



# Fire Protection Products



Date: January 1, 2008

Subject: General Certificate of Conformance for 3M Fire Protection Products

## Product Category: Through Penetration Firestop Products

*Fire Barrier CS-195+ Composite Sheet*  
*Fire Barrier FS-195+ Wrap Strip*  
*Fire Barrier Plastic Pipe Device (PPD)*  
*Fire Barrier Ultra Plastic Pipe Device (PPD)*  
*Fire Barrier Ultra RC Pack*  
*Fire Barrier Moldable Putty+ (MP+)*  
*Interam™ E-5 Series Mats*  
*Interam™ I-10 Series Mats*  
*Interam™ Ultra GS Strip*  
*Interam™ T-49 Tape*  
*Interam™ T-65 Tape*  
*Fire Barrier Cast-In Device & Accessories*  
*3M Fire Barrier Pillow*  
*3M Fire Barrier Self-Locking Pillow*  
*Fire Barrier Expanrol™ Flexible Intumescent Strip (E-FIS)*  
*Fire Barrier Pass-Through Device*  
*Fire Barrier RC-1 Restricting Collar*

*Ultra Fast Anchors*  
*Marine Fire Wrap*  
*Fire Barrier Sealant CP 25WB+ Caulk*  
*Fire Barrier Sealant IC 15WB Caulk*  
*Fire Barrier Sealant IC 15WB+ Caulk*  
*FireDam™ 150+ Caulk*  
*Fire Barrier Water Tight Sealant 3000 WT*  
*Fire Barrier Water Tight Sealant 1003 SL*  
*Fire Barrier Water Tight Sealant 1000 NS*  
*Fire Barrier Silicone Sealant 2000 N/S*  
*Fire Barrier Silicone Sealant 2000+*  
*Fire Block Sealant FB 136*  
*Interam™ FireDam™ 150 Caulk*  
*Fire Barrier Silicone RTV Foam 2001*  
*FireDam™ Spray 100*  
*FireDam™ Spray 200*  
*Fire Barrier Mortar*  
*Fire Barrier Packing Material*

### These products are tested to one or more of the following standards:

- ASTM E 119 (ANSI/UL 263) Fire Tests of Building Construction and Materials Time-Temperature Curve
- ASTM E 814 (ANSI /UL 1479) Fire Tests of Through-Penetration Fire Stops (under positive furnace pressure of minimum .01 inches of water column)
- ASTM E 84 (ANSI/UL 723) Surface Burning Characteristics of Building Materials
- ASTM E 1966 (ANSI / UL 2079) Test for Fire Resistance of Building Joint Systems
- NFPA 252 Standard Methods of Fire Test and Door Assemblies
- UBC Standard 7-2(97)
- IMO Res. A.754(18)
- ASTM E 2307 Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus
- ASTM E 136 Standard Test Method for Behavior of Material in a Vertical Tube Furnace at 750° C
- ASTM C 1338 Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings

No asbestos, PCB's, or lead are used or contained in these products.

Issued by:

Quality Manager or Designee

Product Service Manager, or Designee

## 3M Fire Protection Products

### MATRIX OF UL TESTED AND APPROVED SYSTEMS FOR FIRESTOPPING HVAC PENETRATIONS IN RATED GYPSUM WALLS AND CONCRETE FLOOR & WALL CONSTRUCTION

Penetrating Item	Assembly Penetrated	F Rating	System Number	Products Used
Bare Rec. & square duct Angles Req.	Framed Gypsum Walls	1 & 2 Hr.	WL7008	CP25WB FB3000WT
Bare Rec. & square duct 12" x 12" Max.	Framed Gypsum Walls	1 Hr.	W-L-7052	CP25WB FB3000WT
Bare Rec. & square duct Angles Req.	Framed Gypsum Walls	1 Hr.	W-L-7063	CP25WB FB3000WT
Bare Rec. & square duct Angles Req.	Framed Gypsum Walls	1 & 2 Hr.	W-L-7091	CP25WB IC15WB FB3000WT
Bare round ducts	Framed Gypsum Walls	2 Hr.	W-L-7013	CP25WB FB3000WT
Bare round ducts	Framed Gypsum Walls	1 Hr.	W-L-7045	CP25WB FB3000WT
Bare square ducts 6" x 6" Max.	Framed Gypsum Walls	2 Hr.	W-L-7056	IC15WB CP25WB FB3000WT
Round bare ducts 5" Dia. Max.	Framed Gypsum Walls	1 & 2 Hr.	W-L-7095	IC15WB CP25WB FB3000WT
Insulated Ducts	Framed Gypsum Walls	1 & 2 Hr.	W-L-7051	Ultra GS & CP25WB
Line sets	Framed Gypsum Walls	1 & 2 Hr.	W-L-8018	CP25WB
Line sets	Framed Gypsum Walls	1 & 2 Hr.	W-L-8039	IC15WB
Line sets	Framed Gypsum Walls	1 & 2 Hr.	W-L-8021	FS-195 & CP25WB
Bare Rec. & square duct	Concrete Floor & Walls	3 Hr.	C-AJ-7003	CP25WB FB3000WT
Bare Rec. & square duct Angles Req.	Concrete Floor & Walls	2 Hr.	C-AJ-7076	CP25WB IC15WB FB3000WT
Line sets	Concrete Floor & Walls	2 Hr.	C-AJ-8087	CP25WB

Line sets	Concrete Floor & Walls	2 Hr.	C-AJ-8088	CP25WB FB3000WT
Line sets	Concrete Floor	2 hr.	C-AJ-8123	IC15WB
Line sets	Concrete Floor & Walls	2 Hr.	C-AJ-8135	IC15WB CP25WB FB3000WT
Line Sets	Concrete Floor	3 Hr. 2 Hr.	F-A-8007 F-A-8010	Cast-in-Place Device

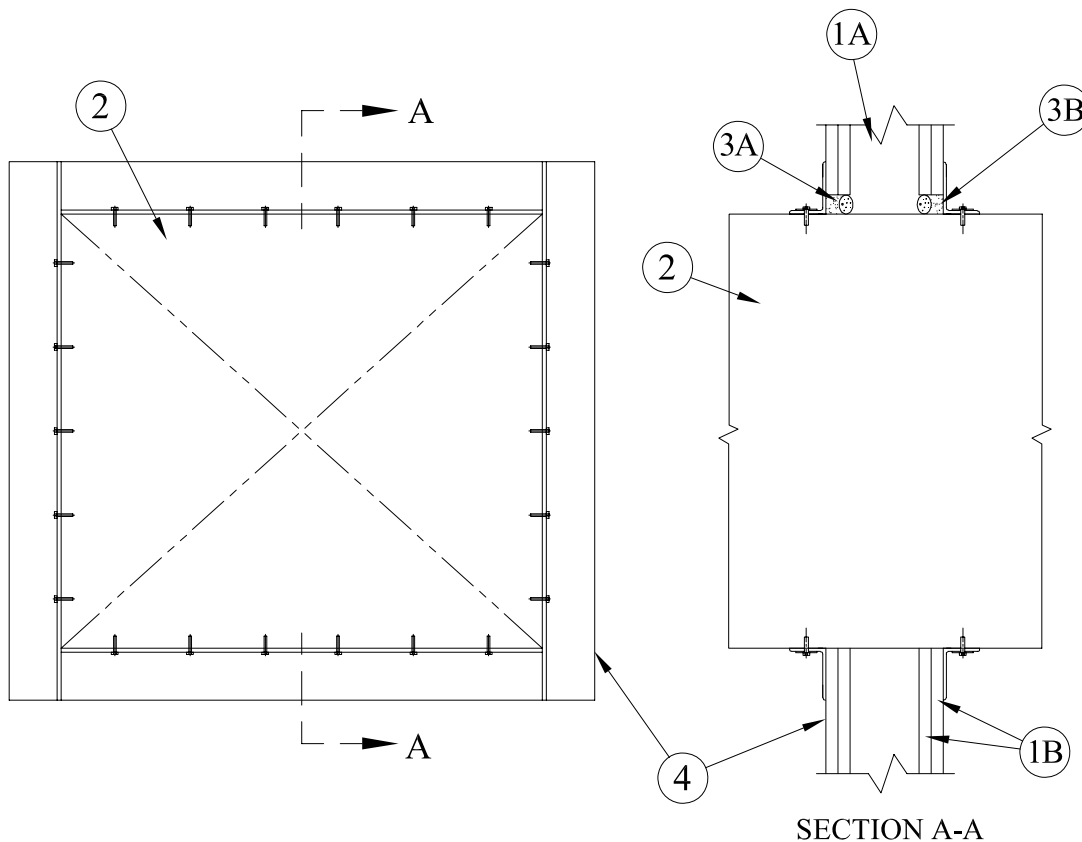
Rev. 3-4-05

## System No. W-L-7008

June 15, 2005

F Rating – 1 & 2 Hr (See Item 1)

T Ratings – 0 Hr



- Wall Assembly** – The 1 and 2 hr fire rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
  - Studs** – Wall framing shall consist of steel channel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional 3-1/2 in. (89 mm) wide steel studs shall be used to completely frame opening.
  - Gypsum Board\*** – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max size of opening to be 1216 sq in. (188.5 cm<sup>2</sup>) with a max dimension of 38 in. (965 mm).

**The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.**
- Through Penetrant** – Nom 36 by 30 in. (914 by 762 mm) (or smaller) No. 24 gauge (or heavier) galv steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (0 mm) (point contact) to max 2 in. (51 mm) is required within the firestop system. Steel duct to be rigidly supported on both sides of floor or wall assembly.
- Firestop System** – The details of the firestop system shall be as follows:
  - Packing Material** (Optional) – Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction-fit into annular space for 2 hr rated wall assemblies only. Packing material to be recessed from both surfaces of wall to accommodate the required thickness of fill material (Item 3B).
  - Fill, Void or Cavity Material\* – Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At the point contact location between duct and wallboard, a min 1/4 in. (6 mm) diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly.

**3M COMPANY** – CP 25WB+ caulk or FB-3000 WT sealant
  - Retaining Angles** – Min 16 gauge galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap wall surfaces of a min of 1 in. (25 mm). Angles attached to duct on both sides of wall with min 1/2 in. (13 mm) long, No. 10 (or larger) sheet metal screws spaced a max of 1 in. (25 mm) from each end of duct and spaced a max of 6 in. (152 mm) OC.

\*Bearing the UL Classification Marking

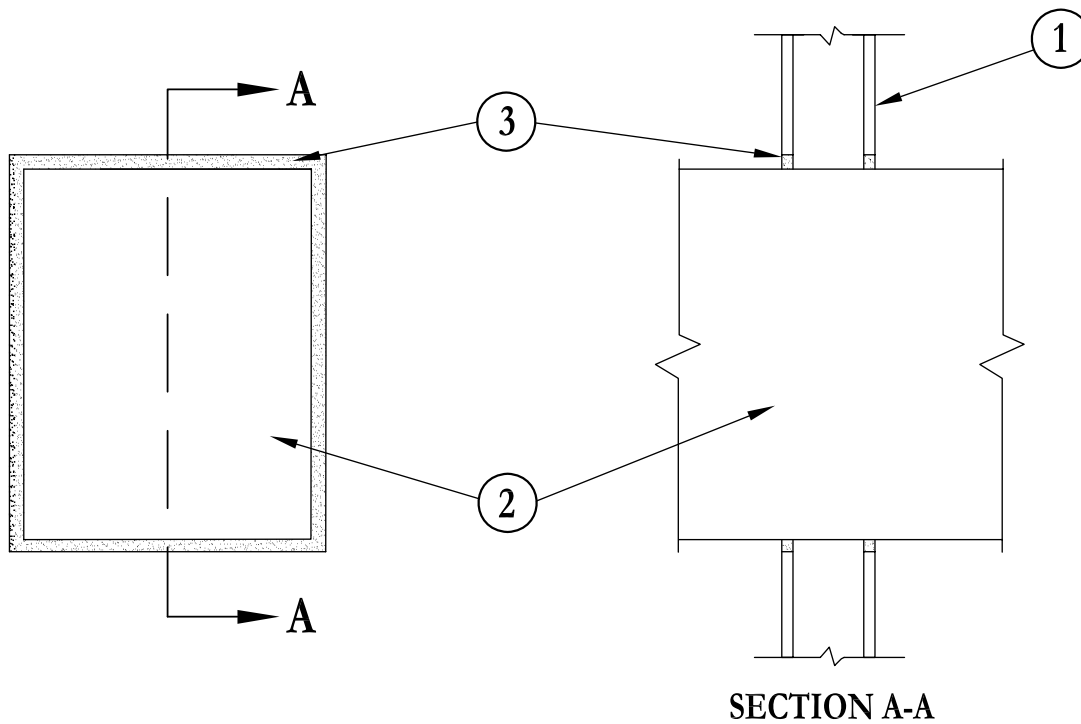
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## System No. W-L-7052

May 19, 2005

F Rating – 1 Hr

T Rating – 0 Hr



- Wall Assembly** – The 1 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features.
  - Studs** – Wall framing may consist of either wood studs or steel studs. Wood studs to consist of nom 2 by 4 in. (51 mm by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
  - Gypsum Board\*** – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max size of opening is 14 by 14 in. (356 mm by 356 mm) square.
- Steel Duct** – Nom 12 by 12 in. (305 mm by 305 mm) (or smaller) No. 24 gauge (or heavier) galv steel duct to be centered within opening with a nom annular space of 1 in. (25 mm). Duct to be rigidly supported on both sides of opening.
- Fill, Void or Cavity Material\* – Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with both surfaces of wall assembly.

**3M COMPANY** – CP 25WB+, IC 15WB+ caulk or FB-3000 WT sealant

\*Bearing the UL Classification Mark

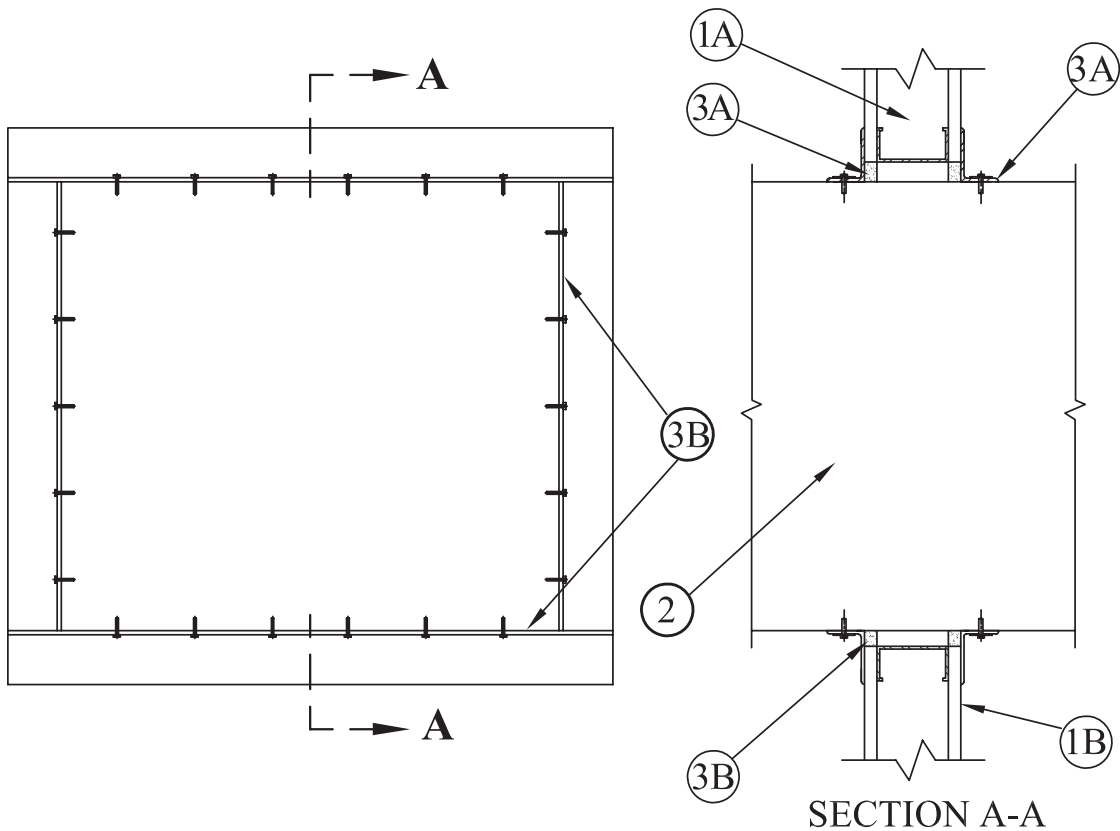
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# System No. W-L-7063

September 07, 2004

F Rating – 1 Hr

T Rating – 3/4 Hr



1. **Wall Assembly** – The 1 hr fire rated wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features.
  - A. **Studs** – Wall framing shall consist of min 3-5/8 in. wide steel studs spaced max 24 in. OC. Additional steel studs shall be used to completely frame opening.
  - B. **Wallboard, Gypsum\*** – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max size of opening is 9,800 sq. in. with a max dimension of 100 in.
2. **Steel Duct** – Nom 96 by 96 in. (or smaller) No. 18 gauge (or heavier) galv steel duct to be installed within the opening. The duct shall be constructed and reinforced in accordance with SMACNA construction standards and provided with 2 in. standing seams. The annular space between the duct and the periphery of opening shall be a min 1 in. to a max 2 in. with the exception that the standing seams which shall be installed at point contact to the framing of the opening. The annular space within the firestop system was 1 in. on both sides, with 2 in. max at the top with 0 in. (point contact) at the bottom. Duct to be rigidly supported on both sides of opening.
3. **Firestop System** – The firestop system shall consist of the following.
  - A. **Fill, Void or Cavity Material\* – Caulk or Sealant** – Min 5/8 in. thickness of caulk applied within annulus, flush with both surfaces of wall assembly.  
**3M COMPANY** – CP 25WB+ caulk or FB-3000 WT sealant
  - B. **Steel Retaining Angles** – Min 16 gauge galv steel angles sized to lap duct a min of 2 in. and lap wall surface a min of 1 in. Angles attached to the duct on both sides of wall with No. 10 (or larger) steel sheet metal screws 1 in. from each end, and 6 in. OC. On the opposite side of wall, the screw pattern to be staggered 6 in. OC to be centered between screw pattern on opposite side of wall.

\*Bearing the UL Classification Mark

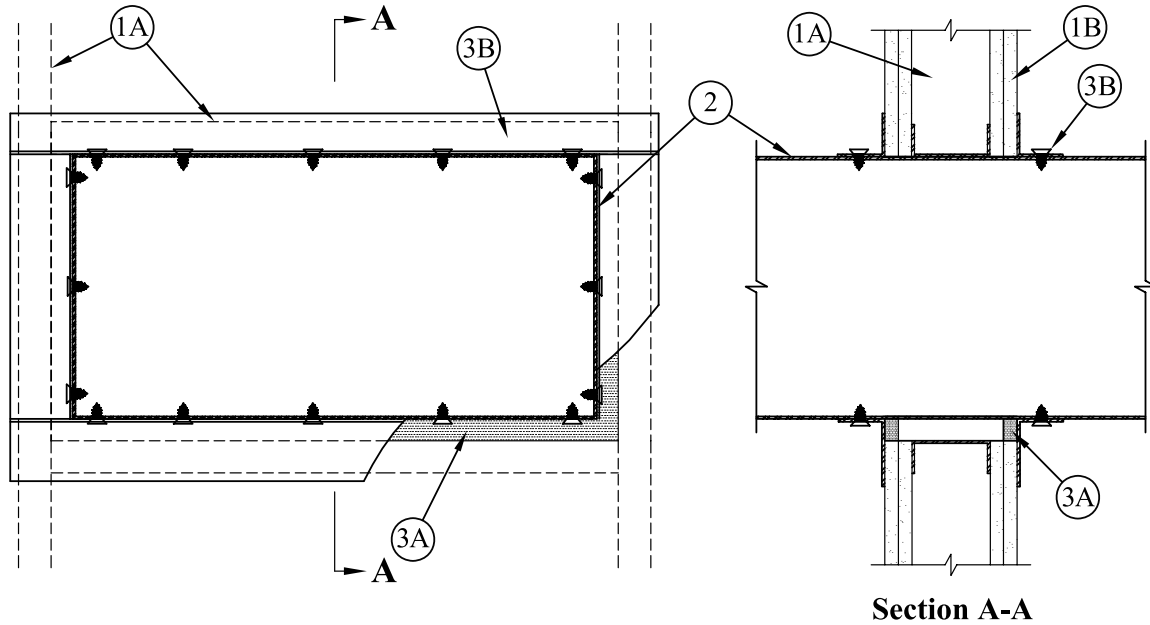
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## System No. W-L-7091

May 19, 2005

F Ratings – 1 &amp; 2 Hr (See Item 1)

T Rating – 0 Hr



Section A-A

1. **Wall Assembly** – The 1 or 2 hr fire rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
  - A. **Studs** – Wall framing shall consist of steel channel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional 3-1/2 in. (89 mm) wide steel studs shall be used to completely frame opening.
  - B. **Gypsum Board\*** – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max size of opening to be 640 sq in. (4129 cm<sup>2</sup>) with a max dimension of 32 in. (813 mm)

**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. **Steel Duct** – Nom 30 in. by 18 in. (762 mm by 457 mm) (or smaller) No. 24 gauge (or heavier) galv steel duct installed concentrically or eccentrically within opening. Annular space between duct and periphery of opening to be min 0 in. (point contact) to max 2 in. (0 mm to max 51 mm). Duct to be rigidly supported on both sides of wall assembly.
3. **Firestop System** – The firestop system shall consist of the following:
  - A. **Fill, Void or Cavity Material\* – Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with both surfaces of wall.  
**3M COMPANY** – CP 25WB+, IC 15WB+ caulk or FB-3000 WT sealant
  - B. **Retaining Angles** – Min 16 gauge galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap wall surfaces a min of 1 in. (25 mm). Angles attached to duct on both sides of wall with min 1/2 in. (13 mm) long, No. 10 (or larger) sheet metal screws spaced a max 1 in. (25 mm) from each end and spaced a max 6 in. (152 mm) OC.

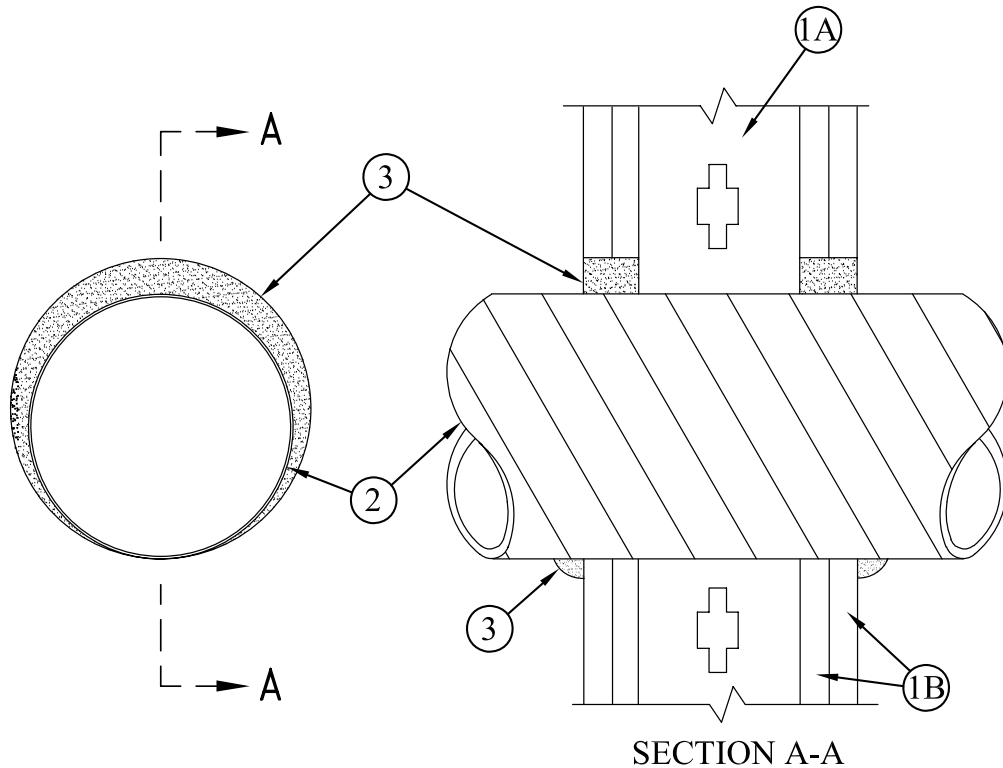
\*Bearing the UL Classification Marking

## System No. W-L-7013

September 07, 2004

F Rating – 2 Hr

T Rating – 0 Hr



1. **Wall Assembly** – The 2 hr fire rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
  - A. **Studs** – Wall framing shall consist of steel channel studs to be min 3-1/2 in. wide and spaced max 24 in. OC.
  - B. **Gypsum Board\*** – Two layers of min 5/8 in. thick gypsum wallboard, as specified in the individual Wall and Partition Design. Max diam of opening is 17-1/2 in.
2. **Through Penetrant** – One steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. to max 1-1/2 in. is required within the firestop system. Steel duct to be rigidly supported on both sides of wall assembly. The following sizes of steel ducts may be used.
  - A. **Steel Duct** – Nom 16 in. diam (or smaller) No. 24 gauge (or heavier) spiral wound galv steel duct.
  - B. **Steel Duct** – Nom 10 in. diam (or smaller) No. 28 gauge (or heavier) galv steel vent duct.
3. **Fill, Void or Cavity Material\* – Caulk or Sealant** – Min 1-1/4 in. thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At the point contact location between duct and wallboard, a min 1/4 in. diam bead of caulk shall be applied at the wallboard/duct interface on both surfaces of wall assembly.

**3M COMPANY** – CP 25WB+ caulk or FB-3000 WT sealant

\*Bearing the UL Classification Marking

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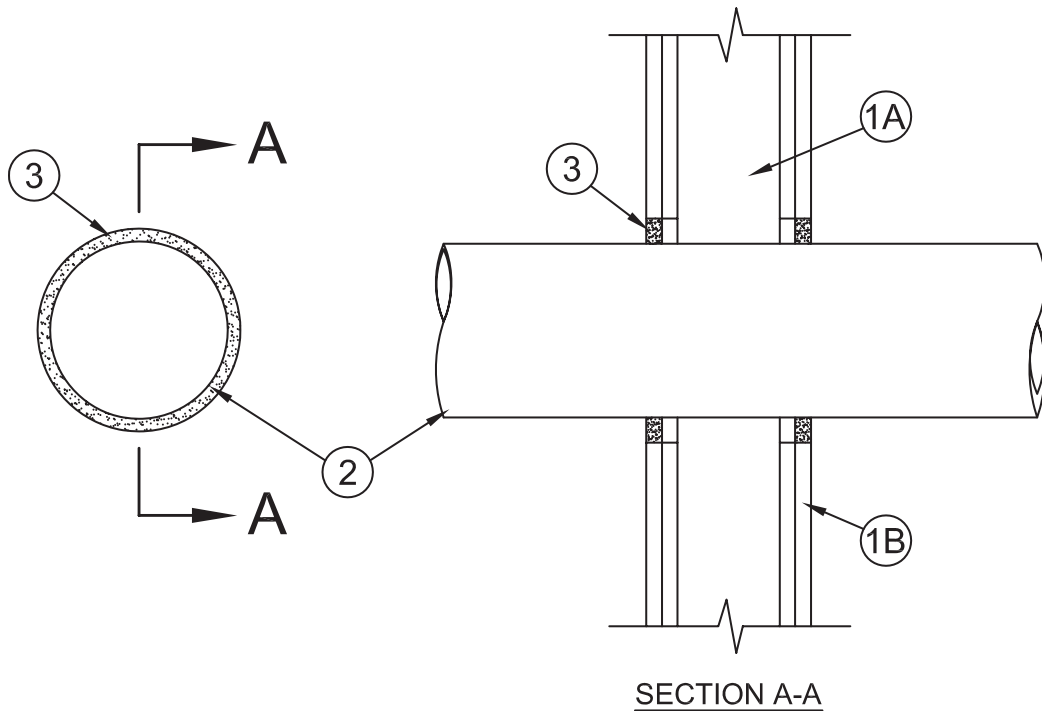


# System No. W-L-7045

July 26, 2007

F Ratings – 1 and 2 Hr (See Item 1)

T Rating – 0 Hr



- Wall Assembly** – The 1 hr or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features.
  - Studs** – Wall framing shall consist of min 3-1/2 in. (89 mm) wide steel channel studs spaced max 24 in. (610 mm) OC. When diam of opening exceeds width of stud cavity, additional lengths of steel stud installed to frame out opening around steel duct (Item 2).
  - Gypsum Board\*** – Min 5/8 in. (16 mm) thick, 4 ft (1.22 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U400 or V400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 25-1/2 in. (648 mm).

**The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.**
- Steel Duct** – Max 24 in. (610 mm) diam No. 24 gauge (or heavier) spiral wound steel duct to be installed concentrically with a 3/4 in. (19 mm) annular space. Duct to be rigidly supported on both sides of wall assembly.
- Fill, Void or Cavity Material\* – Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly.

**3M COMPANY** – CP 25WB+ or FB-3000 WT

\*Bearing the UL Classification Mark

Through Penetrations

Misc. Mechanical

7000 Series

Gypsum

WL

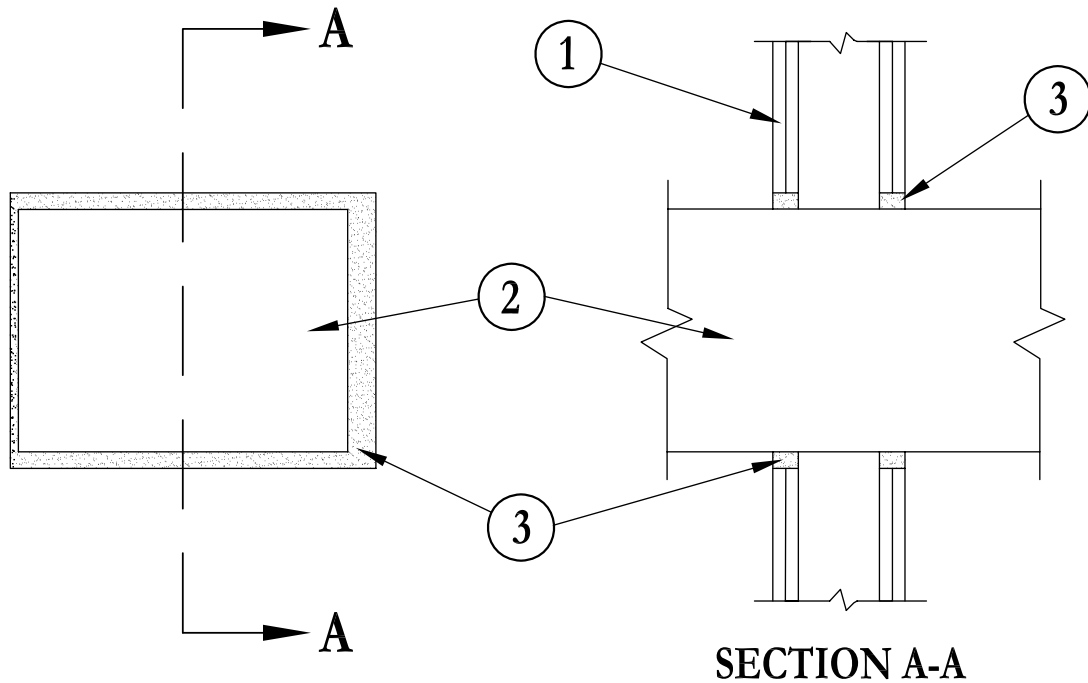
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## System No. W-L-7056

May 19, 2005

F Rating – 2 Hr

T Rating – 1/4 Hr



1. **Wall Assembly** – The 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
  - A. **Studs** – Wall framing may consist of min 2-1/2 in. (64 mm) wide steel channel studs spaced max 24 in. (610 mm) OC.
  - B. **Gypsum Board\*** – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max area of opening is 49 sq in. (316 cm<sup>2</sup>) with max dimension of 7 in. (178 mm).
2. **Steel Duct** – Nom 6 by 6 in. (152 mm by 152 mm) (or smaller) No. 24 gauge (or heavier) steel duct to be installed either concentrically or eccentrically within the opening. The annular space shall be min 1/4 in. to max 3/4 in. (6 mm to max 19 mm). Duct to be rigidly supported on both sides of wall assembly.
3. **Fill, Void or Cavity Materials\* – Caulk, Sealant or Putty** – Min 1-1/4 in. (32 mm) thickness of moldable putty, applied within the annulus flush with both surfaces of the wall.
 

**3M COMPANY** – CP 25WB+, IC 15WB+ caulk, FB-3000 WT sealant or MP+ Stix putty

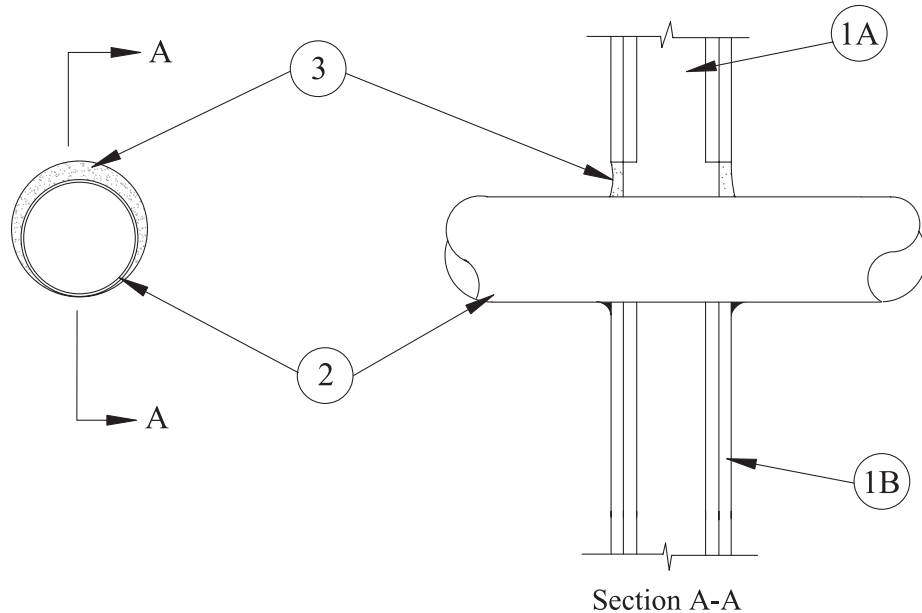
\*Bearing the UL Classification Marking

# System No. W-L-7095

May 19, 2005

F Ratings – 1 & 2 Hr (See Item 1)

T Ratings – 0 & 1/4 Hr (See Item 1)



- Wall Assembly** – The 1 or 2 hr fire rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
  - Studs** – Wall framing shall consist of steel channel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional 3-1/2 in. (89 mm) wide steel studs shall be used to completely frame opening.
  - Gypsum Board\*** – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max diam of opening is 6-1/2 in. (165 mm).

**The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.**  
**The hourly T Rating of the firestop system is 0 and 1/4 Hr for 1 and 2 Hr rated assemblies, respectively.**
- Steel Duct** – Nom 5 in. (127 mm) diam (or smaller) No. 30 gauge (or heavier) galv steel duct installed concentrically or eccentrically within opening. Annular space between duct and periphery of opening to be min 0 in. (point contact) to max 1-1/2 in. (0 mm to max 38 mm). Duct to be rigidly supported on both sides of wall assembly.
- Fill, Void or Cavity Material\* – Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with both surfaces of wall. An additional min 1/4 in. (6 mm) diam bead of caulk applied to the duct/gypsum board interface at the point contact locations on both sides of wall.

**3M COMPANY** – CP 25WB+, IC 15WB+ caulk or FB-3000 WT sealant

\*Bearing the UL Classification Marking

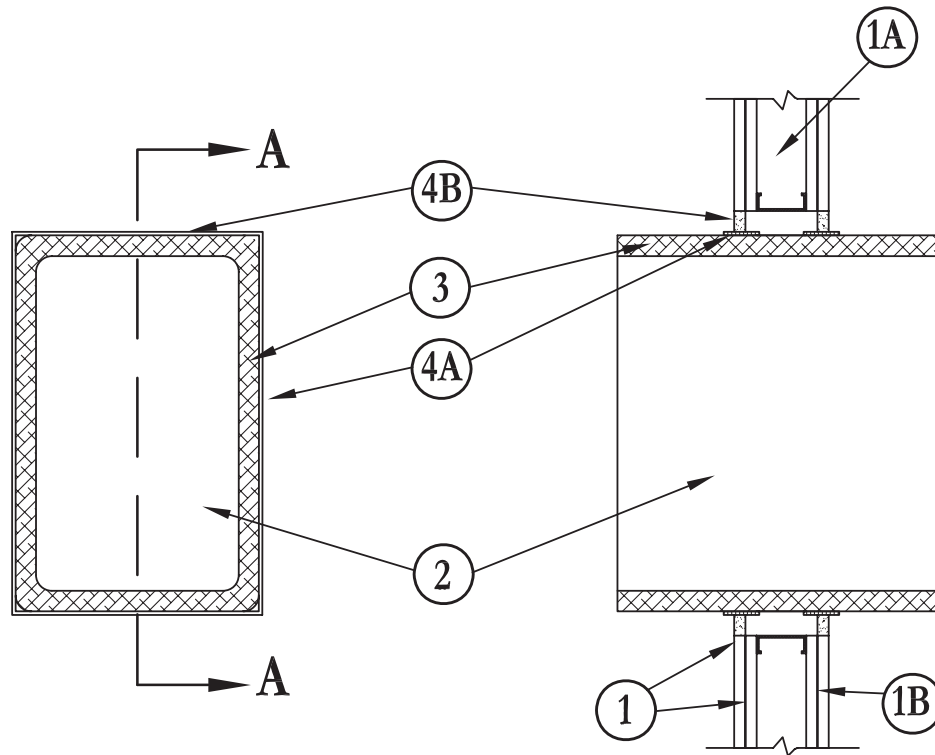
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## System No. W-L-7051

October 02, 2006

F Rating – 1 and 2 Hr (See Item 1)

T Rating – 3/4 and 2 Hr (See Item 1)



SECTION A-A

- Wall Assembly** – The 1 and 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features.
  - Studs** – Wall framing shall consist of min 3-1/2 in. (89 mm) wide steel studs spaced a max 24 in. (610 mm) OC. Additional min 3-1/2 in. (89 mm) wide steel studs shall be used to completely frame the opening.
  - Gypsum Board\*** – Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max size of opening is 35 in. by 29 in. (889 mm by 737 mm) opening.

**The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. The hourly T Rating is 3/4 and 2 Hr for 1 and 2 Hr rated assemblies, respectively.**
- Steel Air Duct** – Nom 30 in. by 24 in. (762 mm by 610 mm) min 24 gauge (or heavier) galv steel air duct to be installed either concentrically or eccentrically within the opening. Duct to be rigidly supported on both sides of wall assembly.
- Duct Insulation\*** – Nom 1-1/2 in. (38 mm) thick glass fiber blanket insulation jacketed on the outside with foil-scrim-kraft facing. Longitudinal and transverse joints sealed with foil-scrim kraft tape. A nominal 1 in. (25 mm) annular space shall be maintained between the insulated duct and the periphery of the opening.  
See **Batts and Blankets (BKNV)** category in the Building Materials Directory for names of manufacturers. Any batts and blankets 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.
- Firestop System** – The firestop system shall consist of the following:
  - Wrap Strip** – One layer of nom 1/8 in. (3.2 mm) thick intumescent material supplied in 2 in. (51 mm) wide strips tightly wrapped around duct insulation and held in place with 2 in. (51 mm) wide min 3 mil foil tape. Wrap strip slid into annulus on both sides of wall such that wrap strips extend approx 1/2 in. (13 mm) beyond both surfaces of wall. Exposed portion of wrap strip to be completely covered with min 3 mil foil tape.  
**3M COMPANY** – Ultra GS
  - Fill, Void or Cavity Material\* – Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly.  
**3M COMPANY** – CP 25WB+, IC 15WB+, FB-3000 WT

\*Bearing the UL Classification Mark

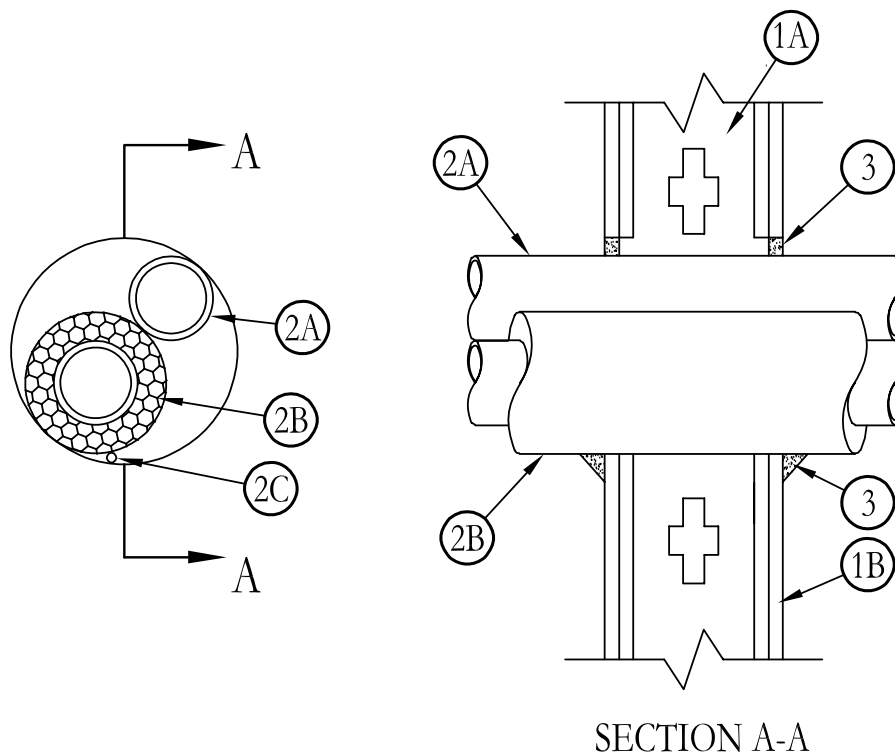
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## System No. W-L-8018

May 19, 2005

F Rating - 1 and 2 Hr (See Item 1)

T Rating - 0 and 3/4 Hr (See Item 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 specified in the individual U400 or V400 Series Wall and Partition Design in the UL Fire Resistive Directory and shall include the following construction features.
  - Studs** – Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 in. by 4 in. (51 mm by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide steel channel studs spaced max 24 in. (610 mm) OC.
  - Gypsum Board\*** – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max diam of opening is 4 in. (102 mm).

**The hourly F Rating of the firestop system is equal to the hourly rating of the wall assembly. The hourly T Rating of the firestop system is 0 and 3/4 Hr for 1 and 2 Hr rated assemblies, respectively.**
- Through Penetrants** – Penetrants to be installed either concentrically or eccentrically within the firestop system. The annular space between penetrants shall be min 0 in. (point contact) to max 1-1/2 in. (0 mm to max 38 mm). The annular space between penetrants and periphery of opening shall be min 0 in. (point contact) to max 1-1/4 in. (0 mm to max 32 mm). Penetrants to be rigidly supported on both sides of wall assembly. The following types and sizes of penetrants may be used:
  - Metallic Pipes** – Max two metallic pipes or tubing. The following types and sizes of metallic pipes or tubing may be used:
    - Copper Tubing** – Nom 1 in. (25 mm) diam (or smaller) Type M (or heavier) copper tube.
    - Copper Pipe** – Nom 1 in. (25 mm) diam (or smaller) Regular (or heavier) copper pipe.
  - Tube Insulation\*- Plastics+** – Nom 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. Tube insulation required for all copper tubes and pipes greater than nom 3/4 in. (19 mm) diam. See **Plastics** (QMFZ2) category in the 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.
  - Cables** – Max one 2/C No. 18 AWG (or smaller) control cable with polyvinyl chloride (PVC) insulation and jacket. Cable to be rigidly supported on both sides of floor or wall assembly.
- Fill, Void or Cavity Materials\* – Caulk, Sealant or Putty** – Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with both surfaces of the wall. Min 1/2 in. (13 mm) diam bead of fill material applied to the wallboard/penetrant interface at point contact location on both surfaces of wall.

**3M COMPANY** – CP 25WB+, IC 15WB+ caulk, FB-3000 WT sealant or MP+ Stix putty

\*Bearing the UL Classification Marking

+Bearing the UL Recognized Component Mark

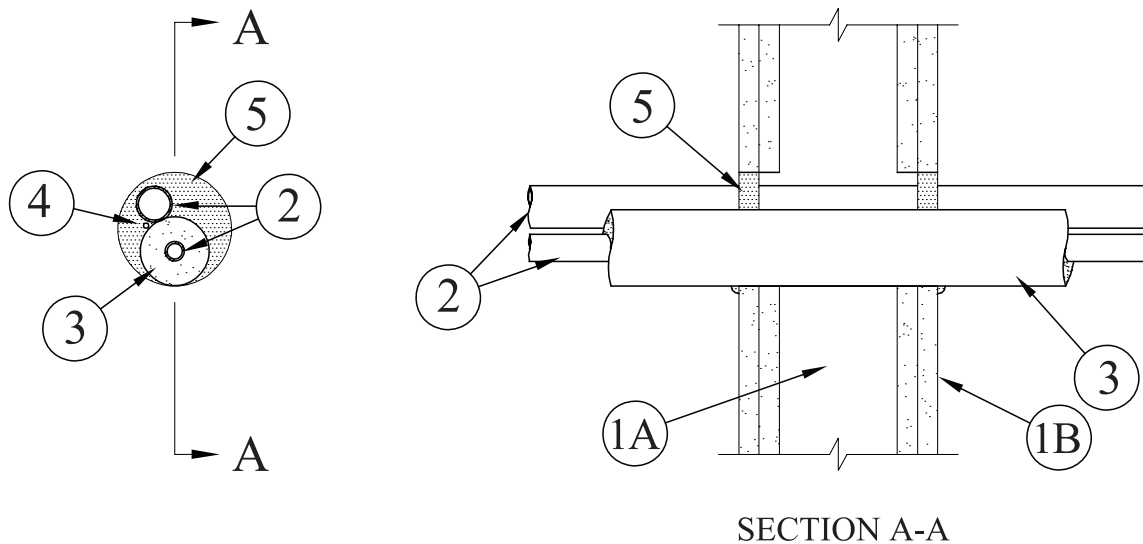
This material was extracted and drawn by 3M Fire Protection Products from the 2006 edition of the UL Fire Resistance Directory.

## System No. W-L-8039

May 19, 2005

F Ratings – 1 & 2 Hr (See Item 1)

T Ratings – 0 & 1/2 Hr (See Item 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 U300, U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
  - Studs** – Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 in. by 4 in. (51 mm by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide spaced max 24 in. (610 mm) OC.
  - Gypsum Board\*** – The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 4 in. (102 mm)

**The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.**  
**The hourly T Rating is 0 and 1/2 Hr for 1 and 2 Hr rated assemblies, respectively.**
- Through Penetrants** – A max of two pipes or tubes and one cable installed eccentrically or concentrically within the opening. Annular space between penetrants and periphery of opening to be min 0 in. (point contact) to max 1-1/2 in. (0 mm to max 38 mm). Separation between penetrants to be min 0 in. (point contact) to max 1-1/2 in. (0 mm to max 38 mm). Penetrants to be rigidly supported on both sides of the wall. The following types and sizes of penetrants may be used:
  - Copper Tubing** – Nom 1 in. (25 mm) diam (or smaller) Type L (or heavier) copper tubing.
  - Copper Pipe** – Nom 1 in. (25 mm) diam (or smaller) Regular (or heavier) copper pipe.
  - Steel Pipe** – Nom 1 in. (25 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
  - Cables** – Max 7/C No. 12 AWG multiconductor power and control cables; XLPE or PVC insulation with XLPE or PVC jacket.
- Tube Insulation-Plastics+** – Nom 3/4 in. (19 mm) thick (or less) acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. The tube insulation may be installed on a max of one pipe or tube. Annular space between the tube insulation and periphery of opening to be min 0 in. (point contact) to max 1-1/2 in. (0 mm to max 38 mm). Space between insulated and uninsulated penetrants to be 0 in. (point contact) to max 1-1/2 in. (0 mm to max 38 mm).

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 94-5A may be used.
- Cables** – Max two 7/C (or less) No. 12 AWG (or smaller) multiconductor power and control cables with XLPE or PVC insulation with XLPE or PVC jacket. Cables to be spaced min 0 in. (point contact) to max 1 in. (0 mm to max 25 mm) from the insulated through penetrants and min 1/2 in. to max 1 in. (13 mm to max 25 mm) from non-insulated through penetrants. The space between the cables and the periphery of the opening shall be min 0 in. (point contact) to max 1 in. (0 mm to max 25 mm). Cables to be rigidly supported on both sides of wall assembly.
- Fill, Void or Cavity Material\* – Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with both surfaces of wall. Min 1/4 in. (6 mm) diam bead of caulk applied to gypsum board/penetrant interface at point contact location on both sides of wall.

**3M COMPANY**– CP 25WB+, IC 15WB+ caulk or FB-3000 WT sealant

\* Bearing the UL Classification Marking

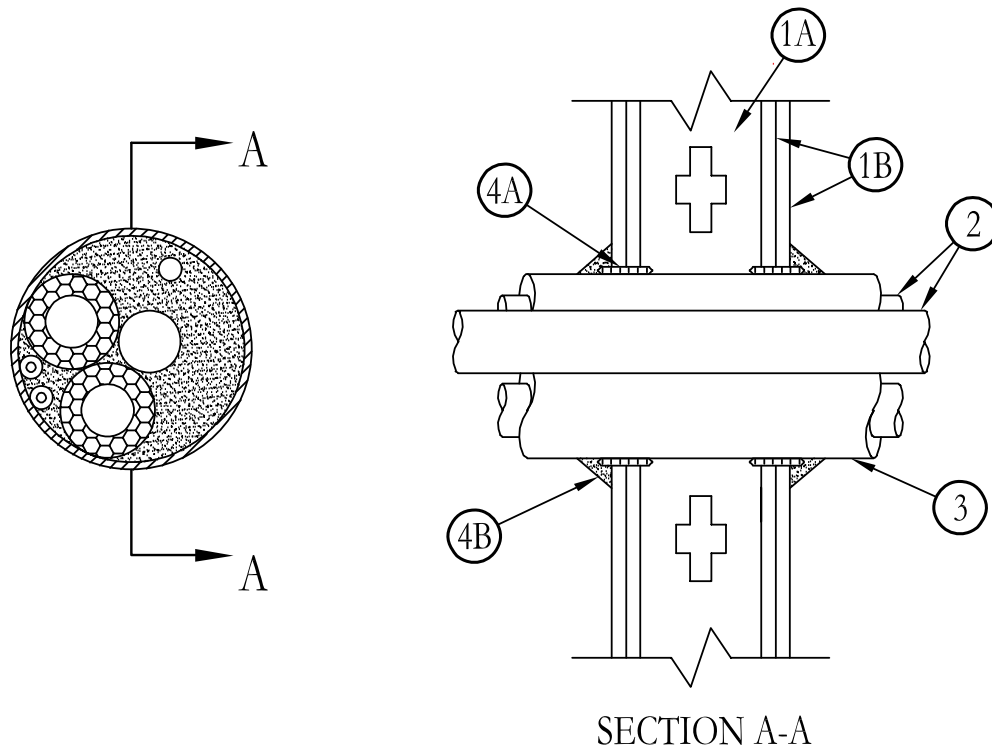
This material was extracted and drawn by 3M Fire Protection Products from the 2007 edition of the UL Fire Resistance Directory. 

**System No. W-L-8021**

May 19 2005

F Ratings – 1 or 2 Hr (See Item 1)

T Ratings – 1/4, 3/4, 1, 1-1/4 &amp; 2 Hr (See Items 2 &amp; 3)



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 specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
  - A. **Studs** – Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 in. by 4 in. (51 mm to max 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-5/8 in. (92 mm) wide and spaced max 24 in. (610 mm) OC.
  - B. **Gypsum Board\*** – Nom 5/8 in. (16 mm) thick gypsum board, as specified in the individual Wall and Partition Design. Max diam of opening is 4-1/2 in. (114 mm).

**The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly.**
2. **Through Penetrants** – Pipes, conduits, tubing or cables to be bundled within the opening such that the aggregate cross-sectional area of penetrants in opening to be max 54 percent of the cross-sectional area of the opening in wall assembly. A min 1/4 in. (6 mm) annular space shall be maintained around uninsulated metallic pipes. The annular space between penetrants and periphery of opening shall be min 1/4 in. to max 1 in. (6 mm to max 25 mm). Penetrants to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of penetrants may be used:
  - A. **Metallic Pipes** – The following types and sizes of metallic pipes, conduits or tubing may be used:
    1. **Steel Pipe** – Nom 3/4 in. (19 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
    2. **Conduit** – Nom 3/4 in. (19 mm) diam (or smaller) steel electrical metallic tubing or steel conduit.
    3. **Copper Tubing** – Nom 3/4 in. (19 mm) diam (or smaller) Type L (or heavier) copper tubing.
    4. **Copper Pipe** – Nom 3/4 in. (19 mm) diam (or smaller) Regular (or heavier) copper pipe.
  - B. **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:
    1. **Polyvinyl Chloride (PVC) Pipe** – Nom 1-1/4 in. (32 mm) diam (or smaller) Schedule 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
    2. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** – Nom 1-1/4 in. (32 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
    3. **Rigid Nonmetallic Conduit++** – Nom 1-1/4 in. (32 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).
  - C. **Cables** – Max 7/C No. 12 AWG multi conductor power and control cables; XLPE or PVC insulation with XLPE or PVC jacket.

**T Rating when uninsulated metallic pipes are used is 1/4 hr for both 1 and 2 hr rated assemblies. T Rating when cables are used is 3/4 hr for 1 and 2 hr rated assemblies. T Ratings when nonmetallic pipes are used are 1 and 2 hr for 1 and 2 hr rated assemblies, respectively.**

This material was extracted and drawn by 3M Fire Protection Products from the 2007 edition of the UL Fire Resistance Directory.



## System No. W-L-8021 *continued*

3. **Pipe Covering** – The following types and sizes of pipe coverings may be used with the metallic pipes:
- A. **Tube Insulation – Plastics+** – Nom 5/8 in. (16 mm) thick (or smaller) acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing with skin may be used.  
See **Plastics+** (QMFZ2) category in the 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.
- B. **Pipe Covering\*** – Nom 1/2 in. (13 mm) thick hollow cylindrical heavy density glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. The annular space between the insulated pipe and the edge of the through opening shall be min 1/4 in. to max 1 in. (6 mm to max 25 mm).  
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.  
**T Rating when insulated pipes are used is 3/4 hr and 1-1/4 hr for 1 and 2 hr rated assemblies, respectively.**
4. **Firestop System** – The details of the firestop system shall be as follows:
- A. **Fill, Void or Cavity Materials\* – Wrap Strip** – Min one layer of 2 in. (51 mm) wide, nom 1/4 in. (6 mm) thick intumescent elastomeric material faced on one side with aluminum foil. Wrap strip tightly wrapped around penetrant bundle (foil side exposed) and recessed within the opening on both sides of the wall such that approximately 1/2 in. (13 mm) of wrap strip extends beyond both surfaces of the wall assembly. Wrap strip held in place with foil tape.  
**3M COMPANY** – FS-195+
- B. **Fill, Void or Cavity Material\* – Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of caulk, applied within the annulus between wrap strip and periphery of opening, flush with both surfaces of wall. Min 1 in. (25 mm) thickness of caulk, applied within the annulus between penetrants and between penetrants and wrap strip, flush with outer edge of wrap strip on both sides of wall. Min 1/2 in. (13 mm) diam bead of caulk applied at the wall/wrap strip interface on both surfaces of wall. Min 1/4 in. (6 mm) diam bead of caulk applied along the outer edge of the wrap strip on both sides of wall.  
**3M COMPANY** – CP 25WB+, IC 15WB+ caulk or FB-3000 WT sealant  
(Note: CP 25WB+ not suitable for use with CPVC pipes.)

\*Bearing the UL Classification Marking

Through Penetrations

Combos

8000 Series

Gypsum

WL

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## System No. C-AJ-7003

October 05, 2006

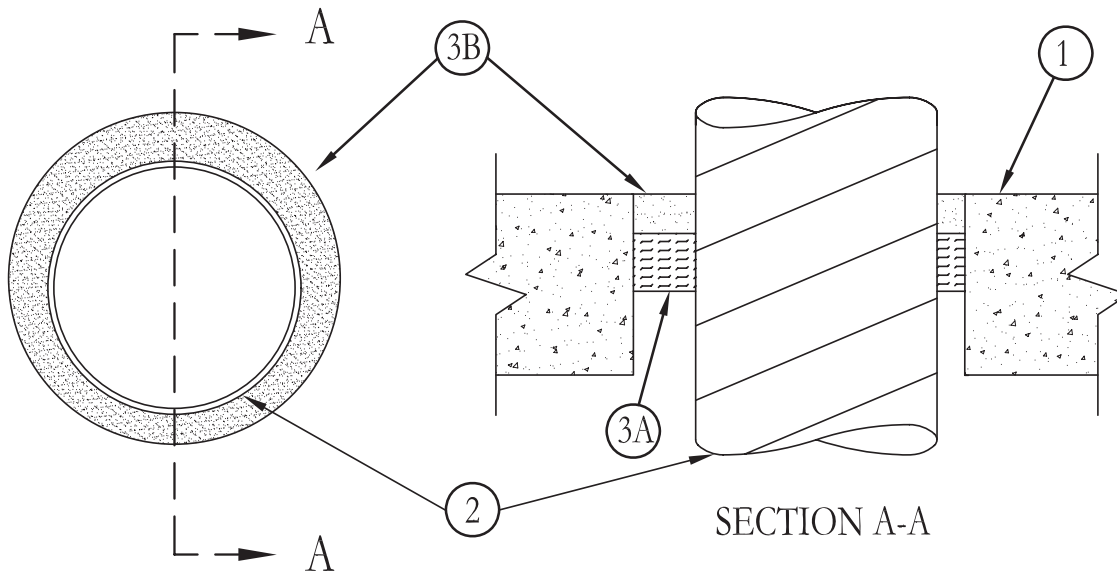
F Rating – 3 Hr

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 I (See Item 3B)



1. **Floor or Wall Assembly** – Min 4-1/2 in. (114 mm) thick lightweight or normal weight (100-150 pcf or 1600-2400 kg/m<sup>3</sup>) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks**\*. Max diam of opening is 18 in. (457 mm).  
See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
- 1A. **Steel Sleeve** – Nom 6 in. (152 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe sleeve, cast into floor or wall flush with floor or wall surfaces.
2. **Through Penetrant** – One steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 1/2 in. (13 mm) to max 1-1/2 in. (38 mm) is required within the firestop system. Steel duct to be rigidly supported on both sides of floor or wall assembly. The following sizes of steel ducts may be used:
  - A. **Steel Duct** – Nom 16 in. (406 mm) diam (or smaller) No. 24 gauge (or heavier) spiral wound galv steel duct.
  - B. **Steel Vent Duct** – Nom 10 in. (254 mm) diam (or smaller) No. 28 gauge (or heavier) galv steel vent duct.
3. **Firestop System** – The firestop system shall consist of the following:
  - A. **Packing Material** – Nom 1 in. (25 mm) thickness of tightly-packed mineral wool batt insulation firmly packed into opening as a permanent form. Polyethylene backer rod or nom 1 in. (25 mm) thick glass fiber insulation may be used with steel vent ducts (Item 2B) in lieu of mineral batt insulation. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of caulk fill material.
  - B. **Fill, Void or Cavity Materials\*** – **Caulk or Sealant** – Min 1 in. (25 mm) thickness of fill material applied within the annulus, flush with top surface of floor or both surfaces of wall assembly. W Rating applies only when FB-3000 WT sealant is used. Water resistance of through penetrant (Item 2) must be considered in addition to water resistance of firestop system.

**3M COMPANY** – CP 25WB+ or FB-3000 WT

(Note: W Rating applies only when FB-3000 WT sealant is used.)

\*Bearing the UL Classification Marking

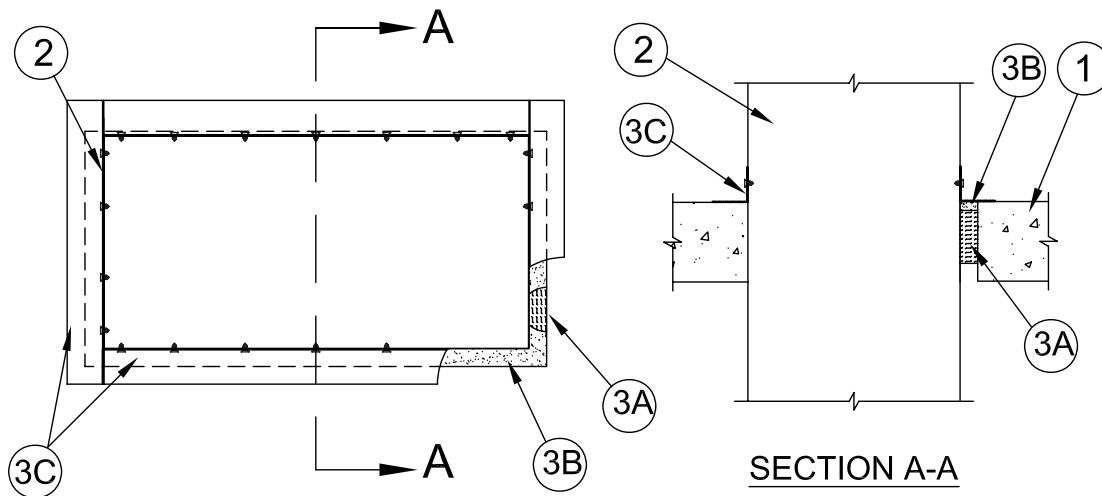
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## System No. C-AJ-7076

March 15, 2007

F Rating – 2 Hr

T Rating – 0 Hr



1. **Floor or Wall Assembly** – Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600 - 2400 kg/m<sup>3</sup>) concrete. Floor assembly may also be constructed of any min 6 in. thick UL Classified hollow-core **Precast Concrete Units**\*. Wall may also be constructed of any UL Classified **Concrete Blocks**\*. Max area of opening 640 sq in. (4129 cm<sup>2</sup>) with a max dimension of 32 in. (812 mm). Max area of in floors constructed of hollow-core concrete is 49 sq in. (316 cm<sup>2</sup> with a max dimension of 7 in. (178 mm). See **Concrete Blocks (CAZT)** and **Precast Concrete Units (CFTV)** categories in Fire Resistance Directory for names of manufacturers.
2. **Steel Duct** – Nom 30 by 18 in. (762 by 457 mm) (or smaller) No. 24 gauge (or heavier) steel duct to be installed concentrically or eccentrically within opening. Annular space between duct and periphery of opening shall be min 0 in. (point contact) to max 2 in. (51 mm). Duct to be rigidly supported on both sides of floor or wall assembly.
3. **Firestop System** – The firestop system shall consist of the following:
  - A. **Packing Material** – Min 3 in. (76 mm) thickness of min 4 pcf or (64 kg/m<sup>3</sup>) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of fill material. In floors constructed of hollow-core concrete, packing material to be recessed from top and bottom surfaces of floor as required to accommodate the required thickness of fill material.
    - A1. **Forming Material**\* – As an alternate to the packing material in Item 3A, nom 4 in. (102 mm) wide strips of min 1/2 in. (13 mm) thick compressible mat to be stacked to a thickness greater than the width of the annular space and compression-fitted, edge-first, to fill the annular space to a min 4 in. (102 mm) depth. Top of forming material to be recessed from top surface of floor or from both surfaces of wall as necessary to accommodate the required thickness of caulk fill material. In floors constructed of hollow-core concrete, forming material to be recessed from top and bottom surfaces of floor as required to accommodate the required thickness of fill material.
 

**3M COMPANY** – Fire Barrier Packing Material
  - B. **Fill, Void or Cavity Materials\* – Caulk or Sealant** – Min 1/2 in. (13 mm) thickness of caulk applied within the annulus, flush with top surface of floor or with both surfaces of wall. In floors constructed of hollow-core concrete, min 1/2 in. (13 mm) thickness of caulk applied within the annulus, flush with top and bottom surfaces of floor. Min 1/4 in. (6 mm) diam bead of caulk applied to the duct/concrete interface at the point contact location on the top surface of floor or both surfaces of wall or hollow-core concrete.
 

**3M COMPANY** – IC 15WB+, CP 25WB+ caulk, or FB-3000 WT sealant
  - C. **Retaining Angles** – Min 16 GA galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap periphery of opening a min of 1 in. (25 mm). Angles attached to all four sides of steel duct on top surface of floor or both surfaces of wall with No. 10 (or larger) steel sheet metal screws spaced a max 1 in. (25 mm) from each end and max 6 in. (152 mm) OC.

\*Bearing the UL Classification Mark

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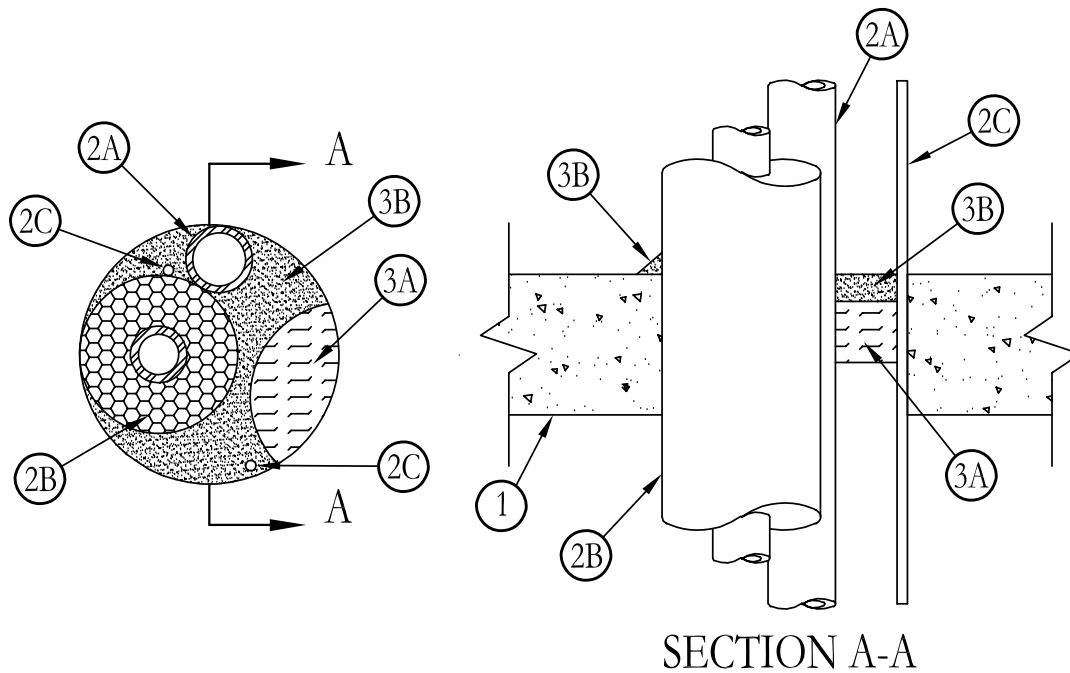
## System No. C-AJ-8087

May 18, 2005

F Rating – 2 HR

T Rating – 1/4 HR

W Rating – Class I (See Item 3)



- Floor or Wall Assembly** – Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m<sup>3</sup>) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks\***. Max diam of opening is 4 in. (102 mm).  
See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
- Through Penetrants** – Metallic pipes, tubing or cable to be installed either concentrically or eccentrically within the firestop system. Penetrants to be rigidly supported on both sides of floor assembly. The following types and sizes of penetrants may be used:
  - Metallic Pipes** – Max two metallic pipes or tubing. The annular space between penetrant and periphery of opening shall be min 0 in. (0 mm) to max 2-1/4 in. (57 mm). The following types and sizes of metallic pipes or tubing may be used:
    - Copper Tubing** – Nom 1 in. (25 mm) diam (or smaller) Type M (or heavier) copper tube.
    - Copper Pipe** – Nom 1 in. (25 mm) diam (or smaller) Regular (or heavier) copper pipe.
  - 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 may be installed on all tubing. The annular space between the insulated penetrating item and uninsulated metallic pipes, conduit or tubing shall be min 0 in. (point contact) to max 1-1/4 in. (0 mm to max 32 mm). The annular space between the insulated penetrating item and the periphery of the opening shall be min 0 in. (point contact) to max 2-1/4 in. (0 mm to max 57 mm).  
See **Plastics** (QMFZ2) category in the 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 94-5A may be used.
  - Cables** – Max two cables spaced min 0 in. (0 mm) (point contact) from tube insulation or min 1/2 in. (13 mm) from other penetrants. The annular space between cable and periphery of opening is min 0 in. (point contact) to max 2-1/4 in. (0 mm to max 57 mm). Cable to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of cables may be used:
    - Max 7/C No. 24 AWG (or smaller) control cable with polyvinyl chloride (PVC) insulation and jacket.
    - Max 2/C No. 10 AWG (or smaller) thermostat wire.
- Firestop System** – The details of the firestop system shall be as follows:
  - Packing Material** – Min 3 in. (76 mm) thickness of min 4 pcf (64 kg/m<sup>3</sup>) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor to accommodate the required thickness of fill material.
  - Fill, Void or Cavity Materials\* – Caulk, Sealant or Putty** – Min 1/2 in. (13 mm) thickness of putty applied within the annulus, flush with top surface of floor. Min 1/2 in. (13 mm) diam bead of putty applied to the penetrant/concrete interface at the point contact location on the top surface of floor.

**3M COMPANY** — CP 25WB+, IC 15WB+ caulk, FB-3000 WT sealant or MP+ Stix putty.

(Note: W Rating applies only when FB-3000 WT sealant is used.)

\*Bearing the UL Classification Marking

+Bearing the UL Recognized Component Marking

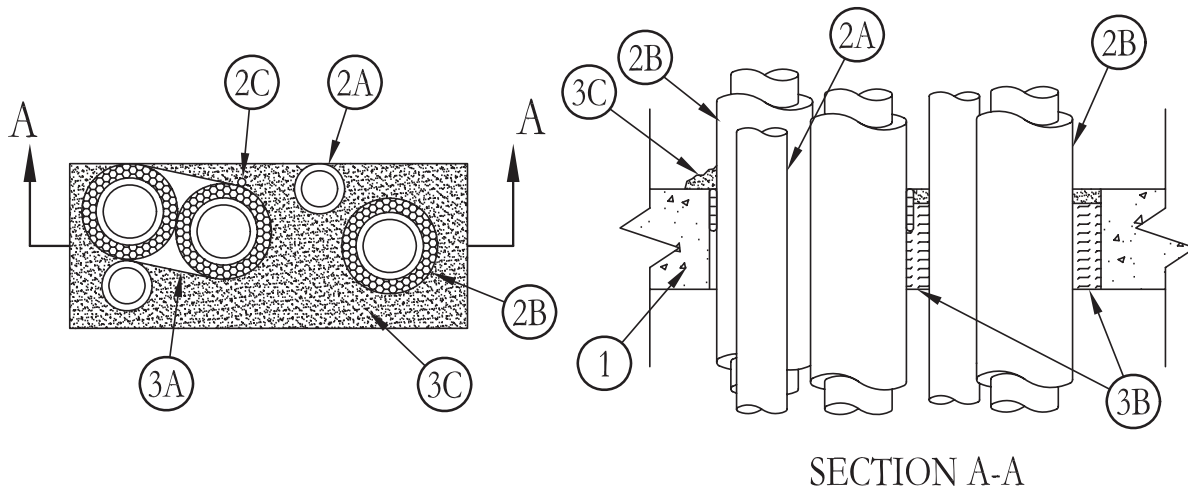
This material was extracted and drawn by 3M Fire Protection Products from the 2007 edition of the UL Fire Resistance Directory. 

## System No. C-AJ-8088

September 07, 2004

F Rating – 2 Hr

T Rating – 0 Hr



1. **Floor or Wall Assembly** – Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks\***. Max area of opening is 144 sq in. with a max dimension of 18 in.  
See **Concrete Blocks (CAZT)** category in the Fire Resistance Directory for names of manufacturers.
2. **Through Penetrants** – Metallic pipes, tubing or cable to be installed either concentrically or eccentrically within the firestop system. Penetrants to be rigidly supported on both sides of floor assembly. The following types and sizes of penetrants may be used.
  - A. **Metallic Pipes** – Max five metallic pipes or tubing. The annular space between uninsulated penetrant and periphery of opening shall be min 0 in. (point contact) to max 2-3/4 in. The following types and sizes of metallic pipes or tubing may be used:
    - A1. **Copper Tubing** – Nom 3 in. diam (or smaller) Type M (or heavier) copper tube.
    - A2. **Copper Pipe** – Nom 3 in. diam (or smaller) Regular (or heavier) copper pipe.
  - B. **Tube Insulation – Plastics+** – Nom 1 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. The tube insulation shall be installed on all tubing greater than nom 2 in. diam. The annular space between the insulated penetrating item and uninsulated metallic pipes, conduit or tubing shall be min 0 in. (point contact) to max 1-1/4 in. The annular space between the insulated penetrating item and the periphery of the opening shall be min 0 in. (point contact) to max 2-3/4 in.  
See **Plastics (QMFZ2)** category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting of the above specifications and having a UL 94 Flammability Classification of 94-5A may be used.
  - C. **Cables** – Max one 2/C No. 18 AWG (or smaller) thermostat wire spaced min 0 in. (point contact) from tube insulation or min 1/2 in. from other penetrants. The annular space between cable and periphery of opening is min 0 in. (point contact) to max 2-3/4 in. Cable to be rigidly supported on both sides of floor or wall assembly.
3. **Firestop System** – The details of the firestop system shall be as follows:
  - A. **Fill, Void or Cavity Materials\* – Wrap Strip** – Nom 1/8 in. thick intumescent material supplied in 2 in. wide strips. Min one layer of wrap strip wrapped around penetrants and pipe insulation and secured in place with steel wire or aluminum foil tape and recessed within the opening not more than 2 in. above the bottom of the floor. Wrap strip required around insulated penetrants which may be tightly bundled together. Wrap strip also required to be installed around insulated penetrants when installed less than 1/2 in. from uninsulated tubes or cables. In such cases where insulated penetrant is at point contact with uninsulated tubes or cables, wrap strip to be wedged between insulation and uninsulated tube or cable by compressing insulation. Wrap strip not required around insulated tubes installed 1/2 in. or greater from other penetrants.  
**3M COMPANY** – Ultra GS
  - B. **Packing Material** – Min 3 in. thickness of min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor to accommodate the required thickness of fill material.
  - C. **Fill, Void or Cavity Materials\* – Putty, Caulk or Sealant** – Min 1/2 in. thickness of fill material applied within the annulus, flush with top surface of floor. Min 1/2 in. diam bead of fill material applied to the penetrant/concrete interface at the point contact location on the top surface of floor.  
**3M COMPANY** – MP+ Stix putty, CP 25WB+ caulk or FB-3000 WT sealant.

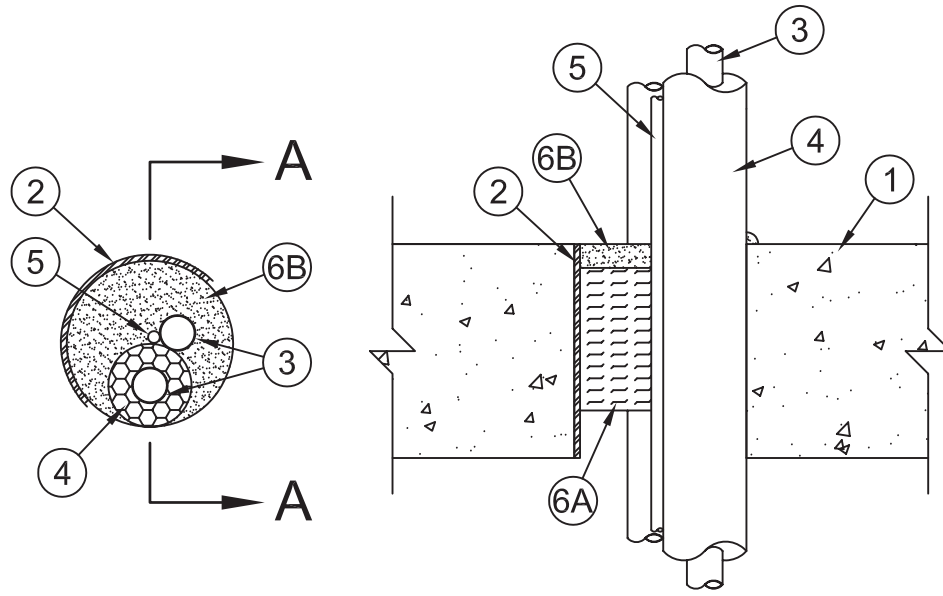
\*Bearing the UL Classification Marking

+Bearing the UL Recognized Component Marking

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## System No. C-AJ-8123

June 19, 2007  
F Rating – 2 Hr  
T Rating – 1/4 Hr



SECTION A-A

1. **Floor or Wall Assembly** – Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m<sup>3</sup>) concrete. Floor assembly may also be constructed of any min 6 in. (152 mm) thick UL Classified hollow-core **Precast Concrete Units**\*. Wall may also be constructed of any UL Classified **Concrete Blocks**\*. Max diam of opening 4 in. (102 mm).  
See **Concrete Blocks (CAZT)** and **Precast Concrete Units (CFTV)** categories in Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve**• (Optional) – Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel sleeve cast or grouted into floor or wall assembly. Steel sleeve may be installed flush or may project max 2 in. (51 mm) beyond the floor or wall surfaces.
3. **Through Penetrants**• – A max of two pipes, conduits or tubes to be installed within the opening. Annular space between the penetrants and the periphery of the opening shall be min 0 in. (point contact) to max 2 in. (0 mm to max 51 mm). Penetrants to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
  - A. **Steel Pipe**•• – Nom 1 in. (25 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
  - B. **Iron Pipe**• – Nom 1 in. (25 mm) diam (or smaller) cast or ductile iron pipe.
  - C. **Conduit**• – Nom 1 in. (25 mm) diam (or smaller) rigid steel conduit or steel electrical metallic tubing (EMT).
  - D. **Copper Pipe**• – Nom 1 in. (25 mm) diam (or smaller) regular (or heavier) copper pipe.
  - E. **Copper Tube**• – Nom 1 in. (25 mm) diam (or smaller) Type L (or heavier) copper tube.
4. **Tube Insulation-Plastics**• + – A max of one pipe, tube or conduit to be provided with nom 3/4 in. (19 mm) thick (or less) acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. The annular space between the insulated penetrant and the periphery of the opening shall be min 0 in. (point contact) to max 2 in. (0 mm to max 51 mm). The annular space between insulated penetrants and non-insulated penetrants shall be min 0 in. (point contact) to max 2 in. (0 mm to max 51 mm).  
See **Plastics (QMFZ2)** category in the 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.
5. **Cables**• – Max two 8/C No. 12 AWG (or smaller) power and control cables with XLPE or PVC insulation with XLPE or PVC jacket. The annular space between the cable and the periphery of the opening shall be min 0 in. (point contact) to max 2 in. (0 mm to max 51 mm). The annular space between cable and insulated penetrants shall be min 0 in. (point contact) to max 2 in. (0 mm to max 51 mm). The annular space between cable and non-insulated penetrants shall be min 1/2 in. to max 2 in. (13 mm to max 51 mm).
6. **Firestop System**• – The details of the firestop system shall be as follows:
  - A. **Packing Material**• – Min 3 in. (76 mm) thickness of min 4 pcf (64 kg/m<sup>3</sup>) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or top edge of sleeve or from both surfaces of wall or both ends of sleeve as required to accommodate the required thickness of fill material. In floors constructed of hollow-core concrete, packing material to be recessed from top and bottom surfaces of floor or sleeve as required to accommodate the required thickness of fill material.
  - B. **Fill, Void or Cavity Materials**\* – **Caulk or Sealant**• – Min 1/2 in. (13 mm) thickness of caulk applied within the annulus, flush with top surface of floor or top edge of sleeve or with both surfaces of wall or both ends of sleeves. In floors constructed of hollow-core concrete, min 1/2 in. (13 mm) thickness of caulk applied within the annulus, flush with top and bottom surfaces of floor or sleeve. Min 1/4 in. (6 mm) diam bead of caulk applied to the penetrant/concrete or penetrant/sleeve interface at the point contact location on the top surface of floor or both surfaces of wall or hollow-core concrete.

**3M COMPANY**– IC 15WB+, CP 25WB+ caulk or FB-3000 WT sealant.

\* Bearing the UL Classification Marking

+ Bearing the UL Recognized Component Mark

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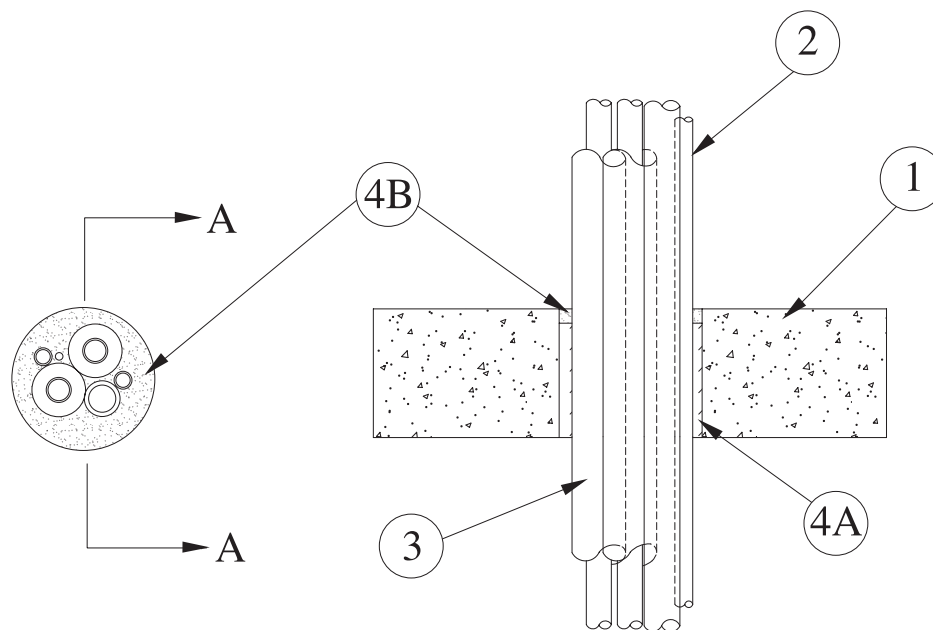
## System No. C-AJ-8135

May 18, 2005

F Rating – 2 Hr

T Rating – 3/4 Hr

W Rating – Class I (See Items 3 and 4)



SECTION A-A

1. **Floor or Wall Assembly** – Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600–2400 kg/m<sup>3</sup>) concrete floor. Min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600–2400 kg/m<sup>3</sup>) concrete wall. Wall may also be constructed of any UL Classified **Concrete Blocks**\*. Max diam of opening 5 in. (127 mm).  
See **Concrete Blocks** (CAZT) category in Fire Resistance Directory for names of manufacturers.
2. **Through Penetrants** – A max of five pipes, conduits or tubes and a max of two cables to be installed within the opening. Annular space between the penetrants and the periphery of the opening shall be min 0 in. (point contact) to max 2 in. (0 mm to max 51 mm). Penetrants to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
  - A. **Metallic Pipes** – A max of four metallic pipes, conduits or tubing may be used. The following types and sizes may be used:
    - A1. **Steel Pipe** – Nom 3/4 in. (19 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
    - A2. **Conduit** – Nom 1/2 in. (13 mm) diam (or smaller) electrical metallic tubing or rigid steel conduit.
    - A3. **Copper Tubing** – Nom 3/4 in. (19 mm) diam (or smaller) Type L (or heavier) copper tubing.
    - A4. **Copper Pipe** – Nom 3/4 in. (19 mm) diam (or smaller) Regular (or heavier) copper pipe.
 All pipes or tubing larger than nom 1/2 in. (13 mm) diam shall be provided with pipe covering (Item 3). Nom 1/2 in. (13 mm) diam (or smaller) pipes or tubing may or may not be provided with pipe covering.
  - B. **Nonmetallic Pipes** – A max of one nonmetallic pipe or conduit may be used. A min 1/4 in. (6 mm) space must be maintained between uninsulated metallic pipes, conduits or tubing and nonmetallic pipes or conduits. The following types and sizes of nonmetallic pipes or conduits may be used:
    - B1. **Polyvinyl Chloride (PVC) Pipe** – Nom 1 in. (25 mm) diam (or smaller) Schedule 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
    - B2. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** – Nom 1 in. (25 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
    - B3. **Rigid Nonmetallic Conduit**++ – Nom 1 in. (25 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70.)
  - C. **Cables** – A max of two cables may be used. Max 8/C No. 12 AWG multiconductor power and control cables; XLPE or PVC insulation with XLPE or PVC jacket.
3. **Pipe Covering** – The following types and sizes of pipe coverings may be used with the metallic pipes or tubes:  
**Note – W Rating applies only when Tube Insulation (Item 3A is used.)**
  - A. **Tube Insulation – Plastics**+++ – Nom 1/2 in. (13 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing.  
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 UL94 Flammability Classification of 94-5VA may be used.

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**System No. C-AJ-8135 continued**

- B. **Pipe Covering\*** – Nom 1/2 in. (13 mm) thick hollow cylindrical heavy density 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.

- 4. **Firestop System** – The details of the firestop system shall be as follows:

- A. **Packing Material** – Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m<sup>3</sup>) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall to accommodate the required thickness of fill material.

- B. **Fill, Void or Cavity Materials\* – Caulk or Sealant** – Min 1/2 in. (13 mm) thickness of caulk applied within the annulus, flush with top surface of floor or with both surfaces of wall. Min 1/4 in. (6 mm) diam bead of caulk applied to the penetrant/concrete interface at the point contact location on the top surface of floor or both surfaces of wall.

**3M COMPANY**– IC 15WB+, CP 25WB+ caulk or FB-3000 WT sealant.

(Note: W Rating applies only when FB-3000 WT sealant is used. CP 25WB+ not suitable for use with CPVC pipes.)

\*Bearing the UL Classification Marking

++Bearing the UL Listing Mark

+++Bearing the UL Recognized Component Mark

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**System No. F-A-8007**

January 09, 2007

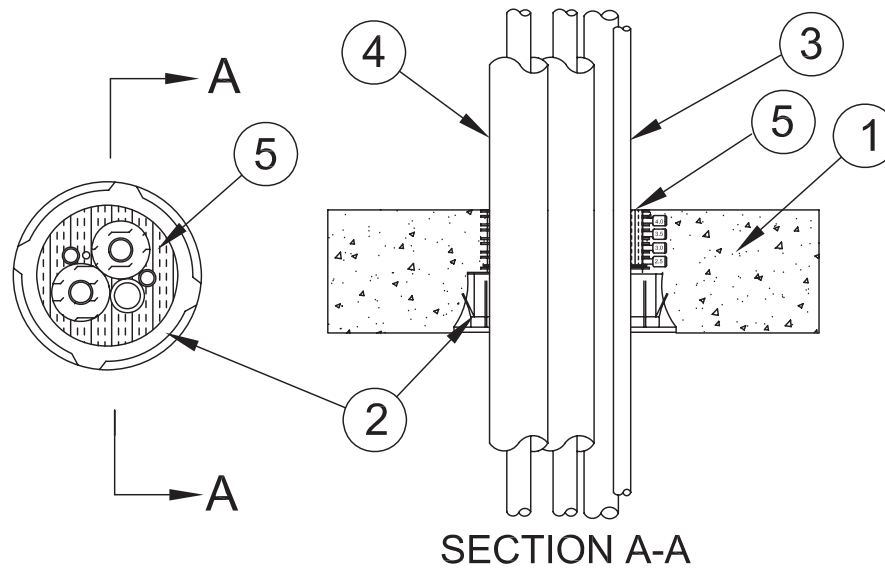
F Rating – 3 Hr

T Rating – 0 Hr

L Rating at Ambient – Less Than 1 CFM/sq ft (See Items 3 and 5A)

L Rating at 400° F – Less Than 1 CFM/sq ft (See Items 3 and 5A)

W Rating – Class 1 (See Items 3, 4B and 5A)



1. **Floor Assembly** – Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m<sup>3</sup>) 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 device may be trimmed flush with top surface of floor or may project up to a max 3-1/2 in. (89 mm) above top surface of floor.  
**3M COMPANY** – 3M Fire Barrier Cast-In Device 2MCID, 3MCID, 4MCID
- 2A. **Firestop Device – Height Adapter\*** – (Not Shown) – For use in floors greater than 8 in. (203 mm) thick. Adapter snaps onto top of firestop device (Item 2).  
**3M COMPANY** – 3M Fire Barrier Cast-In Device Height Adapter, 2HA, 3HA, 4HA
3. **Through Penetrants** – Pipes, tubing or cable to be bundled within the opening. A min 1/4 in. (6 mm) annular space shall be maintained between uninsulated metallic pipes and cable (Item 3C). The annular space between uninsulated metallic pipes and other penetrants shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). The space between penetrants and periphery of opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). **When W or L Ratings are required, the space between penetrants and the space between the penetrants and the inside of the firestop device (Item 2 or 2A) shall be min 1/4 in. (6 mm).** Penetrants to be rigidly supported on both sides of floor assembly. The following types and sizes of penetrants may be used:
  - A. **Metallic Pipes** – The following types and sizes of metallic pipes, conduits or tubing may be used:
    1. **Copper Tubing** – Nom 1 in. (25 mm) diam (or smaller) Type L (or heavier) copper tubing.
    2. **Copper Pipe** – Nom 1 in. diam (or smaller) Regular (or heavier) copper pipe. All pipes or tubing larger than nom 1/2 in. (25 mm) diam shall be provided with pipe covering (Item 4).
  - B. **Polyvinyl Chloride (PVC) Pipe** – A max of one PVC nom 1 in. (25 mm) diam (or smaller) Schedule 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
  - C. **Cables** – A max of two cable, max 8/C No. 18 AWG (or smaller) thermostat cable; XLPE or PVC insulation with XLPE or PVC jacket.
4. **Pipe Covering** – The following types and sizes of pipe coverings may be used with the metallic pipes:
  - A. **Pipe Covering** – Max 3/4 in. (19 mm) thick hollow cylindrical heavy density 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.  
 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.
  - B. **PVC Jacket++** – (Optional, Not Shown) – An additional PVC jacket, supplied in sheet form, shall be tightly wrapped around the all service jacket on the pipe covering (Item 4A) with the longitudinal seam continuously sealed using the self-sealing lap tape or adhesive supplied with the jacket. The jacket is to be nom 48 in. (1.22 m) wide by nom 20 or 30 mil (0.5 or 0.8 mm) thick. The jacket shall extend downward into and/or through the opening from a point 36 to 40 in. (0.91 to 1.02 m) above the top surface of the floor assembly. **The PVC jacket must be used for the W Rating to apply.**  
 See **Plastics (QMFZ2)** category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component plastic material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.

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## System No. F-A-8007 *continued*

- C. **Tube Insulation – Plastics+** – Max 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing.

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 94-5A may be used.

5. **Packing Material** – Min 2 in. (51 mm) thickness of min 4 pcf (64 kg/m<sup>3</sup>) mineral wool batt insulation firmly packed within annulus, flush with the top surface of floor.

- 5A. **Fill, Void or Cavity Materials – Sealant, Caulk or Putty\*** – (Optional, Not Shown) - As an option, the packing material (Item 5) may be reduced in thickness by 1/4 to 1/2 in. (6 to 13 mm) and recessed from the top surface of floor to accommodate a 1/4 to 1/2 in. (6 to 13 mm) thickness of sealant, caulk or putty, installed within annulus, flush with the top surface of floor. For W and L Ratings, a min 1/4 in. (6 mm) bead of sealant is required at the device/concrete interface on the top surface of the floor and a min 1/4 in. (6 mm) depth of sealant is required atop a min 1-3/4 in. (44 mm) thickness of mineral wool packing material inside the firestop device (Item 2 or 2A).

**3M COMPANY** – FB-1000 NS sealant, FB-1003 SL sealant, FB-3000 WT sealant, CP 25WB+ caulk, FireDam 150+ caulk, IC 15WB+ caulk or MP+ putty

(Note: W and L Ratings apply only when FB-1000 NS, FB-1003 SL or FB-3000 WT sealants are used.)

\*Bearing the UL Classification Mark

++ - Bearing the UL Recognized Component Mark

Through Penetrations

Combos

8000 Series

Concrete

FA

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**System No. F-A-8010**

January 09, 2007

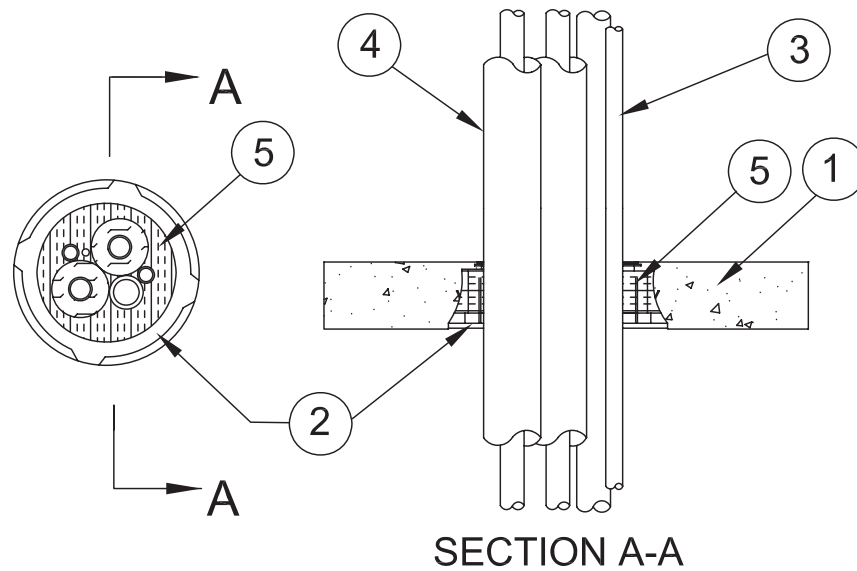
F Rating – 2 Hr

T Rating – 0 Hr

L Rating at Ambient – Less Than 1 CFM/sq ft (See Items 3 and 5A)

L Rating at 400° F – Less Than 1 CFM/sq ft (See Items 3 and 5A)

W Rating – Class 1 (See Items 3 and 5A)



1. **Floor Assembly** – Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m<sup>3</sup>) 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 device may be trimmed flush with top surface of floor or may project up to a max 3-1/2 in. (89 mm) above top surface of floor.  
**3M COMPANY** – 3M Fire Barrier Cast-In Device 2PCID, 3PCID, 4PCID
3. **Through Penetrants** – Pipes, tubing or cable to be bundled within the opening. The annular space between penetrants shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm). The space between penetrants and periphery of opening shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm). **When W or L Ratings are required, the space between penetrants and the space between the penetrants and the inside of the firestop device shall be min 1/4 in. (6 mm).** Penetrants to be rigidly supported on both sides of floor assembly. The following types and sizes of penetrants may be used:
  - A. **Metallic Pipes** – A max of four pipes or tubes installed within opening. The following types and sizes of metallic pipes, conduits or tubing may be used:
    1. **Copper Tubing** – Nom 1 in. (25 mm) diam (or smaller) Type L (or heavier) copper tubing.
    2. **Copper Pipe** – Nom 1 in. (25 mm) diam (or smaller) Regular (or heavier) copper pipe. All pipes or tubing larger than nom 1/2 in. (13 mm) diam shall be provided with pipe covering (Item 4).
  - B. **Polyvinyl Chloride (PVC) Pipe** – A max of one nom 1 in. (25 mm) diam (or smaller) Schedule 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
  - C. **Cables** – A max of two, max 8/C No. 18 AWG (or smaller) thermostat cables; XLPE or PVC insulation with XLPE or PVC jacket.
4. **Tube Insulation – Plastics+** – Nom 1/2 in. (13 mm) thick (or less) acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing.  
 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 94-5A may be used.
5. **Packing Material** – Min 2 in. (51 mm) thick of min 4 pcf (64 kg/m<sup>3</sup>) mineral wool batt insulation firmly packed within annulus, flush with the top surface of floor.
- 5A. **Fill, Void or Cavity Materials – Sealant, Caulk or Putty\*** – (Optional, Not Shown) – As an option, the packing material (Item 5) may be reduced in thickness by 1/4 to 1/2 in. (6 to 13 mm) and recessed from the top surface of floor to accommodate a 1/4 to 1/2 in. (6 to 13 mm) thickness of sealant, caulk or putty, installed within annulus, flush with the top surface of floor. For W and L Ratings, a min 1/4 in. (6 mm) bead of sealant is required at the device/concrete interface on the top surface of the floor and a min 1/4 in. (6 mm) depth of sealant is required atop a min 1-3/4 in. (44 mm) thickness of mineral wool packing material inside the firestop device (Item 2).

**3M COMPANY** – FB-1000 NS sealant, FB-1003 SL sealant, FB-3000 WT sealant, CP 25WB+ caulk, FireDam 150+ caulk, IC 15WB+ caulk or MP+ putty

(Note: W and L Ratings apply only when FB-1000 NS, FB-1003 SL or FB-3000 WT sealants are used.)

\*Bearing the UL Classification Mark

++ - Bearing the UL Recognized Component Mark

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