



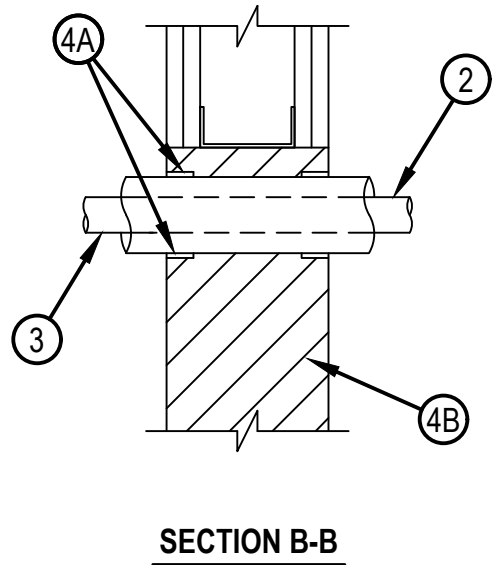
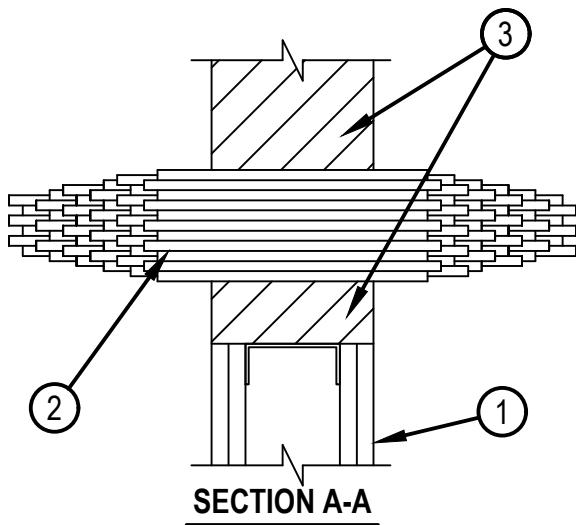
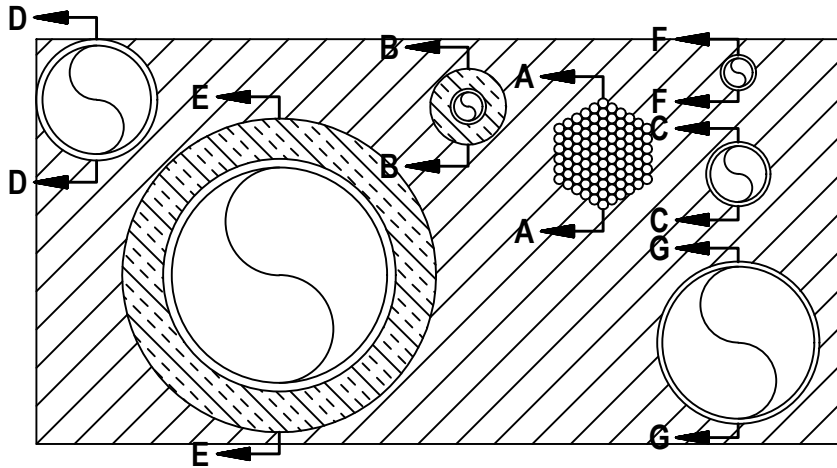
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System No. W-L-8104

F Ratings — 1 and 2 Hr (See Items 1, 3 and 4)
FT Ratings — 0, 1/2, 1, 1-1/2 and 2 Hr (See Item 2)
FH Rating — 0 Hr
FTH Rating — 0 Hr



WL 8104



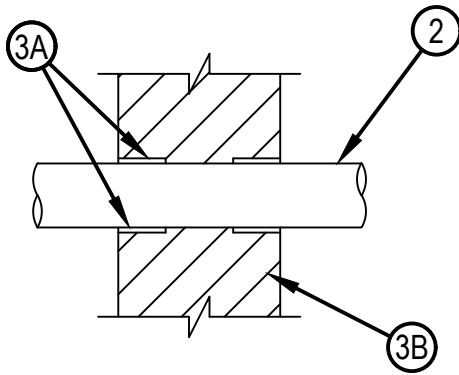
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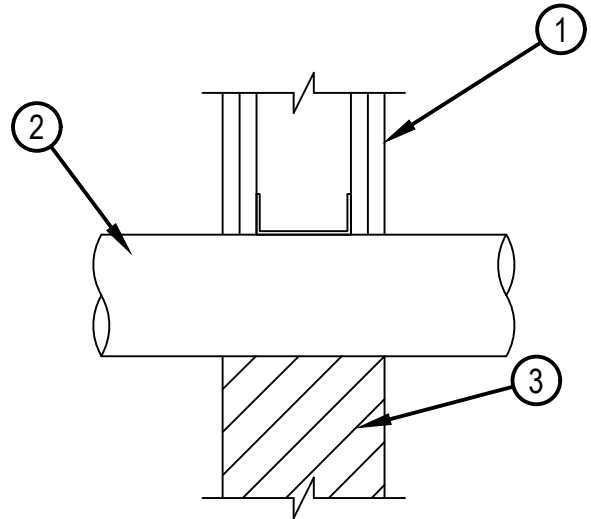
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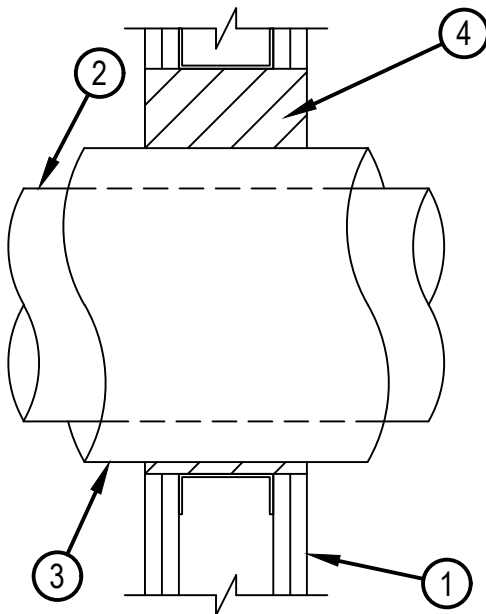
WL 8104



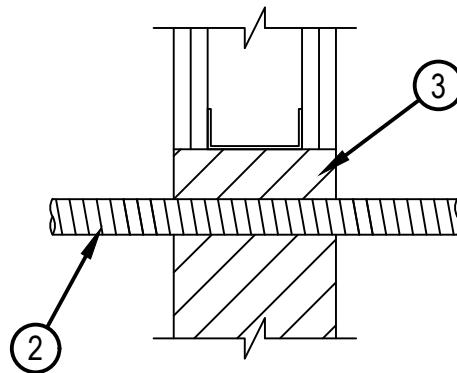
SECTION C-C



SECTION D-D



SECTION E-E



SECTION F-F



Hilti Firestop Systems

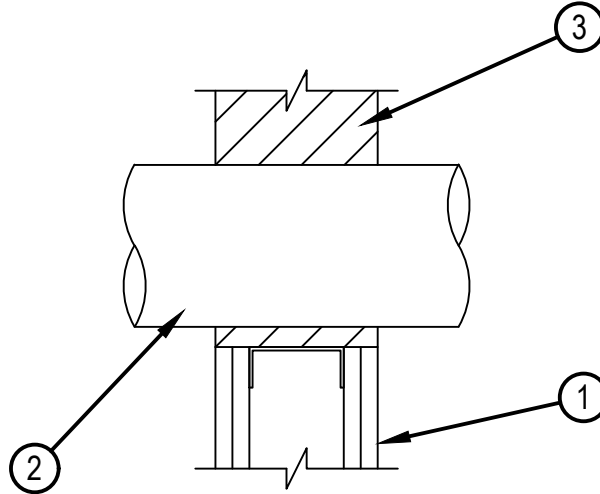
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SECTION G-G

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

- A. Studs — Steel studs 89 mm (3-1/2 in.) deep, fabricated from 25 MSG galv steel, spaced max 610 mm (24 in.) OC.
- B. Gypsum Board* — The gypsum board type, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max area of opening is 2903 cm² (450 in²) with max dimension of 762 mm (30 in.).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrants — A max of seven firestop configurations may be installed within the opening. The space between firestop configurations. Unless otherwise indicated, the space between firestop configurations and periphery of opening shall be min 9.5 mm (3/8 in.). Pipe, conduit, tubing or cables to be rigidly supported on both sides of floor or wall assembly. The T Rating of the system is dependent on the firestop configurations, as shown in the table below. Any combination of the following firestop configurations detailed herein may be used:

Firestop Configuration	1 Hr F Rating FT Rating Hr	2 Hr F Rating FT Rating Hr
A	0	1/2
B	1	1-1/2
C	1/2	1
D	0	0
E	1	2
F	0	0
G	0	0



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Firestop Configuration A

2. Cables — Max 102 mm (4 in.) diam tightly bundled cable. The min space between adjacent penetrants shall be 102 mm (4 in.) Cable bundle may be any combination of the following types and sizes of cables:
 - A. Max 25 pair No. 24 AWG copper telephone cable with polyvinyl chloride (PVC) insulation and jacket materials.
 - B. Max 7/C No. 12 AWG cable with PVC insulation and jacket materials.
 - C. Multiple fiber optical communication cables with PVC jacket material and having a max outside diameter of 3/8 in.
 - D. Max 3/C No. 12 AWG steel clad cables with PVC insulation and jacket materials.
 - E. Max 3/C No. 8 AWG cable with ground with PVC insulation and jacket materials.
 - F. Max RG 59 coaxial cables with PVC insulation and jacket materials.
3. Fill, Void or Cavity Materials* — Foam — Fill material applied within annulus flush with both surfaces of the wall. Min fill material thickness for 1 hr F Rating is 121 mm (4-3/4 in.). Min fill material thickness for 2 hr F Rating is 152 mm (6 in.).
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Firestop Configuration B

2. Copper Tube or Pipe — Nom 25 mm (1 in.) diam (or smaller) Type L copper tube or nom 25 mm (1 in.) diam (or smaller) Regular (or heavier) copper pipe. Min space between adjacent penetrants shall be 76 mm (3 in.).
3. Tube Insulation-Plastics+ — Nom 19 mm (3/4 in.) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. The min space between adjacent penetrants shall be 38 mm (1-1/2 in.).
See Plastics+ (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.
4. Firestop System — The firestop system shall consist of the following:
 - A. Fill, Void or Cavity Material* — Wrap Strip — Nom 4.8 mm by 25 mm (3/16 in. thick by 1 in.) wide intumescent wrap strip. The wrap strip is continuously wrapped around the outer circumference of the pipe covering one time and held in place with tape. Wrap strips are installed flush with each side of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 648-E W45/1-3/4 Wrap Strip
 - B. Fill, Void or Cavity Materials* — Foam — Fill material applied within annulus flush with both surfaces of the wall. Min fill material thickness for 1 hr F Rating is 121 mm (4-3/4 in.). Min fill material thickness for 2 hr F Rating is 152 mm (6 in.).
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Firestop Configuration C

2. Polyvinyl Chloride (PVC) Pipe — Nom 51 mm (2 in.) 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 system. The min space between non-metallic penetrants shall be 25 mm (1 in.). The min space between metallic penetrants shall be 89 mm (3-1/2 in.).
3. Firestop System — The firestop system shall consist of the following:
 - A. Fill, Void or Cavity Material* — Wrap Strip — Nom 4.8 mm by 25 mm wide (3/16 in. thick by 1 in.) intumescent wrap strip. The wrap strip is continuously wrapped around the outer circumference of the pipe covering one time and held in place with tape. Wrap strips are installed flush with each side of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 648-E W25/1" Wrap Strip
 - B. Fill, Void or Cavity Materials* — Foam — Fill material applied within annulus flush with both surfaces of the wall. Min fill material thickness for 1 hr F Rating is 121 mm (4-3/4 in.). Min fill material thickness for 2 hr F Rating is 152 mm (6 in.).
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Firestop Configuration D

2. Through Penetrant — One metallic pipe, conduit or tube to be installed either concentrically or eccentrically within the firestop system. The min annular space between the pipe, conduit or tube and the periphery of the opening shall be min. 0 mm (point contact). The annular space between adjacent penetrants shall be min 89 mm (3-1/2 in.) The following types and sizes of metallic pipes, conduits or tubes may be used:
 - Steel Pipe — Nom 102 mm (4 in.) diam (or smaller) Schedul 10 (or heavier) steel pipe.
 - Iron Pipe — Nom 102 mm (4 in.) diam (or smaller) cast or ductile iron pipe.
 - Conduit — Nom 102 mm (4 in.) diam (or smaller) rigid steel conduit.
 - Conduit — Nom 102 mm (4 in.) diam (or smaller) steel electrical metallic conduit.
 - Copper Tubing — Nom 102 mm (4 in.) diam (or smaller) Type L (or heavier) copper tubing.
 - Copper Pipe — Nom 102 mm (4 in.) diam (or smaller) Regular (or heavier) copper pipe.
3. Fill, Void or Cavity Material* — Foam — Fill material applied within annulus flush with both surfaces of the wall. Min fill material thickness for 1 hr F Rating is 121 mm (4-3/4 in.) Min fill material thickness for 2 hr F Rating is 152 mm (6 in.).
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Firestop Configuration E

2. Steel Pipe — Nom 203 mm (8 in.) diam (or smaller) Schedule 40 (or heavier) steel pipe.
3. Pipe Covering Materials* — Nom 38 mm (1-1/2 in.) 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 product. The min space between adjacent penetrants shall be 51 mm (2 in.).
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.
4. Fill, Void or Cavity Materials* — Foam — Fill material applied within annulus flush with both surfaces of the wall. Min fill material thickness for 1 hr F Rating is 121 mm (4-3/4 in.). Min fill material thickness for 2 hr F Rating is 152 mm (6 in.).
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 660 Firestop Foam

Firestop Configuration F

2. Flexible Conduit — Nom 25 mm (1 in.) diam (or smaller) flexible steel conduit. The min space between adjacent penetrants shall be 89 mm (3-1/2 in.).
3. Fill, Void or Cavity Material* — Foam — Fill material applied within annulus flush with both surfaces of the wall. Min fill material thickness for 1 hr F Rating is 121 mm (4-3/4 in.). Min fill material thickness for 2 hr F Rating is 152 mm (6 in.).
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Firestop Configuration G

2. Steel Duct — Nom 152 mm (6 in.) diam (or smaller) No. 28 gauge (or heavier) galve steel duct. The min space between adjacent penetrants shall be 38 mm (1-1/2 in.).
3. Fill, Void or Cavity Material* — Foam — Fill material applied within annulus flush with both surfaces of the wall. Min fill material thickness for 1 hr F Rating is 121 mm (4-3/4 in.). Min fill material thickness for 2 hr F Rating is 152 mm (6 in.).
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* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.



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