3M

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 Expantrol™ Flexible Intumescent Strip (E-FIS)
Fire Barrier Pass-Through Device
Fire Barrier RC-1Restricting 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

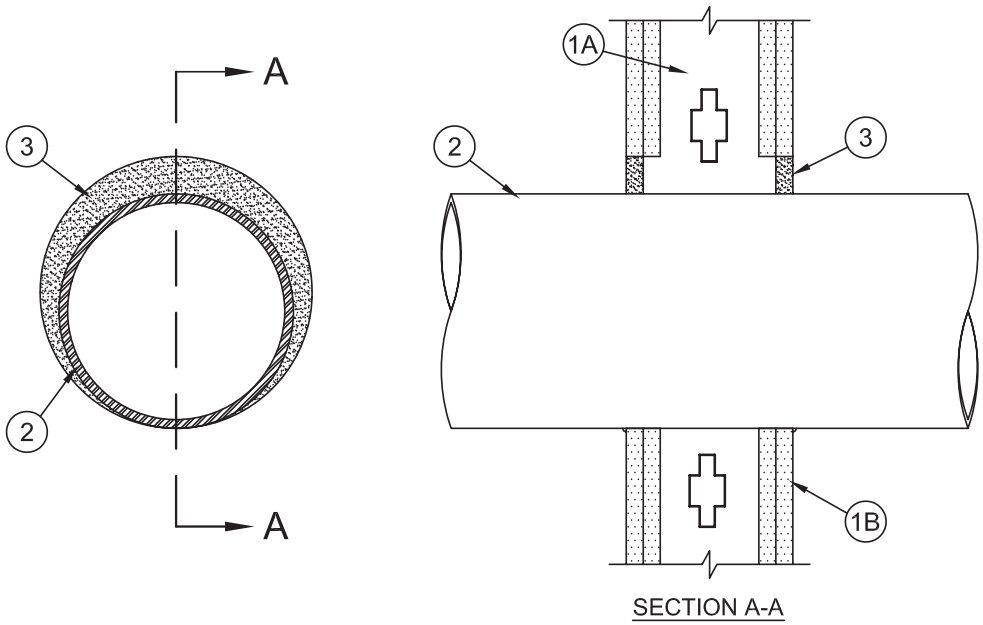
MATRIX OF UL TESTED AND APPROVED SYSTEMS FOR FIRESTOPPING PENETRATIONS AND VOIDS IN RATED WOODFRAME CONSTRUCTION

Penetrating Item	Assembly Penetrated	F Rating	System Number	Products Used
Metal Pipe/Conduit	Framed Gypsum Walls	1 & 2 Hr.	W-L-1296	IC15WB
Metal Pipe/Conduit	Floor/Ceiling	1 & 2 Hr.	F-C-1094	IC15WB
Plastic Pipe/ENT	Framed Gypsum Walls	1 & 2 Hr.	W-L-2299	IC15WB
Plastic Pipe (chase wall optional)	Floor/Ceiling	1 & 2 Hr.	F-C-2241 If pipe >2" or less	IC15WB
Plastic Pipe Inside Rated Wall	Floor/Ceiling	1 & 2 Hr.	F-C-2115	FS-195 & RC1 or Ultra PPD
Plastic Pipe Inside Rated Wall	Floor/Ceiling	1 & 2 Hr.	F-C-2134	IC15WB
Jacketed Cables(s)	Framed Gypsum Walls	1 & 2 Hr.	W-L-3194	IC15WB
Jacketed Cable(s)	Floor/Ceiling	1 & 2 Hr.	F-C-3070	IC15WB
Insulated Pipe Fiber Glass	Framed Gypsum Walls	1 & 2 Hr.	W-L-5168	IC15WB
Insulated Pipe AB/PVC	Framed Gypsum Walls	1 & 2Hr.	W-L-5169	IC15WB
Insulate Pipe Fiber Glass or AB/PVC	Floor Ceiling	1 Hr.	F-C-5058	IC15WB
Ducts Square 30" x 18"	Framed Gypsum Walls	1 Hr.	W-L-7091	IC15WB
Ducts Round 10" 24 Gauge	Floor Ceiling	1 Hr.	F-C-7022	IC15WB
Combo Penetration Line Set (A/C)	Framed Gypsum Walls	1 or 2 Hr.	W-L-8039	IC15WB
Combo Penetration Line Set (A/C)	Floor Ceiling	1 Hr.	F-C-8024	IC15WB
Multiple Metal Pipe/Conduit	Framed Gypsum Walls	1 & 2 Hr.	W-L-1287	IC15WB
Outlet Box	Framed Gyp Wall	1 & 2 Hr.	CLIV	Putty Pad MPP

Multiple Plastic pipe including PEX	Framed Gypsum Walls	1 & 2 Hr.	W-L-2300	IC15WB
Metal pipe **Bottom side**	Concrete floors Precast Parking Garage	3 Hr.	C-AJ-1496	IC15WB CP25WB FB3000 WT
Insulated Pipe **Fiberglass insulation**	Concrete floors Precast Parking Garage	2 Hr.	C-AJ-5210	IC15WB CP25WB FB3000 WT
Insulated Pipe **AB/PVC** insulation	Concrete floors Precast Parking Garage	2 Hr.	C-AJ-5211	IC15WB CP25WB FB3000 WT

System No. W-L-1296

February 14, 2008
F Ratings – 1 and 2 Hr (See Item 1)
T Ratings – 0 and 1/4 Hr (See Item 1)



SECTION A-A

1. **Wall Assembly** – The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300, U400 or V400 Series Wall and Partition Design 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 by 4 in. (51 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.
   B. **Gypsum Board*** – The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 10-5/8 in. (270 mm).
   C. **Steel Sleeve** – (Optional, Not Shown) - Cylindrical sleeve fabricated from min 0.019 in. thick (0.48 mm) galv sheet steel and having a min 2 in. (51 mm) lap along the longitudinal seam. Length of steel sleeve to be equal to thickness of wall. Sleeve installed by coiling the sheet steel to a diam smaller than the through opening, inserting the coil through the openings and releasing the coil to let it uncoil against the circular cutouts in the gypsum wallboard layers.

   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 1/4 Hr for 1 and 2 Hr rated assemblies, respectively.
2. **Through Penetrants** – One metallic pipe, conduit, tubing or flexible metal pipe installed concentrically or eccentrically within opening. Annular space between penetrant and periphery of opening to be min 0 in. (0 mm point contact) to max 2 in. (51 mm). Penetrant to be rigidly supported on both sides of wall. The following types and sizes of penetrants may be used:
   A. **Steel Pipe** – Nom 8 in. (203 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. **Iron Pipe** – Nom 8 in. (203 mm) diam (or smaller) cast or ductile iron pipe.
   C. **Conduit** – Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or nom 6 in. (152 mm) rigid steel conduit.
   D. **Copper Tubing** – Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
   E. **Copper Pipe** – Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
   F. **Through Penetrating Product*** – **Flexible Metal Piping** – The following types of steel flexible metal gas piping may be used:
      1. Nom 2 in. (51 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly.

         OMEGA FLEX INC
      2. Nom 1 in. (25 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly.

         GASTITE, DIV OF TITEFLEX
      3. Nom 1 in. (25 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly.

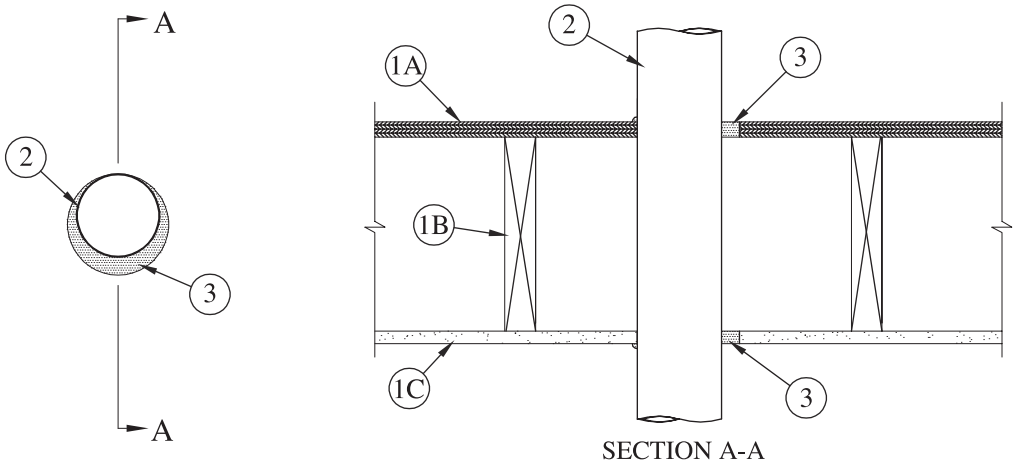
         WARD MFG INC
3. **Fill, Void or Cavity Material* – Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with both surfaces of wall. Min 1/4 in. (6 mm) diam bead of caulk applied to gypsum board/penetrant interface at point contact location on both sides of wall.

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

*Bearing the UL Classification Mark

System No. F-C-1094

May 18, 2005
F Rating – 1 Hr
T Rating – 1/4 Hr



SECTION A-A

1. **Floor-Ceiling Assembly** – The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction details of the floor-ceiling assembly are summarized below:
   - A. **Flooring System** – Lumber or plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Max diam of opening is 5-1/2 in. (140 mm).
   - B. **Wood Joists** – Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped.
   - C. **Gypsum Board*** – Nom 4 ft (122 cm) wide by 5/8 in. (16 mm) thick as specified in the individual Floor-Ceiling Design. Max diam of opening is 5-1/2 in. (140 mm).

1.1 **Chase Wall** (Optional, not. shown) – The through penetrants (Item No. 2) may be routed through a fire-rated single, double or staggered wood stud/gypsum board chase wall having a fire rating consistent with that of the floor-ceiling assembly. The chase wall shall be constructed of the materials and in the manner specified in the individual U300 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   - A. **Studs** – Nom 2 in. by 6 in. (51 mm by 152 mm) or double nom 2 in. by 4 in. (51 mm by 102 mm) lumber studs.
   - B. **Sole Plate** – Nom 2 in. by 6 in. (51 mm by 152 mm) or parallel 2 in. by 4 in. (51 mm by 102 mm) lumber plates, tightly butted. Max diam of opening is 5-1/2 in. (140 mm).
   - C. **Top Plate** – The double top plate shall consist of two nom 2 in. by 6 in. (51 mm by 152 mm) or two sets of parallel 2 in. by 4 in. (51 mm by 102 mm) lumber plates, tightly butted. Max diam of opening is 5-1/2 in. (140 mm).
   - D. **Gypsum Board*** – Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.

2. **Through Penetrants** – One or more metallic pipes, conduits, tubes or flexible metal pipes installed concentrically or eccentrically within opening. Annular space between penetrants and periphery of opening to be min 0 in. (point contact) to max 1-3/8 in. (0 mm to max 35 mm). Penetrants to be rigidly supported on both sides of floor-ceiling. The following types and sizes of penetrants may be used:
   - A. **Steel Pipe** – Nom 4 in. (102 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
   - B. **Iron Pipe** – Nom 4 in. (102 mm) diam (or smaller) cast or ductile iron pipe.
   - C. **Conduit** – Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or nom 6 in. (152 mm) rigid steel conduit.
   - D. **Copper Tubing** – Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
   - E. **Copper Pipe** – Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
   - F. **Through Penetrating Product*** – **Flexible Metal Piping** –The following types of steel flexible metal gas piping may be used:
     1. Nom 2 in. (51 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly.

        OMEGA FLEX INC.
     2. Nom 1 in. (25 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly.

        TITEFLEX CORP, A BUNDY CO.
     3. Nom 1 in. (25 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly.

        WARD MFG INC.

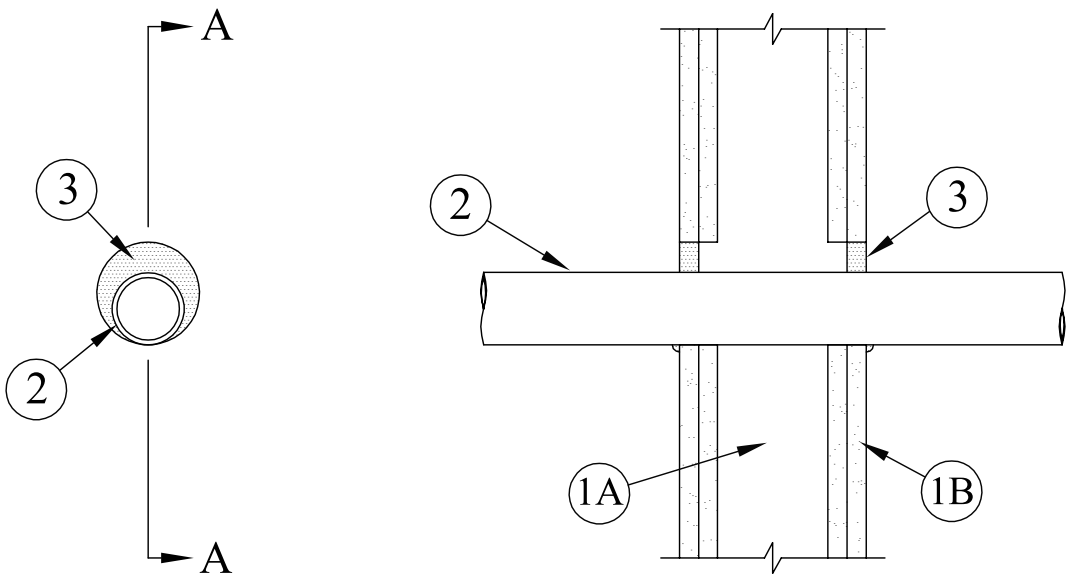
3. **Fill, Void or Cavity Materials*** – **Caulk or Sealant** – Min 3/4 in. (19 mm) thickness of caulk applied within annulus, flush with top surface of floor or sole plate. Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with bottom surface of ceiling or top plate. Min 1/4 in. (6 mm) diam bead of caulk applied at point contact locations at penetrant/floor or sole plate interface on top surface of floor or sole plate and at penetrant/ceiling or top plate interface.

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

*Bearing the UL Classification Marking

System No. W-L-2299

May 19, 2005
F Ratings – 1 & 2 Hr (See Item 1)
T Rating – 0 Hr



SECTION A-A

1. **Wall Assembly** – The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described 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:
   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 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. wide (89 mm) spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board*** – The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 3-1/2 in. (89 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. **Through Penetrants** – One nonmetallic pipe or conduit installed eccentrically or concentrically within opening. Annular space between penetrant and periphery of opening to be min 0 in. (point contact) to max 1-1/8 in. (0 mm to max 29 mm). Penetrant to be rigidly supported on both sides of wall. The following types and sizes of penetrants may be used:
   A. **Polyvinyl Chloride (PVC) Pipe** – Nom 2 in. (51 mm) diam (or smaller) Schedule 40 solid core or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** – Nom 2 in. (51 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+** – Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).
   D. **Acrylonitrile Butadiene Styrene (ABS) Pipe** – Nom 1-1/2 in. (38 mm) diam (or smaller) Schedule 40 solid core or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   E. **Electrical Nonmetallic Tubing (ENT)+** – Nom 1-1/4 in (32 mm) diam (or smaller) ENT installed in accordance with Article 331 of the National Electrical Code (NFPA No. 70).

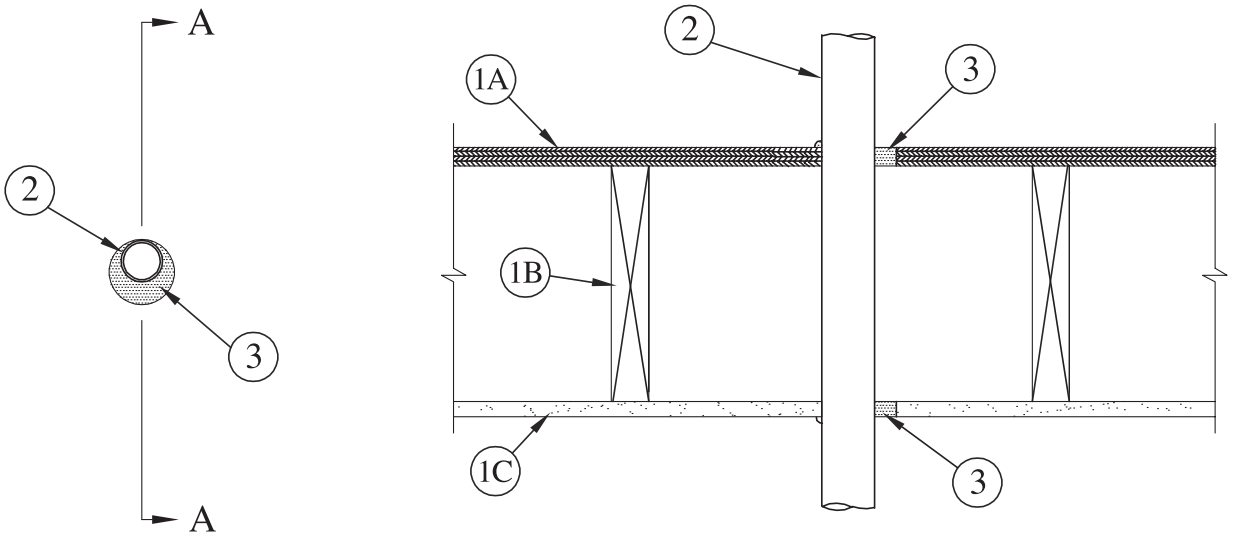
   See **Electrical Nonmetallic Tubing** (FKHU) category in the Electrical Construction Materials Directory for names of manufacturers.
3. **Fill, Void or Cavity Material*** – **Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with both surfaces of wall. Min 1/4 in. (6 mm) diam bead of caulk applied to gypsum board/penetrant interface at point contact location on both sides of wall.

   3M COMPANY – IC 15WB+, CP 25WB+ caulk or FB-3000 WT sealant
   (Note: CP 25WB+ not suitable for use with CPVC pipes.)

*Bearing the UL Classification Marking
+Bearing the UL Listing Mark

System No. F-C-2241

May 18, 2005
F Rating – 1 Hr
T Rating – 0 Hr



SECTION A-A

1. **Floor-Ceiling Assembly** – The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction details of the floor-ceiling assembly are summarized below:
   - A. **Flooring System** – Lumber or plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Diam of opening shall min 5/8 in. (16 mm) to max 1-1/8 in. (29 mm) larger than nom pipe diam.
   - B. **Wood Joists** – Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped.
   - C. **Gypsum Board*** – Nom 4 ft (122 mm) wide by 5/8 in. (16 mm) thick as specified in the individual Floor-Ceiling Design. Diam of opening shall min 5/8 in. (16 mm) to max 1-1/8 in. (29 mm) larger than nom pipe diam.

1.1 **Chase Wall** – (Optional, not. shown) - The through penetrants (Item No. 2) may be routed through a fire-rated single, double or staggered wood stud/gypsum board chase wall having a fire rating consistent with that of the floor-ceiling assembly. The chase wall shall be constructed of the materials and in the manner specified in the individual U300 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   - A. **Studs** – Nom 2 by 6 in. (51 by 152 mm) or double nom 2 by 4 in. (51 by 102 mm) lumber studs.
   - B. **Sole Plate** – Nom 2 by 6 in. (51 by 152 mm) or parallel 2 by 4 in. 51 by (102 mm) lumber plates, tightly butted. Diam of opening shall min 5/8 in. (16 mm) to max 1-1/8 in. (29 mm) larger than nom pipe diam.
   - C. **Top Plate** – The double top plate shall consist of two nom 2 by 6 in. (51 by 152 mm) or two sets of parallel 2 by 4 in. (51 by 102 mm) lumber plates, tightly butted. Diam of opening shall min 5/8 in. (16 mm) to max 1-1/8 in. (29 mm) larger than nom pipe diam.
   - D. **Gypsum Board*** – Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.

2. **Through Penetrants** – One nonmetallic pipe or conduit installed eccentrically or concentrically within opening. Annular space between penetrant and periphery of opening to be min 0 in. (point contact) to max 1-1/8 in. (0 to max 29 mm) Penetrant to be rigidly supported on both sides of wall. The following types and sizes of penetrants may be used:
   - A. **Polyvinyl Chloride (PVC) Pipe** – Nom 2 in. (51 mm) diam (or smaller) Schedule 40 solid core or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   - B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** – Nom 2 in. (51 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   - C. **Rigid Nonmetallic Conduit+** – Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).
   - D. **Acrylonitrile Butadiene Styrene (ABS) Pipe** – Nom 1-1/2 in. (38 mm) diam (or smaller) Schedule 40 solid core or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

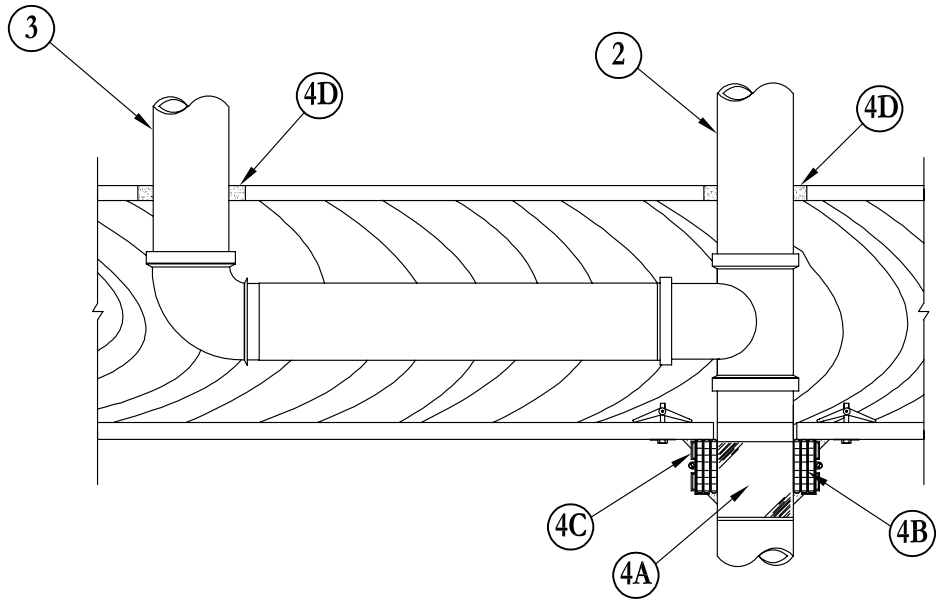
3. **Fill, Void or Cavity Materials* - Caulk or Sealant** – Min 3/4 in. (19 mm) thickness of caulk applied within annulus, flush with top surface of floor or sole plate. Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with bottom surface of ceiling or top plate. Min 1/4 in. (6 mm) diam bead of caulk applied at point contact locations at penetrant/floor or sole plate interface on top surface of floor or sole plate and at penetrant/ceiling or top plate interface.

   3M COMPANY – IC 15WB+, CP 25WB+ caulk or FB-3000 WT sealant
   (Note: CP 25WB+ not suitable for use with CPVC pipes.)

*Bearing the UL Classification Mark

System No. F-C-2115

May 18, 2005
F Ratings – 1 and 2 Hr (See Item 1)
T Ratings – 1 and 2 Hr (See Item 1)



1. **Floor-Ceiling Assembly** – The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Design in the UL Fire Resistance Directory. The 2 hr fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511 or L536 in the UL Fire Resistance Directory. **The F and T Ratings of the firestop system are equal to the rating of the floor-ceiling assembly**. The general construction features of the floor-ceiling assembly are summarized below:
   A. **Flooring System** – Lumber or plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Diameter of opening shall be max 1 in. (25 mm) larger than the nom diam of pipe (Items 2 and 3). As an option, the opening for the branch piping (Item 3) may be rectangular, 8 in. by 12 in. (203 mm by 305 mm) max for 1 hr rated assemblies only.
   B. **Wood Joists** – For 1 hr fire-rated floor-ceiling assemblies, nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped. For 2 hr fire-rated floor-ceiling assemblies, nom 2 in. by 10 in. (51 by 254 mm) lumber joists spaced 16 in. (406 mm) OC with nom 1 by 3 in. (25 mm by 76 mm) lumber bridging and with ends firestopped.
   C. **Gypsum Board*** – Nom 4 ft (122 cm) wide by 5/8 in. (16 mm) thick, as specified in the individual Floor-Ceiling Design. First layer of wallboard nailed to wood joists. Second layer of wallboard (2 hr fire-rated assembly) screw-attached to furring channels. Diam of opening shall be max 1 in. (25 mm) larger than the nom diam of pipe (Item 2). Wallboard plate for rectangular floor opening in 1 hr rated assemblies to be one or two piece, sized to overlap opening a min of 2 in. (51 mm) on all sides and shall be screw attached to underside of flooring with drywall or wood screws a max of 4 in. (102 mm) OC. Diam of opening to be 1 in. (25 mm) larger than nom diam of branch piping.

1.1 **Chase Wall** (Optional, not shown) – The through penetrant (Item 2) may be routed through a 1 or 2 hr fire-rate single, double or staggered wood stud/gypsum wallboard chase wall constructed of the materials and in the manner specified in the individual U300 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs** – Nom 2 in. by 6 in. (51 mm by 152 mm) or double nom 2 in. by 4 in. (51 mm by 102 mm) lumber studs.
   B. **Sole Plate** – Nom 2 in. by 6 in. (51 mm by 152 mm) or parallel 2 in. by 4 in. (51 mm by 102 mm) lumber plates, tightly butted. Diam of opening shall be max 1 in. (25 mm) larger than the nom diam of pipe (Item 2).
   C. **Top Plate** – The double top plate shall consist of two nom 2 in. by 6 in. (51 mm by 152 mm) or two sets of parallel 2 in. by 4 in. (51 mm by 102 mm) lumber plates, tightly butted. Diam of opening shall be max 1 in. (25 mm) larger than the nom diam of pipe (Item 2).
   D. **Gypsum Board*** – Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.

2. **Through Penetrant** – One nonmetallic pipe to be installed within the firestop system. Pipe to be rigidly supported on both sides of floor-ceiling assembly. The annular space between pipe and periphery of opening shall be min of 0 in. (point contact) to max 1/2 in. (0 mm to 13 mm) Pipe may be installed with continuous point contact. The following types and sizes of nonmetallic pipes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe** – Nom 4 in. (102 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.
   B. **Cellular Core Polyvinyl Chloride (ccPVC) Pipe** – Nom 4 in. (102 mm) diam (or smaller) Schedule 40 cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   C. **Acrylonitrile Butadiene Styrene (ABS) Pipe** – Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.

System No. F-C-2115 *continued*

D. **Cellular Core Acrylonitrile Butadiene Styrene (ccABS) Pipe** – Nom 4 in. (102 mm) diam (or smaller) Schedule 40 cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.

3. **Branch Piping** (Optional) – One nonmetallic pipe with or without nom 3 in. (76 mm) diam (or smaller) toilet flange (not shown) to be connected to through penetrant (Item 2) and installed within opening in subfloor or wallboard plate. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 1/2 in. (0 mm to 13 mm). Pipe may be installed with continuous point contact. Branch piping may terminate in a max 3 in. (76 mm) diam toilet flange, which corresponds to the type of branch piping. The following types and sizes of nonmetallic pipes may be used:

A. **Polyvinyl Chloride (PVC) Pipe** – Nom 3 in. (76 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.

B. **Cellular Core Polyvinyl Chloride (ccPVC) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.

C. **Acrylonitrile Butadiene Styrene (ABS) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.

D. **Cellular Core Acrylonitrile Butadiene Styrene (ccABS) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.

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

A. **Foil Tape** – Nom 4 in. (102 mm) wide, 3 mil thick aluminum tape wrapped around pipe prior to the installation of the wrap strip (Item 4B). Min of one wrap, flush with the ceiling or top plate and proceeding downward. Not required when wrap strip Item 4B2 is used. Required only on pipes noted in table shown in Item 4B1 .

B1. **Fill, Void or Cavity Materials*** – **Wrap Strip** – Nom 1/4 in. (6 mm) thick intumescent elastomeric material faced on one side with aluminum foil, supplied in 1 in. and 2 in. (25 mm and 51 mm) wide strips. Strips tightly wrapped around nonmetallic pipe (foil side exposed) with the edges butted against the bottom surface of the gypsum wallboard ceiling. The min wrap strip width and the number of layers of wrap strip required are dependent upon the type of pipe and the nom diam as shown in the following table:

Pipe Type	Nom Pipe Diam In. (mm)	Wrap Strip Width In. (mm)	Min Wrap Strip Layers
PVC or CPVC	1/2 to 1-1/2 (13 to 38)	1 (25)	1
PVC or CPVC	2 to 2-1/2 (51 to 64)	1 (25)	2
PVC or CPVC	3 (76)	1 (25)	3
ccPVC, ABS or ccABS (a)	2 (51)	1 (25)	2
ABS, PVC, ccPVC or CPVC	1/2 to 2 (13 to 51)	2 (51)	1
ABS, PVC, ccPVC or CPVC	2-1/2 to 3 (64 to 76)	2 (51)	2
PVC or CPVC	3-1/2 to 4 (89 to 102)	2 (51)	3
ABS (a)	3-1/2 to 4 (89 to 102)	2 (51)	3
ccPVC	3-1/2 to 4 (89 to 102)	2 (51)	3
ccABS (a)	1/2 to 2 (13 to 51)	2 (51)	1
ccABS (a)	2-1/2 to 3 (64 to 76)	2 (51)	2
ccABS (a)	3-1/2 to 4 (89 to 102)	2 (51)	3

(a) – Requires use of aluminum tape detailed in Item 4A.

3M COMPANY – FS-195+

B2. **Fill, Void or Cavity Materials*** – **Wrap Strip** – (Alternate material to Item 4B1)– Nom 1/8 in. (3.2 mm) thick intumescent material supplied in 2 in. (51 mm) wide strips. Wrap strip tightly wrapped around nonmetallic pipe with continuous layers and butted tightly against the bottom surface of the gypsum wallboard ceiling or top plate. The min number of layers required is dependent upon the nom diam of the pipe and the hourly F Rating of the system. For 1 hr rated assemblies, the number of wrap strip layers are as follows. For nom 2 in. (51 mm) diam (and smaller) pipes, one layer is required. For nom 2-1/2 in. and 3 in. (64 mm and 76 mm) diam pipes, two layers are required. For nom 3-1/2 in. and 4 in. (89 mm and 102 mm) diam pipes, three layers are required. For 2 hr rated assemblies, the number of wrap strip layers are as follows. For nom 2 in. (51 mm) diam (and smaller) pipes, two layers are required. For nom 2-1/2 in. and 3 in. (64 mm and 76 mm) diam pipes, three layers are required. For nom 3-1/2 in. and 4 in. (89 mm and 102 mm) diam pipes, four layers are required.

3M COMPANY – Ultra GS

C. **Steel Collar** – Nom 1 in. or 2 in. (25 mm or 51 mm) deep collar with 1-1/4 in. (32 mm) wide by 2 in. (51 mm) long anchor tabs and min 3/4 in. (19 mm) long tabs to retain wrap strip layers. Coils of precut min 0.016 in. (0.41 mm) thick (28 gauge) galv sheet steel are available from wrap strip manufacturer. As an alternate, collar may be field fabricated from min 0.016 in. (0.41 mm) thick (28 gauge) galv sheet steel in accordance with instruction sheet supplied by wrap strip manufacturer. Steel collar, with anchor tabs bent outward 90 degrees, wrapped tightly around wrap strip layers with min 1 in. (25 mm) overlap at the seam. A min 1/2 in. (13 mm) wide by min 0.028 in. (0.71 mm) thick stainless steel band clamp secured around collar at midheight. As an alternate to the band clamp, collar for systems with three or more layers of wrap strip may be fastened together along the overlapping seam with three No. 6 by 3/8 in. (10 mm) long self-tapping steel screws. Collar secured to gypsum wallboard ceiling using 3/16 in. (5 mm) diam steel toggle bolts (5/8 in. (16 mm) grip) in conjunction with 1-1/4 in. (32 mm) diam steel fender washers. Collar secured to top plate when chase wall is used using min 1 in. long No. 12 (or larger) steel wood screws in conjunction with 1-1/4 in. (32 mm) diam steel fender washers. Min of two fasteners, symmetrically located, required for nom 1/2 in. to nom 2 in. (13 mm to nom 51 mm) diam pipes. Min of three fasteners, symmetrically located, required for nom 2-1/2 in. to nom 3 in. (64 mm to nom 76 mm) diam pipes. Min of four symmetrically located fasteners required for nom 3-1/2 in. and 4 in. (89 mm and 102 mm) diam pipes. Wrap strip retainer tabs to be bent 90 degrees toward pipe to lock wrap strip layers in position.

D. **Fill, Void or Cavity Materials*** – **Caulk or Sealant** – Min 3/4 in. (19 mm) thickness of caulk applied within annular space around perimeter of through penetrant and branch piping (Items 2 and 3), flush with top surface of floor. Min 1/2 in. (13 mm) diam bead applied at the pipe/floor interface and the pipe/wallboard or plate interface and at the seams in the wallboard plate.

3M COMPANY – CP 25WB+, IC 15WB+, FireDam 150+ caulk or FB-3000 WT sealant

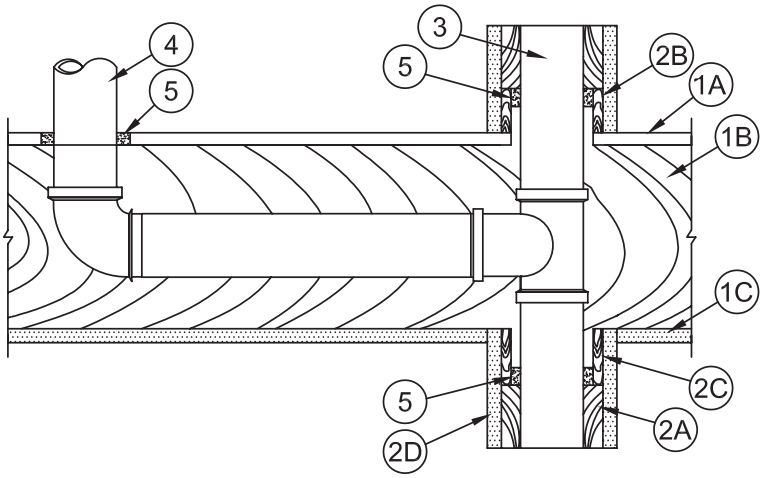
E. **Firestop Device*** – As an alternate to Items 4B1, 4B2 and 4C, firestop device to be installed in accordance with the accompanying installation instructions. Firestop device to be installed and a latched around pipe and secured to underside of ceiling with Ultra Fast Anchors or with 3/16 in. (5 mm) diam steel toggle bolts (5/8 in. (16 mm) grip) in conjunction with 1-1/4 in. (32 mm) diam steel fender washers. Collar secured to top plate when case wall is used with Ultra Fast Anchor Straps or 1/4 in. by 2 in. (6 mm by 51 mm) long steel screws in conjunction with 3/4 in. (19 mm) diam steel washers. Min of two fasteners, symmetrically located, required for nom 2 in. (51 mm) diam pipes. Min of three symmetrically located fasteners required for nom 3 in. (76 mm) diam pipes. Min of four symmetrically located fasteners required for nom 4 in. (102 mm) diam pipes.

3M COMPANY – Ultra RC Pack 2.0, 3.0, 4.0

*Bearing the UL Classification Mark

System No. F-C-2134

February 14, 2008
F Rating – 1 Hr
T Rating – 0 Hr



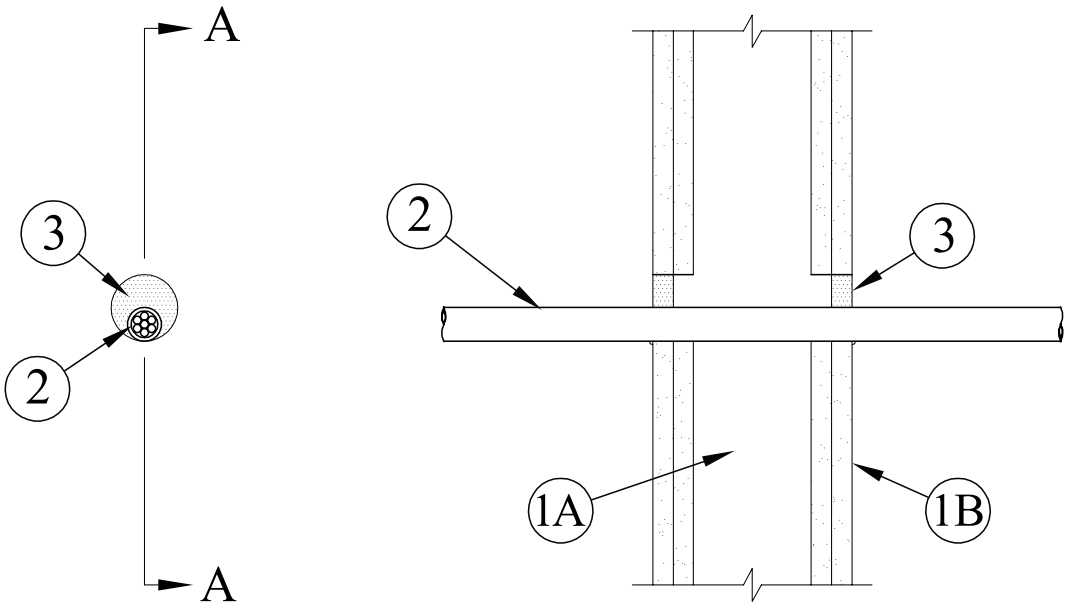
1. **Floor Assembly** – The 1 hr fire rated wood truss or combination wood and steel truss Floor-Ceiling assembly shall be constructed of the materials and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory, as summarized below:
   - A. **Flooring System** – Lumber or plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Diam of opening shall be 1/2 in. to 1 in. (13 to 25 mm) larger than the outside diam of nonmetallic pipe (Items 3 and 4).
   - B. **Joists** – Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and ends firestopped.
   - C. **Gypsum Board*** – Nom 4 ft (1.2 m) wide by 5/8 in. (16 mm) thick, attached as described in the individual Floor-Ceiling Design.
2. **Chase Wall** – The through penetrant (Item No. 3) shall be routed through a 1 hr fire-rated single, double or staggered wood studs/gypsum board chase wall constructed of the materials and in the manner specified in the individual U300 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   - A. **Studs** – Nom 2 by 4 in. (51 by 102 mm) or 2 by 6 in. (51 by 152 mm) lumber studs.
   - B. **Sole Plate** – Nom 2 by 4 in. (51 by 102 mm) or 2 by 6 in. (51 by 152 mm) lumber plates. Diam of opening or length of notch-out in sole plate to be 1/2 in. to 1 in. (13 to 25 mm) larger than outside diam of pipe.
   - C. **Top Plate** – The double top plate shall consist of two nom 2 by 4 in. (51 by 102 mm) or 2 by 6 in. (51 by 152 mm) lumber plates. Diam of opening or length of notch-out in top plate to be 1/2 in. to 1 in. (13 to 25 mm) larger than outside diam of pipe.
   - D. **Gypsum Board*** – Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.
3. **Through Penetrant** – One nonmetallic pipe to be installed within the firestop system. Pipe to be rigidly supported on both sides of floor-ceiling assembly. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 1/2 in. (0 to max 13 mm). The following types and sizes of nonmetallic pipes may be used:
   - A. **Polyvinyl Chloride (PVC) Pipe** – Nom 3 in. (76 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.
   - B. **Cellular Core Polyvinyl Chloride (ccPVC) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   - C. **Acrylonitrile Butadiene Styrene (ABS) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   - D. **Cellular Core Acrylonitrile Butadiene Styrene (ccABS) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
4. **Branch Piping** – (Optional) - One nonmetallic pipe to be connected to through penetrant (Item 3) and installed within opening in subfloor. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 1/2 in. (13 mm). The following types and sizes of nonmetallic pipes may be used:
   - A. **Polyvinyl Chloride (PVC) Pipe** – Nom 3 in. (76 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.
   - B. **Cellular Core Polyvinyl Chloride (ccPVC) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   - C. **Acrylonitrile Butadiene Styrene (ABS) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   - D. **Cellular Core Acrylonitrile Butadiene Styrene (ccABS) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
5. **Fill, Void or Cavity Materials*** – **Caulk or Sealant** – Min 3/4 in. (19 mm) thickness of caulk applied within annular space around perimeter of through penetrant (Item 3), flush with top surface of floor or sole plate and flush with bottom surface of top plate. Min 3/4 in. (19 mm) thickness of caulk applied within annular space around perimeter of branch piping (Item 4), flush with top surface of floor. Min 1/2 in. (13 mm) diam bead applied at the pipe/floor interface and the pipe/plate interface.

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

*Bearing the UL Classification Mark

System No. W-L-3194

May 19, 2005
F Ratings – 1 & 2 Hr (See Item 1)
T Ratings – 0 & 1/2 Hr (See Item 1)



SECTION A-A

1. **Wall Assembly** – The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described 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:
   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 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.
   B. **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 2-1/2 in. (64 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.
2. **Cable** – One cable installed eccentrically or concentrically within opening. Annular space between cable and periphery of opening to be min 0 in. (point contact) to max 1 in. (0 mm to max 25 mm). Cable to be rigidly supported on both sides of the wall. The following types and sizes of cable may be used:
   A. Max 200 pair No. 22 AWG (or smaller) copper conductor with polyvinyl chloride (PVC) insulation and jacketing material.
   B. Max 1/C No. 350 kcmil (or smaller) copper conductor cable with cross-linked polyethylene (XLPE) or PVC jacket.
   C. Max 7/C No. 12 AWG (or smaller) copper conductor power and control cables with XLPE or PVC insulation with XLPE or PVC jacket.
   D. Max 3/C No. 2/0 AWG (or smaller) copper or aluminum conductor SER cables with XLPE or PVC insulation and jacket.
   E. Max 4/C No. 2/0 AWG (or smaller) copper conductor, aluminum clad or steel clad TECK 90 cable with or without PVC jacketed.
   F. Max 110/125 fiber optic (F.O.) cable with PVC insulation and jacket.
   G. Max 3/C with ground No. 8 AWG (or smaller) copper conductor NM cable with PVC insulation and jacket.
   H. Max RG/U coaxial cable with fluorinated ethylene insulation and jacket.
   I. Max 4 pair No. 24 AWG (or smaller) copper conductor data cable with Hylar jacket and insulation.
   J. **Through Penetrating Product*** – Any cables, **Armored Cable**+ or **Metal Clad Cable**+ currently Classified under the **Through Penetrating Product** category.

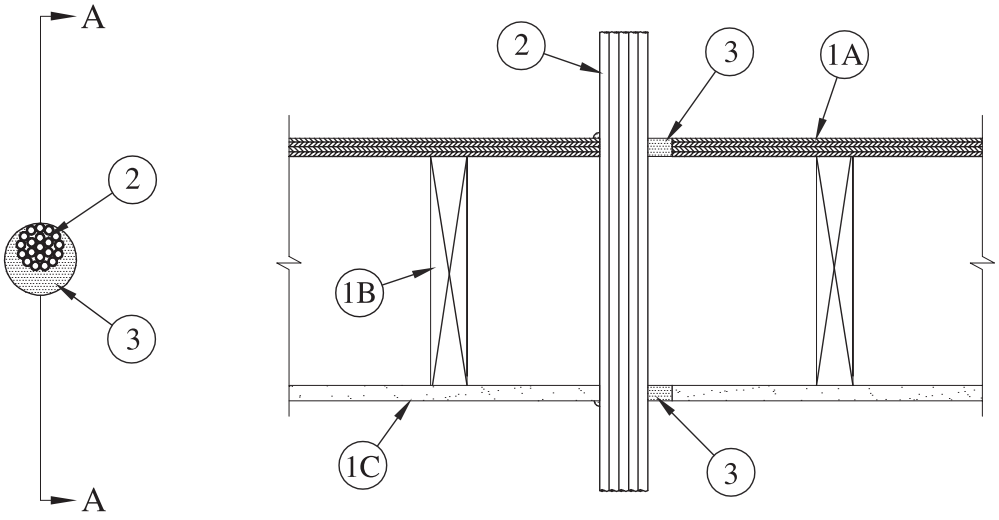
      See **Through Penetrating Product** (XHLY) category in the Fire Resistance Directory for names of manufacturers
3. **Fill, Void or Cavity Material* – Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with both surfaces of wall. Min 1/4 in. (6 mm) diam bead of caulk applied to gypsum board/cable interface at point contact location on both sides of wall.

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

*Bearing the UL Classification Marking

System No. F-C-3070

May 19, 2005
F Rating – 1 Hr
T Rating – 1 Hr



SECTION A-A

1. **Floor-Ceiling Assembly** – The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction details of the floor-ceiling assembly are summarized below:
   - A. **Flooring System** – Lumber or plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Max diam of opening is 3 in. (76 mm).
   - B. **Wood Joists** – Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped.
   - C. **Gypsum Board*** – Nom 4 ft (122 cm) wide by 5/8 in. (16 mm) thick as specified in the individual Floor-Ceiling Design. Max diam of opening is 3 in. (76 mm).

1.1 **Chase Wall** (Optional, not. shown) – The through penetrants (Item No. 2) may be routed through a fire-rated single, double or staggered wood stud/gypsum board chase wall having a fire rating consistent with that of the floor-ceiling assembly. The chase wall shall be constructed of the materials and in the manner specified in the individual U300 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   - A. **Studs** – Nom 2 in. by 6 in. (51 mm by 152 mm) or double nom 2 in. by 4 in. (51 mm by 102 mm) lumber studs.
   - B. **Sole Plate** – Nom 2 in. by 6 in. (51 mm by 152 mm) or parallel 2 in. by 4 in. (51 mm by 102 mm) lumber plates, tightly butted. Max diam of opening is 3 in. (76 mm).
   - C. **Top Plate** – The double top plate shall consist of two nom 2 in. by 6 in. (51 mm by 152 mm) or two sets of parallel 2 in. by 4 in. (51 mm by 102 mm) lumber plates, tightly butted. Max diam of opening is 3 in. (76 mm).
   - D. **Gypsum Board*** – Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.

2. **Cables** – Max 2 in. diam cable bundle installed eccentrically or concentrically within opening. Annular space between cable bundle and periphery of opening to be min 0 in. (point contact) to max 1 in. (0 mm to 25 mm). Cable bundle to be rigidly supported on both sides of wall. The following types and sizes of cables may be used:
   - A. Max 200 pair No. 22 AWG (or smaller) copper conductor with polyvinyl chloride (PVC) insulation and jacketing material.
   - B. Max 1/C No. 350 kcmil (or smaller) copper conductor cable with cross-linked polyethylene (XLPE) or PVC jacket.
   - C. Max 7/C No. 12 AWG (or smaller) copper conductor power and control cables with XLPE or PVC insulation with XLPE or PVC jacket.
   - D. Max 3/C No. 2/0 AWG (or smaller) copper or aluminum conductor SER cables with XLPE or PVC insulation and jacket.
   - E. Max 4/C No. 2/0 AWG (or smaller) copper conductor, aluminum clad or steel clad TECK 90 cable with or without PVC jacketed.
   - F. Max 110/125 fiber optic (F.O.) cable with PVC insulation and jacket.
   - G. Max 3/C with ground No. 8 AWG (or smaller) copper conductor NM cable with PVC insulation and jacket.
   - H. Max RG/U coaxial cable with fluorinated ethylene insulation and jacket.
   - I. Max 4 pair No. 24 AWG (or smaller) copper conductor data cable with Hylar jacket and insulation.
   - J. **Through Penetrating Product*** – Any cables, **Armored Cable**+ or **Metal Clad Cable**+ currently Classified under the Through Penetrating Product category.

   See **Through Penetrating Product** (XHLY) category in the Fire Resistance Directory for names of manufacturers

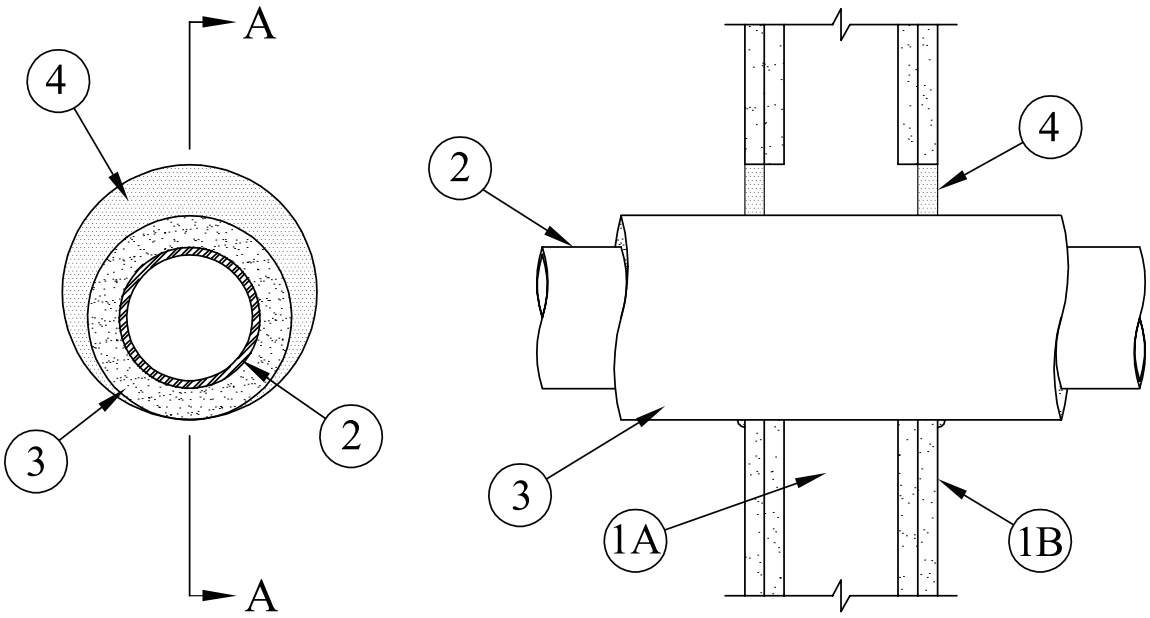
3. **Fill, Void or Cavity Materials*** – **Caulk or Sealant** – Min 3/4 in. (19 mm) thickness of caulk applied within annulus, flush with top surface of floor or sole plate. Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with bottom surface of ceiling or top plate. Min 1/4 in. (6 mm) diam bead of caulk applied at point contact locations at cable bundle/floor or sole plate interface on top surface of floor or sole plate and at cable bundle/ceiling or top plate interface.

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

*Bearing the UL Classification Marking

System No. W-L-5168

May 19, 2005
F Ratings – 1 & 2 Hr (See Item 1)
T Ratings – 0, 1/2, 3/4, 1-1/4 and 1-1/2 Hr (See Item 3)



SECTION A-A

1. **Wall Assembly** – The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described 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:

   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 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.

   B. **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 12-1/2 in. (318 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. **Through Penetrants** – One metallic pipe or tubing installed concentrically or eccentrically within opening. Penetrant to be rigidly supported on both sides of wall. The following types and sizes of penetrants may be used:

   A. **Steel Pipe** – Nom 8 in. (203 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

   B. **Iron Pipe** – Nom 8 in. (203 mm) diam (or smaller) cast or ductile iron pipe.

   C. **Copper Tubing** – Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.

   D. **Copper Pipe** – Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.

3. **Pipe Covering*** – Nom 1 in., 1-1/2 in. or 2 in. (25 mm, 38 mm or 51 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 SSL tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. Annular space between pipe covering and periphery of opening to be min 0 in. (point contact) to max 1-7/8 in. (0 mm to max 48 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.

   The hourly T Rating is 1-1/4 Hr for pipe coverings of nom 1 in. and 1-1/2 in. (25 mm and 38 mm) thick for 2 Hr rated assemblies. The hourly T Rating is 1-1/2 Hr for pipe coverings of nom 2 in. (51 mm) thick for 2 Hr rated assemblies. The hourly T Rating is 1/2 Hr for pipe coverings of nom 1 in. and 1-1/2 in. (25 mm and 38 mm) thick for 1 Hr rated assemblies. The hourly T Rating is 3/4 Hr for pipe coverings of nom 2 in. (51 mm) thick for 1 Hr rated assemblies.

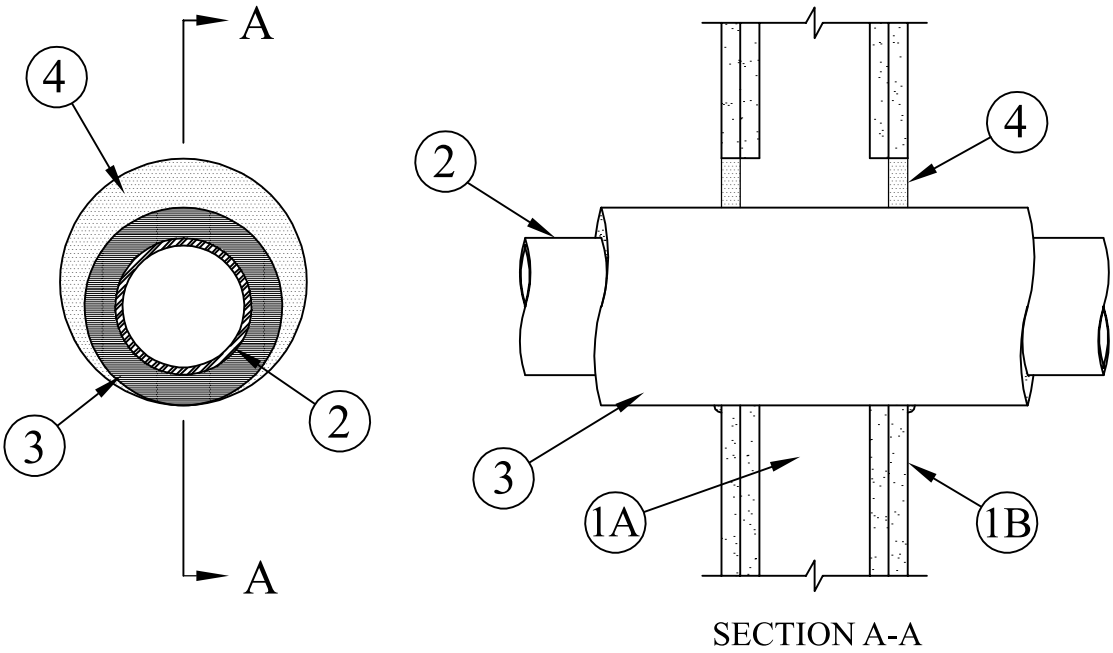
4. **Fill, Void or Cavity Material* – Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with both surfaces of wall. Min 1/4 in. (6 mm) diam bead of caulk applied to gypsum board/pipe covering interface at point contact location on both sides of wall.

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

*Bearing the UL Classification Marking

System No. W-L-5169

May 19, 2005
F Ratings – 1 & 2 Hr (See Item 1)
T Ratings – 0 & 1 Hr (See Item 3)



SECTION A-A

1. **Wall Assembly** – The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described 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:
   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 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.
   B. **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 7-1/2 in. (191 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. **Through Penetrants** – One metallic pipe or tubing installed concentrically or eccentrically within opening. Penetrant to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or tubing may be used:
   A. **Steel Pipe** – Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. **Iron Pipe** – Nom 4 in. (102 mm) diam (or smaller) cast or ductile iron pipe.
   C. **Copper Tubing** – Nom 2 in. (51 mm) diam (or smaller) Type L (or heavier) copper tubing.
   D. **Copper Pipe** – Nom 2 in. (51 mm) diam (or smaller) Regular (or heavier) copper pipe.
3. **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. Annular space between tube insulation and periphery of opening to be min 0 in. (point contact) to max 1-1/2 in. (0 mm to 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.

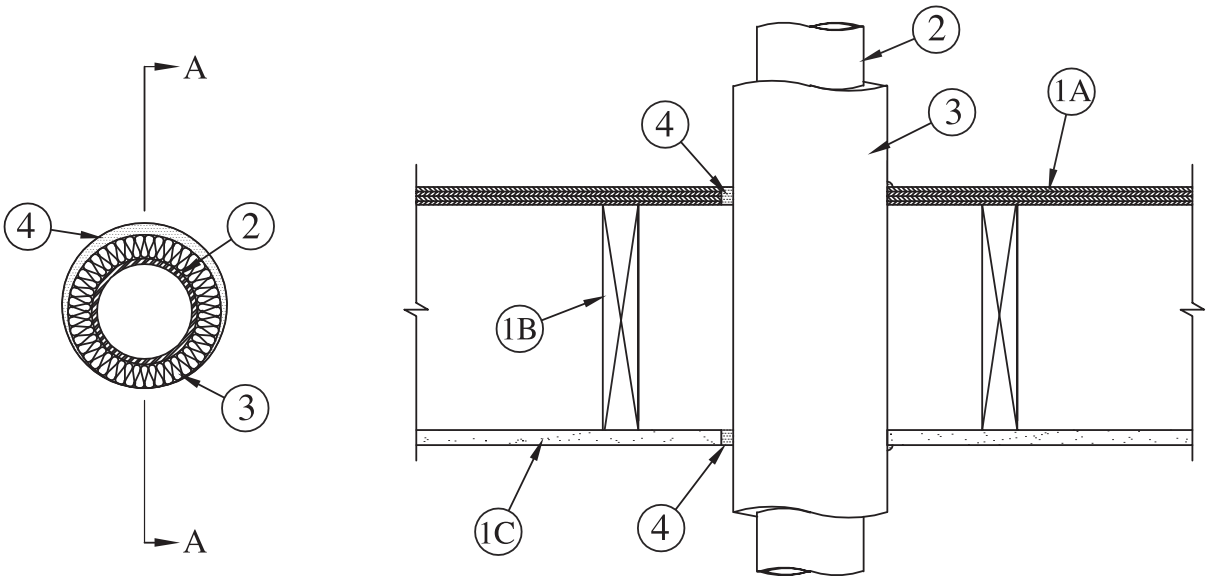
   T Rating is 1 Hr for nom 3/4 in. (19 mm) thick tube insulation in 2 Hr rated assemblies. T Rating is 0 Hr for 3/4 in. (19 mm) thick tube insulation in 1 Hr rated assemblies. T Rating is 0 Hr for tube insulations less than nom 3/4 in. (19 mm) thick in 1 and 2 Hr rated assemblies.
4. **Fill, Void or Cavity 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/tube insulation 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
+Bearing the UL Recognized Component Marking

System No. F-C-5058

May 19, 2005
F Rating – 1 Hr
T Ratings – 0, 3/4 and 1 Hr (See Item 3)



SECTION A-A

1. **Floor-Ceiling Assembly** – The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction details of the floor-ceiling assembly are summarized below:
   A. **Flooring System** – Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening is 8 in. (203 mm).
   B. **Wood Joists** – Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. **Gypsum Board*** – Nom 4 ft (122 cm) wide by 5/8 in. (16 mm) thick as specified in the individual Floor-Ceiling Design. Max diam of opening is 8 in. (203 mm).
2. **Through Penetrants** – One metallic pipe, conduit, tubing or flexible metal pipe installed concentrically or eccentrically within opening. Penetrant to be rigidly supported on both sides of floor-ceiling. The following types and sizes of penetrants may be used:
   A. **Steel Pipe** – Nom 4 in. (102 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. **Iron Pipe** – Nom 4 in. (102 mm) diam (or smaller) cast or ductile iron pipe.
   C. **Copper Tubing** – Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
   D. **Copper Pipe** – Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
3. **Pipe Coverings** – Pipe covering installed such that the annular space between pipe covering and periphery of opening shall be min 0 in. (point contact) to max 7/8 in. (0 mm to 22 mm). The following types of pipe coverings shall be used:
   A. **Pipe Coverings*** – Nom 1-1/2 in. (38 mm) thick (or less) 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 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.
   B. **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.

      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.

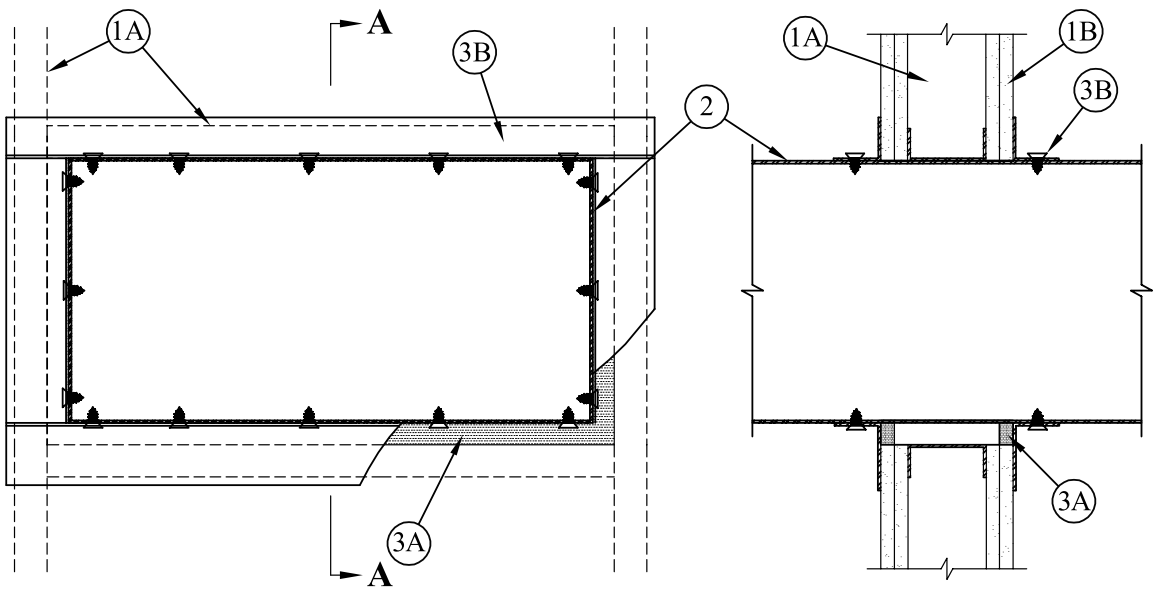
   T Rating is 1 Hr for nom 1-1/2 and 1 in. (25 mm) thick glass fiber units. T Rating is 0 Hr for glass fiber units less than nom 1 in. (25 mm) thick. T Rating is 3/4 Hr for nom 3/4 in. (19 mm) thick tube insulation. T Rating is 0 Hr for tube insulations less than nom 3/4 in. (19 mm) thick.
4. **Fill, Void or Cavity Materials*** – **Caulk or Sealant** – Min 3/4 in. (19 mm) thickness of caulk applied within annulus, flush with top surface of floor. Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with bottom surface of ceiling. Min 1/4 in. (6 mm) diam bead of caulk applied at point contact locations at pipe covering/floor interface on top surface of floor and at pipe covering/ceiling interface.

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

*Bearing the UL Classification Marking
+Bearing the UL Recognized Component Marking

System No. W-L-7091

May 19, 2005
F Ratings – 1 & 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^2) 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.

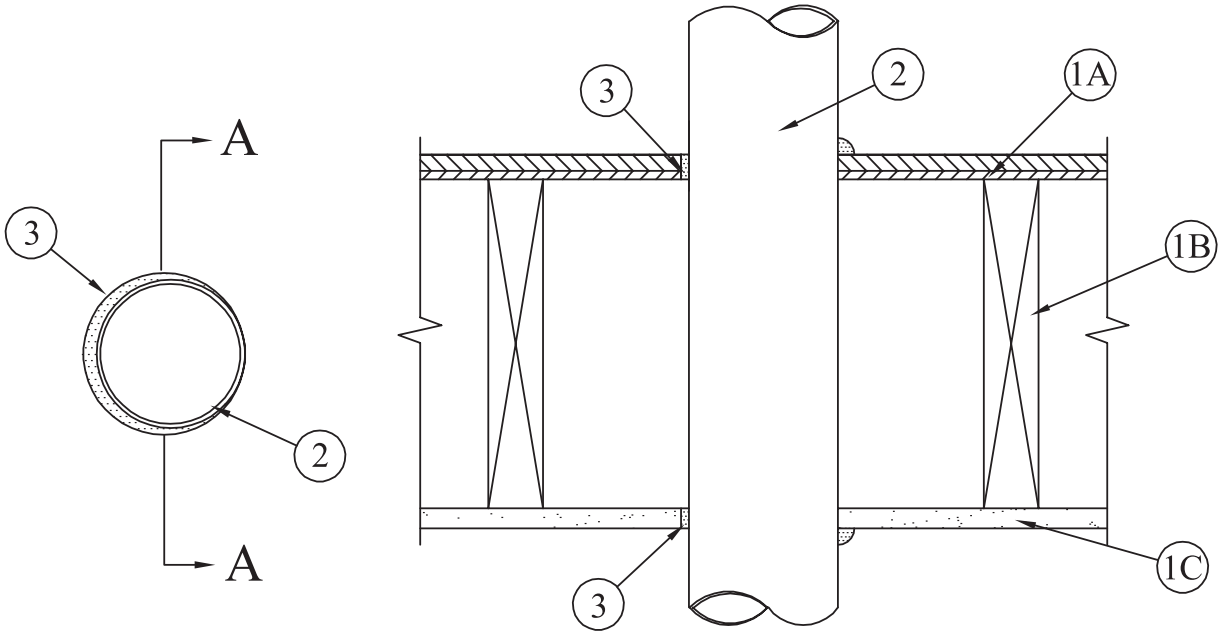
      3M COMPANY – CP 25WB+, IC 15WB+ caulk or FB-3000 WT sealant

   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. F-C-7022

May 19, 2005
F Rating – 1 Hr
T Rating – 1/4 Hr



SECTION A-A

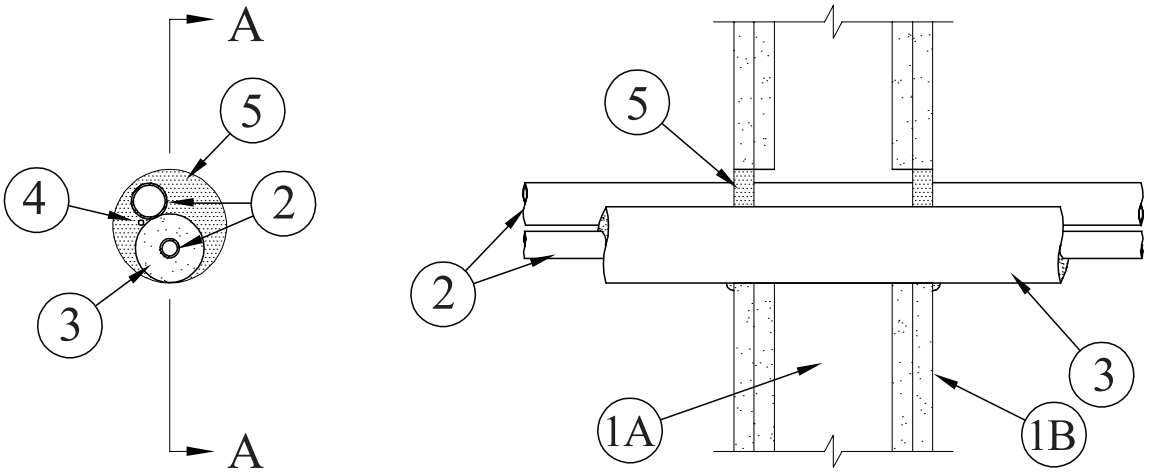
1. **Floor-Ceiling Assembly** – The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction details of the floor-ceiling assembly are summarized below:
   A. **Flooring System** – Lumber or plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Max diam of opening is 11 in. (279 mm).
   B. **Wood Joists** – Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped.
   C. **Gypsum Board*** – Nom 4 ft. (122 cm) wide by 5/8 in. (16 mm) thick as specified in the individual Floor-Ceiling Design. Max diam of opening is 11 in. (279 mm).
2. **Steel Duct** – Nom 10 in. (254 mm) (or smaller) No. 28 gauge (or heavier) steel duct or nom 5 in. (127 mm) (or smaller) No. 30 gauge (or heavier) steel duct to be installed either concentrically or eccentrically within opening. The annular space between duct and periphery of opening shall be min 0 in. (point contact) to max 1 in. (0 mm to max 25 mm). Duct to be rigidly supported on both sides of floor assembly.
3. **Fill, Void or Cavity Materials*** – **Caulk or Sealant** – Min 3/4 in. (19 mm) thickness of caulk applied within annulus, flush with top surface of floor. Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with bottom surface of ceiling. Min 1/4 in. (6 mm) diam bead of caulk applied at point contact locations at duct/floor interface on top surface of floor and at duct/ceiling interface.

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

*Bearing the UL Classification Marking

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)



SECTION A-A

1. **Wall Assembly** – The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described 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:

   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 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.

   B. **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.

2. **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:

   A. **Copper Tubing** – Nom 1 in. (25 mm) diam (or smaller) Type L (or heavier) copper tubing.

   B. **Copper Pipe** – Nom 1 in. (25 mm) diam (or smaller) Regular (or heavier) copper pipe.

   C. **Steel Pipe** – Nom 1 in. (25 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.

   D. **Cables** – Max 7/C No. 12 AWG multiconductor power and control cables; XLPE or PVC insulation with XLPE or PVC jacket.

3. **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.

4. **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.

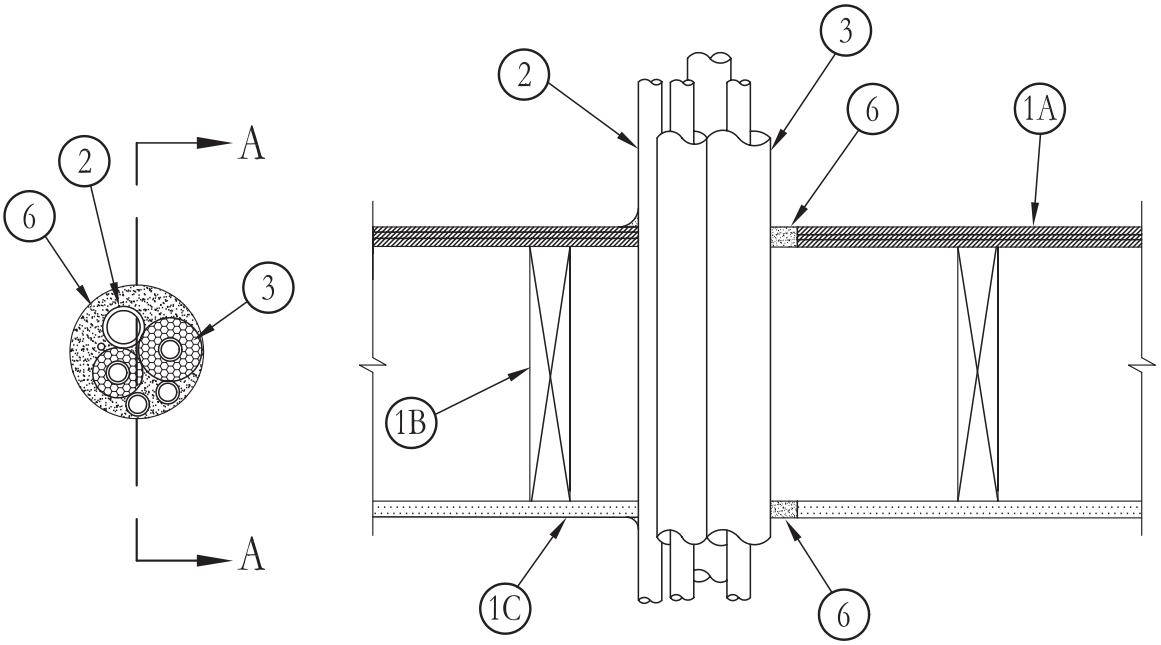
5. **Fill, Void or Cavity Material*** – **Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with both surfaces of wall. Min 1/4 in. (6 mm) diam bead of caulk applied to gypsum board/penetrant interface at point contact location on both sides of wall.

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

* Bearing the UL Classification Marking

System No. F-C-8024

May 19, 2005
F Rating – 1 Hr
T Rating – 1/4 Hr



SECTION A-A

1. **Floor-Ceiling Assembly** – The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction details of the floor-ceiling assembly are summarized below:
   A. **Flooring System** – Lumber or plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Max diam of opening is 5 in. (127 mm).
   B. **Wood Joists** – Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped.
   C. **Gypsum Board*** – Nom 4 ft (122 mm) wide by 5/8 in. (16 mm) thick as specified in the individual Floor-Ceiling Design. Max diam of opening is 5 in. (127 mm).

1.1 **Chase Wall** (Optional, not. shown) – The through penetrants (Item No. 2) may be routed through a fire-rated single, double or staggered wood stud/gypsum board chase wall having a fire rating consistent with that of the floor-ceiling assembly. The chase wall shall be constructed of the materials and in the manner specified in the individual U300 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs** – Nom 2 in. by 6 in. (51 mm by 152 mm) or double nom 2 in. by 4 in. (51 mm by 102 mm) lumber studs.
   B. **Sole Plate** – Nom 2 in. by 6 in. (51 mm by 152 mm) or parallel 2 in. by 4 in. (51 mm by 102 mm) lumber plates, tightly butted. Max diam of opening is 5 in. (127 mm).
   C. **Top Plate** – The double top plate shall consist of two nom 2 in. by 6 in. (51 mm by 152 mm) or two sets of parallel 2 in. by 4 in. (51 mm by 102 mm) lumber plates, tightly butted. Max diam of opening is 5 in. (127 mm).
   D. **Gypsum Board*** – Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.

2. **Through Penetrants** – One or more metallic pipes, conduits or tubing to be installed concentrically or eccentrically within opening. Pipes, conduits or tubing to be spaced min 0 in. (point contact) to max 1 in. (0 mm to max 25 mm) apart. The space between the pipes, conduits or tubing and the periphery of the opening shall be min 0 in. (point contact) to max 1 in. (0 mm to max 25 mm). Penetrants to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of metallic pipe, conduits or tubing may be used:
   A. **Steel Pipe** – Nom 3/4 in. (19 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. **Conduit** – Nom 3/4 in. (19 mm) diam (or smaller) steel electrical metallic tubing or steel conduit.
   C. **Copper Tubing** – Nom 3/4 in. (19 mm) diam (or smaller) Type L (or heavier) copper tubing.
   D. **Copper Pipe** – Nom 3/4 in. (19 mm) diam (or smaller) Regular (or heavier) copper pipe.

3. **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 annular space between the insulated penetrant and the periphery of the opening shall be min 0 in. (point contact) to max 1 in. (0 mm to max 25 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.

System No. F-C-8024 *continued*

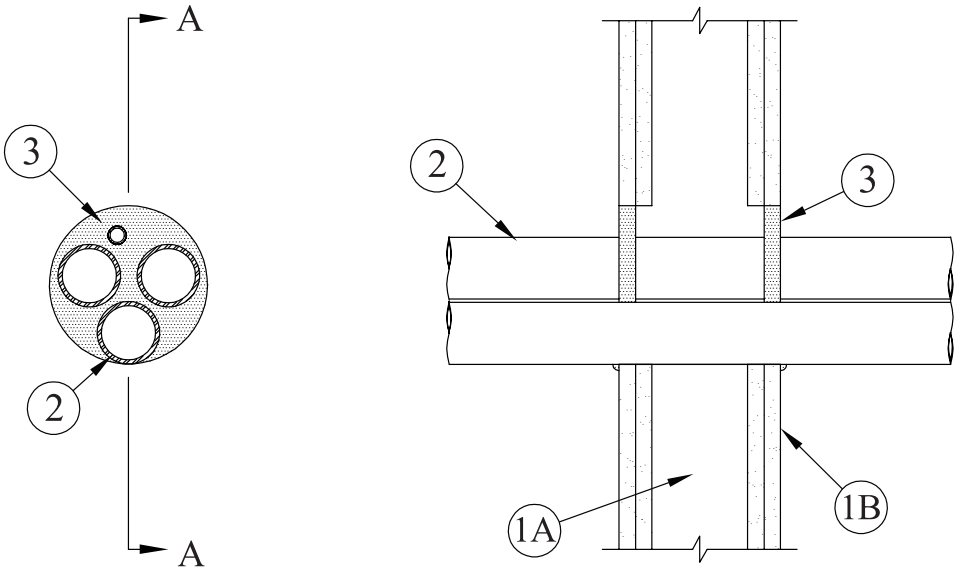
4. **Nonmetallic Pipes** – One nonmetallic pipe or conduit to be installed within the firestop system. Pipe or conduit to be spaced min 0 in. (point contact) to max 1 in. (0 mm to max 25 mm) from the insulated through penetrants and min 1/2 in. to max 1 in. (13 mm to max 25 mm) from non-insulated through penetrants. The space between the pipe or conduit and the periphery of the opening shall be min 0 in. (point contact) to max 1 in. (0 mm to max 25 mm). Pipe or conduit to be rigidly supported on both sides of floor-ceiling assembly. One of the following types and sizes of nonmetallic through penetrants may be used:
   A. **Polyvinyl Chloride (PVC) Pipe** – Nom 1-1/2 in. (38 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.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** – Nom 1-1/2 in. (38 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit**++ – Nom 1-1/2 in. (38 mm) diam (or smaller) Schedule 40 solid-core PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).
5. **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 the floor-ceiling assembly.
6. **Fill, Void or Cavity Materials*** – **Caulk or Sealant** – Min 3/4 in. (19 mm) thickness of caulk applied within annulus, flush with top surface of floor or sole plate. Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with bottom surface of ceiling or top plate. Min 1/4 in. (6 mm) diam bead of caulk applied at point contact locations at penetrant/floor interface on top surface of floor or sole plate and at penetrant/ceiling or top plate interface.

   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
+Bearing the UL Recognized Component Marking
++Bearing the UL Listing Mark

System No. W-L-1287

May 19, 2005
F Ratings – 1 & 2 Hr (See Item 1)
T Ratings – 0 & 1/4 Hr (See Item 1)



SECTIONA-A

1. **Wall Assembly** – The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described 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:

   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 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.

   B. **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 8 in. (203 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 1/4 Hr for 1 and 2 Hr rated assemblies, respectively.

2. **Through Penetrants** – One or more metallic pipes, conduits, tubes or flexible metal pipes installed concentrically or eccentrically within opening. Annular space between penetrants and periphery of opening to be min 0 in. (point contact) to max 2 in. (0 mm to max 51 mm). Space between penetrants to be min 1/4 in. to max 2 in. (6 mm to max 51 mm). Penetrants to be rigidly supported on both sides of wall. The following types and sizes of penetrants may be used:

   A. **Steel Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.

   B. **Iron Pipe** – Nom 3 in. (76 mm) diam (or smaller) cast or ductile iron pipe.

   C. **Conduit** – Nom 3 in. (76 mm) diam (or smaller) steel conduit or steel electrical metallic tubing.

   D. **Copper Tubing** – Nom 2 in. (51 mm) diam (or smaller) Type L (or heavier) copper tubing.

   E. **Copper Pipe** – Nom 2 in. (51 mm) diam (or smaller) Regular (or heavier) copper pipe.

   F. **Through Penetrating Product* – Flexible Metal Piping** – The following types of steel flexible metal gas piping may be used:

      1. Nom 2 in. (51 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly.

         OMEGA FLEX INC.

      2. Nom 1 in. (25 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly.

         TITEFLEX CORP, A BUNDY CO

      3. Nom 1 in. (25 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly.

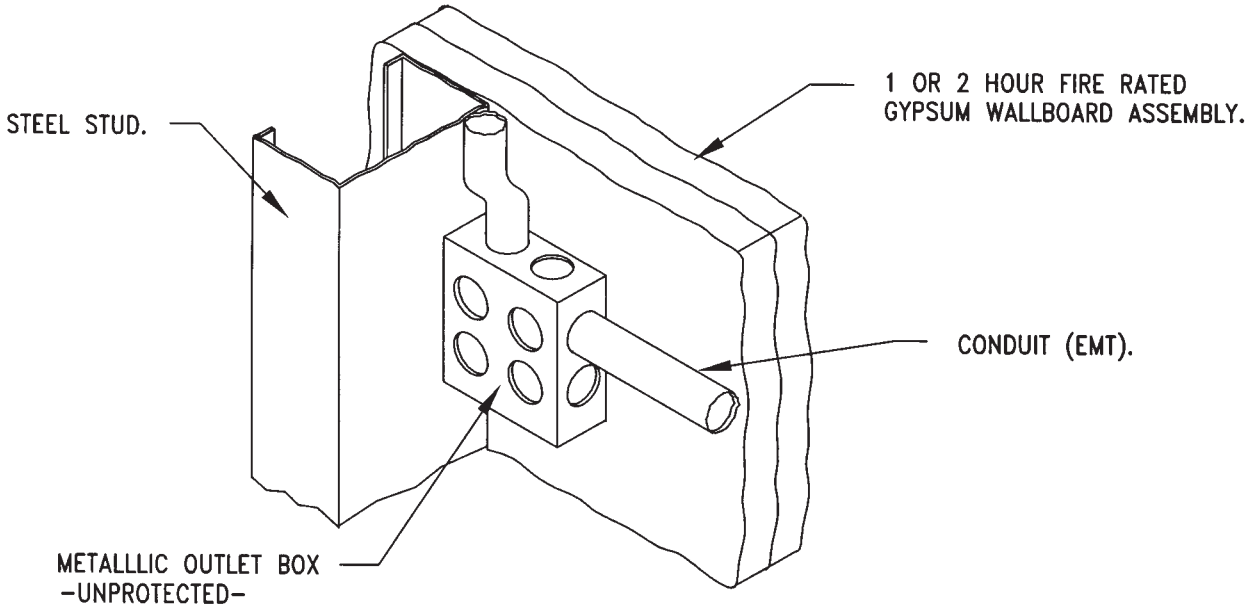
         WARD MFG INC.

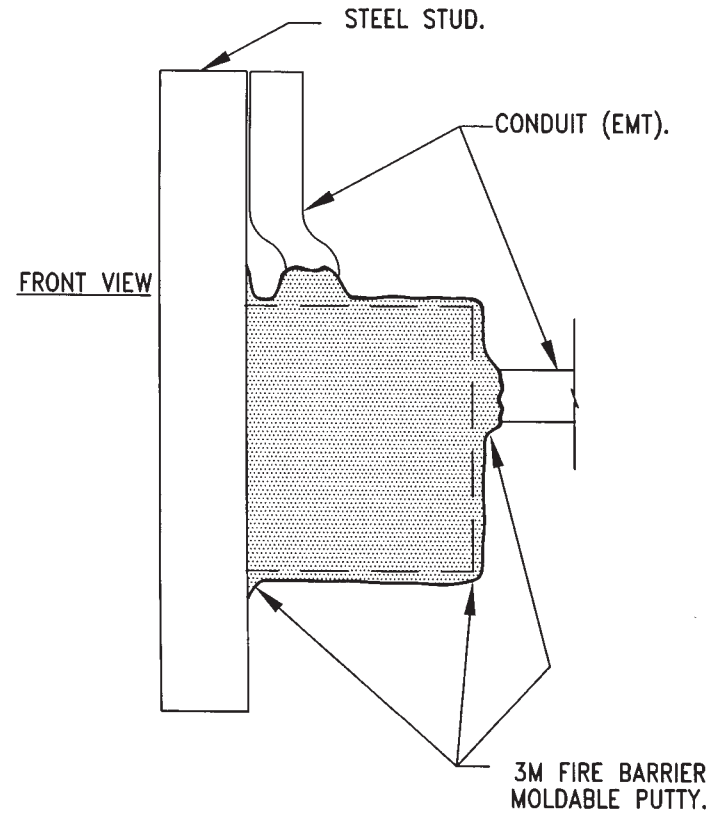
3. **Fill, Void or Cavity Material* – Caulk or Sealant** – Min 5/8 in. (16 mm) thickness of caulk applied within annulus, flush with both surfaces of wall. Min 1/4 in. (6 mm) diam bead of caulk applied to gypsum board/penetrant interface at point contact location on both sides of wall.

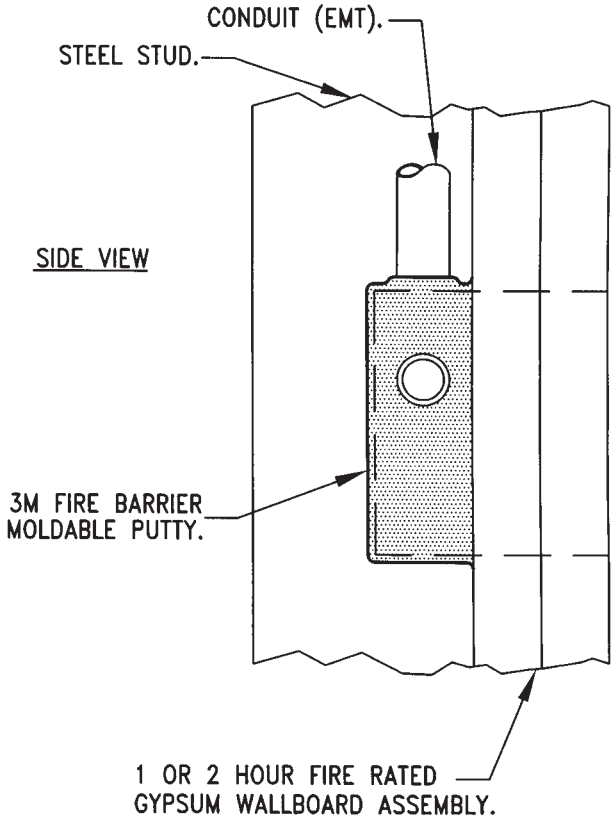
   3M COMPANY – IC 15WB+, CP 25WB+ caulk or FB-3000 WT sealant.

*Bearing the UL Classification Marking

Suggested Installation for 3M™ Fire Barrier Moldable Putty+ on Electrical Outlet Boxes







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

WALL OPENING PROTECTIVE MATERIALS
(CLIV)

This category covers proprietary compositions which are used to maintain the hourly ratings of fire resistive walls and partitions containing flush mounted devices such as outlet boxes, electrical cabinets and mechanical cabinets. The individual Classifications indicate the specific applications and the method of installation for which the materials have been evaluated.

The basic standard used to investigate products in this category is ANSI/UL 263, "Fire Tests of Building Construction and Materials".

LOOK FOR CLASSIFICATION MARKING ON PRODUCT

The Classification Marking of Underwriters Laboratories Inc. (shown below) on the product or container is the only method provided by Underwriters Laboratories Inc. to identify Wall Opening Protective Materials produced under its Classification and Follow-Up Service.

UNDERWRITERS LABORATORIES INC.®
CLASSIFIED
WALL OPENING PROTECTIVE MATERIAL
FIRE RESISTANCE CLASSIFICATION
SEE PRODUCT CATEGORY IN UL FIRE RESISTANCE DIRECTORY

3M COMPANY **R9700**
3M CENTER, ST PAUL MN 55144 USA

Type MPP+ moldable putty pads for use with max 4-11/16 by 4-11/16 by 2-1/8 in. deep flush device UL Listed Metallic Outlet Boxes installed with steel cover plates for use in 1 or 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. wide wood or steel studs and constructed as specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory.

Type MPP+ moldable putty pads for use with max 4-11/16 by 4-11/16 by 2 1/8 in. deep flush device UL Listed Metallic Outlet Boxes installed with steel or plastic cover plates for use in 1 hr or 2 hr fire rated gypsum board wall assemblies framed with min 5-1/2 in. wide wood or steel studs and constructed as specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. Metallic outlet boxes to be provided with steel attachment brackets which offset box min 1/4 in. from stud. Putty pad to be affixed to the back and all four sides of the box. Boxes may be installed back-to-back within the stud cavity. When back-to-back boxes are interconnected, a ball of putty is to be installed to plug the open end of each electrical metallic tube or conduit within the outlet boxes.

Type MPP+ moldable putty pads for use with max 4 by 4 by 2-1/8 in. deep flush device UL Listed Metallic Outlet Boxes installed with plastic cover plates for use in 1 or 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. wide wood or steel studs and constructed as specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory.

Type MPP+ moldable putty pads for use with max 14 by 4 by 2-1/2 in. deep flush device UL Listed Metallic Outlet Boxes installed with steel cover plates for use in 1 or 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. wide steel studs and constructed as specified in the individual U400 or V400 Series Wall and Partition Designs in the fire Resistance Directory.

Type MPP+ moldable putty pads for use with max 14 by 4-1/2 by 2-1/2 in. deep UL Listed Nonmetallic Outlet Boxes manufactured by Carlon Electrical Products, made of PVC and bearing a 2 hr rating under the "Outlet Boxes and Fittings Classified for Fire Resistance" category in the Fire Resistance Directory. Boxes installed with steel cover plates, for use in 1 or 2 hr rated gypsum board wall assemblies framed with min 3-1/2 in. wide wood studs and constructed as specified in the individual U300 Series Wall and Partition Designs in the Fire Resistance Directory.

Type MPP+ moldable putty pads for use with max 4 by 3-1/4 by 3-3/4 in. deep UL Listed Nonmetallic Outlet Boxes manufactured by Thomas & Betts Corp., made of polycarbonate, Type 234 or made of phenolic, Type 1052 and bearing a 2 hr rating under the "Outlet Boxes and Fittings Classified for Fire Resistance" category in the Fire Resistance Directory. Boxes installed with steel cover plates. For use in 1 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. wide wood studs and constructed as specified in the individual U300 series Wall and Partition Designs in the Fire Resistance Directory.

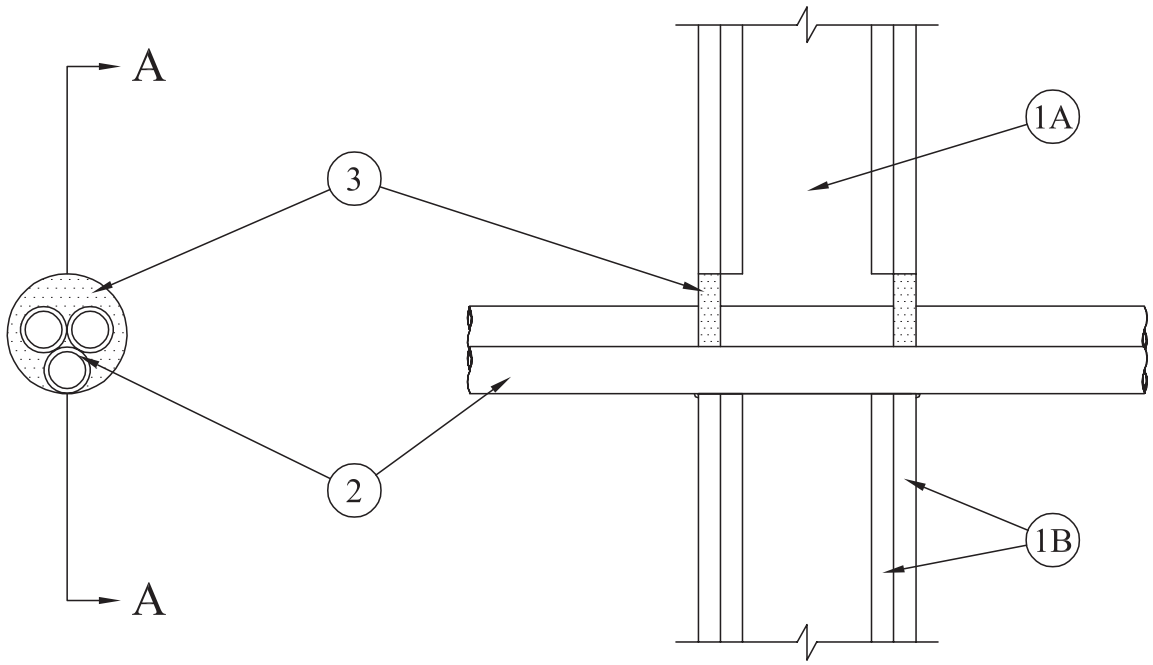
Type MPP+ moldable putty pads for use with max 4 by 3-3/4 by 3 in. deep UL Listed Nonmetallic Outlet Boxes manufactured by Carlon Electrical Products, made of PVC and bearing a 2 hr rating under the "Outlet Boxes and Fittings Classified for Fire Resistance" category in the Fire Resistance Directory. Boxes installed with plastic cover plates, for use in 1 hr rated gypsum board wall assemblies framed with min 3-1/2 in. wide wood studs and constructed as specified in the individual U300 Series Wall and Partition Designs in the Fire Resistance Directory.

Type MPP+ moldable putty pads for use with max 4 by 3-1/4 by 3-3/4 in. deep UL Listed Nonmetallic Outlet Boxes manufactured by Thomas & Betts Corp., made of phenolic, Type 2002-738-C and bearing a 2 hr rating under the "Outlet Boxes and Fittings Classified for Fire Resistance" category in the Fire Resistance Directory. Boxes installed with steel cover plates. For use in 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. wide steel studs and constructed as specified in the individual U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory.

Moldable putty pads are to be installed to completely cover the exterior surfaces of the outlet box (except for the side of the outlet box against the stud unless otherwise noted) including nailing tabs and to completely seal against the stud within the stud cavity. Multiple moldable putty pads may be installed on an outlet box to attain the required minimum thickness of putty material. Additional putty material used to seal around each conduit and/or cable fitting on the exterior of each box. A min 1/10 in. thickness of putty material is required on the exterior surfaces of flush device boxes in 1 and 2 hr fire rated Wall and Partition Designs. When the moldable putty pad outlet box protective material is used on boxes on both sides of wall as directed, the horizontal separation between outlet boxes on opposite sides of the wall may be less than 24 in. provided that the outlet boxes are not installed back to back, except as noted.

System No. W-L-2300

May 19, 2005
F Ratings – 1 & 2 Hr (See Item 1)
T Ratings – 0 & 1/2 Hr (See Item 1)



Section A-A

1. **Wall Assembly** – The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described 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:
   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 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.
   B. **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).

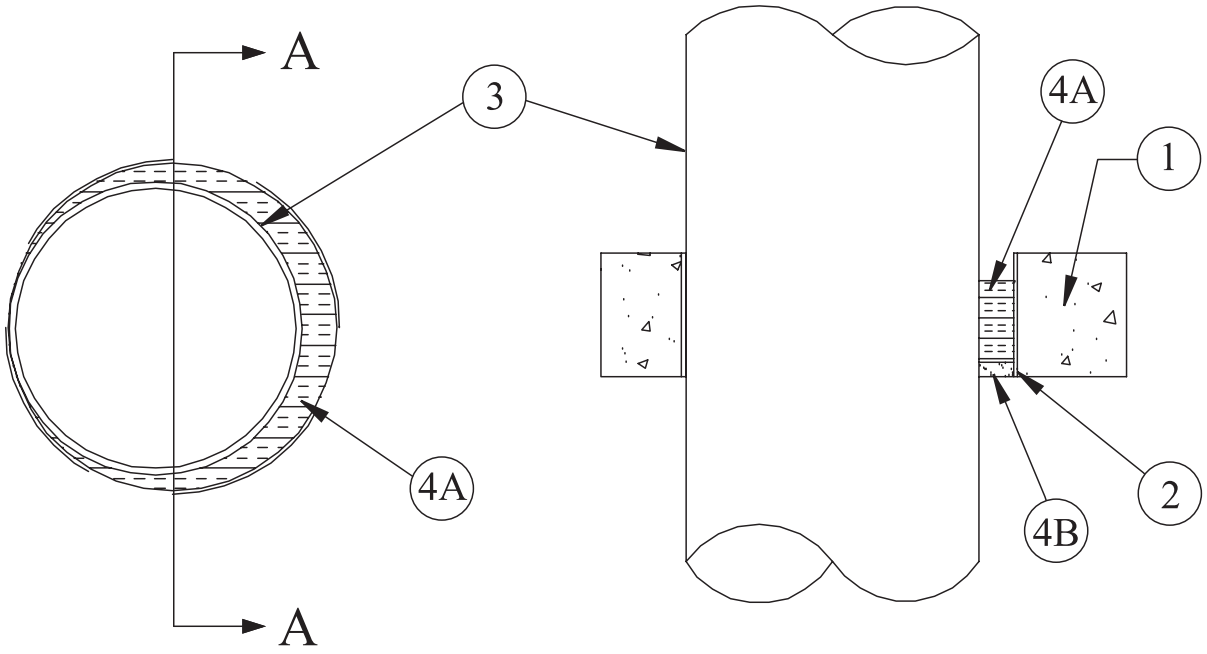
   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. The hourly T Rating is 0 and 1/2 Hr for 1 and 2 Hr rated assemblies, respectively.
2. **Through Penetrants** – One or more nonmetallic pipes, conduits or tubes installed concentrically or eccentrically within opening. Annular space between penetrants and periphery of opening to be min 0 in. (point contact) to max 1 in. (0 mm to max 25 mm). Space between penetrants shall be min 0 in. (point contact) to max 1 in. (0 mm to max 25 mm). Penetrants to be rigidly supported on both sides of wall. The following types and sizes of penetrants may be used:
   A. **Polyvinyl Chloride (PVC) Pipe** – Nom 1-1/2 in. (38 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. **Rigid Nonmetallic Conduit++** – Nom 1-1/2 in. (38 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).
   C. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** – Nom 1-1/2 in. (38 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   D. **Crosslinked Polyethylene (PEX) Tubing** – Nom 1 in. (25 mm) diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
3. **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 – IC 15WB+, CP 25WB+ caulk or FB-3000 WT sealant
   (Note: CP 25WB+ not suitable for use with CPVC pipes.)

*Bearing the UL Classification Marking

System No. C-AJ-1496

May 18, 2005
F Rating – 3 Hr
T Rating – 0 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^3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening 13-3/4 in. (349 mm).

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

2. **Steel Sleeve** – (optional) – Schedule 10 (or heavier) steel sleeve cast or grouted into slab, flush with bottom of floor. Sleeve may extend a max of 2 in. (51 mm) above top surface of floor or both surfaces of wall.

3. **Through Penetrant** – One metallic pipe or tubing installed concentrically or eccentrically within opening. Annular space between penetrant and sleeve or periphery of opening shall be min of 0 in. (0 mm) (point contact) to max 3 in. (76 mm). Penetrant to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of penetrants may be used:

   A. **Steel Pipe** – Nom 10 in. (254 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

   B. **Iron Pipe** – Nom 10 in. (254 mm) diam (or smaller) cast or ductile iron pipe.

   C. **Conduit** – Nom 6 in. diam (or smaller) steel conduit or nom 4 in. diam (or smaller) steel electrical metallic tubing.

   D. **Copper Tubing** – Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.

   E. **Copper Pipe** – Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.

4. **Firestop System** – The firestop system shall consist of the following:

   A. **Packing Material** – Min 3 in. (76 mm) thickness of min 4 pcf (64 kg/m^3) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from bottom surface of floor or from both surfaces of wall to accommodate the required thickness of fill material.

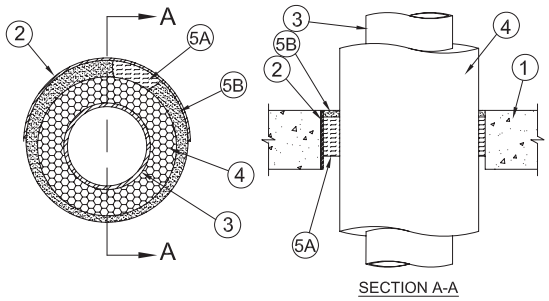
   B. **Fill, Void or Cavity Materials* – Caulk or Sealant** – Min 1/2 in. (13 mm) thickness of caulk applied within the annulus, flush with bottom surface of floor or with both surfaces of wall.

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

*-Bearing the UL Classification Mark

System No. C-AJ-5210

March 15, 2007
F Ratings – 1-1/2 & 2 Hr (See Item 4)
T Ratings – 1/2, 3/4, 1 & 1-1/4 Hr (See Item 4)



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^3) 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 14 in. (356 mm). Max diam of opening in floors constructed of hollow-core concrete is 7 in. (178 mm).

   See **Concrete Blocks** (CAZT) and **Precast Concrete Units** (CFTV) categories in Fire Resistance Directory for names of manufacturers.

2. **Steel Sleeve** – (Optional) – Nom 14 in. (356 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. As an alternate, nom 14 in. (356 mm) diam (or smaller) sleeve fabricated from nom 0.028 in. (0.71 mm) thick galv steel cast or grouted into floor or wall assembly flush with floor or wall surfaces.

3. **Through Penetrants** – One metallic pipe or tubing to be installed concentrically or eccentrically within opening. Penetrant to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubes may be used:

   A. **Steel Pipe** – Nom 8 in. (203 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. **Iron Pipe** – Nom 8 in. (203 mm) diam (or smaller) cast or ductile iron pipe.
   C. **Copper Tubing** – Nom 4 in. (102 mm) diam (or smaller) Type M (or heavier) copper tube.
   D. **Copper Pipe** – Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.

4. **Pipe Covering** – Nom 2 in. (51 mm) thick (or less) 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. Annular space between the pipe covering and periphery of opening or sleeve shall be min 1/2 in. to max 1 in. (13 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.

   The hourly F and T Ratings are dependent on the type of pipe or tube and the nom thickness of the pipe covering, as shown below:

Penetrant	Pipe Covering Nom Thickness, in. (mm)	F Rating, Hr	T Rating, Hr
A & B	2 (51)	2	1-1/4
C & D	2 (51)	1-1/2	1
A, B, C & D	1 (25)	2	3/4
A, B, C & D	1/2 (13)	2	1/2

5. **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 or (64 kg/m^3) 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.

   A1. **Forming Material*** – As an alternate to the packing material in Item 5A, 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 or sleeve as required to accommodate the required thickness of fill material.

   3M COMPANY – Fire Barrier Packing Material

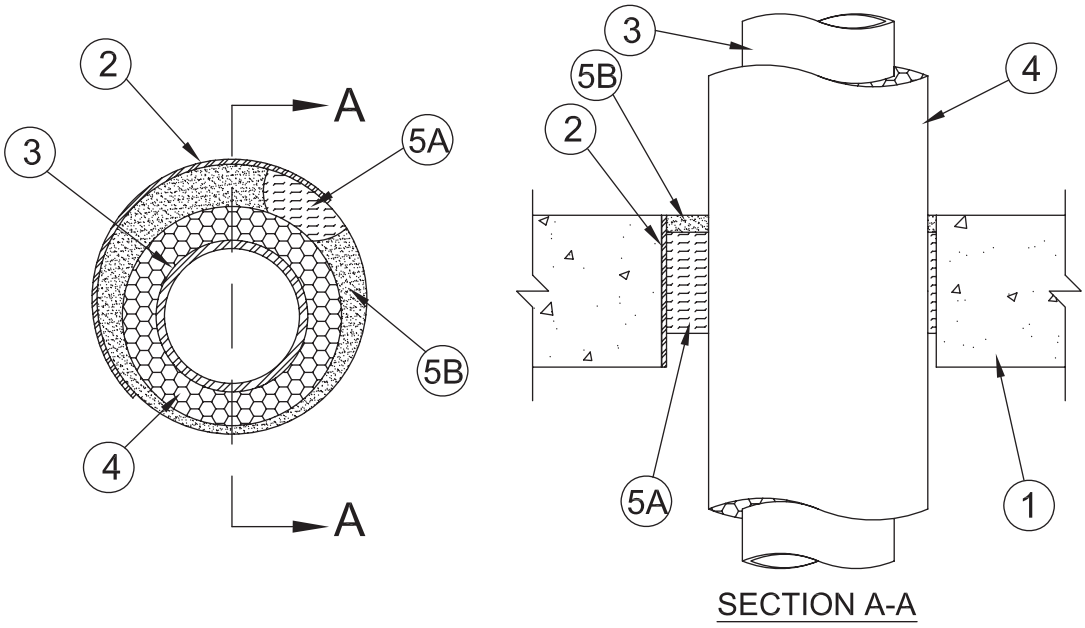
   B. **Fill, Void or Cavity Materials*** – **Caulk or Sealant** – Min 1/2 in. (13 mm) thickness of caulk applied within the annulus, flush with top surface of floor or top edge of sleeve or with both surfaces of wall or both ends of sleeves. In floors constructed of hollow-core concrete, min 1/2 in. (13 mm) thickness of caulk applied within the annulus, flush with top and bottom surfaces of floor or sleeve.

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

*Bearing the UL Classification Mark

System No. C-AJ-5211

March 05, 2007
F Rating – 2 Hr
T Ratings – 0 & 1/2 Hr (See Item 4)
W Rating – Class 1 (See Item 5)



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^3) 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 8 in. (203 mm) Max diam of opening in floors constructed of hollow-core concrete is 7 in. (178 mm).

   See **Concrete Blocks** (CAZT) and **Precast Concrete Units** (CFTV) categories in Fire Resistance Directory for names of manufacturers.

2. **Steel Sleeve** – (Optional) - Nom 8 in. (203 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. As an alternate, nom 8 in. (203 mm) diam (or smaller) sleeve fabricated from nom 0.019 in. (0.48 mm) thick galv steel cast or grouted into floor or wall assembly flush with floor or wall surfaces.

3. **Through Penetrants** – One metallic pipe to be installed concentrically or eccentrically within opening. Penetrant to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes may be used:

   A. **Steel Pipe** – Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

   B. **Iron Pipe** – Nom 4 in. (102 mm) diam (or smaller) cast or ductile iron pipe.

   C. **Copper Tubing** – Nom 2 in. (51 mm) diam (or smaller) Type L (or heavier) copper tubing.

   D. **Copper Pipe** – Nom 2 in. (51 mm) diam (or smaller) Regular (or heavier) copper pipe.

4. **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. Annular space between the insulated penetrating item and the periphery of the opening shall be min 1/2 in. to max 1-1/2 in. (13 mm to max 38 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.

   T Rating is 1/2 Hr for nom 3/4 in. (19 mm) thick tube insulation. T Rating is 0 Hr for tube insulations less than nom 3/4 in. (19 mm) thick.

5. **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^3) 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.

      3M COMPANY – IC 15WB+, CP 25WB+ caulk or FB-3000 WT sealant
      (Note: W Rating applies only when FB-3000 WT is used.)

*Bearing the UL Classification Mark
+ Bearing the UL Recognized Component Mark

Fire Barrier IC 15WB+ Sealant

Product Data

SYSTEM COMPATIBLE

FILL, VOID OR CAVITY MATERIALS
FOR USE IN JOINT SYSTEMS AND
THROUGH-PENETRATION FIRESTOP SYSTEMS
SEE UL DIRECTORY OF PRODUCTS CERTIFIED FOR CANADA
SEE UL FIRE RESISTANCE DIRECTORY
90G9

1. Product Description

3M™ Fire Barrier IC 15WB+ Sealant is a latex sealant designed for use as a one-part fire, smoke, noxious gas and water resistant sealant. In addition, the unique intumescent property of this material (expands when heated) means that as the combustible pipe, cable or pipe insulation is consumed by fire, the sealant expands to maintain the penetration seal.

3M Fire Barrier IC 15WB+ Sealant can be installed with a standard or bulk caulking gun, pneumatic pumping equipment or it can be easily applied with a putty knife or trowel. Sealant bonds to gypsum wallboard, concrete, metals, wood, plastic and cable jacketing. No mixing is required. Tool within 5 minutes of application, if required.

3M Fire Barrier IC 15WB+ Features

- Water Base: Easy clean up, no special handling, routine disposal.
- Intumescent: Expands when heated to maintain seal around items consumed by fire.
- Endothermic: Absorbs heat energy, releases chemically bound water.
- Thixotropic: Will not sag or run in overhead or vertical applications.
- Halogen-free.
- Fast dry: Tack-free in approximately 8 to 12 minutes @ 73°F (23°C).
- Paintable. Best results obtained after 72 hour cure.
- Minimal shrinkage.
- Yellow color.
- High flow rate: 2000 g/min. with 1/4 in. (6 mm) nozzle.
- Point contact allowed.
- Continuous operating temperature not to exceed 120°F (48°C).

2. Applications

Use 3M Fire Barrier IC 15WB+ Sealant to firestop the following construction voids:

- Blank openings
- Metallic pipes
- Non-metallic pipes
- Cables
- Cable trays
- Insulated pipes
- Busways
- HVAC vents and ducts
- Combinations
- Bottom of wall construction joints

The product will restore fire rated construction to its original integrity when installed in accordance with the applicable listed UL system.

3. Physical Properties

Unit	Volume	Units/ Ctn.
10.1 fl. oz. (0,29 L) Cartridge	18.2 cu. in. (298 cu. cm)	12
20.0 fl. oz. (0,59 L) Sausage	36.0 cu. in. (591 cu. cm)	10
27.0 fl. oz. (0,79 L) Cartridge	48.7 cu. in. (798 cu. cm)	6
4.5 gallon (17,0 L) Pail	1039.0 cu. in. (17034 cu. cm)	1

4. Specifications

Product

The firestopping sealant shall be a one-part, intumescent, latex elastomer. The sealant shall be capable of expanding a minimum of 2 times at 1000°F. The material shall be thixotropic and be applicable to overhead, vertical and horizontal firestops. The sealant shall be listed by independent test agencies such as UL, FM or OPL and be tested to, and pass the criteria of, ASTM E 814 (UL 1479) standard test method for fire tests of through-penetration fire stops and ASTM E 1966 (UL 2079) standard test method for fire-resistive joint systems.

Typically Specified Divisions

Division 7	Thermal and Moisture Protection
07840	Firestopping

5. Performance

A. Typical Physical Properties

Tack Free Time (ASTM C679-87):	8 to 12 minutes @73°F (23°C)
Expansion at 662° F (350°C):	2.0
Color:	Yellow
Density:	12.0 lb./gal. (1,43 kg/L)
Adhesion:	Very good on all construction substrates
Application:	Caulk guns, trowel, spatula, pressurized pumps
Durometer Hardness (Shore A):	70
Solids:	80% by weight
VOC:	0
Odor:	Pleasant non-irritating
Flow Rate:	2000 grams/min. from 1/4 in. (6,35 mm) nozzle at 50 psi
ASTM E 84: Flame Spread:	0
Smoke Development:	0
Boeing Flow (Sag Characteristics):	<2 in. (5,08 cm) in 5 minutes

B. Firestopping Properties

Meets the criteria of ASTM E 814 (UL 1479) standard test method for fire tests of through-penetration fire stops tested under positive pressure, and ASTM E 1966 (UL 2079) standard test for fire-resistive joint systems. Consult current UL Fire Resistance Directory for listed systems.

6. Installation Techniques

Shown are examples of approved applications of IC 15WB+ Sealant. Additional drawings and details are available from 3M Authorized Fire Protection Products Distributors.

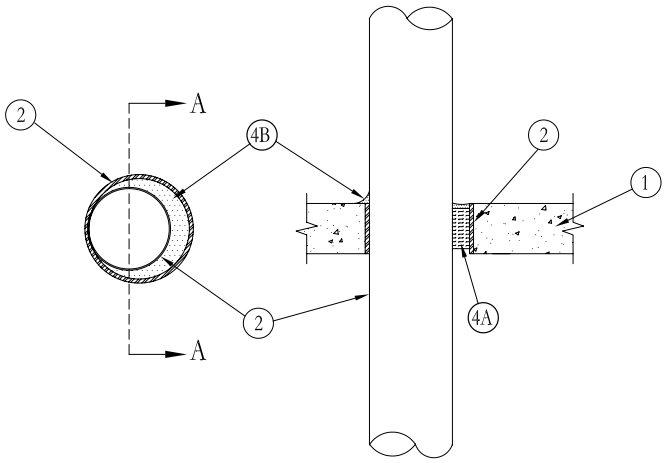
Installation Notes:

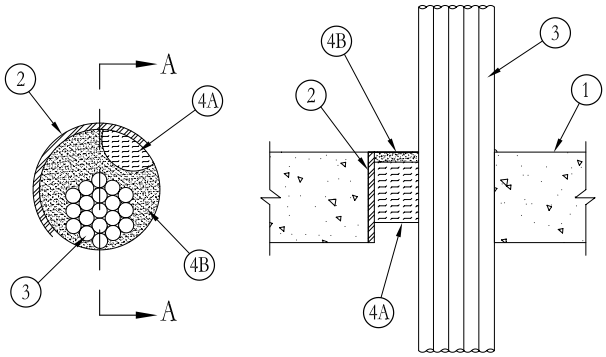
1. Metal Pipe/Conduit applications through nominal 10.75 in. (273,0 mm) outside diameter.
- Installed depth of IC 15WB+ Sealant 1/2 in. (12,7 mm).
- Refer to appropriate system for annular space requirement.
- Minimum 4 pcf mineral wool for backing.

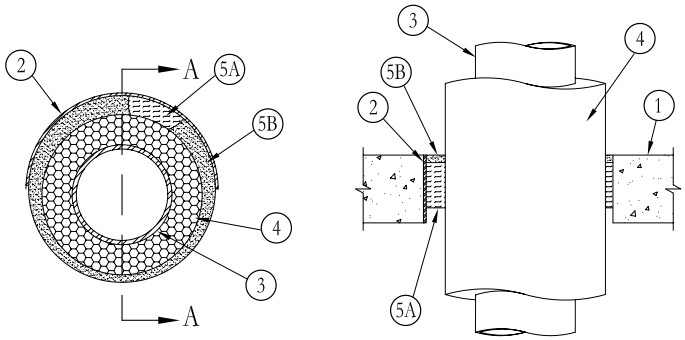
2. Insulated Cable Applications
- A 1/2 in. (12,7 mm) minimum depth of IC 15WB+ Sealant.
- All cases require mineral wool (safing) for backing.

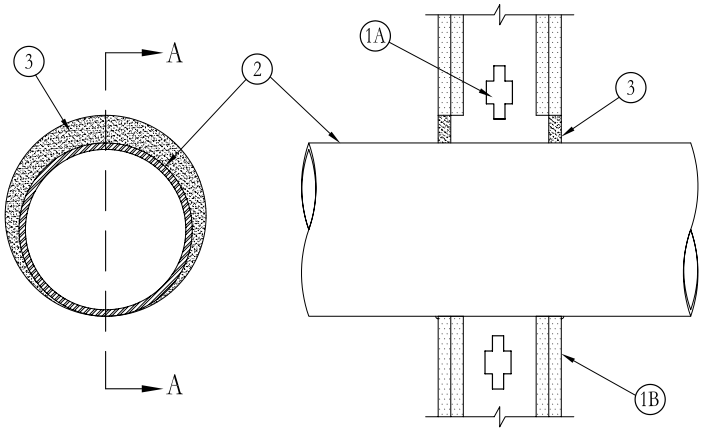
3. Fiberglass Insulated Pipe Applications
- Refer to appropriate system for insulation thicknesses, annular space, mineral wool and sealant application.

Typical Penetration Firestops For Metal Pipe/Conduit, Insulated Cable and Fiberglass Insulated Pipe Through Fire Rated Constructions









7. Maintenance

3M Fire Barrier IC 15WB+ Sealant is stable under normal storage conditions and has a one year shelf life. Stock rotation is recommended. Store between 40°F (4°C) and 90°F (32°C) for maximum shelf life. Keep from freezing during storage.

8. Purchase Information

3M Fire Barrier IC 15WB+ Sealant is available from 3M Authorized Fire Protection Products Distributors. For information on where to buy, go to www.3m.com/firestop or call (800) 328-1687.

9. Safe Handling Information

Consult Material Safety Data Sheet prior to handling and disposing of 3M Fire Barrier IC 15WB+ Sealant.

*FGG/BM® System Compatible indicates this product has been tested and is monitored on an on going basis to assure chemical compatibility with FlowGuard Gold®, BlazeMaster®, and Corzan® pipe and fittings.

FGG/BM®, FlowGuard Gold®, BlazeMaster® and Corzan® are registered trademarks of Noveon IP HoldingsCorp.

Warranty and Limited Remedy

This product will be free from defects in material and manufacture for a period of ninety (90) days from date of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of application. If this 3M product is proved to be defective within the warranty period stated above, your exclusive remedy and 3M's sole obligation shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product.

Limitation of Liability

Except where prohibited by law, 3M will not be liable for any loss or damage arising from the use of this 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

3M

Building Safety Solutions Department

3M Center, 223-2S-24
St. Paul, MN 55144-1000
(800) 328-1687
www.3m.com/firestop

Printed in U.S.A.
Bolger 5060101
 98-0400-5077-9

Fire Barrier CP 25WB+Caulk

Product Data

FILL VOID OR CAVITY MATERIALS
CLASSIFIED BY UNDERWRITERS
LABORATORIES, INC.® FOR USE IN
THROUGH-PENETRATION
FIRESTOP SYSTEMS (XHEZ).
SEE CURRENT UL FIRE
RESISTANCE DIRECTORY
50L6, 90G9

1. Product Description

3M™ Fire Barrier CP 25WB+ Caulk is a premium elastomeric latex caulk designed for use as a one-part fire, smoke, noxious gas and water sealant. In addition, the unique intumescent property of this material (expands when heated) means that as cable or pipe insulation is consumed by fire, CP 25WB+ Caulk expands to maintain the penetration seal.

CP 25WB+ Caulk features superior adhesion strength, caulk rate and no-sag application with expanded UL Classified fire protection systems plus a halogen-free formula.

3M Fire Barrier CP 25WB+ Caulk can be installed with a standard caulking gun, pneumatic pumping equipment or it can be easily applied with a putty knife or trowel. CP 25WB+ Caulk will bond to concrete, metals, wood, plastic and cable jacketing. No mixing is required.

CP 25WB+ Caulk Features

- Water Base: Easy clean up, no special handling, routine disposal.
- Intumescent: Expands when heated to seal around items consumed by fire.
- Endothermic: Absorbs heat energy, releases chemically bound water.
- Thixotropic: Will not sag or run in overhead or vertical applications.
- Halogen-free.
- Fast dry: Tack-free in approximately 10-15 minutes.
- Paintable. (Best results obtained after 72 hour cure.)
- Minimal shrinkage.
- Brown color.
- Water seal: Seals against inadvertant water spills in the unexpanded state.
- High caulk rate: 1000 g/min. with in. nozzle.
- Point contact allowed.
- Continuous Operating Temperature not to exceed 120°F (48°C).

2. Applications

Use to seal construction openings, blank openings and penetrating items against the passage of flame, noxious gas, smoke and water. Restores fire rated construction to original integrity. Also for use with 3M Brand Fire Barrier FS195+ Wrap/Strip and CS-195+ Composite Sheet.

3. Specifications

Product

The firestopping caulk shall be a one-part, intumescent, latex elastomer. The caulk shall be capable of expanding a minimum of 3 times at 1000°F. The material shall be thixotropic and be applicable to overhead, vertical and horizontal firestops. The caulk shall be listed by independent test agencies such as UL or FM and be tested to, and pass the criteria of, ASTM E 814 Fire Test, tested under positive pressure. It shall comply with the requirements of the NEC (NFPA-70), BOCA, ICBO, SBCCI and NFPA Code #101.

Typically Specified Divisions

Division 7	Thermal and Moisture Protection Firestopping
07270	
Division 13	Special Construction Fire Suppression and Supervisory Systems
13900	
Division 15	Mechanical
15250	Mechanical Insulation Fire Protection
15300	
Division 16	Electrical
16050	Basic Electrical Materials and Methods

4. Performance

A. Typical Physical Properties

	Unit	Value
Tack Free Time (ASTM C679-87)	Minutes at 72°F (22°C)	10-15
Expansion at 662°F (350°C)	X	2.0-3.0
Color	—	Reddish Brown
Density	Lb./gal. (Kg/l)	11.2 (1,35)
Adhesion	All construction substrates	Very Good
Application	Method	Caulk guns, trowel, spatula pressurized pumps
Durometer (hardness)	Shore A	70
ASTM E 84		
Flame Spread	—	5
Smoke Development	—	0
Solids	Percent (%) by weight	79
VOC	Percent (%) by weight	0
Odor	—	Pleasant, non-irritating
Flow Rate	Grams/min.	1000
1/4 in. (6,35 mm) nozzle at 50 psi		
Boeing Flow (Sag Characteristics)	Inches	0

B. Firestopping Properties

Meets the criteria of ASTM E 814 Fire Test, tested under positive pressure. Consult current UL Fire Resistance Directory for systems listed under 3M Product CP 25WB+ Caulk.

C. Firestopping Code Requirements

ICBO Uniform Building Code (1997 Edition)	SBCCI Standard Building Code (1997 Edition)	BOCA Basic/National Building Code (1996 Edition)	NFPA Life Safety Code 101 (1997 Edition)
702 DEFINITIONS 706 CONSTRUCTION JOINTS 708 WOOD FRAME CONSTRUCTION FIREBLOCKING 709 WALL & PARTITION PENETRATION PROTECTION 709.3.2.2 CURTAIN WALL GAP 710 FLOOR/CEILING OR ROOF/CEILING PENETRATION PROTECTION 711.3 SHAFT ALTERNATIVE 714 THROUGH-PENETRATION FIRESTOPS F&T REQUIREMENTS UBC STANDARD 7-1 EQUIVALENT TO ASTM E 119 UBC STANDARD 7-5 EQUIVALENT TO ASTM E 814	104.2.4 PLANS MUST SHOW HOW INTEGRITY IS MAINTAINED FOR ASSEMBLIES PENETRATED 202 DEFINITIONS 705.3 WOOD FRAME CONSTRUCTION FIREBLOCKING 705.3.1.5 CURTAIN WALL GAP 705.4 (GENERAL) PENETRATIONS OF FIRE RATED ASSEMBLIES 705.5 (WALLS) 705.6 (FLOORS) 705.7 FIRE RESISTANT JOINT SYSTEMS	702.0 REVISED AND EXPANDED DEFINITIONS FOR PENETRATIONS AND JOINTS 703.1 CONSTRUCTION DOCUMENTS SHALL INDICATE DETAILS AND MATERIALS FOR PROVIDING RATINGS AT JOINTS AND PENETRATIONS 703.1.1 PENETRATIONS AND JOINTS SHALL NOT BE CONCEALED FROM VIEW BEFORE INSPECTION 703.2 BUILDINGS FOR MORE THAN TWO STORIES SHALL INDICATE ALL PENETRATIONS 704.1.1 SUFFICIENT DATA SHALL BE AVAILABLE TO JUSTIFY UNTESTED MATERIALS USED FOR RESTORATION OF FIRE RATINGS 707.0 FIRE WALLS AND PARTY WALLS 707.10 PENETRATIONS - REFERS TO 714 707.8 JOINTS - REFERS TO 709.7 709.0 FIRE SEPARATION ASSEMBLIES 709.6 PENETRATIONS - REFER TO 714 709.7 JOINTS 711.0 FIRE PARTITIONS 711.6 PENETRATIONS - REFERS TO 714 711.7 JOINTS - REFER TO 709.7 713.0 FLOOR/CEILING AND ROOF/CEILING ASSEMBLIES 713.2 CURTAIN WALL GAP 713.4 PENETRATIONS - REFERS TO 714 713.5 JOINTS - REFERS TO 709.7 714.0 PENETRATIONS - ALL REQUIREMENTS (GENERAL) 714.1 THROUGH 714.1.6.2 WALL ASSEMBLIES 714.2 THROUGH 714.2.6.5 FLOOR/CEILING AND ROOF/CEILING ASSEMBLIES 714.3 THROUGH 714.3.2 NONRATED ASSEMBLIES 721.0 FIREBLOCKING AND DRAFTSTOPPING	6-2.3.2.4 PENETRATIONS AND MISC. OPENINGS &FIRE BARRIERS 6.2.4.2, EXCEPTION 5 OPENINGS (EXPANSION OR SEISMIC JOINTS) IN FLOORS APPENDIX A-6-2.4.2 6-3.6.1 PENETRATIONS AND MISC. OPENINGS IN FLOORS AND SMOKE BARRIERS NFPA #221 FIRE WALLS AND BARRIERS **NFPA Code 70 NEC National Electric Code** 300-21 FIRESTOPPING **CABO One and Two Family Dwelling Code (1995 Edition)** 602.7 FIRESTOPPING (FIREBLOCKING IN OTHER MODEL CODES)

5. Installation Techniques

Shown are examples of approved applications of CP 25WB+ Caulk. Additional drawings and details are available through your Authorized 3M Fire Protection Products Distributor.

Installation Notes:

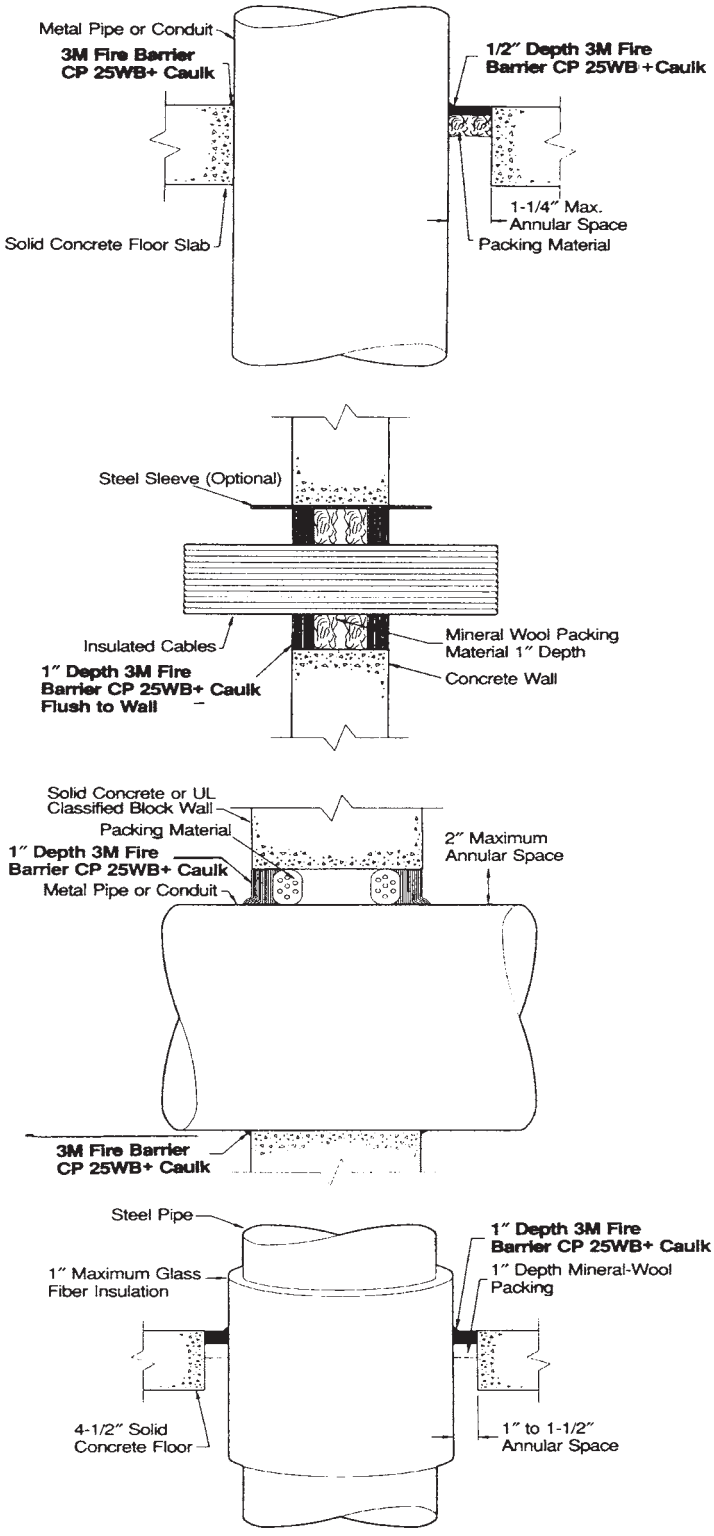
1. Metal Pipe/Conduit applications through nominal 12 in. (304,8 mm) outside diameter.
   - Installed depth of CP 25WB+ Caulk depends on annular space.
   - When the annular space is less than 1-1/4 in. (31,8 mm), a 1/2 in. (12,7 mm) minimum depth of CP 25WB+ Caulk is required.
   - When the annular space is greater than 1-1/4 in. (31,8 mm), a 1 in. (25,4 mm) minimum depth of CP 25WB+ Caulk is required.
   - Common building materials, such as backer rod may be used for metal pipe applications.

2. Metal Pipe applications larger than nominal 12 in. (304,8 mm) outside diameter.
   - All cases require a 1 in. (25,4mm) minimum depth of CP 25WB+ Caulk.

3. Insulated Cable Applications.
   - All cases require a 1 in. (25,4mm) minimum depth of CP 25WB+ Caulk.
   - All cases require mineral wool (safing) for packing.

4. Fiberglass Insulated Pipe Applications.
   - 1 in. (25,4 mm) of fiberglass insulation on up to a nominal 12 in. (304,8 mm) of metal pipe may be firestopped with a 1 in. (25,4 mm) depth of CP 25WB+ Caulk.
   - 1 in. (25,4 mm) depth of mineral wool packing required.

Typical Penetration Firestops For Metal Pipe/Conduit and Insulated Cable Through Fire Rated Construction



6. Maintenance

The CP 25WB+ Caulk is stable under normal storage conditions and has a one year shelf life. Normal stock and stock rotation are recommended.

Recommended

Store between 40°F (4°C)-90°F (32°C) for maximum shelf life. Keep from freezing.

7. Availability

3M Brand Fire Barrier CP 25WB+ Caulk is available from Authorized 3M Fire Protection Products Distributors. It is available in Standard 10.1 fl. oz. cartridge, 20 oz. sausage, 27.0 oz. cartridge, 2 gallon pail and 5 gallon pail.

Warranty and Limited Remedy. This product will be free from defects in material and manufacture for a period of ninety (90) days from date of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of application. If this 3M product is proved to be defective within the warranty period stated above, your exclusive remedy and 3M's sole obligation shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product.

Limitation of Liability. Except where prohibited by law, 3M will not be liable for any loss or damages arising from the use of this 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

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Fire Barrier Water Tight Sealant
3000 WT

Product Data

1. Product Description

3M Fire Barrier Water Tight Sealant 3000 WT is a premium, ready-to-use, single component, neutral cure, non-slumping, intumescent silicone sealant. The sealant cures upon exposure to atmospheric humidity to form a flexible seal.

3M Fire Barrier Water Tight Sealant 3000 WT is used to firestop openings and penetrations through fire rated floor slabs, walls, other building partitions and assemblies. 3M Fire Barrier Water Tight Sealant 3000 WT, when properly installed, will help control the spread of fire, smoke and noxious gases. 3M Fire Barrier Water Tight Sealant 3000 WT also meets the new UL Water Leakage Test, W Rating – Class 1 requirements for systems tested and listed in accordance with ANSI/UL 1479. Refer to www.3M.com/firestop for listed and tested watertight systems.

2. Product Features

The 3M Fire Barrier Water Tight Sealant 3000 WT is flexible, weather resistant and intumescent. It also bonds to most construction materials and has the following features:

- Excellent Adhesion
- Re-enterable / Repairable
- Excellent Weatherability
- Cures Upon Exposure to Atmospheric Humidity
- Applied with Standard or Bulk Caulking Guns or Pneumatic Pumping Equipment
- Gray Color with Black Flecks
- Meets ASTM G21 for Fungi Resistance

3. Applications

Use 3M Fire Barrier Water Tight Sealant 3000 WT to firestop the following interior construction voids:

- Blank openings
- Metallic pipes
- Non-metallic pipes
- Cables
- Cable trays
- Insulated pipes
- Busways
- HVAC vents and ducts
- Combos
- Bottom of wall construction joints

The product will restore the integrity of the fire rated floor or wall assembly when installed in accordance with the applicable listed system.

4. Specifications

Product

The firestopping sealant is a premium, ready-to-use, single component, neutral cure, non-slumping, intumescent silicone sealant. The sealant shall be listed by independent test agencies such as UL, OPL or FM and be tested to and pass the criteria of ASTM E 814 (UL 1479) Standard Test Method for Fire Tests of Through-Penetration Fire Stops and ASTM E 1966 (UL 2079) Standard Test Method for Fire-Resistive Joint Systems. They shall comply with the requirements contained within the NEC (NFPA 70), BOCAI, ICBO, SBCCI, IBC, IFC, IRC, NFPA 101 and NFPA 5000.

5. Performance

A. Typical Physical Properties

As Supplied	3000 WT
MIL-S-8802 Flow, Sag or Slump	Nil
Working Time, Minutes	20-40
Color	Light Gray with Black Flecks
Full Cure and Adhesion at 77° F (25° C) Days	14-21
Specific Gravity	1.25

As Cured – After 21 Days at 77° F (25° C) and 50% R.H.	3000 WT
Expansion Volume	>6 times at 662° F (350° C)
Service Temperature Range ASTM C 1299	-14° F to 230° F (-10° C to 110° C)

B. Firestopping Properties

Meets the criteria of ASTM E 814 (UL 1479) Standard Test Method for Fire Tests of Through-Penetration Fire Stops and ASTM E 1966 (UL 2079) Standard Test Method for Fire-Resistive Joint Systems. Consult current independent test laboratories directories for listings.

6. Installation Techniques

Consult your Authorized 3M Fire Protection Products Distributor for current drawings and system details. Listed and tested Systems are also available on the 3M Fire Protection Products website – www.3m.com/firestop

Installation Notes:

- Do not use alcohol to clean surfaces in the penetration or joint opening. Alcohol can keep the sealant from curing properly. Recommended cleaning solvents are mineral spirits, xylene, toluene or methyl ethyl ketone (MEK).
- Clean surface of the opening and all penetrating items to allow proper adhesion of firestop materials. Remove all grease, dirt, oil, wax, loose debris, dust, etc.
- The 10.1 oz. tube must have the inner foil seal punctured after cutting the tip of the nozzle on the tube prior to use.
- Install the damming materials, as necessary, to meet the requirements of the appropriate system.
- Install the required depth of the 3M Fire Barrier Water Tight Sealant 3000 WT for the appropriate system and rating specified.
- Clean all tools after use with a commercial solvent such as, mineral spirits, xylene, toluene or methyl ethyl ketone (MEK).

7. Limitations

3M Fire Barrier Water Tight Sealant 3000 WT should not be applied to:

- Polycarbonates
- Building materials that bleed oils or solvents (e.g., impregnated wood, oil based caulks, green or partially vulcanized rubber)
- Unvented spaces where sealant is not exposed to atmospheric moisture
- Wet or frost coated surfaces
- In confined cure conditions there may be discoloration of brass, copper or other sensitive metals

8. Maintenance

3M Fire Barrier Water Tight Sealant 3000 WT is stable under normal storage conditions. Shelf life is 12 months from the date of packaging when stored in a clean, dry area with temperatures between 40° F and 90° F (4° C and 32° C). Stock rotation is recommended.

9. Availability

3M Fire Barrier Water Tight Sealant 3000 WT is available from Authorized 3M Fire Protection Products Distributors.

Packaging Information

Product	Unit	Volume (in.^{3})	Units/Ctn.	Wt./Ctn. Lbs.
Fire Barrier Water Tight Sealant 3000 WT	10.1 fl. oz. (298 ml)	18.2 (298 cm^3)	12	12 (5.44 kg)
	4.5 gallons (17.0 L)	1040 (17042 cm^3)	1	49 (22.2 kg)

10. Safe Handling Information

Consult the Material Safety Data Sheet prior to handling and disposing of the 3M Fire Barrier Water Tight Sealant 3000 WT.

Warranty and Limited Remedy. This product will be free from defects in material and manufacture for a period of ninety (90) days from date of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of application. If this 3M product is proved to be defective within the warranty period stated above, your exclusive remedy and 3M's sole obligation shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product.

Limitation of Liability. Except where prohibited by law, 3M will not be liable for any loss or damages arising from the use of this 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

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Fire Barrier FS-195+ Wrap/Strip

Product Data

FILL, VOID OR CAVITY MATERIALS
CLASSIFIED BY
UNDERWRITERS LABORATORIES. INC®
FOR USE IN THROUGH-PENETRATION FIRESTOP SYSTEMS (XHEZ).
SEE CURRENT UL FIRE RESISTANCE DIRECTORY.

1. Product Description

3M Fire Barrier FS-195+ Wrap/ Strip is one-part, organic/inorganic, fire resistive elastomeric sheet with aluminum foil on one side. It is available in convenient strips which are quickly and easily installed. FS-195+ is designed to firestop penetrations in fire-rated walls and floors and floor-ceiling assemblies.

The unique, intumescent property of this material (expands when heated) means that as penetrating items such as, plastic pipe, cable jackets and pipe insulation are consumed by fire, FS-195+ Wrap/Strip expands to maintain a tight seal preventing the spread of fire, deadly smoke, and other by-products of combustion.

FS-195+ is UL classified in firestop systems for plastic and metal pipe/ conduit, insulated metal pipe, bus duct, glass pipe and insulated cable. See the UL Fire Resistance Directory.

Product features are:

- Intumescent: Expands when heated to seal around items consumed by fire.
- Smoke seal: Retards spread of toxic by-products of combustion.
- Superior, documented aging properties. Proven stability and performance for life of building.
- Improved flexibility: Easy, cost-effective installation.
- Low flame spread and smoke development.
- Normal disposal procedures.
- Versatile: Can be cut to fit irregular shapes.
- Re-enterable: No special tools required.
- Non-flame supporting.
- Low odor.
- Red-brown color: Consistent, enforceable.

2. Applications

3M Fire Barrier FS-195+ Wrap/Strip provides a rapid and cost-effective means of sealing wall and floor penetrations where fire resistance is required.

Because of its unique intumescent action, FS-195+ can be used to seal a variety of penetration types including: telephone cable, metal pipe, plastic pipe and conduit, insulated metal pipe and blank penetrations.

When used by itself or in conjunction with other 3M Fire Barrier Products such as CS-195+ Composite Sheet, CP 25WB+ Caulk, Moldable Putty+ or RC-1 Restricting Collar, fire rated penetration seals can be provided for cable trays, bus duct and cable bundles.

3. Physical Properties

Strip Size: (¼" X 2" x 24")

Detail:
Wrap/Strip thickness
0.22" - 0.32"

Aluminum foil Thickness
.002" ± 0.0005"

4. Specifications

A. Product

The penetration seal must be capable of passing ASTM E814 (ANSI/UL 1479) Standard Method of Fire Tests for Through Penetration Fire Stops up to the desired fire resistance.

B. Engineering/ Architectural

All penetrations in fire-rated walls or floors shall be fitted and sealed with 3M Brand Fire Barrier Products in accordance with the manufacturer's installation instructions.

5. Performance Tests

A. Physical & Electrical Properties

Thermal Conductivity

• FS195+ sheet as supplied: 2.392 BTU/hr/ft^2/°F• in @ 110°F
2.406 BTU/hr/ft^2/°F• in @ 165°F

Intumescent Activation:

Expansion sequence begins	300°F (150°C)
Significant expansion	350°F (175°C)
Multi-directional free expansion	5 to 15 times (8 times average)
Weight loss (TGA)	20% @ 662°F/350°C 31% @ 932°F/500°C

Hardness: 70 to 90 Shore A

Tensile Strength (psi)/Elongation (%): (ASTM D-412)104 psi/514%

Color: Red - Brown / Black Char

B. Weatherability

				After Exposure	
				Elastic	Nominal
Test Condition	Temperature	Humidity	Time	Properties	Expansion
Oven	194°F/90°C	-	90 Days	Very Good	6

C. Fire Performance Tests

Test	Results
Summary of Fire Tests Results per ASTM E 814 (UL1479)	Up to 4 hours rating for penetrations in wall and floors. See UL Building Materials Directory.
Flame Spread Index (ASTM E 84)	5
Smoke Development Index (ASTM E 84)	50
Oxygen Index (ASTM D 2863)	50

6. Installation Techniques

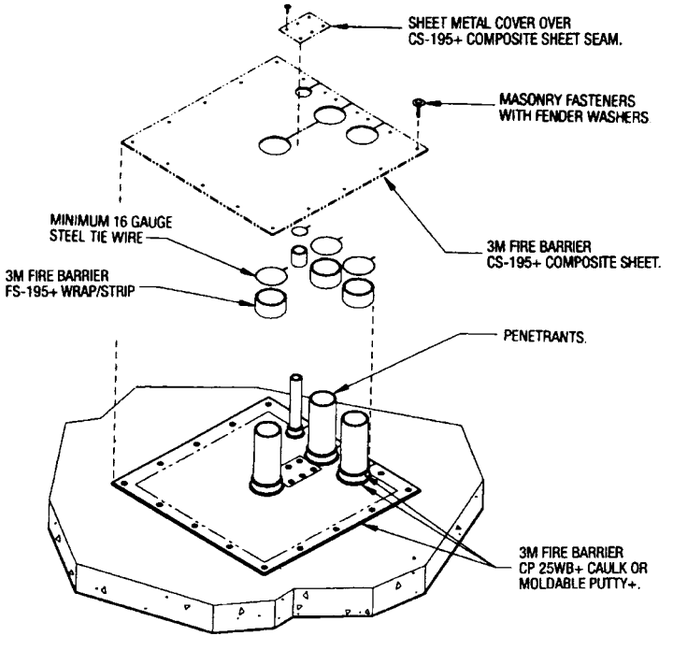
Exact instructions for specific applications are available upon request from 3M or your local 3M Fire Protection Products Distributor. The following summarizes a representative application:

A. Penetration Firestop for Large Openings With Pipe Using CS-195+ Composite Sheet and FS-195+ Wrap/Strip. See Underwriters Laboratories Fire Resistance Directory for current system numbers.

1. Seal around pipes. Wrap two inch wide 3M Fire Barrier FS-195+Wrap/ Strip around each pipe, foil side facing out. Position so wrap/strip extend one inch above the floor surface and one inch into the floor. Secure with steel wire.

2. Cover Sheet. Opening is covered with Composite Sheet cut to fit snugly around pipes and wrap/strip and to overlap the opening by a minimum of two inches. The sheet's galvanized steel layer should face outward (exposed).

3. Seal entire penetration. 3M Fire Barrier CP 25WB+ Caulk or Moldable Putty+ is used to seal the penetration. A ¼" diameter bead of caulk or putty is applied around the opening before or after installing the cover sheet. After the cover sheet is in place, caulk or putty is applied between the wrap/strip and the composite sheet and between the wrap/strip and the pipe. A thin film of caulk or putty is used to cover the entire wrap/strip area. All openings in the composite cover sheet are filled with CP 25WB+ Caulk or Moldable Putty+ to complete the seal.



B. Penetration Firestop for insulated metal pipe in gypsum wallboard assemblies. Refer to current UL Fire Resistance Directory for system numbers.

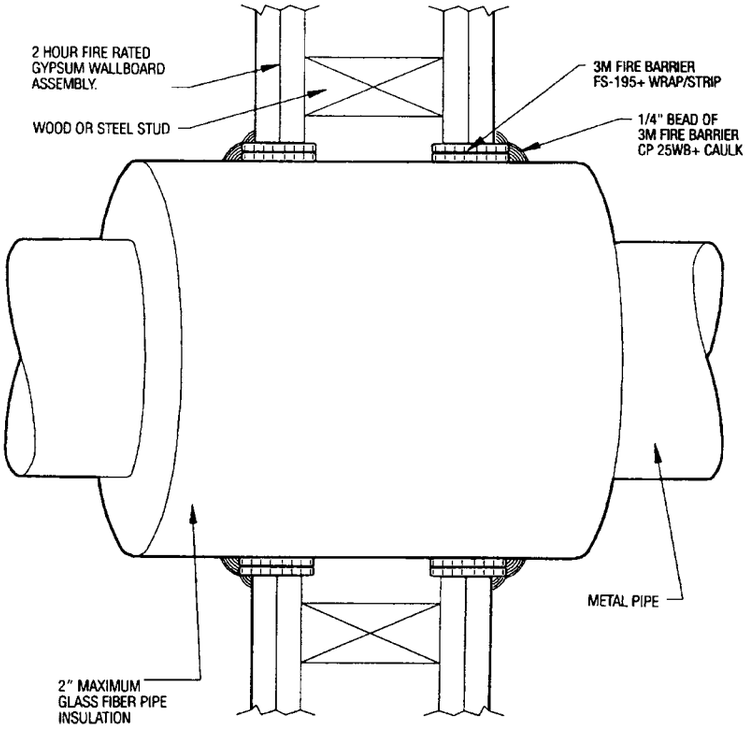
1. Install the firestop symmetrically on both sides of the wall assembly.

2. Minimum annular space requirement is 1/2 in. Maximum annular space requirement is 3/4 in.

3. Two layers of 3M Fire Barrier FS-195+ Wrap/Strip are required.

4. Tightly wrap the FS-195+ Wrap/ Strip, foil side out, around the pipe insulation with the seam butted. Stagger the butted seams. Secure the FS-195+ Wrap/Strip with a steel tie wire or aluminum foil tape and slide the FS-195+ Wrap/Strip into the annular space. The FS-195+ Wrap/Strip should be positioned so approximately 3/4 in. protrudes from the wall surface.

5. Seal the FS-195+ Wrap/Strip with 3M Fire Barrier CP 25WB+ with a 1/4 in. bead at the FS-195+ Wrap/Strip/ wall interface and the FS-195+ Wrap/Strip/insulation interface.



C. Penetration Firestop for Plastic Pipe up to 10" max. dia. in Fire-Rated Floors and Walls. Refer to current UL Fire Resistance Directory for system numbers.

1. As an alternative to the 3M Fire Barrier RC-1 Restricting Collar and FS-195+ Wrap/Strip assembly the 3M Fire Barrier Plastic Pipe Device (PPD), UL File No. R9269, may be substituted.

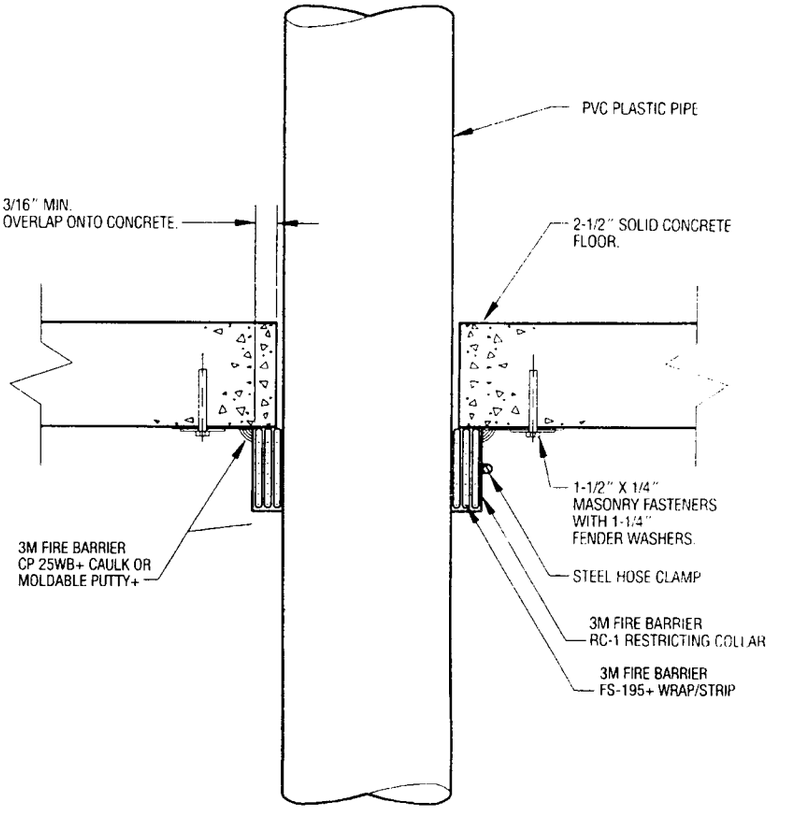
2. Tightly wrap the proper number of FS-195+ Wrap/Strips around the plastic pipe foil side out. Secure with tape or tie wire. Make sure FS-195+ Wrap/Strip or PPD butts securely against the concrete with a 3/16 inch minimum overlap over the edge of the penetrating opening. When using more than one wrap, stagger the butted seams.

3. Apply RC-1 Restricting Collar. Remove enough RC-1 Restricting Collar to make one wrap around the applied FS-195+ Wrap/Strip with a minimum 1 inch overlap. Bend the mounting tabs away from the pipe at right angles, flush with the bottom floor surface. **Warning:** Edges of the RC-1 Restricting Collar are sharp. Handle with care.

4. Tightly secure the RC-1 Restricting Collar around the pipe with a steel hose clamp centered on the RC-1 Restricting Collar assembly. Two bands of 16 gauge steel tie wire placed 1/2 inch from the ends of the RC-1 Restricting Collar assembly may be used instead of the hose clamp.

5. Secure the collar to the slab with ¼ inch x 1½ inch masonry fasteners. Use 1¼ inch diameter fender washers on the mounting tabs. Fender washers are not needed when using the PPD. For 3 inch and smaller pipe secure a minimum of 3 mounting tabs. For 4 inch pipe secure a minimum of 4 mounting tabs. Secure all mounting tabs on the PPD.

6. Seal the system with a 1/4 inch bead of 3M Fire Barrier CP 25WB+ Caulk or Moldable Putty+ at the concrete and collar assembly interface.



7. Maintenance

3M Fire Barrier FS-195+ Wrap/Strip remains stable for an indefinite period of time under normal storage conditions.

8. Availability

3M Fire Barrier FS-195+ Wrap/Strip is available in strips 2" x 24" packaged 10 per box. Available from 3M Fire Protection Products Distributors.

Other 3M Fire Protection Products: CP 25WB+ Caulk- 10 1/2 oz. Tube and 5 Gallon Pails. CS 195+ Composite Sheet - 16" x 28", 36" x 36", 24" x 36", 36" x 41". Restricting Collar. Moldable Putty+ Stix and pads. Plastic Pipe Devices-1.5",2",3",4".

Warranty and Limited Remedy. This product will be free from defects in material and manufacture for a period of ninety (90) days from date of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of application. If this 3M product is proved to be defective within the warranty period stated above, your exclusive remedy and 3M's sole obligation shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product.

Limitation of Liability. Except where prohibited by law, 3M will not be liable for any loss or damages arising from the use of this 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

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Barrier RC-1 Restricting Collar

Product Data

This collar works in conjunction with 3M FS-195+ wrap/strip to close an opening left by a burned away pipe.

- UL-classified for use on PVC, CPVC, ABS, CCPVC, CCABS, PVDF, PP and PB plastic pipe
- Easy installation
- 28 gauge steel
- Convenient 25 ft. (7,62 m) roll
- Required for firestopping plastic pipes larger than 4 in. (101,6 mm) in diameter

Product	Size	Units Per Carton
RC-1 Restricting Collar	2 in. 25 ft. (50,8 mm x 7,62m)	1
	1 in. x 25 ft. (25,4 mm x 7,62 m)	1

Important Notice to Purchaser:
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Limitation of Liability.
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St. Paul, MN 55144-1000

800 328 1687

Interam™ Graphite Mat (Ultra GS)

Product Data

Product Description

3M™ Interam™ Ultra GS is a graphite based, largely inorganic, flexible, fire resistive, intumescent mat.

It is available in convenient rolls for quick and easy installation. Ultra GS is designed to firestop plastic pipe penetrations in fire-rated walls and floors and floor-ceiling assemblies.

The unique, intumescent property (expands when heated) of this material means that as penetrating items such as plastic pipe are consumed by fire, Ultra GS expands to maintain a tight seal, preventing the spread of fire, deadly smoke, and other by-products of combustion.

Ultra GS is UL classified in firestop systems for plastic pipe. See the current UL Fire Resistance Directory.

Product Features:

- Intumescent: Expands when heated to seal around items consumed by fire.
- Thermal insulator: Intumescent char provides thermal insulation to deter heat transfer of a fire.
- Smoke seal: Retards spread of toxic by-products of combustion when used in conjunction with CP 25WB+ or Moldable Putty+.
- Excellent flexibility: Conformable, cost effective installation.
- Meets performance criteria ASTM E-814 (UL 1479).
- Excellent weatherability:
- Versatile: Easily cut and shaped with common tools..
- Normal Disposal procedures.

Applications

3M Interam Ultra GS provides a rapid and cost-effective means of sealing wall and floor penetrations where fire resistance is required.

The 3M Interam Ultra GS is used to seal ccPVC, PVC, CPVC, FRPP, PVDF, ccABS, and ABS pipes penetrating 1 and 2 hour fire rated gypsum wallboard assemblies and up to 3 hour fire rated concrete walls and floors. It may be applied to drain, waste, vent or closed pipe systems. The Ultra GS is used in conjunction with the RC-1 Restricting Collar for firestopping plastic pipe. See current UL Fire Resistance Directory for through-penetration systems.

3. Specifications

A. Product

The penetration seal must be capable of passing ASTM E-814 (ANSI/UL 1479) Standard Method of Fire Tests for Through Penetration Fire Stops up to the desired fire resistance.

B. Engineering/Architectural

All penetrations in fire-rated walls or floors shall be fitted and sealed with 3M Brand Fire Barrier Products in accordance with the manufacturer's installation instructions.

Performance

A. Physical Properties

Color: Gray/Black

B. Roll Size: 1/8" x 2" x 40' (3 mm x 5,08 cm x 12,1 m)

Heat Expansion (Intumescence):

Expansion begins.....410°F (210°C)
Significant expansion.....555°F (290°C)
Free expansion.....25 times (5 min @ 662°F [350°C])

C. Weatherability (Tested to ASTM G23 and G53)

Test Condition		Time	After Exposure
Temperature/Humidity	90°F (32°C)/90%	120 Days	No change in expansion

D. Surface Burning Characteristics (ASTM E-84, UL 723)

Flame spread index	0
Smoke development index	5

Warranty and Limited Remedy: This product will be free from defects in material and manufacture for a period of ninety (90) days from the date of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTIBILITY OR FITNESS FOR A PARTICULAR PURPOSE.** User is responsible for determining whether the 3M product is for a particular purpose and suitable for user's method of application. If this 3M product is proved to be defective within the warranty period stated above, your exclusive remedy and 3M's sole obligation shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product.

Limitation of Liability: Except where prohibited by law, 3M will not be liable for any loss or damages arising from the use of this 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligance or strict liability.

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Ultra Plastic Pipe Device

One-minute application. Three-hour protection.

The 3M™ Ultra PPD Plastic Pipe Device is the quickest, easiest firestop around. Its patent-pending, ultra fast anchoring system secures the device to most substrates without any power tools. All you need is a pliers to get up to 1-, 2- and 3-hour, UL-classified protection — in just one minute.

The one-piece metal collar assembly encases an intumescent material developed in 3M laboratories. When exposed to temperatures of 300°F (149°C) and higher, the material expands up to 25x its original volume, sealing off the plastic pipe while releasing chemically bound water to help cool it.

Less confusing. More convenient.

The 3M Ultra PPD firestops ccPVC, PVC, CPVC, FRPP, PVDF, ccABS and ABS pipes penetrating 1- and 2-hour floor/ceiling assemblies; 1-, 2- and 3-hour fire-rated gypsum wallboard assemblies; and up to 3-hour fire-rated concrete wall and floor assemblies. It may be applied to drain, waste, vent or closed-pipe systems. In short, the 3M Ultra PPD firestops most varieties of plastic pipe in gypsum and 2-1/2″ (63mm) and 4-1/2″ (114mm) concrete. So there's never any confusion over which type of device to use. This one versatile PPD covers them all.

The 3M Ultra PPD also has a softer intumescent material than other conventional PPDs, so it's easier to wrap around the pipe. And it has a simplified closure system — just lock the latch and bend the tab. There's no need to apply caulk. And there's no need for power tools either, so it's especially convenient in hard-to-work areas such as on scaffolding.

Saves time. Saves money.

All this convenience and time savings means it saves you money, too. And it doesn't take long to really add up. In fact, in the time it takes to install one conventional PPD, you could have at least four 3M Ultra PPDs installed.

So get the UL-classified protection you need — in a fraction of the time — with 3M Ultra PPD.

3M™ Ultra Plastic Pipe Device

Complete application in just one minute.

Slide ultra fast anchor straps through the stamped slots of the PPD.

:00

Open Ultra PPD and fit around the pipe, then close to the first locking position.

:15

Slide anchor straps through the annular space between the pipe and the edge of the opening until they catch the opposite edge of the opening.

:30

Slide Ultra PPD flush against the substrate surface, close collar to final locking position, and bend tab over. Use pliers to pull anchor straps tight, put a half twist in them, and bend them over the PPD body.

:45

In just one minute, using only a pliers, you have up to 3-hour, UL-classified protection.

:60

NOTE: *The 3M Ultra PPD is equipped for conventional anchoring, which should be used when the annular space does not allow for using the anchor straps.*

Specifications

Installations shall be in strict accordance with manufacturer's written instructions, as shown on approved shop drawings. The device is also classified by Underwriter's Laboratory, Inc. as a through-penetration firestop device when testing in accordance with ASTM E 814 (UL 1479) for up to a 3-hour rating.

PPD/ Pipe size	Color	Intumescent material	Anchors per collar
1.5″ (38mm)	Red	3M™ Interam™ Ultra GS	2
2″ (50mm)	Red	3M™ Interam™ Ultra GS	2
3″ (76mm)	Red	3M™ Interam™ Ultra GS	3
4″ (101mm)	Red	3M™ Interam™ Ultra GS	4

No need to use power tools, mounting screws, washers and other fasteners that can take almost five minutes to install …

…when you can install a 3M Ultra PPD in a fraction of the time simply by using the patented ultra fast anchor straps and a pliers.

Performance test

- UL tests per ASTM E 814 (UL 1479)
- UL-classified, 1-, 2- and 3-hour fire (F) and temperature (T) rating. See UL Fire Resistance Directory under Through-Penetration Firestop Device (XHCR) R9269 (N) 90G8.

CLASSIFIED UL

Through-Penetration Firestop Device (XHCR). Classified by Underwriter's Laboratory, Inc. See UL Fire Resistance Directory R9269 90G8.

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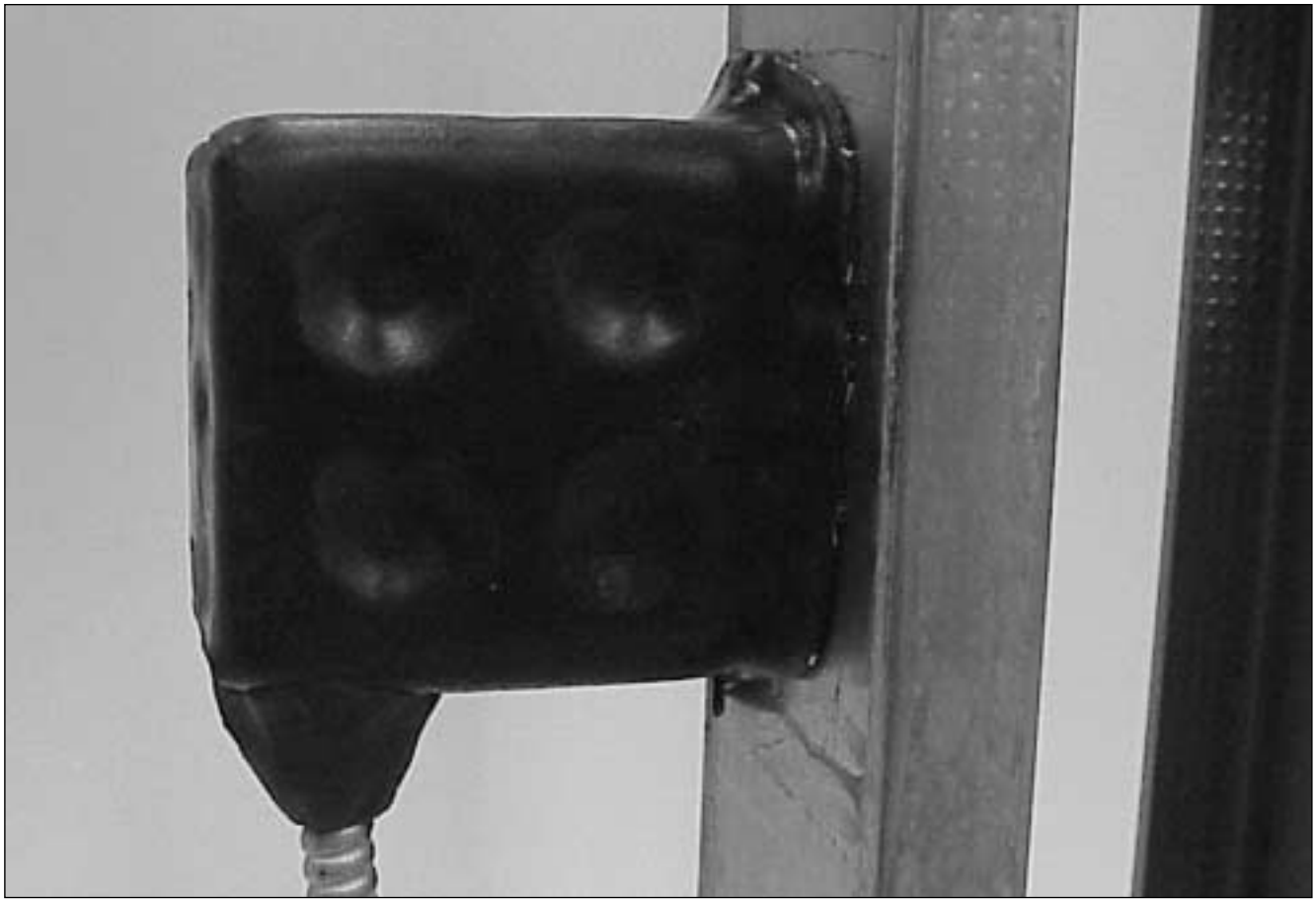
Fire Barrier Moldable Putty+

Product Data and Installation Instructions



1. Product Description

3M™ Fire Barrier Moldable Putty+ consists of a synthetic elastomer designed for use as a one part, intumescent fire resistive putty used to restore the integrity of fire rated building construction. Up to a four hour fire rating is achieved when tested in accordance with the time/temperature curves and water hose stream tests of UL 1479 and ASTM E 814. This is achieved by the unique intumescent (expanding when heated) and high strength insulating char-forming properties of this material. 3M Moldable Putty+ Stix is approximately 1.4 inches (35,6 mm) in diameter by 11 inches (279 mm) in length. Moldable Putty+ Pads are 4 x 8 x 1/8 inches (102 mm x 203 mm x 3,2 mm), 7 x 7 x 1/8 inches (178 mm x 178 mm x 3,2 mm), and 9.5 x 9.5 x 1/8 inches (241,3 mm x 241,3 mm x 3,2 mm), and Moldable Putty+ Cable Wrap is 2 x 8 x 1/8 inches (51 mm x 203 mm x 3.2 mm) approximate dimensions.

Features

- Tested to UL 910 flammability test
- Halogen-free formula: Free from corrosive gases during a fire, making it safe for building occupants and sensitive electrical equipment.
- Minimal odor.
- Long shelf-life: Stix and pad packages can be sealed for reuse. Putty will not dry out or crumble.
- Easily re-enterable.
- Provides a draft and cold smoke seal in the installed condition, even before any temperature rise occurs, resultant from a fire.
- Adheres to all common building surfaces (Cement, gypsum, wood and plastic), including metal and plastic electrical boxes.
- One part, solventless pads or stix are easily hand molded, with no damming required (this applies to non-insulated metal pipe/conduit), allowing for easy application.
- Intumescent: expands when heated, forming a hard char, preventing the transmission of hot gases and fire.
- Designed to meet the intent of NEC 300-21 (NFPA 70). ICBO, SBCCI and BOCA Building Codes.
- No special tools required.
- Contains no asbestos, non-toxic.

2. Applications

Used to seal cable (including fiber optic inner duct and cable), insulated pipe, electrical conduit, and metal pipe, penetrations against air draft, smoke, noxious gas and flame propagation.

3M Fire Barrier Product	Size	Volume
Moldable Putty+ Stix	1.4 in. x 11 in. (35,6 mm x 279 mm)	21.2 $in.^3$
MPP+ Pads	4 in. x 8 in. x 1/8 in. (102 mm x 203 mm x 3,2 mm)	4 $in.^3$
	7 in. x 7 in. x 1/8 in. (178 mm x 178 mm x 3,2 mm)	6.12 $in.^3$
	9.5 in. x 9.5 in. x 1/8 in. (241,3 mm x 241,3 mm x 3,2 mm)	11.3 $in.^3$
MP+ Cable Wrap	2 in. x 8 in. x 1/8 in. (51 mm x 203 mm x 3,2 cm)	2 $in.^3$

3. Typical Physical Properties

Color: Red

Density: 8-11 lbs./gal. (0,95-1,35 kg/L)

Weight:

2 in. x 8 in. Cable Wrap (51 mm x 203 mm)	1.35 oz (38 g)
4 in. x 8 in. Pad (102 mm x 203 mm)	2.7 oz (76 g)
7 in. x 7 in. Pad (178 mm x 178 mm)	4.1 oz (115 g)
9.5 in. x 9.5 in. Pad (241,3 mm x 241,3 mm)	7.6 oz (215 g)
1.4 in. x 11 in. Stix (35,6 mm x 279 mm)	20 oz (567 g)

4. Specifications

The Fire Barrier Moldable Putty+ shall be a one part, intumescent elastomer. Under normal environmental conditions, the material shall be noncorrosive to metal and compatible with synthetic cable jackets. When exposed to flame or heat it shall be capable of expanding and comply with paragraph 300-21 of N.E.C. (NFPA 70) and meet the requirements of UL 1479, ASTM E 814.

5. Performance

Properties (Typical Values)

Adhesion: Very good to most surfaces

Fire Resistance: 1-4 Hours (system dependent)

Heat Expansion:

Begins:	437°F (225°C)
Significant:	617°F (325°C)
Free Expansion:	Nominal 3 times

Test Conditions

Oven: 90 days, 176°F (80°C): 2.7 Times Nominal Expansion

Humidity Chamber: 90 days, 90°F (32°C), 90% R.H.: 2.6 Times Nominal Expansion

6. Installation Techniques

The drawings on the next page show an example of one of the UL classified firestop systems using 3M Fire Barrier Moldable Putty+. Drawings for other tested firestop systems are available.

All surfaces shall be clean and free of dust, grease, oil, loose materials, rust or other substances to ensure adequate adhesion. Remove desired amount of 3M Fire Barrier Putty+ from stix or pads and install putty into the appropriate 3M firestop system. Note: Make sure the 3M Fire Barrier Putty+ is in complete contact with the inside surface of the opening and also the surface of the penetrating item.

Refer to following page for instructions on installing MPP+ Moldable Putty Pads and Moldable Putty+ Cable Wraps.

7. Maintenance

3M Fire Barrier Moldable Putty+ is stable under normal storage conditions. Normal stock and stock rotation practices are recommended. This product is not impaired by freezing; however, it should be warmed to at least 32°F (0°C) before applying.

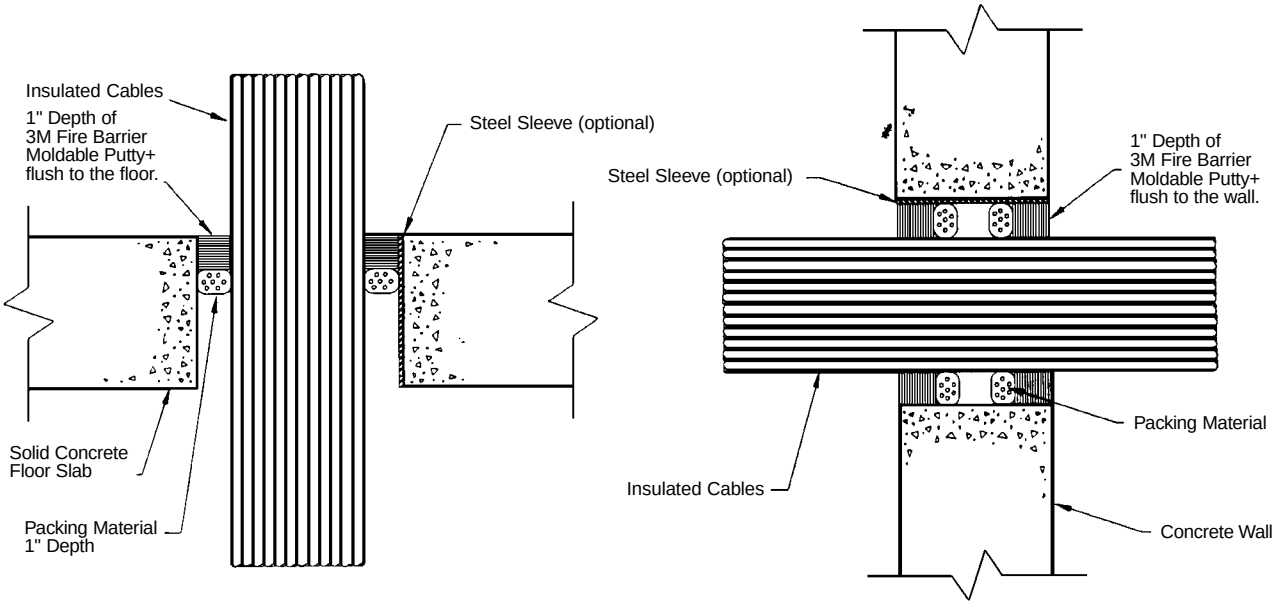
8. Purchase Information

3M Fire Barrier products are available through a network of nationwide distributors. For information on where to buy, go to www.3m.com/firestop. 3M Moldable Putty+ Stix is available in 1.4 diameter by 11 inch long stix (35,6 mm x 279 mm), approximate dimensions, and are packaged 10 stixs per box. Moldable Putty+ Pads are available 4 x 8 x 1/8 inch pads (102 mm x 203 mm x 3,2mm) and are packaged 10 pads per box, 10 boxes per carton and in 7 x 7 x 1/8 inch pads (178 mm x 178 mm x 3,2 mm), 9.5 x 9.5 x 1/8 inch pads (241,3 mm x 241,3 mm x 3,2 mm), and are packaged 20 per box and 5 boxes per carton. Moldable Putty+ Cable Wraps are available 2 in. x 8 in. x i/8 in. (51 mm x 203 mm x 3,2 mm) and are packaged 20 strips per box and 10 boxes per carton.

9. Safe Handling Information

Consult Material Safety Data Sheet prior to handling and disposing of 3M Fire Barrier Moldable Putty+.

Insulated Cables/Moldable Putty Penetration Seal/Concrete



Notes:

1. For concrete/concrete block walls, install 3M Fire Barrier Moldable Putty+ on both sides of wall.
2. Recommendations based on product performance per ASTM E 814 (UL 1479) Fire Test and UL System CAJ 3021.
3. Cable types covered include: telephone, power/control, or fiber optic.
4. Firestop system rating up to 3 hr. F.
5. There are other UL classification listings and configurations not described in this data sheet. For specific information consult current Underwriters Laboratories, Inc. Fire Resistance Directory.

3M Fire Barrier MPP+ Moldable Putty Pads

Installation Instructions For UL Listed Metallic and Non-metallic Outlet Boxes

Refer to the Wall Opening Protective Material (CLIV) listing in either the 3M Fire Protection Products Applications and Specifiers Guide or the UL Fire Resistance Directory Volume 1 for MPP+ Moldable Putty Pad application on UL Listed metallic and nonmetallic outlet boxes. No special skills or tools are required. To ensure adequate adhesion, all surfaces shall be clean and free of dust, grease, oil, loose materials, rust or other substances.

Step 1: Remove liner from both sides of pad.

Step 2: UL Listed metallic or nonmetallic outlet boxes (refer to above listing)

Step 3: Starting at top, align to front edge of box and overlap onto the stud 1/2 inch (13 mm).

Step 4: Adhere remaining pad to box and cut to provide a snug fit around conduits or cables.

Step 5: Extra putty will pleat at corners after pad has been applied to surface of box.

Step 6: Trim excess putty from corners and apply it to conduit fittings or cables connected to the box. Ensure pad is pressed firmly to surface of top, back, bottom, and side of box.

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