

UL DESIGN W-L-2075

System No. W-L-2075
 F Ratings - 1 and 2 Hr (See Item 4)
 T Ratings - 0 and 2 Hr (See Item 4)
 L Rating At Ambient - Less Than 1 CFM/Sq Ft
 L Rating At 400 F - 4 CFM/Sq Ft

1. Floor or Wall Assembly - The fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
 A. Studs - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nominal 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2 1/2 in. wide and spaced max 24 in. OC.
 B. Gypsum Board - Nom 5/8 in. thick gypsum wallboard, as specified in the individual Wall and Partition Designs.

2. Metallic Sleeve - (Optional) - Nom 4 in. diam (or smaller) Schedule 40 (or thinner) steel pipe cast into wall assembly with joint compound and installed flush with wall surface.

3. Electrical Nonmetallic Tubing - Nom 2 in. diam (or smaller) corrugated wall electrical nonmetallic tubing (ENT) constructed of polyvinyl chloride (PVC) tubing to be rigidly supported on both sides of wall assembly. A non-annular space of 3/4 in. is required within the firestop system.

See Electrical Nonmetallic Tubing (ENT) category in the Electrical Construction Materials Directory for names of manufacturers.

4. Fill, Void or Cavity Material - Sealant - Installed symmetrically on both sides of the wall. The hourly fire rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. Fill material applied within the annulus, flush with ends of the steel sleeve as the thickness shown in the table below:

F Rating - Hr	T Rating - Hr	Fil M Depth - in
1	2	5/8
2	2	1-1/4

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 *Bearing the UL Listing Mark
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UL DESIGN W-L-3058

System No. W-L-3058
 F Rating - 2 Hr
 T Rating - 1-1/2 Hr
 L Rating At Ambient - Less Than 1 CFM/Sq Ft
 L Rating At 400 F - 4 CFM/Sq Ft

1. Wall Assembly - The fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
 A. Studs - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nominal 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC.
 B. Gypsum Board - Two layers of nominal 5/8 in. thick gypsum wallboard, as specified in the individual Wall and Partition Designs. Max diam of opening is 12 in.

2. Cables - Max 25 pair No. 24 AWG telephone cable, polyvinyl insulation and jacket materials. One cable to be centered within the firestop system. Cable to be rigidly supported on both sides of wall assembly.

3. Fill, Void or Cavity Material - Sealant - Fill material forced into annular space to max extent possible. Additional fill material to be installed such that a min 1/4 in. crown is formed around the penetrating item.

A. Studs - Nom 2 by 4 in. (51 by 102 mm) lumber studs.
 B. Sole Plate - Nom 2 by 4 in. (51 by 102 mm) lumber plates. Diam of opening shall be 1/2 in. less than the diam of rough-penetrant (Item 3).
 C. Top Plate - The double top plate shall consist of two nominal 2 by 4 in. (51 by 102 mm) lumber plates. Diam opening shall be 1/2 in. (25 mm) larger than the non diam of rough-penetrant (Item 3).
 D. Gypsum Board - Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Designs.

3. Through - Penetrants - One nonmetallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space between the fire-resistant annular periphery of the opening shall be a min 0 in. (point contact) to a max of 5/8 in. (16 mm). Pipe to be rigidly supported on both sides of the floor-ceiling assembly. The following types and sizes of non-metallic pipes, conduits or tubing may be used:
 A. Polyvinyl Chloride (PVC) - Nom 2 in. (51 mm) diam (or smaller) regular or schedule 40 cellular or solid core PVC pipe for use in ducted (drain) or unvented (drain, vent or vent) systems.
 B. Acrylonitrile Butadiene Styrene (ABS) - Nom 2 in. (51 mm) diam (or smaller) regular or schedule 40 cellular or solid core ABS pipe for use in ducted (drain) or unvented (drain, vent or vent) piping systems.
 C. Chlorinated Polyethylene (CPE) - Nom 2 in. (51 mm) diam (or smaller) SDR 17 GPVC pipe for use in closed (process or service) vented (drain, vent or vent) piping systems.

4. Fill, Void or Cavity Material - Sealant - Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with top surface of floor or ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with and flush with bottom surface of ceiling or floor.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - FS - One Sealant
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UL DESIGN F-C-2142

System No. F-C-2142
 F Ratings - 1 and 2 Hr (See Item 1)
 T Ratings - 0, 1 and 1-3/4 Hr (See Item 3)

1. Floor-Ceiling Assembly - The fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in individual U500 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 be 1 in. (25 mm) larger than the non-diam of through-penetrant (Item 3).
 B. Wood Joists - Nom 2 by 10 in. (51 by 254 mm) lumber joists spaced 16 in. (406 mm) OC with nominal 1 by 3 in. (25 by 76 mm) lumber bridging and with ends firestoped. As an alternate to lumber 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 with ends firestoped.
 C. Furring Channels - (Not shown) - Resilient galv steel furring installed perpendicular to wood joists (Item 1b) between wallboard (Item 1d) and wood joists as required in the individual Floor-Ceiling Design.
 D. Gypsum Board - Nom 4 1/2 in. wide by 5/8 in. (16 mm) thick as specified in the individual Floor-Ceiling Design. Diam of opening shall be 1 in. (25 mm) larger than the non-diam of through-penetrant (Item 3).

2. Chase Wall - (Optional) - The through-penetrant (Item 3) may be routed through a 1 hr fire-rated 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 by 4 in. (51 by 102 mm) lumber studs.
 B. Sole Plate - Nom 2 by 4 in. (51 by 102 mm) lumber plates. Diam of opening shall be 1/2 in. less than the diam of rough-penetrant (Item 3).
 C. Top Plate - The double top plate shall consist of two nominal 2 by 4 in. (51 by 102 mm) lumber plates. Diam opening shall be 1/2 in. (25 mm) larger than the non-diam of through-penetrant (Item 3).
 D. Gypsum Board - Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Designs.

3. Through - Penetrants - One nonmetallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space between the fire-resistant annular periphery of the opening shall be a min 0 in. (point contact) to a max of 5/8 in. (16 mm). Pipe to be rigidly supported on both sides of the floor-ceiling assembly. The following types and sizes of non-metallic pipes, conduits or tubing may be used:
 A. Polyvinyl Chloride (PVC) - Nom 2 in. (51 mm) diam (or smaller) regular or schedule 40 cellular or solid core PVC pipe for use in ducted (drain) or unvented (drain, vent or vent) piping systems.
 B. Acrylonitrile Butadiene Styrene (ABS) - Nom 2 in. (51 mm) diam (or smaller) regular or schedule 40 cellular or solid core ABS pipe for use in ducted (drain) or unvented (drain, vent or vent) piping systems.
 C. Chlorinated Polyethylene (CPE) - Nom 2 in. (51 mm) diam (or smaller) SDR 17 GPVC pipe for use in closed (process or service) vented (drain, vent or vent) piping systems.

4. Fill, Void or Cavity Material - Sealant - Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with top surface of floor or ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with and flush with bottom surface of ceiling or floor.

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U.L. SYSTEM R 14546

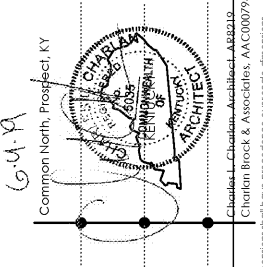
OUTLET BOX AT 1-HR RATED WALLS

THE RECTORSEAL CORP.
 2601 SPENWICK DR, HOUSTON TX 77055

Metacaulk Fire Rated Putty Pads or Blastop Fire Rated Putty Pads for use with max 4 by 4 in. flush device UL Listed Metallic Outlet boxes in 1 and 2 hr fire rated gypsum wallboard assemblies framed with min 3 1/2" deep wood or steel studs and constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the Fire Resistance Directory. Min 1/8" thick 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 adjacent to the stud) and completely seal against the stud within the stud cavity. When 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" provided that the boxes are not installed back-to-back.

Metacaulk Box Guard or Blastop Lectra Stop inserts for use with max 2-1/2" x 4 in. flush device UL Listed Metallic Outlet Boxes without internal clamps. 2 hr fire rated gypsum wallboard wall assemblies framed with min 3-1/2" deep steel studs and constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the Fire Resistance Directory. One 47mm wide by 95mm high insert adhered side-by-side of the outlet box in accordance with the installation instructions supplied with the product. Installation to comply with Article 370-16 of the National Electric Code, (NFPA 70). When protective material is used within outlet 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 boxes are not installed back-to-back.

Metacaulk Box Guard or Blastop Lectra Stop inserts for use with max 4 by 4 in. flush device UL Listed Metallic Outlet Boxes without internal clamps in 2 hr fire rated gypsum wallboard wall assemblies framed with min 3-1/2" deep steel studs and constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the Fire Resistance Directory. Two 47mm wide by 95mm high insert adhered side-by-side to the interior back wall of the outlet box in accordance with the installation instructions supplied with the product. Installation to comply with Article 370-16 of the National Electric Code, (NFPA 70). When protective material is used within outlet 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 boxes are not installed back-to-back.



UL DESIGN W-L-3065

System No. W-L-3065

ANSI/UL 1476 (ASTM E814)	CANULC S115
F Rating - 1 and 2 Hr (See Item 1)	F Rating - 1 and 2 Hr (See Item 1)
T Rating - 0 and 3/4 Hr (See Item 3)	T Rating - 0 and 3/4 Hr (See Item 3)
L Rating At Ambient - 15 CFM/Sq Ft	FH Rating - 1 and 2 Hr (See Item 1)
L Rating At 400 F - 8 CFM/Sq Ft	FTH Rating - 0 and 3/4 Hr (See Item 3)
	L Rating At 400 F - 8 CFM/Sq Ft

1. Wall Assembly - The fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
 A. Studs - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nominal 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2 1/2 in. wide and spaced max 24 in. OC.
 B. Gypsum Board - Nom 5/8 in. thick gypsum wallboard, as specified in the individual Wall and Partition Designs. Max diam of opening is 12 in.

2. Cables - Max 25 pair No. 24 AWG telephone cable, polyvinyl insulation and jacket materials. One cable to be centered within the firestop system. Cable to be rigidly supported on both sides of wall assembly.

3. Fill, Void or Cavity Material - Sealant - Fill material forced into annular space to max extent possible. Additional fill material to be installed such that a min 1/4 in. crown is formed around the penetrating item.

A. Studs - Nom 2 by 4 in. (51 by 102 mm) lumber studs.
 B. Sole Plate - Nom 2 by 4 in. (51 by 102 mm) lumber plates. Diam of opening shall be 1/2 in. less than the diam of rough-penetrant (Item 3).
 C. Top Plate - The double top plate shall consist of two nominal 2 by 4 in. (51 by 102 mm) lumber plates. Diam opening shall be 1/2 in. (25 mm) larger than the non-diam of rough-penetrant (Item 3).
 D. Gypsum Board - Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Designs.

3. Through - Penetrants - One nonmetallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space between the fire-resistant annular periphery of the opening shall be a min 0 in. (point contact) to a max of 5/8 in. (16 mm). Pipe to be rigidly supported on both sides of the floor-ceiling assembly. The following types and sizes of non-metallic pipes, conduits or tubing may be used:
 A. Polyvinyl Chloride (PVC) - Nom 2 in. (51 mm) diam (or smaller) regular or schedule 40 cellular or solid core PVC pipe for use in ducted (drain) or unvented (drain, vent or vent) piping systems.
 B. Acrylonitrile Butadiene Styrene (ABS) - Nom 2 in. (51 mm) diam (or smaller) regular or schedule 40 cellular or solid core ABS pipe for use in ducted (drain) or unvented (drain, vent or vent) piping systems.
 C. Chlorinated Polyethylene (CPE) - Nom 2 in. (51 mm) diam (or smaller) SDR 17 GPVC pipe for use in closed (process or service) vented (drain, vent or vent) piping systems.

4. Fill, Void or Cavity Material - Sealant - Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with top surface of floor or ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with and flush with bottom surface of ceiling or floor.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - FS - One Sealant
 *Bearing the UL Classification Mark

UL DESIGN W-L-1054

System No. W-L-1054

ANSI/UL 1476 (ASTM E814)	CANULC S115
F Rating - 1 and 2 Hr (See Items 1 and 3)	F Rating - 1 and 2 Hr (See Items 1 and 3)
T Rating - 0 Hr	FT Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Sq Ft	FH Rating - 1 and 2 Hr (See Items 1 and 3)
L Rating At 400 F - Less Than 1 CFM/Sq Ft	FTH Rating - 0 Hr
	L Rating At Ambient - Less Than 1 CFM/Sq Ft
	L Rating At 400 F - 1 CFM/Sq Ft

1. Wall Assembly - The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
 A. Studs - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nominal 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2 1/2 in. wide and spaced max 24 in. OC. When steel studs are used and the diam of opening exceeds the width of stud cavity, the opening shall be framed on all sides using lengths of steel stud installed between the vertical studs and screw-attached to the steel studs at each end. The framed opening in the wall shall be 4 to 6 in. wider and 4 to 6 in. higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. clearance is present between the penetrating item and the framing on all four sides.
 B. Gypsum Board - 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 12-1/4 in. for steel stud walls. Max diam of opening is 14-1/2 in. for wood stud walls.

The F Rating of the firestop system is equal to the fire rating of the wall assembly.

2. Through-Penetrants - One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 0 in. to max 2-1/4 in. Pipe may be installed with continuous point contact. Pipes, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. Pipes, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
 A. Steel Pipe - Nom 3/4 in. (19 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
 B. Iron Pipe - Nom 3/4 in. (19 mm) diam (or smaller) cast or ductile iron pipe.
 C. Conduit - Nom 4 in. diam (or smaller) steel electrical metallic tubing or 6 in. diam steel conduit.
 D. Copper Tubing - Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
 E. Copper Pipe - Nom 6 in. diam (or smaller) regular (or heavier) copper pipe.

3. Fill, Void or Cavity Material - Sealant - Min 5/8 in. thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point or continuous contact locations between pipe and wall, a min 1/2 in. diam bead of fill material shall be applied at the pipe wall interface on both sides of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - FS - One Sealant
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DETAIL NO. 1

OUTLET BOX AT TYPICAL PARTY WALL

ONE LAYER 5/8" TYPE 'X' DRYWALL EACH SIDE OF PARTYWALL ON 2X4 STUDS AT 16" O.C. INSTALL IN ACCORDANCE WITH UL 2X4 SOUD BLOCKING BETWEEN VERTICAL STUDS. TYPICAL ELECTRICAL OUTLET BOX, ONE LAYER 5/8" TYPE 'X' DRYWALL 8" X 16".

PENETRATIONS

GENERAL - Penetrations through all or a portion of a Wall or Partition assembly can significantly affect the hourly rating. These penetrations may include, but are not limited to, such items as piping, electrical access or distribution. Specifications for Through-Penetration Firestop Devices and Through-Penetration Firestop Systems are contained in the Building Materials Directory. The category of "Outlet Boxes and Fittings Classified for Fire Resistance" includes Classification for nonmetallic outlet and switch boxes for use in Wall or Partition assemblies. The information given for each classification includes the model number for the Classified products, a description of the rated assemblies, the spacing limitations for the boxes and the installation details. Listed single and double gang metallic outlet and switch boxes with metallic or nonmetallic cover plates may be used in bearing and nonbearing wood stud and steel stud walls with ratings not exceeding 2 hr. These walls shall have gypsum wallboard facing similar to those shown in Design Nos. U301, U411, and U425. The surface area of individual metallic outlet or switch boxes shall not exceed 16 sq. ft. The aggregate surface area of the boxes shall not exceed 100 sq. ft. per 100 sq. ft. Boxes located on opposite sides of walls or partition shall be separated by a horizontal distance of 24 in. The metallic outlet or switch boxes shall be securely fastened to the studs and the opening in the wallboard facing shall be cut so that the clearance between the box and the wallboard does not exceed 1/8 in.

NOTES

APPLY RUBBER GASKETS OR NON-HARDENING CAULK TO SEAL ALL OPENINGS AROUND PIPES AND CONDUITS THAT PENETRATE WALLS (EVEN WHEN VISUALLY HIDDEN BEHIND DRYWALL LAYERS).

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 Prospect, Kentucky

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FIRE RATED ASSEMBLIES
 PENETRATION DETAILS

date: 06-04-2019
 job no: 3789-15
 drawn by: JHB
 reviewed by: CBA
 file: 3789-A8.32
 issue history:

APARTMENT RATED ASSEMBLIES AND PENETRATIONS

ASSEMBLY:			PENETRATIONS											
WALL TYPE:	RATING	ASSEMBLY:	STEEL PIPE	STEEL VENT DUCT	STEEL COLLAR	IRON PIPE	CONDUIT	COPPER TUBE	COPPER PIPING	SANITARY TEE	DRAIN PIPING	PVC	VENT PIPE	CABLES
EXTERIOR FRAME WALL	1 HOUR	UL-U356	UL-W-L-1054	N/A		UL-W-L-1085	UL-W-L-1085	UL-W-L-1085	UL-W-L-1085			UL-W-L-2098		UL-W-L-3065
CORRIDOR FRAME WALL	1 HOUR	ESS-2323	UL-W-L-1054	N/A		UL-W-L-1085	UL-W-L-1085	UL-W-L-1085	UL-W-L-1085			UL-W-L-2098		UL-W-L-3065
TENANT SEPARATION WALL	1 HOUR	UL-U341	UL-W-L-1054	N/A		UL-W-L-1085	UL-W-L-1085	UL-W-L-1085	UL-W-L-1085			UL-W-L-2098		UL-W-L-3065
INTERIOR FRAME BEARING WALL	1 HOUR	UL-U305	UL-W-L-1054	N/A		UL-W-L-1085	UL-W-L-1085	UL-W-L-1085	UL-W-L-1085			UL-W-L-2098		UL-W-L-3065
INTERIOR NON-BEARING WALL	NOT REQUIRED													
FLOOR / CEILING ASSEMBLIES	1 HOUR	UL-L563	UL-F-C-1009	UL-F-C-7013	UL-F-C-2051	UL-F-C-1009	UL-F-C-1009	UL-F-C-1009 / 8009	UL-F-C-1009 / 8009	UL-F-C-2203	UL-F-C-2203 / 2189	UL-F-C-8009	UL-F-C-2203	UL-W-L-3012
ROOF / CEILING ASSEMBLIES	1 HOUR	UL-PS42		UL-F-C-7013									UL-F-C-2203	

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