A. Steel Pipe — Nom 1 in. (25 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Iron Pipe — Nom 1 in. (25 mm) diam (or smaller) cast or ductile iron pipe.
C. Copper Pipe — Nom 1 in. (25 mm) diam (or smaller) Regular (or heavier) copper pipe.
D. Copper Tube — Nom 1 in. (25 mm) diam (or smaller) Type L (or heavier) copper tube.
3B. Nonmetallic Pipes — A max of one nonmetallic pipe or conduit may be used. The following types and sizes of nonmetallic pipes or conduits may be used:
A. Polyvinyl Chloride (PVC) Pipe — Nom 1-1/4 in. (32 mm) diam (or smaller) Schedule 40 solid core PVC pipe for use in vented (drain, waste or vent) or closed (process or supply) piping systems.
B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 1-1/4 in. (32 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
3C. Cables — A max of two 4 pair No. 8 AWG (or smaller) thermostat cables with PVC insulation and jacket.
4. Tube Insulation - Plastics# — Nom 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. The tube insulation shall be installed on all metallic penetrants (Item 3A) having a nom diam greater than 1/2 in. (13 mm).
See Plastics (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 94-5VA may be used.
5. Packing Material — Min 2 in. (51 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed within top of device, flush with the top of device.
*Bearing the UL Classification Mark

Hilti Firestop Systems

System No. F-A-2103

F Rating — 2 Hr
T Rating — 0 Hr

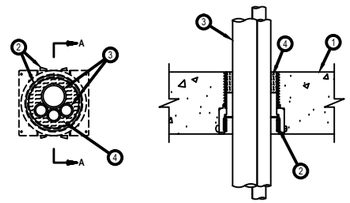


1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly — (Optional - Not Shown)-The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-160/6"N, CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6"
3. Through Penetrants — Nonmetallic pipe or conduit bundle consisting of max three nonmetallic pipes or conduit installed concentrically within the firestop system. Pipe or conduit to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
A. Polyvinyl Chloride (PVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) Schedule 40 solid or cellular 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 2 in. (51 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
C. Electrical Nonmetallic Tubing (ENT)+ — Nom 1 in. (25 mm) diam (or smaller) ENT formed from PVC. ENT to be installed in accordance with Article 331 of the National Electrical Code (NFPA No. 70).
See Electrical Nonmetallic Tubing (FKHU) category in the Electrical Construction Materials Directory for names of manufacturers.
4. Packing Material — Min 4 pcf (64 kg/m3) mineral wool batt insulation tightly packed into the device flush with the top surface of the device.
+Bearing the UL Listing Marking
*Bearing the UL Classification Mark

Hilti Firestop Systems

System No. F-B-2040

F Rating — 2 Hr
T Rating — 0 Hr



1. Floor Assembly — Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions, flush with top surface of the concrete.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-P 2", CP 680-P 3", CP 680-P 4"
3. Crosslinked Polyethylene (PEX) Tubing — Nom 2 in. (51 mm) diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Nonmetallic tubing bundle consisting of max four tubes installed concentrically within the firestop system. Tubing to be rigidly supported on both sides of floor assembly.
4. Packing Material — Min 2 in. (51 mm) depth of 4 pcf (64 kg/m3) mineral wool batt insulation tightly packed into the device flush with the top surface of the floor.
4A. Forming Material* — (Not Shown) - As an alternate to Item 4, min 2 in. (51 mm) depth of foam forming material installed to fill device flush with the top surface of the floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CF-AS CJP Foam Sealant

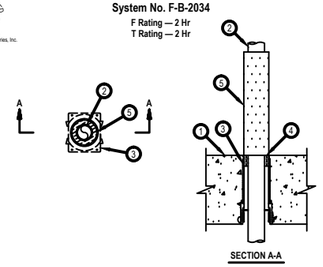
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
April 20, 2012

System No. F-B-2034

F Rating — 2 Hr
T Rating — 2 Hr



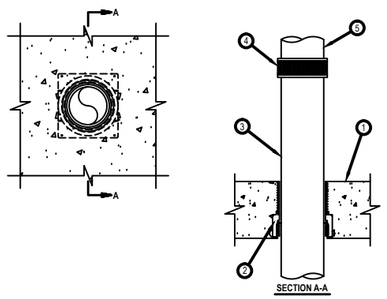
1. Floor Assembly — Min 8 in. (203 mm) thick lightweight or normal weight concrete (100-150 pcf or 1600-2400 kg/m3).
1A. Floor Assembly - (Not Shown) — As an alternate to Item 1, the fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series Designs in the Fire Resistance Directory and as summarized below:
   A. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
   B. Concrete — Min 8 in. (203 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
2. Through Penetrant — One nonmetallic pipe to be centered within the firestop system. Pipe to be rigidly supported on both sides of floor assembly. The following type and size of pipes may be used:
   A. Polypropylene (PP) Pipe — Nom 1-1/2 in. (38 mm) diam (or smaller) SDR 11 or SDR 7.4 PP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Polypropylene (PP) Pipe — Nom 40 mm OD (or smaller) Fusiotherm® SDR11 or SDR 7.4 for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
3. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-P 2"
4. Packing Material — Min 1-1/4 in. (32 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation shall be firmly packed into top of device, flush with the top of the device.
5. Pipe Covering* — (Optional) - Min 1/2 in. (13 mm) thick hollow cylindrical glass fiber units with an all service jacket installed around pipe at the top of the floor and extending min 12 in. (305 mm) above floor surface or device. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product.
   See Pipe and Equipment Covering Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
November 15, 2011

System No. F-B-2033

F Rating — 2 Hr
T Rating — 2 Hr



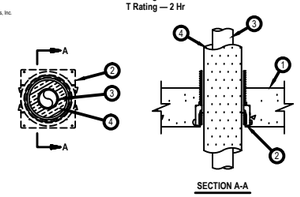
1. Floor Assembly — Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
2. Firestop Device* — Cast in place firestop device with intumescent ring permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions. Device size to be same size as nom diam of nonmetallic pipe (4 in. pipe with 4 in. device, 3 in. pipe with 3 in. device etc.). Device to be installed flush with bottom of floor. Top of device cut flush with top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-P 4", CP 680-P 3", CP 680-P 2"
3. Nonmetallic Pipe — One nonmetallic pipe to be centered within the firestop system. Pipe to extend min 12 in. (305 mm) above top surface of floor. Pipe to be rigidly supported on both sides of floor assembly. The following type and size of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid core or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
4. Compression Coupling — Nonmetallic pipe (Item 3) to be secured to metallic pipe (Item 5) with compression type high pressure pipe coupling with elastomeric gasket and a stainless steel jacket with stainless steel band clamps.
5. Metallic Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) cast or ductile iron pipe. Pipe to be rigidly supported.
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
August 17, 2007

System No. F-A-2205

F Rating — 2 Hr
T Rating — 2 Hr



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions. The device may extend a max 2 in. (51 mm) above the top surface of the concrete. Device size is dependent on diam of penetrant and pipe covering as specified in Table in item 4 below.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-P 3", CP 680-P 4"
3. Through Penetrants — One nonmetallic pipe to be centered within the firestop system. Pipe to be rigidly supported on both sides of floor assembly. The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) Schedule 40 solid or cellular 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 2 in. (51 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
4. Pipe and Equipment Covering Materials* — Nom 1 in. (25 mm) thick hollow cylindrical heavy density (min 3.5 pcf) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product.
   See Pipe and Equipment Covering — Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

Nom Pipe Diameter	Pipe Covering Thickness	Firestop Device
1 in. (25 mm)	1 in. (25 mm)	CP 680-P 3"
2 in. (51 mm)	1 in. (25 mm)	CP 680-P 4"

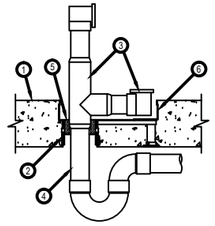
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
July 13, 2009

System No. F-A-2177

F Rating — 2 Hr
T Rating — 2 Hr



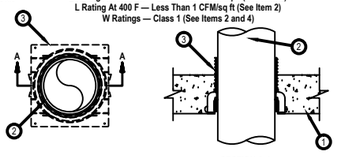
1. Floor Assembly — Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
2. Firestop Device* — Cast in place firestop device with intumescent ring permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions. Device to be installed flush with bottom of floor. Top of device cut flush with top surface of packing material (Item 5).
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-P 3"
3. Waste/Overflow Fitting — Nom 1-1/2 or 2 in. (38 or 51 mm) diam Schedule 40 cellular or solid core polyvinyl chloride (PVC) waste/overflow fitting installed through device. Thin wall PVC may be used if connection to drain piping is made above the firestop device (Item 2).
4. Drain Piping — Nom 1-1/2 or 2 in. (38 or 51 mm) diam Schedule 40 cellular or solid core polyvinyl chloride (PVC) cemented together and secured to waste/overflow fitting with a compression coupling. Drain piping rigidly supported away from device with suitable hangers.
5. Packing Material — Min 2 in. (51 mm) thickness of 4 pcf (64 kg/m3) mineral wool batt insulation tightly packed into top of firestop device (Item 2) to completely fill annular space between pipe and device.
6 Firestop Device* - Tub Box — Nom 8-1/2 by 12 by 2 in. (216 by 305 by 51 mm) deep acrylonitrile butadiene styrene (ABS) tub box with adjustable legs. Cast in place firestop device installed above firestop device (Item 2) and permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 681 Tub Box
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
September 26, 2008

System No. F-A-2166

F Rating — 4 Hr
T Rating — 1/4 Hr
L Rating At Ambient — Less Than 1 CFM/sq ft (See Item 2)
L Rating At 400 F — Less Than 1 CFM/sq ft (See Item 2)
W Ratings — Class 1 (See Items 2 and 4)



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight 100-150 pcf (1600-2400 kg/m3) concrete.
1A. Floor Assembly - (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
   A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight 100-150 pcf (1600-2400 kg/m3) concrete topping as measured over the top plane of the steel floor units.
   B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Through Penetrants — One nonmetallic pipe to be installed within the firestop system. Pipe to be rigidly supported on both sides of floor assembly. For W Rating with Water Barrier Module (Item 4), pipe shall be installed from bottom of device. The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 solid-core or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 6 in. (152 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Rigid Nonmetallic Conduit (RNC)++ — Nom 6 in. (152 mm) diam Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).
   The firestop device and nonmetallic penetrant shall be sized as follows:

Nom Pipe Diameter	Firestop Device
2 in. (51 mm)	CP 680-75/2.5"N CP 680-P 2"
3 in. (76 mm)	CP 680-P 3"
3 to 4 in. (76 to 102 mm)	CP 680-110/4"N CP 680-P 4"
6 in. (152 mm)	CP 680-160/6"N CP 680-P 6"

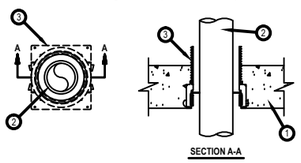
++ L Rating applies only to CP 680-P devices and only when the nom diam of pipe equals size of device (2 in. diam pipe in 2" device etc.)
L Rating does not apply to CP 680N devices.
3. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-160/6"N, CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6"
4. Firestop Device* - Water Barrier Module — (Optional, Not Shown) - Applies to nom 2", 3", 4" and 6" water barrier modules used in combination with the CP 680-P 2", CP 680-P 3", CP 680-P 4" and CP 680-P 6" devices, respectively, and supplied by device manufacturer. Module is threaded onto top of device. W Rating applies only when water barrier module is used and nom diam of penetrant equals size of device.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Water Barrier Module
4A. Firestop Device* - (Optional, Not Shown) - Alternate to Water Barrier Module (Item 4). Top Seal Plug for use with CP 680-P 2" device installed in accordance with the manufacturer's instructions. W Rating applies only to the IPS Top Seal Plug with nom 2 in. (51 mm) diam penetrants and CPS Top Seal Plug for nom 2 in. (51 mm) diam penetrants.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CPS and IPS Top Seal Plugs
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
February 27, 2008

System No. F-A-2145

F Ratings — 2 and 3 Hr (See Item 1)
T Rating — 0 Hr
W Rating — Class 1 (See Items 4 and 4A)



1. Floor Assembly — Min 2-1/2 in. (64 mm) or 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly - (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
   A. Concrete — Min 2-1/2 in. (64 mm) or 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
   B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
   F Rating is 2 Hr for min 2-1/2 in. (64 mm) thick concrete. F Rating is 3 Hr for min 4-1/2 in. (114 mm) thick concrete.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions. The 4" device may extend a max 2 in. (51 mm) above the top surface of the concrete. The max extension above the slab for the 2 and 2.5" devices are not restricted.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-P 2", CP 680-P 3", CP 680-P 4"
3. Through Penetrants — One nonmetallic pipe to be installed within the firestop system. Pipe to be rigidly supported on both sides of floor assembly. The following types and sizes of nonmetallic pipes may be used:
   A. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) FLOWGUARD GOLD® SDR11 CPVC pipe for use in closed (process or supply) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 3 in. (76 mm) diam (or smaller) BLAZEMASTER® SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   The firestop devices and nonmetallic pipes shall be sized as follows:

Nom Pipe Diameter	Firestop Device
3/4 in. to 2 in. (19 mm to 51 mm)	CP 680-75/2.5"N
1-1/2 in. (38 mm)	CP 680-P 2"
3 in. (76 mm)	CP 680-110/4"N, CP 680-P 3", CP 680-P 4"

4. Firestop Device* — (Not shown) - Top Seal Plug for use with CP 680-P 2" device installed in accordance with the manufacturer's instructions. The Top Seal Plug is optional for nom 1-1/2 in. (38 mm) pipes and conduits. Top Seal Plugs are required for all pipes and conduits less than nom 1-1/2 in. (38 mm). W Rating applies only to the IPS Top Seal Plug and nom 2 in. diam penetrants, and to CPS Top Seal Plugs with nom 1/2 to 2 in. (13 to 51 mm) diam penetrants.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CPS and IPS Top Seal Plugs
4A. Firestop Device* - Water Barrier Module — (Optional, Not Shown) - Alternate to Top Seal Plug (Item 4). Applies to nom 2", 3" and 4" water barrier modules used in combination with the CP 680-P 2", CP 680-P 3" and CP 680-P 4" devices, respectively, and supplied by device manufacturer. Module is threaded onto top of device. W Rating applies only when water barrier module is used and nom penetrant diam equals device size.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Water Barrier Module
5. Packing Material — (Not Shown) When pipe sizes are less than those shown in the table above and CP-680-P 2", CP-680-P 3" and CP-680-P 4" are used, a 4 in. (102 mm) thickness of 4 pcf (64 kg/m3) mineral wool insulation shall be firmly packed to the fullest extent possible within annulus flush with top surface of device.
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
February 27, 2008

System No. F-A-2142

F Rating — 2 Hr
T Ratings — 0 and 2 Hr (See Item 3)

1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly — (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series Floor-Ceiling Designs in the UL Fire Resistance Directory and as summarized below:
   A. Concrete — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete topping as measured over top of steel floor units.
   B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-P 2", CP 680-P 3", CP 680-P 4"
3. Through Penetrants — One nom 4 in. (102 mm) diam (or smaller) tight bundle of nom 1/2 in. (13 mm) diam (or smaller) SDR 9 crosslinked polyethylene (PEX) tubes for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Tubes to be rigidly supported on both sides of floor assembly.
   The firestop device and penetrant shall be sized as follows:

Nom Bundle Diameter *	Firestop Device	T Rating-Hr
2 in. (51 mm)	CP 680-P 2"	2
2-1/2 in. (64 mm)	CP 680N-75/2.5"	2
3 in. (76 mm)	CP 680-P 3"	2
4 in. (102 mm)	CP 680N-110/4" CP 680-P 4"	2

* - When bundle diameters smaller than those shown in the table are used, bundles shall be installed in conjunction with Item 4 and the T Ratings are 0 hr.
4. Packing Material — (Not Shown) When bundle sizes are less than those shown in the above table, min 4 pcf (64 kg/m3) mineral wool insulation shall be firmly packed to the fullest extent possible within the device flush with top surface of device.
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
December 13, 2006

Notes:

1. *Refer to section 15084 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, Volume 2*
   - ** NFPA 101 Life Safety 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-penetrations shall be prominently labeled with the following information:*
   - ** ATTENTION: Fire Rated Assembly*
   - ** UL System #*
   - ** Product(s) used*
   - ** Hourly Rating (F-Rating)*
   - ** Installation Date*

<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:

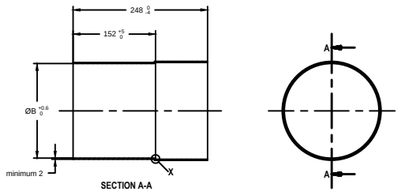
TYPICAL FIRESTOP DETAILS

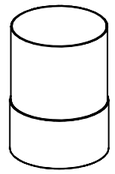
SHEET NAME:

SHEET NUMBER:

CAST-IN COMBUSTIBLE 3.4

CAST-IN DEVICE EXTENSION





M 1:8

DETAIL X

M 10:1

ITEM NO.	DESCRIPTION	ØA	ØB
354456	extension 2 1/2	82.5	78.5
354457	extension 4	122.5	118.5
354458	extension 6	178.5	174.5

radius not dimensioned = 0.5
Scale = 1:4
Dimensions in mm

Notes:

1. *Refer to section 15084 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, Volume 2*
   - ** NFPA 101 Life Safety Code*
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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.*
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   - ** UL System #*
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   - ** Hourly Rating (F-Rating)*
   - ** Installation Date*

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

DRAWN:

CHECKED:

ISSUE DATE:

REVISIONS:

TYPICAL FIRESTOP DETAILS

SHEET NAME:

SHEET NUMBER:

CAST-IN COMBUSTIBLE 4.4