

System No. F-A-5016
F Rating — 3 Hr
T Ratings — 0, 3/4, 1, 3 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 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 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 680-1104* N, CP 680-1606* N, CP 682-752.5* CP 682-1104* 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. Through Penetrants — One metallic pipe or tubing to be installed within the firestop device. Pipe or tubing to be rigidly supported on both sides of floor assembly. The following types of pipe or tubing may be used:
A. Steel Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Copper Tubing — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
C. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
The firestop device and metallic penetrant shall be sized as follows:

Nom Pipe Diameter* (in. (mm))	Nom Pipe Cover-in. (mm)	Firestop	T Rating-Hr
1/2 in. (13 mm)	1 (25)	CP 680-752.5* N, CP 682-752.5* CP 680-M 2*, CP 680-P 2*	3
1 in. (25 mm)	1 (25)	CP 680-1104* N, CP 682-1104* CP 680-M 3*, CP 680-P 3*, CP 680-M 4*, CP 680-P 4*	3/4
2 in. (51 mm)	3/4 (19)	CP 680-1104* N, CP 680-P 4*	1
4 in. (102 mm)	3/4 (19)	CP 680-1606* N, CP 680-P 6*	3/4

* When pipe diameter smaller than shown in above table is used, the insulated pipe shall be installed in conjunction with Item 5 and the T Ratings are 0 hr.
4. Tube Insulation - Plastic — Nom 3/4 or 1 in. (19 or 25 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing.
See Plastics (DMFZZ) category in the 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-V-0 may be used.
5. Packing Material* — (Not Shown) When pipe sizes are less than those shown in the table in Item 3, min 4 in. (102 mm) thickness of 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

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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 680-752.5* N, CP 680-1104* N, CP 680-1606* N, CP682-752.5* CP682-1104* 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 1/2 C 750 kcmil (or smaller) copper conductor cable with polyvinyl chloride (PVC) insulation and jacket.
B. Max 7/8 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 3/8 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 680-752.5* N, CP 682-752.5* CP 680-M 2*, CP 680-P 2*	1/4
3 in. (76 mm)	CP 680-752.5* N, CP 682-752.5* CP 680-M 3*, CP 680-P 3*	1/2
4-1/2 in. (114 mm)	CP 680-1104* N, CP 682-1104* CP 680-M 4*, CP 680-P 4*	1/2
6-1/2 in. (165 mm)	CP 680-1606* 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 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

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

System No. F-A-5018
F Rating — 3 Hr
T Ratings — 1-3/4, 2, 2-1/2, 2-3/4, and 3 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 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 4-1/2 in. (114 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 680-752.5* N, CP 680-1104* N, CP 680-1606* N, CP 682-752.5* CP 682-1104* 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. Through Penetrants — One metallic pipe or tubing to be installed within the firestop device. Pipe or tubing to be rigidly supported on both sides of floor assembly. The following types of pipe or tubing may be used:
A. Steel Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Copper Tubing — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
C. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
The firestop device, metallic penetrant and pipe covering shall be sized as follows:

Nom Pipe Diameter* (in. (mm))	Nom Thick of Pipe Covering, in. (mm)	Firestop Device	T Rating, Hr
1/2 (13)	1 (25)	CP 680-752.5* N, CP 680-P 2*	2-1/2
1/2 (13)	1 (25)	CP 682-752.5* CP 680-M 2*	2-3/4
1 (25)	1 (25)	CP 680-M 3*, CP 680-P 3*	1-3/4
1 (25) (See Item 5)	1-1/2 (38)	CP682-1104* CP 680-M 4*	3
2 (51)	1 (25)	CP 682-1104* CP 680-M 4*	1-3/4
2 (51)	1 (25)	CP 680-1104* N, CP 680-P 4*	2-3/4
2 (51)	2 (51)	CP 680-1606* N, CP 680-P 6*	3
4 (102)	1 (25)	CP 680-1606* N, CP 680-P 6*	2

4. Pipe Covering* — Nom 1, 1-1/2 and 2 in. (25, 38 and 51 mm) thick hollow cylindrical heavy density (min 3 pcf or 56 kg/m³) glass fiber units, jacketed on the outside with all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied SSL 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.
5. Packing Material* — When using a 1 in. (25 mm) diam pipe with 1-1/2 in. (38 mm) thick glass fiber pipe insulation in a 4 in. (102 mm) device, a min 2 in. (51 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation shall be firmly packed to the top of device, flush with the top of the device.
*Bearing the UL Classification Mark

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

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 680-1104* N, CP 680-1104* N, CP 682-1104* N, CP 680-M 3*, CP 680-P 4*

3. Through Penetrants — Pipes, tubing or cable to be banded 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 - Plastic — 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 (DMFZZ) 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-V-0 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 the device.
*Bearing the UL Classification Mark

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System No. F-B-1009
F Rating — 3 Hr
T Rating — 1/2 Hr

1. Floor Assembly — Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. When aerator adaptor for CP 680-M or -P 4 in. device is used, min floor thickness is 6-1/2 in. (165 mm). When aerator adaptor for CP 680-M or -P 3 in. device is used, min floor thickness is 5 in. (127 mm).
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement and 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 680-1104* N, CP 680-1104* N, CP 682-1104* N, CP 680-M 3*, CP 680-M 4*, CP 680-P 3*, CP 680-P 4*

3. Aerator Adapter — Nom 3-1/2 in. (89 mm) deep (CP 680NCP682N 4" device) and nom 3-15/16 in. (100 mm) deep (CP 680-M and -P devices in 4 in. size only), and nom 2-1/2 in. (64 mm) deep (CP 680-M and -P devices in 3 in. size only), cast-in-place adapter attached 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 metallic pipe to be installed concentrically within the firestop device. Pipe, conduit or tubing to be rigidly supported on both sides of floor assembly. The following types of pipe may be used:
A. Steel Pipe — Nom 3 or 4 in. (76 or 102 mm) diam Schedule 40 (or heavier) steel pipe.
B. Iron Pipe — Nom 3 or 4 in. (76 or 102 mm) diam cast or ductile iron pipe.
5. Aerator Fitting — (Not Shown) Nom 3 or 4 in. (76 or 102 mm) diam cast iron aerator fitting. Fitting shall not penetrate the firestop device.
*Bearing the UL Classification Mark

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System No. F-A-1016
F Rating — 2 Hr
T Rating — 0 Hr
L Rating At Ambient — 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 4B and 4B1)

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 floor assembly in accordance with accompanying installation instructions. The device may extend a max of 2 in. (51 mm) above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680N-752.5*, CP 680N-1104*, CP 680N-1606*, CP 682-752.5*, CP 682-1104*, 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. Through Penetrants — One metallic pipe, conduit or tubing to be installed within the firestop device. Pipe, conduit or tubing to be rigidly supported on both sides of floor assembly. The following types of pipe, conduit or tubing may be used:
A. Steel Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Iron Pipe — Nom 6 in. (152 mm) diam (or smaller) cast or ductile iron pipe.
C. Conduit — Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit.
D. Conduit — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
E. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
F. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.
The firestop device and metallic penetrant shall be sized as follows:

Nom Pipe Diam + ** (in. (mm))	Firestop Device
1-1/2 to 2-1/2 in. (38 to 64 mm) - Other than copper pipe or tubing	CP680N-752.5* or CP682-752.5*
1-1/2 to 2 in. (38 to 51 mm) - Other than copper pipe or tubing	CP 680-M 2*, CP 680-P 2*
2 to 2-1/2 in. (51 to 64 mm) - Copper pipe or tubing	CP680N-752.5* or CP682-752.5*
2-1/2 to 3 in. (64 to 76 mm)	CP 680-M 2*, CP 680-P 2*
4 in. (102 mm)	CP 680-M 3*, CP 680-P 3*
6 in. (152 mm)	CP680N-1104* or CP682-1104* CP 680-M 4*, CP 680-P 4* CP680N-1606* CP 680-M 6*, CP 680-P 6*

** When metallic pipes of diameters smaller than those shown above are installed within the device, CP618 Firestop Putty Stick or mineral wool insulation shall be installed within the device.
+ L Rating applies only to CP 680-M and -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 and CP682 devices.
4. Fill, Void or Cavity Material* — Putty (Not Shown) — 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
4A. Packing Material (Not Shown) — As an alternate to Item 4, 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.
4B. Firestop Device* - Top Seal Plug — (Optional, Not Shown) - Top seal plug for use with CP 680-M 2" and CP 680-P 2" devices and nom pipe, conduit or tubing sizes of 1/2 in. (13 mm) to 2 in. (51 mm) diam. Plug is friction fit into top of firestop device (Item 2) in accordance with the manufacturer's instructions. When top seal plug is used, no putty (Item 4) or packing material (Item 4A) is required. W Rating applies only to nom 1, 1-1/4, 1-1/2 and 2 in. (25, 32, 38 and 51 mm) diam copper pipe/tube in conjunction with 2" CP68 Top Seal and CP 680-M 2" or CP 680-P 2" devices.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CPS Top Seal Plug
4B1. Firestop Device* - Water Barrier Module — (Optional, Not Shown) - Used as an alternate to the top seal plug (Item 4B) and in combination with the CP 680-M and CP 680-P devices to achieve a W Rating. Module is threaded onto top of device. See Table below for sizes of device/module and penetrants covered. When water barrier module is used, a W Rating applies to the water barrier module, device and penetrant sizes specified in Table below. For W Rating with Water Barrier Module, pipe shall be installed from bottom of device.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Water Barrier Module

Penetrant Type (See Item 3 above)	Nom Penetrant Diam	Size of Device/Module
A, B, C, D	2"	2"
	2-1/2"	2"
	3"	3"
	4"	4"
	6"	6"
E, F	2"	2"
	3"	3"
	4"	4"
	6"	6"

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System No. F-B-1009
F Rating — 3 Hr
T Rating — 1/2 Hr

1. Floor Assembly — Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. When aerator adaptor for CP 680-M or -P 4 in. device is used, min floor thickness is 6-1/2 in. (165 mm). When aerator adaptor for CP 680-M or -P 3 in. device is used, min floor thickness is 5 in. (127 mm).
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement and 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 680-1104* N, CP 680-1104* N, CP 682-1104* N, CP 680-M 3*, CP 680-M 4*, CP 680-P 3*, CP 680-P 4*

3. Aerator Adapter — Nom 3-1/2 in. (89 mm) deep (CP 680NCP682N 4" device) and nom 3-15/16 in. (100 mm) deep (CP 680-M and -P devices in 4 in. size only), and nom 2-1/2 in. (64 mm) deep (CP 680-M and -P devices in 3 in. size only), cast-in-place adapter attached 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 metallic pipe to be installed concentrically within the firestop device. Pipe, conduit or tubing to be rigidly supported on both sides of floor assembly. The following types of pipe may be used:
A. Steel Pipe — Nom 3 or 4 in. (76 or 102 mm) diam Schedule 40 (or heavier) steel pipe.
B. Iron Pipe — Nom 3 or 4 in. (76 or 102 mm) diam cast or ductile iron pipe.
5. Aerator Fitting — (Not Shown) Nom 3 or 4 in. (76 or 102 mm) diam cast iron aerator fitting. Fitting shall not penetrate the firestop device.
*Bearing the UL Classification Mark

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

System No. F-A-1017
F Rating — 3 Hr
T Rating — 0 Hr
L Rating At Ambient — 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 Item 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 or grouted in concrete floor assembly in accordance with accompanying installation instructions. The device may extend a max of 2 in. (51 mm) above the top surface of the concrete. The max extension above the concrete for the CP 680N-752.5* and CP 682-752.5* devices is not restricted when Top Seal Plug (Item 4B) is used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680N-752.5*, CP 680N-1104*, CP 680N-1606*, CP 682-752.5*, CP 682-1104*, 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. Through Penetrants — One metallic pipe, conduit or tubing to be installed within the firestop device. Pipe, conduit or tubing to be rigidly supported on both sides of floor assembly. The following types of pipe, conduit or tubing may be used:
A. Steel Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Iron Pipe — Nom 6 in. (152 mm) diam (or smaller) cast or ductile iron pipe.
C. Conduit — Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit.
D. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic conduit.
E. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
F. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.
The firestop device and metallic penetrant shall be sized as follows:

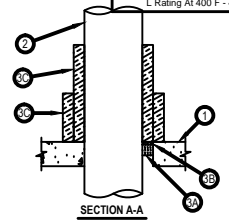
Nom Pipe Diameter* + ** (in. (mm))	Firestop Device
1-1/2 to 2-1/2 in. (38 to 64 mm)	CP 680N-752.5* or CP 682-752.5*
1-1/2 to 2 in. (38 to 51 mm)	CP 680-M 2*, CP 680-P 2*
2-1/2 to 3 in. (64 to 76 mm)	CP 680-M 3*, CP 680-P 3*
3 to 4 in. (76 to 102 mm) (Copper pipe or tubing)	CP 680N-1104*
3 to 4 in. (76 to 102 mm) (Other than copper pipe or tubing)	CP 680-M 4*, CP 680-P 4*
4 in. (102 mm) (Copper pipe or tubing)	CP 682-1104* CP 680-M 4*, CP 680-P 4*
4 in. (102 mm) (Copper pipe or tubing)	CP 680N-1606* CP 680-M 6*, CP 680-P 6*
6 in. (152 mm)	CP 680-M 6*, CP 680-P 6*

** When metallic pipes of diameters smaller than those shown above are installed within the device, CP618 Firestop Putty Stick or mineral wool insulation shall be installed within the device.
+ L Rating applies only to CP 680-M and -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 and CP682 devices.
4. Fill, Void or Cavity Material* — Putty (Not Shown) — 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
4A. Packing Material (Not Shown) — As an alternate to Item 4, 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.
4B. Firestop Device* - Top Seal Plug — (Optional, Not Shown) - Top seal plug for use with CP 680-M 2" and CP 680-P 2" devices and nom pipe, conduit or tubing sizes of 1/2 in. (13 mm) to 2 in. (51 mm) diam. Plug is friction fit into top of firestop device (Item 2) in accordance with the manufacturer's instructions. When top seal plug is used, no putty (Item 4) or packing material (Item 4A) is required. W Rating applies only to nom 1, 1-1/4, 1-1/2 and 2 in. (25, 32, 38 and 51 mm) diam copper pipe/tube in conjunction with 2" CP68 Top Seal and CP 680-M 2" or CP 680-P 2" devices.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CPS Top Seal Plug
4B1. Firestop Device* - Water Barrier Module — (Optional, Not Shown) - Used as an alternate to top seal plug (Item 4B) and in combination with the CP 680-M and CP 680-P devices to achieve a W Rating. Module is threaded onto top of device. See Table below for sizes of device/module and penetrants covered. When water barrier module is used, a W Rating applies to the water barrier module, device and penetrant sizes specified in Table below. For W Rating with Water Barrier Module, pipe shall be installed from bottom of device.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Water Barrier Module

Penetrant Type (See Item 3 above)	Nom Penetrant Diam	Size of Device/Module
A, B, C, D	2"	2"
	2-1/2"	2"
	3"	3"
	4"	4"
	6"	6"
E, F	2"	2"
	3"	3"
	4"	4"
</		



System No. F-A-1105	
ANSI/UL 1479 (ASTM E814)	CANULC S115
F Rating - 2 Hr	F Rating - 2 Hr
F Rating - 2 Hr	FT Rating - 2 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Rating - 2 Hr
L Rating At 400 F - 4 CFM/sq ft	FTH Rating - 2 Hr
W Rating - Class 1 (See Item 3B)	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - 4 CFM/sq ft



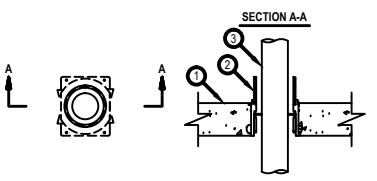
1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. As an alternate, any min 2 hr fire rated D700, D800 or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory having a min 2-1/2 in. (64 mm) thickness of lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete topping over the steel deck may be used. Max diam of opening is 12-3/4 in. (324 mm).
2. Through/Penetrant — One metallic pipe installed concentrically or eccentrically within opening. Annular space between penetrant and periphery of opening shall be min of 0 in. (point contact) to max 2 in. (51 mm). Penetrant to be rigidly supported on both sides of floor assembly. The following types and sizes of penetrants may be used:
 - A. Steel Pipe — Nom 10 in. (254 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.
 - B. Iron Pipe — Nom 10 in. (254 mm) diam (or smaller) cast or ductile iron pipe.
 - C. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or nom 6 in. (152 mm) diam (or smaller) rigid steel conduit.
3. Firestop System — The firestop system shall consist of the following:
 - A. Packing Material — Min 2 in. (51 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation firmly packed into opening as a permanent form. When CP 604, CFS-S SIL GG or CFS-S SIL SL Sealant is used (see Item 3B), min thickness of packing material is 4 in. (102 mm) and min thickness of floor is 4-1/2 in. (114 mm). Packing material to be recessed from top surface of floor to accommodate the required thickness of fill material.
 - B. Fill, Void or Cavity Material* - Sealant — Min 1/2 in. (13 mm) thickness of sealant applied within the annulus, flush with top surface of floor. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant, FS-ONE MAX Intumescent Sealant or CP 604 Self-Leveling Firestop Sealant, CFS-S SIL GG or CFS-S SIL SL Sealant
 - W Rating applies only when CP 604, CFS-S SIL GG or CFS-S SIL SL Sealant is used.
 - C. Duct Wrap Material* — Encapsulated duct wrap tightly wrapped around penetrant to extend 24 in. (610 mm) above the floor for penetrants of nom 4 in. (102 mm) diam or smaller, and 36 in. (914 mm) above floor for penetrants greater than a nom 4 in. (102 mm) diam. An additional layer of encapsulated duct wrap tightly wrapped around the first layer of duct wrap to extend 12 in. (305 mm) (914 mm) above floor. All longitudinal seams of both layers of duct wrap and joints between layers of duct wrap are sealed with foil tape. One of the following types and thicknesses of duct wrap may be used:
 - C1. Nom 1-1/2 in. (38 mm) or 2 in. (51 mm) thick encapsulated duct wrap.
 - UNIFRAX I L L C — Firewrap Duct Insulation or FireWrap Duct 1.5 Insulation
 - C2. Nom 1-1/2 in. (38 mm) thick encapsulated duct wrap.
 - THERMAL CERAMICS INC — FireMaster FastWrap XL Duct Insulation



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System No. F-A-3034	
F Rating — 3 Hr	
FT Rating — 0 and 1/2 Hr (See Item 3)	
FH Rating — 0 and 3 Hr (See Item 3)	
FTH Rating — 0 and 1/2 Hr (See Item 3)	

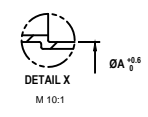
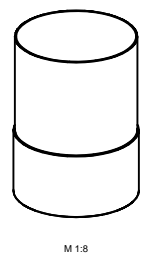
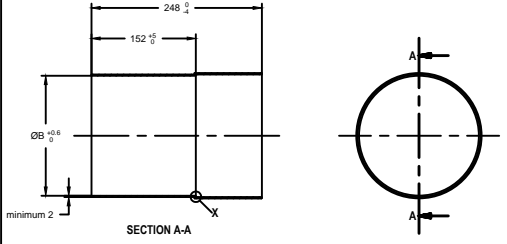


1. Floor Assembly — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete.
 - 1A. Floor Assembly — (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified 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 in accordance with accompanying installation instructions. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-752.5N, CP682-722.5, CP 680-M-2, CP 680-P-2
3. Cable — One nom 4C, 500 kcmil copper or aluminum conductor PVC jacketed aluminum clad or steel clad TEK cable installed concentrically within device. Cable to be rigidly supported on both sides of floor assembly. FT, FH and FTH Ratings are 0 hr when aluminum conductor cable is used.



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CAST-IN DEVICE EXTENSION



ITEM NO.	DESCRIPTION	QA	QB
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
 - * 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)."
 </Notes to designer (delete this note after reading and replace with title block information)>

JOB NUMBER: _____

DRAWN: _____

CHECKED: _____

ISSUE DATE: _____

REVISIONS: _____

TYPICAL FIRESTOP DETAILS

SHEET NAME: _____