System Number	Rating	Description HEAD-OF-WALL JOINTS	Sheet Number
HW-D-0043	1, 2, 3 & 4 HR	GYPSUM WALL PERPENDICULAR TO DECK	SHEET 1
HW-D-0747 HW-D-0210	1 & 2 HR 1 & 2 HR	GYPSUM WALL PARALLEL TO DECK, STEEL PLATE BRIDGING FLUTES  GYPSUM WALL PARALLEL TO DECK, DIRECTLY UNDER BOTTOM FLUTE	SHEET 1
W-D-0365	1 & 2 HR	GYPSUM WALL PARALLEL TO DECK, PARTIALLY UNDER BOTTOM FLUTE	SHEET 1
IW-D-0252 IW-D-0617	1 & 2 HR 1 & 2 HR	GYPSUM WALL UNDER STEEL BEAM  GYPSUM WALL OFFSET FROM STEEL BEAM	SHEET 2 SHEET 2
IW-D-0548	1 & 2 HR	GYPSUM SHAFT WALL PERPENDICULAR TO DECK	SHEET 3
HW-D-0644 HW-D-0642	1 & 2 HR 1 & 2 HR	GYPSUM SHAFT WALL PARALLEL TO DECK GYPSUM SHAFT WALL UNDER STEEL BEAM	SHEET 3 SHEET 4
HW-D-0645	1 & 2 HR	GYPSUM SHAFT WALL OFFSET FROM STEEL BEAM	SHEET 4
HW-D-0646 HW-D-0140	1 & 2 HR 3 HR	GYPSUM SHAFT WALL AT EDGE OF SLAB (e.g. STAIRWELL)  CONCRETE/BLOCK WALL PARALLEL TO DECK	SHEET 4 SHEET 5
HW-D-0086	1, 2, 3 & 4 HR	CONCRETE/BLOCK WALL PERPENDICULAR TO DECK	SHEET 5
3W-S-0003	1 & 2 HR	BOTTOM-OF-WALL JOINTS  GYPSUM WALL - SEALANT	SHEET 5
BW-S-0017	1 & 2 HR	GYPSUM WALL - TRACK TOP GASKET	SHEET 5
3W-S-0020 3W-S-0038	1 & 2 HR 1 & 2 HR	GYPSUM SHAFT WALL - SEALANT GYPSUM SHAFT WALL - TRACK TOP GASKET	SHEET 5
• • • • • • • • • • • • • • • • • •	1.02	FLOOR TO FLOOR JOINTS (MIN 4-1/2" FLOOR THICKNESS)	0.122.0
F-D-1001	3 HR	CONCRETE FLOOR TO CONCRETE FLOOR - MAX 4" JOINT - MINERAL WOOL + SIL300 SILICONE SEALANT	SHEET 5
FF-D-1007 FF-D-1008	2 HR 3 HR	CONCRETE FLOOR TO CONCRETE FLOOR - MAX 4" JOINT - MINERAL WOOL + AS200 SPRAY  CONCRETE FLOOR TO CONCRETE FLOOR - MAX 4" JOINT - MINERAL WOOL + ES SEALANT	SHEET 5 SHEET 6
		FLOOR TO WALL JOINTS (MIN 4-1/2" THICKNESS)	
FW-D-1001 FW-D-1006	1, 2, & 3 HR 2 HR	CONCRETE FLOOR TO CONCRETE/BLOCK WALL - MINERAL WOO L+ SIL300 SILICONE SEALANT  CONCRETE FLOOR TO CONCRETE/BLOCK WALL - MINERAL WOOL + AS200 SPRAY	SHEET 6
FW-D-1007	3 HR	CONCRETE FLOOR TO CONCRETE/BLOCK WALL - MINERAL WOOL + ES SEALANT	SHEET 6
ANALO 0050	4.0.2.9.4.110	WALL-TO-WALL JOINTS	0,155.0
WW-S-0052 WW-S-0063	1, 2, 3 & 4 HR 1 & 2 HR	GYPSUM WALL TO CONCRETE/BLOCK WALL - SEALANT  GYPSUM WALL TO CONCRETE/BLOCK WALL - TRACK TOP GASKET	SHEET 6
WW-S-0064	1 & 2 HR	GYPSUM SHAFT WALL TO CONCRETE/BLOCK WALL - TRACK TOP GASKET	SHEET 6
WW-D-0004 WW-D-1006	3 HR 2 HR	CONCRETE/BLOCK WALLS - MAX 1" JOINT - BACKER ROD + SEALANT  CONCRETE/BLOCK WALLS - MAX 4" JOINT - MINERAL WOOL + SPRAY	SHEET 6
		WALL-TO-FIREPROOFED COLUMN	
STI-JF-120-01 STI-JF-120-02	2 HR 2 HR	GYPSUM WALL TO COLUMN WEB - AS200 SPRAY & BACKING  GYPSUM WALL TO COLUMN FLANGE - LCI SEALANT & BACKING	SHEET 7
v. 140 <sup>-</sup> 04	~	PERIMETER FIRE BARRIER SYSTEMS	SIILL I
CW-D-1041	2 HR	CURTAIN WALL - MIN 6' SILL HEIGHT - QUICK CLIP SYSTEM	SHEET 7
CW-D-1044 CW-D-1051	2 HR 2 HR	CURTAIN WALL - STEEL BACKPAN, FLUSH SILL - FIRESTOP SPRAY  CURTAIN WALL - CONTINUOUS GLAZING (KISS MULLION), OPTIONAL RAISED FLOOR - QUICK CLIP SYSTEM	SHEET 7 SHEET 7
STI/BPF-120-03	2 HR	CURTAIN WALL - ALL VISION GLASS, FLUSH SILL, SHADOW BOX - FIRESTOP SPRAY	SHEET 8
STI/BPF-120-04 CW-S-1007	2 HR 2 HR	HYBRID WINDOW WALL - MULTIPLE CLOSURE PANEL OPTIONS - WINDOW WALL GASKET  STEEL STUD WALL - PLATFORM FRAMED, MULTIPLE FINISH OPTIONS - TRACK TOP GASKET	SHEET 8 SHEET 8
CW-S-2076	2 HR	STEEL STUD WALL - BALLOON FRAMED, MULTIPLE FINISH OPTIONS - FIRESTOP SPRAY	SHEET 8
C-AJ-1353	2 & 3 HR	METAL PIPE/CONDUIT PENETRATIONS  CONCRETE FLOOR OR CONCRETE/BLOCK WALL - SINGLE METAL PIPE/CONDUIT - SEALANT (2 HR) & BACKING (3 HR)	SHEET 8
C-AJ-1353 C-AJ-1361	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - SINGLE METAL PIPE/CONDUITS, MAX 49 SQ. IN. OPENING  CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MULTIPLE METAL PIPE/CONDUITS, MAX 49 SQ. IN. OPENING	SHEET 9
C-AJ-1354	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MULTIPLE METAL CONDUIT, MAX 6" DIA. OPENING	SHEET 9
F-A-1110 F-A-1093	3 HR 2 HR F & T	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - 1.5" - 6" METAL PIPE/CONDUIT - CAST-IN DEVICE  EQUAL F & T RATINGS FOR EXPOSED METAL PIPE/CONDUIT PENETRATIONS	SHEET 9 SHEET 9
-A-1138	2 HR F & T	FLOOR SINK - SEALANT & DUCT WRAP	SHEET 9
F-A-1129 W-L-1049	2 HR 1 & 2 HR	CONCRETE FLOOR - TOILET DRAIN - CLOSET FLANGE GASKET  GYPSUM WALL - SINGLE METAL PIPE/CONDUIT	SHEET 9 SHEET 10
W-L-1168	1 & 2 HR	GYPSUM WALL - MULTIPLE METAL PIPE/CONDUIT IN RECTANGULAR OPENING	SHEET 10
C-AJ-5087	2 HR	INSULATED METAL PIPE PENETRATIONS  CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 24" METAL PIPE WITH MAX 2" GLASS FIBER INSULATION	SHEET 10
C-AJ-5155	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 4" METAL PIPE WITH 1/2" - 3/4" AB/PVC (FOAM RUBBER) INSULATION	SHEET 10
C-AJ-5347 F-A-5041	2 HR F & T 3 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 4" METAL PIPE WITH E-WRAP T - PUTTY OR SEALANT  CONCRETE FLOOR - MAX 4" METAL PIPE WITH MAX 1" GLASS FIBER INSULATION - CAST-IN DEVICE	SHEET 10 SHEET 10
W-L-5014	1 & 2 HR	GYPSUM WALL - MAX 12" METAL PIPE WITH MAX 2" GLASS FIBER INSULATION	SHEET 11
W-L-5054 W-L-5262	1 & 2 HR 1 & 2 HR	GYPSUM WALL - MAX 4" METAL PIPE WITH 3/4-1" AB/PVC (FOAM RUBBER) INSULATION  GYPSUM SHAFT WALL - MAX 2" METAL PIPE WITH 1" GLASS FIBER INSULATION	SHEET 11 SHEET 11
<u> </u>		PLASTIC PIPE/CONDUIT PENETRATIONS	0.002.00
C-AJ-2578	3 HR 2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 2" PLASTIC PIPE - SEALANT & BACKING  CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 4" PLASTIC PIPE - WRAP STRIP THICK IN	SHEET 11 SHEET 11
C-AJ-2282 C-AJ-2297	2 & 3 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 4" PLASTIC PIPE - WRAP STRIP TUCK-IN  CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 6" PLASTIC PIPE - FIRESTOP COLLAR	SHEET 11
F-A-2246 F-A-2073	2 HR 3 HR	MIN 2-1/2" CONCRETE FLOOR - MAX 4" PLASTIC PIPE - CAST-IN DEVICE  MIN 2-1/2" CONCRETE FLOOR - MAX 4" PLASTIC PIPE - DROP IN COLLAR	SHEET 12 SHEET 12
-A-2077	2 HR	MIN 2-1/2" CONCRETE FLOOR - MAX 4" PLASTIC PIPE - WRAP STRIP TUCK-IN	SHEET 12
A-2186	2 HR 2 HR	MIN 2-1/2" CONCRETE FLOOR - MAX 2" PLASTIC PIPE - SEALANT & BACKING  MIN 2-1/2" CONCRETE FLOOR/METAL DECK - MAX 12" PLASTIC PIPE - FIRESTOP COLLAR	SHEET 12 SHEET 12
F-A-2210 F-A-2216	2 HR	MIN 2-1/2" CONCRETE FLOOR - TOILET DRAIN - CLOSET FLANGE GASKET	SHEET 13
N-L-2241	1 & 2 HR	GYPSUM WALL - MAX 2" PLASTIC PIPE - SEALANT ONLY	SHEET 13 SHEET 13
N-L-2248 N-L-2237	1 & 2 HR 1 & 2 HR	GYPSUM WALL - MAX 3" PLASTIC PIPE - WRAP STRIP TUCK-IN  GYPSUM WALL - MAX 4" PLASTIC PIPE - FIRESTOP COLLARS	SHEET 13
N-L-2257	2 HR	GYPSUM SHAFT WALL - MAX 4" PLASTIC PIPE - FIRESTOP COLLAR  CARLE DENIETRATIONS (NOT IN CONDITION)	SHEET 13
C-AJ-3154	2, 3, & 4 HR	CABLE PENETRATIONS (NOT IN CONDUIT)  CONCRETE FLOOR OR CONCRETE/BLOCK WALL - CABLES WITH OPTIONAL SLEEVE - SEALANT & BACKING	SHEET 13
C-AJ-3260	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - SINGLE EZ-PATH 44+ (FOR FREQUENT CABLE CHANGES)	SHEET 13
C-AJ-3317 F-A-3055	3 HR 2 & 3 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - EZ-PATH 44+ GRID UP TO 16 UNITS (FOR FREQUENT CABLE CHANGES)  CONCRETE FLOOR - CABLES - CAST-IN DEVICE	SHEET 13 SHEET 14
F-A-3054	2, 3 & 4 HR	CONCRETE FLOOR - SINGLE EZ PATH 44+ (FOR FREQUENT CABLE CHANGES)	SHEET 14
W-J-3158 W-L-3210	2 HR 1 & 2 HR	CONCRETE/BLOCK WALL - EZ-PATH 44+ UP TO 5 UNITS GANGED (FOR FREQUENT CABLE CHANGES)  GYPSUM WALL - OPTIONAL SLEEVE - SEALANT & BACKING	SHEET 14 SHEET 14
V-L-3377	1, 2, 3 & 4 HR	GYPSUM WALL - SINGLE EZ-PATH SERIES 22, 33, 44, 44+ (FOR FREQUENT CABLE CHANGES)	SHEET 14
W-L-3306 W-L-3379	1 & 2 HR 1 & 2 HR	GYPSUM WALL - UP TO 5 EZ-PATH 44+ UP GANGED (FOR FREQUENT CABLE CHANGES)  GYPSUM SHAFT WALL - CABLES THRU METAL SLEEVE - SEALANT & BACKING	SHEET 15 SHEET 15
00,0	1. ~~	RETROFIT CABLE PENETRATIONS (FOR RENOVATIONS/ALTERATIONS)	SILLI IV
F-A-3063	2 HR	MIN 4-1/2" CONCRETE FLOOR - RETROFIT DEVICE	SHEET 15
F-A-3064 W-J-3240	2 HR F &T 2 HR	MIN 4-1/2" CONCRETE FLOOR - RETROFIT DEVICE - EQUAL F & T RATINGS FOR EXPOSED PENETRATIONS  CONCRETE/BLOCK WALL - RETROFIT DEVICE	SHEET 15 SHEET 15
W-L-3435	1 & 2 HR	GYPSUM WALL - RETROFIT DEVICE	SHEET 16
2 A 1 9220	3 NB	CABLE TRAYS  MIN 2 1/2" CONCRETE/BLOCK ELOOR OR WALL, MIYED BENETBANTS, EIRESTOR MORTAR	CUEET 40
C-AJ-8220 C-AJ-4089	2 HR 2 HR	MIN 2-1/2" CONCRETE/BLOCK FLOOR OR WALL - MIXED PENETRANTS - FIRESTOP MORTAR  MIN 4-1/2" CONCRETE BLOCK FLOOR OR WALL - CABLE TRAY - PILLOWS + SEALANT OR PUTTY	SHEET 16 SHEET 16
W-L-3306	1 & 2 HR	GYPSUM WALL - FOR FREQUENT CABLE CHANGES, TERMINATE TRAY AT WALL - USE UP TO 5 EZ-PATH 44+ GANGED	SHEET 17
N-L-8026 N-L-4043	1 & 2 HR 1 & 2 HR	GYPSUM WALL SEALANT OVER MINERAL WOOL BACKING  GYPSUM WALL - PILLOWS + PUTTY	SHEET 17 SHEET 17
		ELECTRICAL BUSWAY PENETRATIONS	
C-AJ-6008 W-L-6001	3 HR 1 & 2 HR	MIN 4-1/2" CONCRETE OR BLOCK WALL - SEALANT & BACKING  GYPSUM WALL - SEALANT & BACKING	SHEET 17 SHEET 17
W-L-6001 W-L-6005	1 & 2 HR 1 & 2 HR	GYPSUM WALL - SEALANT & BACKING  GYPSUM WALL - SSP PILLOWS	SHEET 17 SHEET 17
		DUCT PENETRATIONS (WITHOUT DAMPERS)	
C-AJ-7143 C-AJ-7023	2 HR 2 & 3 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 60" X 36" DUCT - INSULATED - SEALANT & BACKING + RETAINING ANGLES  CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 24" DIA. ROUND DUCT - SEALANT & BACKING	SHEET 18 SHEET 18
V-J-7092	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 24" DIA. ROUND DUCT - SEALANT & BACKING  CONCRETE/BLOCK WALL - MAX 92" X 96" DUCT - OPTIONAL INSULATION - FYREFLANGE GASKET	SHEET 18 SHEET 18
N-L-7025	1 & 2 HR	GYPSUM WALL - MAX 100" X 100" DUCT - SEALANT & RETAINING ANGLES	SHEET 18
N-L-7026 N-L-7029	1 & 2 HR 1 & 2 HR	GYPSUM WALL - MAX 24" DIA. ROUND DUCT - SEALANT ONLY  GYPSUM WALL - MAX 24" X 24" DUCT - SEALANT ONLY	SHEET 18 SHEET 19
V-L-7145	1 & 2 HR	GYPSUM WALL - INSULATED RECTANGULAR DUCT - SEALANT & BACKING	SHEET 19
N-L-7179 N-L-7099	1 & 2 HR 1 & 2 HR	GYPSUM WALL - INSULATED ROUND DUCT - SEALANT ONLY  GYPSUM WALL - INSULATED GREASE DUCT - SEALANT & BACKING	SHEET 19 SHEET 19
W-L-7066	1 & 2 HR	GYPSUM SHAFT WALL - MAX 6" DIA. ROUND DUCT THRU SLEEVE - SEALANT & BACKING	SHEET 19
	1 & 2 HR	GYPSUM SHAFT WALL - MAX 8" X 8" DUCT, NO SLEEVE - SEALANT & BACKING  GYPSUM SHAFT WALL - MAX 12" X 12" DUCT THRU SLEEVE - SEALANT & BACKING	SHEET 19 SHEET 20
	1 & 2 HR	OTFOUN ORACT WALL-MAY IS A IS DOOT TURD OFFER FOR AND A DARWING	UIILE   Zii
W-L-7090 W-L-7252 W-L-7238	1 & 2 HR 1 & 2 HR	GYPSUM SHAFT WALL - MAX 24" X 40" DUCT, NO SLEEVE - FYREFLANGE GASKET	SHEET 20

		LARGE OPENINGS & MIXED PENETRANTS	
C-AJ-8113	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL- SEALANT & BACKING	SHEET 20
C-AJ-8093	2 & 3 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - PILLOWS + SEALANT OR PUTTY	SHEET 21
W-L-8026	1 & 2 HR	GYPSUM WALL - LARGE OPENING, MIXED PENETRANTS - SEALANT & BACKING	SHEET 21
W-L-8050	1 & 2 HR	GYPSUM WALL - LARGE OPENING, MIXED PENETRANTS - PILLOWS + SEALANT OR PUTTY	SHEET 21
	•	ELECTRICAL & UTILITY BOXES	
C-AJ-1217	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - PULL OR JUNCTION BOX - SEALANT	SHEET 22
CLIV.R14288	1 & 2 HR	GYPSUM WALL - ELEC BOX - PUTTY PADS OR ELEC BOX INSERTS	SHEET 22
W-L-1448	1 & 2 HR	GYPSUM WALL - PULL OR JUNCTION BOX - SEALANT ONLY	SHEET 22
W-L-7307	1 & 2 HR	GYPSUM WALL - ELEC, UTILITY OR MED GAS VALVE BOX - E-WRAP	SHEET 22
		CIRCUIT INTEGRITY	
STI/AF 120-01	1 & 2 HR	MIN 1" STEEL CONDUIT - E-WRAP	SHEET 22
	·	FUEL LINE PROTECTION	
FP-3	2 HR	1" - 4" STEEL PIPE - E-WRAP	SHEET 23
FP-4	2 HR	3" - 4" OUTER CONTAINMENT PIPE - E-WRAP	SHEET 23
C-AJ-5437	2 HR F & T	PIPE PENETRATION - MAX 4" METAL PIPE WITH E-WRAP THRU CONCRETE/BLOCK FLOOR OR WALL - PUTTY OR SEALANT	SHEET 23

UL FIRE RESISTANCE DIRECTORY NOMENCLATURE					
hrough Penetrations					
First letter represents what is being penetrated:	Second letter(s) provide more information about the floor or wall:  A = Concrete Floors with a min thickness that is	Four digit number describes the penetrating item(s):  0000-0999 = Blank Openings	Example: C-AJ-1150  C = Floor or Wall Penetration		
F = Floor W = Wall C = Floors or Walls (combined)	Less than or Equal to 5".  B = Concrete Floors with a min thickness that is Greater than 5".  C = Framed Floors  E = For-Ceiling Assemblies consisting of Concrete with Membrane Protection.  J = Concrete or Masonry Walls with a min thickness that is Less than or Equal to 8".  L = Framed Walls	1000-1999 = Metal Pipe, Conduit, or Tubing 2000-2999 = Non-Metallic Pipe, Conduit, or Tubing 3000-3999 = Cables 4000-4999 = Cable Trays 5000-5999 = Insulated Pipes 6000-6999 = Miscellaneous Electrical (Busway) 7000-7999 = Miscellaneous Mechanical 8000-8999 = Mixed Penetrating Items 9000-9999 = Reserved for Future Use	A = Concrete Floor that is 5" or less J = Concrete or Masonry Walls that are 8" or less 1150 = Metal Pipe, Conduit, or Tubing		
int Systems					
First letter identifies the type joint:	Second letter(s) provide more information about the floor or wall:	Four digit number describes the joint width:	Example: HW-D-0757		
CJ = Floor FF = Wall WW = Floors or Walls (combined) FW = Floor to Wall HW = Head to Wall BW = Bottom of Wall	S = No Movement (Static) D = Allows Movement (Dynamic)	0000-0999 = Less than or Equal to 2" 1000-1999 = Greater than 2" and Less than or Equal to 6" 2000-2999 = Greater than 6" and Less than or Equal to 12" 3000-3999 = Greater than 12" and Less than or Equal to 24" 4000-4999 = Greater than 24"	HW = Head to Wall D = Allows Movement (Dynamic) 0757 = Less than or Equal to 2"		

#### **GENERAL NOTES:**

- 1. Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
- UL Fire Resistance Directory; Current Edition or UL Product iQ™
- NFPA 101 Life Safety Code
- All governing local and regional building codes
- Intertek Directory of Building **Products**
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

### PROJECT NAME:

PROJECT\_NAME:

### PROJECT LOCATION:

PROJECT\_LOCATION:

### ARCHITECT/CONSULTANT:

ARCHITECT/CONSULTANT:

TITLE: TYPICAL FIRESTOP DETAILS -STEEL-FRAMED BUILDING

WITH METAL DECK Specified Technologies Inc.

210 Evans Way Somerville, NJ 08876

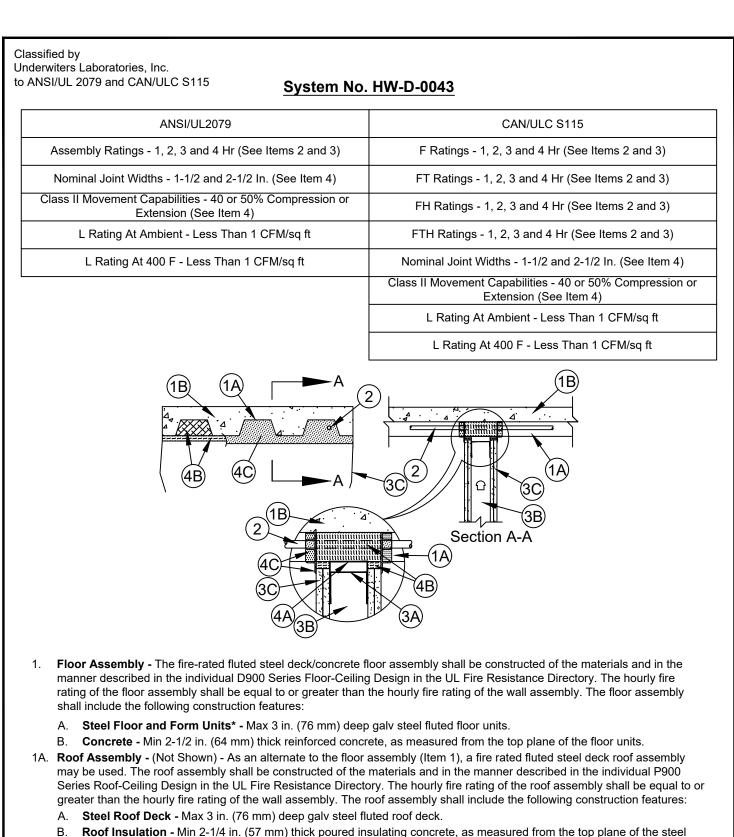


Toll Free: (800)992-1180 Phone: (908)526-8000

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E-Mail:techserv@stifirestop.com



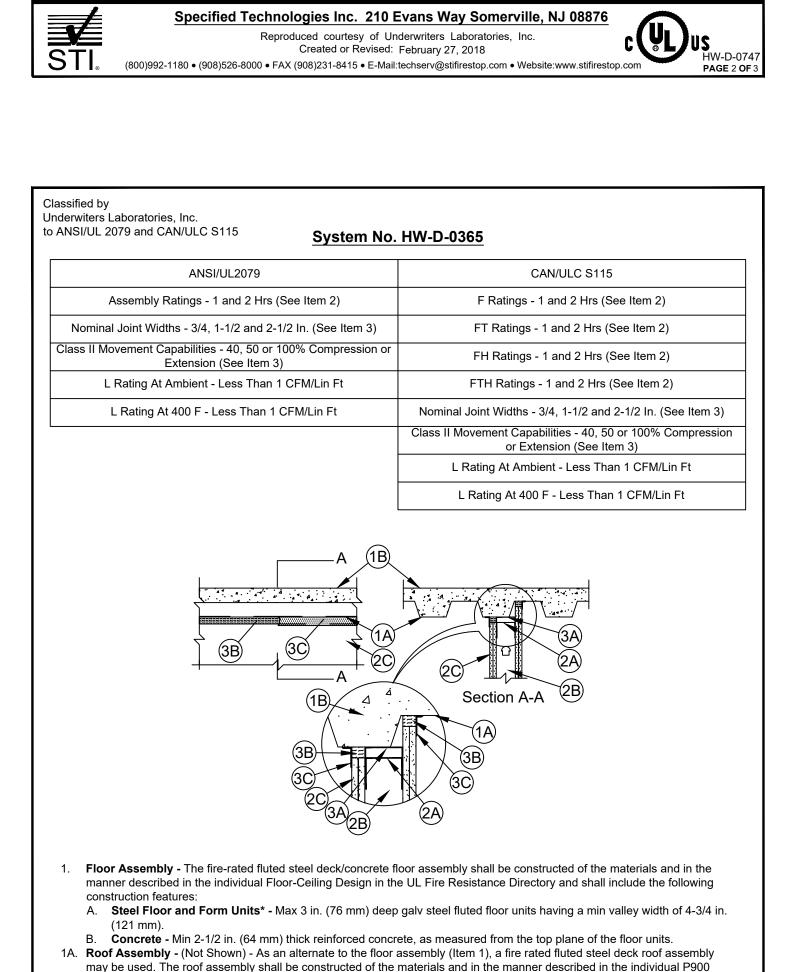


B. Roof Insulation - Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the steel Through Penetrant - (Optional) - Max one penetrant per flute to be installed parallel and centered within the flutes of the steel deck. Penetrants installed with a min annular space of 1/2 to 1-2/ in. in. (13-38 mm) between the penetrant and the steel deck. Penetrant to be rigidly supported on both sides of wall assembly. The following types and sizes of penetrants may be Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876 Reproduced courtesy of Underwriters Laboratories. Inc

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3. Forming Material\* - Mineral wool batt insulation, nom 4 pcf (64 kg/m3), cut to the shape of the fluted floor units, friction fit to completely fill the flutes above the steel plate. Adjacent lengths of batts to be tightly butted with butted seams spaced min 24 in. (610 mm) apart along the length of the plugs. INDUSTRIAL INSULATION GROUP L L C - MinWool-1200 Safing JOHNS MANVILLE - Safing ROCK WOOL MANUFACTURING CO - Delta Board ROCKWOOL MALAYSIA SDN BHD - SAFE **ROCKWOOL** - SAFE THERMAFIBER INC - Type SAF A. Forming Material\* - As an option to Item 3, preformed mineral wool plugs, formed to the shape of the fluted floor units, friction fit to completely fill the flutes above the steel plate. Adjacent lengths of batts to be tightly butted with butted seams spaced min 24 in. (610 mm) apart along the length of the plugs. **THERMAFIBER INC** - TopStop mineral wool deck plugs Type SAF batts Wall Assembly - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features: A. Steel Floor and Ceiling Runners - Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 4B). Length of flange to equal fully extended width of joint plus 1/4 in. (6 mm). Ceiling runner secured to steel plate with two No. 8 self-drilling, self-tapping steel screws spaced 24 in. (610 mm) OC. Where ceiling runner overlaps floor or roof assembly, fasten with steel masonry anchors spaced max 24 in. (610 mm) OC or min 3/4 in. (19 mm) long steel masonry or powder actuated fasteners spaced at a max of 24 in. (610 mm) OC. A1. Light Gauge Framing\* - Vertical Deflection Ceiling Runner - As an alternate to the ceiling runner in Item 4A, vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clip provided with step bushings for permanent fastening of steel studs. Flanges sized to accommodate steel studs (Item 4B). Vertical deflection ceiling runner secured to steel plate with two No. 8 self-drilling, self-tapping steel screws spaced 24 in. (610 mm) OC. Where ceiling runner overlaps floor or roof assembly, fasten with steel masonry anchors spaced max 24 in. (610 mm) OC or min 3/4 in. (19 mm) long steel masonry or powder actuated fasteners spaced at a max of 24 in. (610 mm) OC. THE STEEL NETWORK INC - VertiTrack VTD358, VTD400, VTD600 and VTD800 A2. Light Gauge Framing\* - Notched Ceiling Runner - As an alternate to the ceiling runners in Items 4A or 4A1, notched ceiling runners to consist of C-shaped galv steel channel with notched return flanges sized to accommodate steel studs (Item 4B). Notched ceiling runner secured to steel plate with two No. 8 self-drilling, self-tapping steel screws spaced 24 in. (610 mm) OC. Where ceiling runner overlaps floor or roof assembly, fasten with steel masonry anchors spaced max 24 in. (610 mm) OC or min 3/4 in. (19 mm) long steel masonry or powder actuated fasteners spaced at a max of 24 in. **OLMAR SUPPLY INC** - Type SCR A3. Light Gauge Framing\* - Slotted Ceiling Runner - As an alternate to the ceiling runner in Item 4A through 4A2, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Items 4B). Ceiling runner secured to steel plate with two No. 8 self-drilling, self-tapping steel screws spaced 24 in. (610 mm) OC. Where ceiling runner overlaps floor or roof assembly, fasten with steel masonry anchors spaced max 24 in. (610 mm) OC or min 3/4 in. (19 mm) long steel masonry or powder actuated fasteners spaced at a max of 24 in. (610 mm) OC. BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS - SLP-TRK **CALIFORNIA EXPANDED METAL PRODUCTS CO** - CST CLARKDIETRICH BUILDING SYSTEMS - Type SLT, SLT-H METAL-LITE INC - The System RAM SALES L L C - RAM Slotted Track SCAFCO STEEL STUD MANUFACTURING CO - Slotted Track



Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or

greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:

A. Steel Roof Deck - Max 3 in. (76 mm) deep galv steel fluted roof deck having a min valley width of 4-3/4 in. (121 mm).

B. Roof Insulation - Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the steel

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Roof Covering\* - Hot mopped or cold-application materials compatible with insulating concrete.

A. Conduit - Nom 1/2 in. diam (or smaller) steel electrical metallic tubing (EMT) or steel conduit. B. Conduit - Nom 1-1/2 in. diam (or smaller) Schedule 40 PVC conduit. C. 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. D. Chlorinated Polyvinyl Chloride (CPVC) Pipe - Nom 1-1/2 in. (38 mm) diam (or smaller) SDR17 SDR13.5 CPVC pipe for use in closed (process or supply) piping systems. When steel conduit or EMT (Item 2A) is installed in flute of steel deck, the hourly rating of the joint system is 1 hr. When nonmetallic penetrates (Items 2B, 2C and 2D) are installed in flute of steel deck, the hourly rating of the joint system is equal to the hourly fire rating of the wall assembly up to a max of 2 hr. Wall Assembly - 1, 2, 3 or 4 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400, or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features: A. Steel Floor and Ceiling Runners - Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs. When deflection channel (Item 4A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 to 3/4 in. (13 to 19 mm) gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended ioint width. Ceiling runner installed perpendicular to direction of fluted steel deck and secured with steel masonry anchors or welds spaced max 24 in. (610 mm) OC. A1. Light Gauge Framing\* - Slotted Ceiling Runner - Slotted ceiling runner may be used as an alternate to the ceiling runner in Item 3A. Slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 3B). Ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel masonry anchors spaced max 24 in. (610 mm) OC. When slotted ceiling runner is used, deflection channel BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS - SLP-TRK, SLPTRK325 **CALIFORNIA EXPANDED METAL PRODUCTS CO -** CST, CST325 CLARKDIETRICH BUILDING SYSTEMS - Type SLT, SLT-H MARINO/WARE, DIV OF WARE INDUSTRIES INC - Type SLT **METAL-LITE INC** - The System RAM SALES L L C - RAM Slotted Track SCAFCO STEEL STUD MANUFACTURING CO TELLING INDUSTRIES L L C - True-Action Deflection Track A2. Light Gauge Framing\* - Vertical Deflection Ceiling Runner - When the nom joint width is less than or equal to 1 in. (25 mm), vertical deflection ceiling runner may be used as an alternate to the ceiling runner in Items 3A and 3A1., Vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips, provided with step bushings, for permanent fastening of steel studs. Vertical deflection ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonr anchors spaced max 24 in. (610 mm) OC. When vertical deflection ceiling runner is used, deflection channel (Item 4A) shall not be used. A3. Light Gauge Framing\* - Notched Ceiling Runner - As an alternate to the ceiling runners in Items 3A through 3A3, notched ceiling runners to consist of C-shaped galv steel channel with notched return flanges sized to accommodate steel studs (Item 3B). Notched ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors spaced max 24 in. (610 mm) OC. When notched ceiling runner is used, deflection channel (Item 4A) shall not be used. A4. Steel Framing Members\* - Sound Isolation Clips - (Not Shown, For Max 2 hr Assembly Rating) - As an alternate attachment means for the ceiling runner to the underside of the floor or roof assembly when no deflection channel (Item 4A) is used, sound isolation clips installed in accordance with the accompanying installation instructions. Sound isolation clip installed through nom 1 in. (25 mm) diam hole in ceiling runner and attached to top of ceiling runner using four min No. 8 by 1/2 in. (13 mm) long self-tapping galv steel screws. Sound isolation clips to be installed adjacent to every stud location but not more than 24 in. (610 mm) OC and attached to the underside of floor or roof assembly using min 3/16 in. (5 mm) diam by 2-1/2 in. (64 mm) long steel masonry anchors. PAC INTERNATIONAL L C - Type RSIC-U-HD Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876 Reproduced courtesy of Underwriters Laboratories. 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B. Studs - Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 1 in. (25 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. When vertical deflection ceiling runner (Item 4A1) is used, steel studs secured to slotted vertical deflection clips, through bushings, with steel screws at mid-height of each slot. When slotted ceiling runner (Item 4A3) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. (13 mm) long wafer head steel screws at mid-height of slot on each side of wall. Stud spacing not to exceed 24 in. (610 mm) OC. . Batts and Blankets\* - (Not Shown) - As an alternate to the forming material (Item 5B), min 2.5 pcf (40 kg/m3) mineral wool batt insulation, of a width and thickness to completely fill stud cavity. Insulation batts friction fit to completely fill all stud cavities below the bottom surface of the steel ceiling runner. See Batts and Blankets (BZJZ) category in the Fire Resistance Directory for names of manufacturers. D. Batts and Blankets\* - (Not Shown) - In 1 hr fire rated wall assemblies as an alternate to the forming material (Item 5B). any glass fiber insulation bearing the UL Classification Marking as to fire resistance or surface burning characteristics, of a width and thickness to completely fill stud cavity. Insulation batts friction fit to completely fill all stud cavities below the bottom surface of the steel ceiling runner. At the steel ceiling runner, the top 6 in. (152 mm) section of insulation to be folded back upon itself to double the density at this location. See Batts and Blankets (BZJZ) category in the Fire Resistance Directory for names of manufacturers. Gypsum Board\* - Gypsum board sheets installed to a min total thickness of 5/8 in. (16 mm) and 1-1/4 in. (32 mm) on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a nom 1 in. (25 mm) gap shall be maintained between the top of the gypsum board and the bottom surface of the steel plate. The top row of screws shall be installed into the steel studs 1 to 5 in. (25 to 127 mm) below the bottom edge of the ceiling runner flange. The hourly fire rating of the joint system is dependent on the hourly fire rating of the wall assembly in which it is Joint System - Max separation between bottom of steel plate and top of gypsum board is 1 in. (25 mm). The joint system is designed to accommodate a max 100 percent compression or extension from its installed width. The joint system consists of A. Fill, Void or Cavity Material\* - Factory-supplied intumescent gasket installed and nominally centered over the ceiling runner (Item 4A, 4A1, 4A2, 4A3) prior to attachment to underside of steel plate. Gypsum wallboard layers to be installed on both sides of the wall maintaining a minimum 1/8 in. (3 mm) overlap over the intumescent gasket at time of SPECIFIED TECHNOLOGIES INC - Speed Flex Track Top Gasket B. Forming Material\* - When stud cavities are not filled with mineral wool batt insulation or glass fiber insulation (Items 4C or 4D), nom 4 in. (102 mm) thick by 6 in. (152 mm) wide sections of 4 pcf (64 kg/m3) mineral wool batt insulation installed between studs (Item 4B) flush with the bottom surface of the steel ceiling runner. INDUSTRIAL INSULATION GROUP L L C - MinWool-1200 Safing JOHNS MANVILLE - Safing ROCK WOOL MANUFACTURING CO - Delta Board **ROCKWOOL MALAYSIA SDN BHD** - Safe ROCKWOOL - Safe THERMAFIBER INC - SAF

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL

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Certification (such as Canada), respectively.

Wall Assembly - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the and shall include the following construction features: A. Steel Floor and Ceiling Runners - Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs. Ceiling runner to be provided with min 1-1/4 in. (32 mm) to max 3 in. (76 mm) flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 to 1 in. (13 to 25 mm) gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, ceiling runner installed parallel with direction of fluted steel floor units or roof deck and secured to valley with steel fasteners or welds spaced max 24 in. (610 mm) OC. Ceiling runner not to cantilever more than 1-1/2 in. (38 mm) beyond A1. Light Gauge Framing\* - Slotted Ceiling Runner - As an alternate to the ceiling runner in Item 2A, slotted ceiling runner consisting of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Ceiling runner installed parallel with direction of fluted steel floor or roof deck and secured to valley with steel fasteners or welds spaced max 24 in. OC. Slotted ceiling runner not to cantilever more than 1-1/2 in. beyond edge of valley. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used. BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS - SLP-TRK CALIFORNIA EXPANDED METAL PRODUCTS CO - CST **CLARKDIETRICH BUILDING SYSTEMS** - Type SLT, SLT-H MARINO/WARE, DIV OF WARE INDUSTRIES INC - Type SLT METAL-LITE INC - The System RAM SALES L L C - RAM Slotted Track A2. Light Gauge Framing\* - Clipped Ceiling Runner - As an alternate to the ceiling runner in Items 2A and 2A1, clipped runner to consist of galv steel channel with clips preformed in track flanges which positively engage the inside flange of the steel studs (Item 2B). Track sized to accommodate steel studs (Item 2B). Track flanges to be min 3-1/4 in. (83 mm). Clipped ceiling runner installed parallel with direction of fluted steel floor units or roof deck and secured to valley with steel fasteners spaced max 24 in. (610 mm) OC. Clipped ceiling runner not to cantilever more than 1-1/2 in. (38 mm) beyond edge of valley. When clipped ceiling runner is used, deflection channel (Item 3A) shall not be used. TOTAL STEEL SOLUTIONS L L C - Snap Trak A3. Light Gauge Framing\* - Vertical Deflection Ceiling Runner - As an alternate to the ceiling runner in Items 2A, 2A1 and 2A2, vertical deflection ceiling runner consisting of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips, provided with step bushings, for permanent fastening of steel studs. Vertical deflection ceiling runner installed parallel with direction of fluted steel floor or roof deck and secured to valley with steel fasteners or welds spaced max 24 in. (610 mm) OC. Vertical deflection ceiling runner not to cantilever more than 1-1/2 in. (38 mm) beyond edge of valley. When vertical deflection ceiling runner is used, deflection channel (Item 3A) shall not be used. THE STEEL NETWORK INC - VertiTrack VTD362, VTD400, VTD600 and VTD800 B. Studs - Steel studs to be min 3-5/8 in. (92 mm) wide. Studs cut 1/2 to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner (Item 2A) with sheet metal screws located 3/4 in. (19 mm) below the bottom to the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. (13 mm) long wafer head steel screws at midheight of slot on each side of wall. When vertical deflection ceiling runner (Item 2A3) is used, steel studs secured to slotted vertical deflection clips, through bushings, with steel screws at midheight of each slot. Stud spacing not to exceed 24 in. (610 mm) OC. . Gypsum Board\* - Gypsum board sheets installed to a min total 5/8 or 1-1/4 in. (16 or 32 mm) thickness on each side of wall for 1 and 2 hr rated assemblies, respectively. Wall to be constructed as specified in the individual U400, V400 or W400 Series Design in the UL Fire Resistance Directory, except that a max 2-1/2 in. (25 mm) gap shall be maintained between the top of the gypsum board and the underside of the steel floor or roof deck . The screws attaching the gypsum

board to the studs along the top of the wall shall be located 1 in. (25 mm) below the bottom of the ceiling runner. No

gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel.

The hourly fire rating of the joint system is equal to the hourly fire rating of the wall.

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Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876 Reproduced courtesy of Underwriters Laboratories, Inc. Created or Revised: September 02, 2016 (800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techsery@stifirestop.com • Website:www.stifirestop.com system) is 3/4,1-1/2 or 2-1/2 in. (19, 38 or 64 mm). The joint system is designed to accommodate a max 50 percent compression or extension from its installed width for max 1-1/2 in. (38 mm) wide joints and a max 40 percent compression or extension from its installed width for max 2-1/2 in. (64 mm) wide joints. When Item 3B1 is used in lieu of the mineral wool strips described in Item 3B, the maximum joint width is 3/4 in. (19 mm) and the movement capabilities are 100% compression or extension. The joint system shall consist of forming and fill materials, with or without a deflection channel (Item 3A), as follows: A. Deflection Channel - Max 3 in. (76 mm) deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection channel installed parallel with direction of fluted steel floor units or roof deck and secured to valley with steel fasteners or welds spaced max 24 in. (610 mm) OC. Deflection channel not to cantilever more than 1-1/2 in. (38 mm) beyond edge of valley. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1/2 to 1 in. (13 to 25 mm) gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner nests inside the deflection channel without attachment. B. Forming Material\* - Min 5/8 or 1-1/4 in. (16 or 32 mm) wide strips of nom 4 pcf (64 kg/m3) density mineral wool batt insulation for 1 or 2 hr rated assemblies, respectively. Strips of mineral wool compressed 50 percent in thickness and installed cut edge first to fill the gap between the top of the gypsum board and the underside of the steel floor or roof deck. The forming material shall be installed flush with both surfaces of wall. INDUSTRIAL INSULATION GROUP L L C - MinWool-1200 Safing JOHNS MANVILLE - Safing ROCK WOOL MANUFACTURING CO - Delta Board ROCKWOOL MALAYSIA SDN BHD - Safe ROCKWOOL - Safe **THERMAFIBER INC** - Type SAF B1. Forming Material\* - (Not Shown) - As an option to Item 3B, nom 3/16 in. (4.8 mm) thick by 4 in. (102 mm) high joint forming material profile installed on both sides of the wall assembly. Profile installed by first marking a line across the top of the wall 3 in. (76 mm) below the bottom plane of the steel floor or roof deck valleys. Joint profile material positioned with its top edge against the underside of the steel deck and with its bottom edge on the line scribed on the wall assembly. Bottom of the joint profile attached to gypsum board with nom 1/2 in. (13 mm) long steel staples spaced not greater than 8 in. (203 mm) OC. Adjoining lengths of profile to overlap approx 3/4 in. (19 mm) at shiplapped ends. **SPECIFIED TECHNOLOGIES INC** - SpecSeal Speed Flex Joint Profile C. Fill, Void or Cavity Material\* - Sealant - Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or 1.6 mm dry thickness) of fill material spray applied on each side of the wall between the top of the wall and the bottom of the steel floor or roof deck, overlapping min 1/2 in. (13 mm) onto both the gypsum board and steel floor or roof deck on both sides of wall. SPECIFIED TECHNOLOGIES INC - SpecSeal AS 200 Elastomeric Spray \* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively. Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876 Reproduced courtesy of Underwriters Laboratories, Inc. Created or Revised: November 17, 2017 (800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techserv@stifirestop.com • Website:www.stifirestop.c

B. Studs - Steel studs to be min 3-1/2 in (89 mm) wide. Studs cut 1/2 to 1-1/4 in. (13 to 32 mm) less in length than

assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 4A) is used, steel

channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. When slotted ceiling

runner (Item 3A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. (13 mm) long wafer head

steel screws at midheight of slot on each side of wall. When vertical deflection ceiling runner (Item 2A2) is used, steel

studs secured to slotted vertical deflection clips, through the bushings, with steel screws at midheight of each slot. Stud

Gypsum Board\* - Gypsum board sheets installed to a min total thickness of 5/8 in., 1-1/4 in., 1-1/2 in. or 2 in. (16, 32, 38

individual U400 Series Design in the UL Fire Resistance Directory, except that a max 1 or 2 in, (25 or 51 mm) gap (See

The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. (25 mm) below the

When through penetrant (Item 2) is not used, the hourly fire rating of the joint system is equal to the hourly fire

Item 4) shall be maintained between the top of the gypsum board and the bottom surface of the steel floor or roof deck

bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the

Joint System - Max separation between bottom of floor or roof deck and top of gypsum board (at time of installation

of joint system) is 2-1/2 in. (64 mm) for 1 and 2 hr Ratings and 1 in. (25 mm) for 3 and 4 hr Ratings. The joint system

mm) wide joints and a max 40 percent compression or extension from its installed width for max 2-1/2 in. (64 mm)

wide joints. The joint system shall consist of forming and fill materials, with or without a deflection channel (Item 4A), as

A. **Deflection Channel -** (Optional) - Max 2 in. (51 mm) deep min 24 gauge galy steel channel sized to accommodate

deflection channel. The ceiling runner nests inside the deflection channel without attachment.

INDUSTRIAL INSULATION GROUP L L C - MinWool-1200 Safing

**THERMAFIBER INC** - TopStop mineral wool deck plugs Type SAF batts

SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray

mm) onto the steel deck and steel conduit or EMT (when used) on both sides of wall.

ROCK WOOL MANUFACTURING CO - Delta Board

ROCKWOOL MALAYSIA SDN BHD - Safe

of gypsum board and bottom of steel deck.

Certification (such as Canada), respectively.

ROCKWOOL - Safe

to ANSI/UL 2079

THERMAFIBER INC - SAF

is designed to accommodate a max 50 percent compression or extension from its installed width for max 1-1/2 in. (38

ceiling runner (Item 3A). Deflection channel installed perpendicular to direction of fluted steel deck and secured to

valleys with steel masonry anchors or welds spaced max 24 in. (610 mm) OC. The ceiling runner is installed within the

B. Forming Material\* - Nom 4 pcf (64 kg/m3) mineral wool batt cut to the shape of the steel deck flute and installed into the

flutes above the ceiling channel. The mineral wool batt pieces are to be stacked to a thickness approx 1 in. (25 mm)

greater than the overall thickness of the wall and compressed approx 14 percent in depth thickness such that it is flush with the gypsum board surface on both sides of the wall. When sound isolation clips (Item 2A5) are used, the space

between the top of the ceiling runner and the underside of the floor or roof shall be tightly packed with mineral wool batt

insulation. Additional sections of mineral wool batt insulation are compressed 50 percent in thickness and installed cut

B1. Forming Material\* - (Optional, Not Shown) - Preformed mineral wool plugs, formed to the shape of the fluted floor units,

friction fit to completely fill the flutes above the ceiling channel. The plugs shall project beyond each side of the ceiling

Additional forming material, described in Item 4B, to be used in conjunction with the plugs to fill the gap between the top

runner and shall be recessed from both wall surfaces to accommodate the required thickness of fill material (Item 4C).

2. Fill, Void or Cavity Material\* - Sealant - Min 1/16 in. (1.6 mm) dry thickness (min 1/8 in. or 3.2 mm wet thickness) of fill

material spray applied on each side of the wall in the flutes of the steel floor or roof deck and between the top of the wall

and the bottom of the steel floor or roof deck and overlap a min 1/2 in. (13 mm) onto gypsum board on both sides of wall.

Additional 1/6 in. (1.6 mm) dry thickness (1/8 in. or 3.2 mm wet thickness) of fill material shall overlap a min 1/2 in. (13

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL

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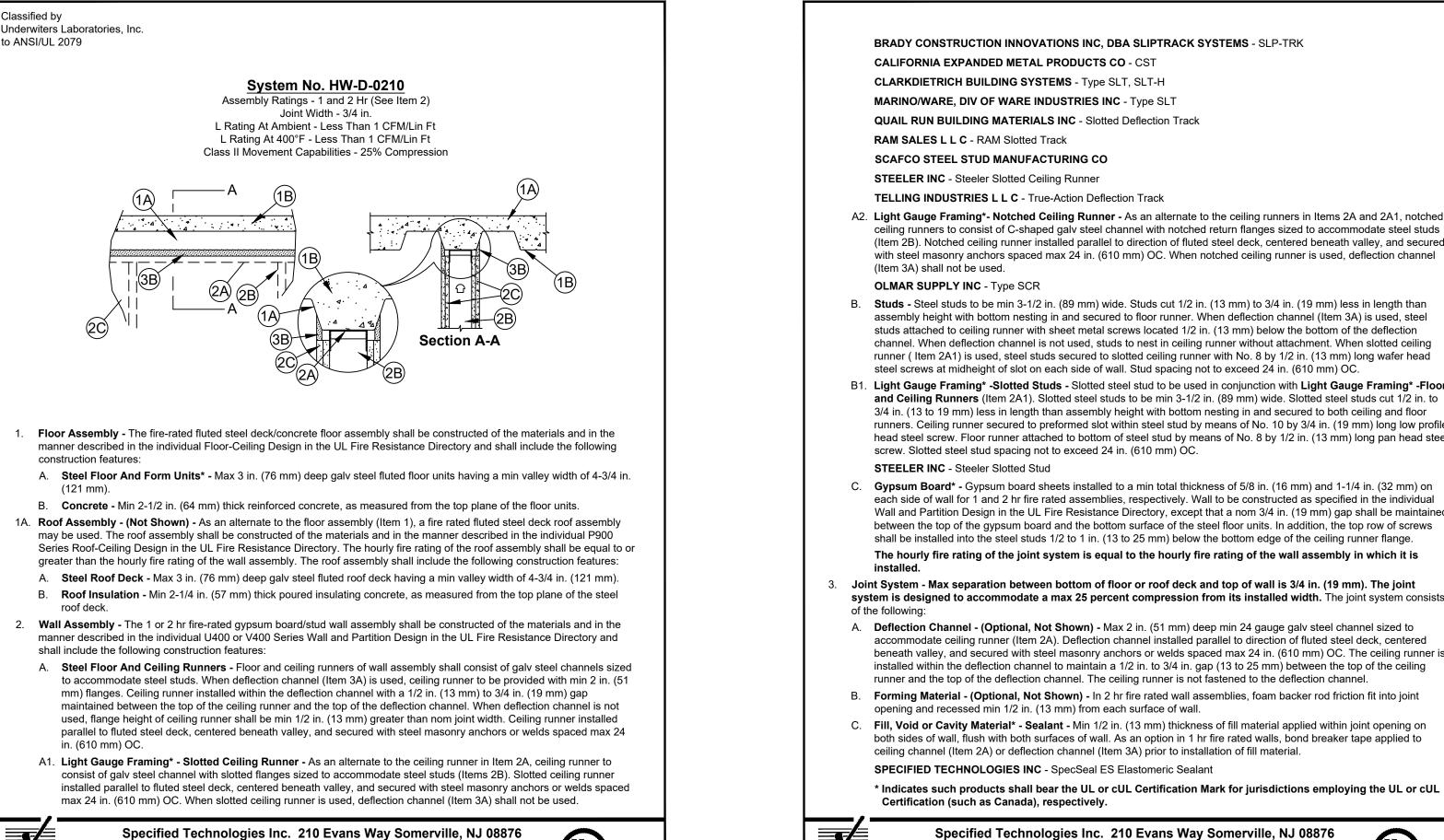
edge first to completely fill the gap above the top of the gypsum board, flush with both surfaces of wall.

deflection channel to maintain a 1/2 to 3/4 in. (13 to 19 mm) gap between the top of the ceiling runner and the top of the

or 51 mm) on each side of wall for 1, 2, 3 and 4 hr fire rated assemblies, respectively. Wall to be constructed in the

studs attached to ceiling runner with sheet metal screws located 1/2 in. (13 mm) below the bottom to the deflection

Underwiters Laboratories, Inc. to ANSI/UL 2079 and CAN/ULC S115 System No. HW-D-0747 ANSI/UL2079 CAN/ULC S115 Assembly Ratings - 1 and 2 Hr (See Item 4) F Ratings - 1 and 2 Hr (See Item 4) FT Ratings - 1 and 2 Hr (See Item 4) Nominal Joint Width - 1 In Class II Movement Capabilities - 100% Compression or FH Ratings - 1 and 2 Hr (See Item 4) L Rating At Ambient - Less Than 1 CFM/Lin FT FTH Ratings - 1 and 2 Hr (See Item 4) L Rating At 400 F - Less Than 1 CFM/Lin FT Nominal Joint Width - 1 In. Class II Movement Capabilities - 100% Compression or L Rating At Ambient - Less Than 1.55 L/s/m L Rating At 204°C - Less Than 1.55 L/s/m Floor Assembly - The fire-rated fluted steel floor unit/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the Fire Resistance Directory. The hourly fire rating of the floor assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The floor assembly shall include the following construction features: A. Steel Floor and Form Units\* - Max 3 in. (76 mm) deep galv steel fluted floor units. B. Concrete - Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units. A. Roof Assembly - (Not Shown) - As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features: A. Steel Roof Deck - Max 3 in. (76 mm) deep galv steel fluted roof deck. B. Roof Insulation - Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the steel Steel Plate - Min 16 MSG (0.059 in. or 1.5 mm thick) galv steel plate cut to a width to span the flute and to overlap min 1-1/2 in. (38 mm) on the adjacent valleys of fluted floor or roof assembly. Plate continuous above wall and fastened to floor or roof assembly with 1/4 in. (6 mm) diam by 1-1/4 in. (32 mm) long steel concrete anchors or with min 0.145 in. diam by min 3/4 in. (19 mm) long steel powder actuated fasteners spaced max 24" (610 mm) OC. Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876 Reproduced courtesy of Underwriters Laboratories, Inc Created or Revised: February 27, 2018 (800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techsery@stifirestop.com • Website:www.stifirestop.com



BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS - SLP-TRK CALIFORNIA EXPANDED METAL PRODUCTS CO - CST **CLARKDIETRICH BUILDING SYSTEMS - Type SLT, SLT-H** MARINO/WARE, DIV OF WARE INDUSTRIES INC - Type SLT QUAIL RUN BUILDING MATERIALS INC - Slotted Deflection Track TELLING INDUSTRIES L L C - True-Action Deflection Track A2. Light Gauge Framing\*- Notched Ceiling Runner - As an alternate to the ceiling runners in Items 2A and 2A1, notched ceiling runners to consist of C-shaped galv steel channel with notched return flanges sized to accommodate steel studs (Item 2B). Notched ceiling runner installed parallel to direction of fluted steel deck, centered beneath valley, and secured with steel masonry anchors spaced max 24 in. (610 mm) OC. When notched ceiling runner is used, deflection channel B. Studs - Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 1/2 in. (13 mm) to 3/4 in. (19 mm) less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner with sheet metal screws located 1/2 in. (13 mm) below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. (13 mm) long wafer head steel screws at midheight of slot on each side of wall. Stud spacing not to exceed 24 in. (610 mm) OC. B1. Light Gauge Framing\* -Slotted Studs - Slotted steel stud to be used in conjunction with Light Gauge Framing\* -Floor and Ceiling Runners (Item 2A1). Slotted steel studs to be min 3-1/2 in. (89 mm) wide. Slotted steel studs cut 1/2 in. to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in and secured to both ceiling and floor runners. Ceiling runner secured to preformed slot within steel stud by means of No. 10 by 3/4 in. (19 mm) long low profile head steel screw. Floor runner attached to bottom of steel stud by means of No. 8 by 1/2 in. (13 mm) long pan head steel screw. Slotted steel stud spacing not to exceed 24 in. (610 mm) OC. C. **Gypsum Board\* -** Gypsum board sheets installed to a min total thickness of 5/8 in. (16 mm) and 1-1/4 in. (32 mm) on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a nom 3/4 in. (19 mm) gap shall be maintained between the top of the gypsum board and the bottom surface of the steel floor units. In addition, the top row of screws shall be installed into the steel studs 1/2 to 1 in. (13 to 25 mm) below the bottom edge of the ceiling runner flange. The hourly fire rating of the joint system is equal to the hourly fire rating of the wall assembly in which it is Joint System - Max separation between bottom of floor or roof deck and top of wall is 3/4 in. (19 mm). The joint system is designed to accommodate a max 25 percent compression from its installed width. The ioint system consists A. **Deflection Channel - (Optional, Not Shown) -** Max 2 in. (51 mm) deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection channel installed parallel to direction of fluted steel deck, centered beneath valley, and secured with steel masonry anchors or welds spaced max 24 in. (610 mm) OC. The ceiling runner is installed within the deflection channel to maintain a 1/2 in. to 3/4 in. gap (13 to 25 mm) between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel. B. Forming Material - (Optional, Not Shown) - In 2 hr fire rated wall assemblies, foam backer rod friction fit into joint opening and recessed min 1/2 in. (13 mm) from each surface of wall. Fill, Void or Cavity Material\* - Sealant - Min 1/2 in. (13 mm) thickness of fill material applied within joint opening on both sides of wall, flush with both surfaces of wall. As an option in 1 hr fire rated walls, bond breaker tape applied to ceiling channel (Item 2A) or deflection channel (Item 3A) prior to installation of fill material. SPECIFIED TECHNOLOGIES INC - SpecSeal ES Elastomeric Sealant

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### **GENERAL NOTES:** . Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification. 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including

- but not limited to the following: Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
- UL Fire Resistance Directory; Current Edition
- NFPA 101 Life Safety Code
- All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing** 

**DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

#### PROJECT NAME:

PROJECT\_NAME:

PROJECT LOCATION:

PROJECT\_LOCATION:

### ARCHITECT/CONSULTANT:

ARCHITECT/CONSULTANT:

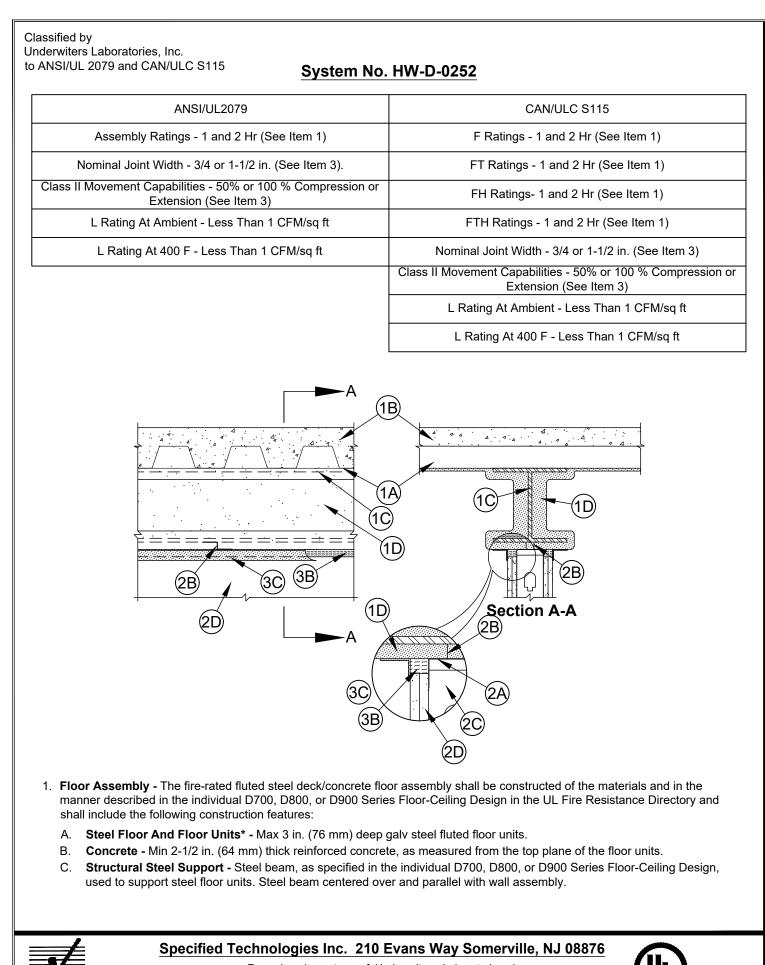
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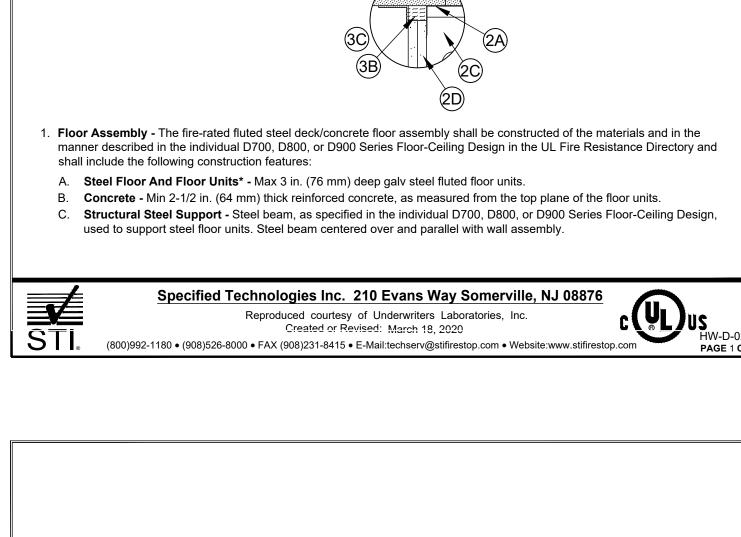
STI FIRESTOP SYSTEMS

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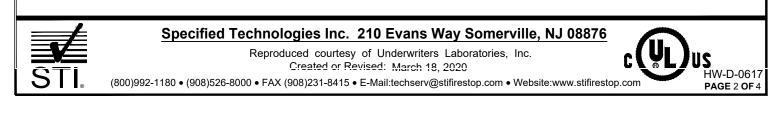




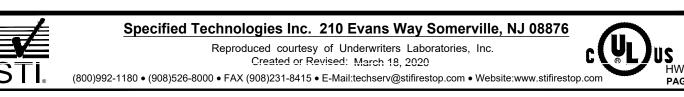




- b. Steel Attachment Clips Z-shaped bars or channels, located to span from steel beam to min 1 in. (25 mm) beyond face of wall and spaced max 24 in. (610 mm) on center. Z-shaped bars are nom 1-1/2 to 2 in. (38 to 51 mm) deep and formed from min 16 gauge painted or galvanized steel. Channels are nom 1-1/2 in. (38 mm) or 2 in. (51 mm) deep and formed from min 16 gauge painted or galvanized steel. Each bar or channel welded to steel beam and welded, bolted or screwed to ceiling runner of wall. Each bar or channel shall be fully covered with spray applied fire resistive material (Item 1F) to the minimum thickness of material required on the flanges of the steel beam. Steel Lath - Nom 3/8 in. (10 mm) diamond mesh expanded steel rib lath having a nom weight of 3.4 lb/yd2 (1.8 kg/m2) shall be installed over and attached to the steel attachment clip bars or channels (Item 1D) to completely cover the exposed area from the flange tip of the steel beam to the end of the bar/channel framing extending beyond the wall surface. The lath shall be secured with steel fasteners or tie wire and shall be fully covered with spray applied fire resistive material (Item 1F). F. Spray-Applied Fire Resistive Material\* - After installation of steel attachment clip and steel lath (Items 1D and 1E), steel floor units and structural steel support to be sprayed with the min thickness of material specified in the individual D700 or D900 Series Design. The flutes of the steel floor units are to be filled with material across the entire top flange of the steel beam. Each bar or channel attachment clip member (Item 1D) shall be fully covered with spray applied fire resistive material to the minimum thickness of material required on the flanges of the steel beam. The thickness of material applied to the expanded steel lath shall be sufficient to completely fill the spaces between the bar/channel attachment clip above the wall. Additional material shall be applied to the web of the steel beam on each side of the wall. The min total thickness of material applied to each side of the steel beam web shall be 13/16 in. (21 mm) for 1 hr fire rated assemblies and 1 3/8 in. (35 mm) for 2 hr fire rated assemblies. For D700 Series Designs, all surfaces of the steel
- floor units to be sprayed with the thickness of material specified in the individual D700 Series Design. For D900 Series Designs structural steel supports, steel attachment clip and steel lath only to be sprayed in accordance with the specifications in the individual D900 Series Design. GCP APPLIED TECHNOLOGIES INC - Type MK-6/HY, MK-6/HYES, MK-65 and RG ISOLATEK INTERNATIONAL - Type 300 or Type II **SOUTHWEST FIREPROOFING PRODUCTS CO - Type 5, Type 5GP**
- The hourly fire rating of the floor assembly shall be equal to or greater than the hourly fire rating of the wall 1A. Roof Assembly - (Not Shown) - As an alternate to the floor assembly, a fire-rated fluted steel deck roof assembly may be
- used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 or P700 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The roof assembly shall include the following construction
- A. Steel Roof Deck Max 3 in. (76 mm) deep galv steel fluted roof deck.
- B. Roof Insulation For P900 Series Designs, min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top roof deck. For P700 Series Designs, roof insulation shall be as specified in the individual design.
- C. Structural Steel Support Steel beam, as specified in the individual P700 or P900 Series Floor-Ceiling Design, used to support steel floor units. Steel beam parallel with wall assembly and 8 in. (203 mm) max from wall assembly.
- D. Steel Attachment Clips Z-shaped bars or channels, located to span from steel beam to min 1 in. (25 mm) beyond face of wall and spaced max 24 in. (610 mm) on center. Z-shaped bars are nom 1-1/2 to 2 in. (38 to 51 mm) deep and formed from min 16 gauge painted or galvanized steel. Channels are nom 1-1/2 in. (38 mm) or 2 in. (51 mm) deep and formed from min 16 gauge painted or galvanized steel. Each bar or channel welded to steel beam and welded, bolted or screwed to ceiling runner of wall. Each bar or channel shall be fully covered with spray applied fire resistive material to the minimum thickness of material required on the flanges of the steel beam.
- E. Steel Lath Nom 3/8 in. (10 mm) diamond mesh expanded steel rib lath having a nom weight of 3.4 lb/yd2 (1.8 kg/m2) shall be installed over and attached to the steel attachment clip bars or channels (Item 1AD) to completely cover the exposed area from the flange tip of the steel beam to the end of the bar/channel framing extending beyond the wall surface. The lath shall be secured with steel fasteners or tie wire and shall be fully covered with spray applied fire resistive material (Item 1AF).



- D. Spray-Applied Fire Resistive Material\* After installation of the steel attachment clips (Item 2B), steel floor units and structural steel support to be sprayed with the min thickness of material specified in the individual D700, D800, or D900 Series Design. The flutes of the steel floor units are to be filled with material across the entire top flange of the steel beam Additional material shall be applied to the web of the steel beam on each side of the wall. For a 1 hr Assembly Rating, the thickness of material applied to each side of the steel beam web shall be 13/16 in. (21 mm). For a 2 hr Assembly Rating, the thickness of material applied to each side of the steel beam web shall be 1-3/8 in. (35 mm). GCP APPLIED TECHNOLOGIES INC - Type MK-6/HY
- **SOUTHWEST FIREPROOFING PRODUCTS CO** Type 5, Type 5GP 01. Spray-Applied Fire Resistive Material\* - After installation of the steel attachment clips (Item 2B), steel floor units and structural steel support to be sprayed with the min thickness of material specified in the individual D700, D800, or D900 Series Design. The flutes of the steel floor units are to be filled with material across the entire top flange of the steel beam Additional material shall be applied to the web of the steel beam on each side of the wall. For a 1 hr Assembly Rating, the thickness of material applied to each side of the steel beam web shall be 11/16 in. (18 mm). For a 2 hr Assembly Rating, the thickness of material applied to each side of the steel beam web shall be 1-1/2 in. (38 mm).
- ISOLATEK INTERNATIONAL Type 300 or Type II . Wall Assembly - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
- . Steel Floor and Ceiling Runners Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with min 1-1/4 in. (32 mm) to max 2 in. (51 mm) flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 in. (13 mm) to 3/4 in. (19 mm) gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width and ceiling runner is secured to steel beam (Item 1A) with steel attachment clips (Item 2B) spaced max 24 in. (610 mm) OC. Ceiling runner or deflection channel to be centered beneath and parallel with bottom flange of steel beam. A clearance equal to the required thickness of spray-applied fireproofing material (Item 1D) shall be maintained between the top of the ceiling runner or
- deflection channel and the bottom flange of the steel beam. A1. Light Gauge Framing\* - Slotted Ceiling Runner - Slotted ceiling runner may be used as an alternate to the ceiling runner in Item 2A. Slotted ceiling runner to consist of galy steel channel with slotted flanges sized to accommodate steel studs (Item 2C). Ceiling runner is secured to steel beam (Item 1A) with steel attachment clips (Item 2B) spaced max 24 in. (610 mm) OC. Slotted ceiling runner to be centered beneath and parallel with bottom flange of steel beam. A clearance equal to the required thickness of spray-applied fireproofing material (Item 1D) shall be maintained between the top of the
- slotted ceiling runner and the bottom flange of the steel beam. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used. BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS - SLP-TRK, SLPTRK325
- CALIFORNIA EXPANDED METAL PRODUCTS CO CST , CST325 **CLARKDIETRICH BUILDING SYSTEMS - Type SLT, SLT-H** MARINO/WARE, DIV OF WARE INDUSTRIES INC - Type SLT
- **METAL-LITE INC** The System RAM SALES L L C - RAM Slotted Track
- Steel Attachment Clips Z-shaped clips formed from 1 in. (25 mm) wide strips of min 20 ga galv steel. Clips to be sized to extend through the thickness of the spray-applied fire-resistive material on the bottom flange of the steel beam with 2 in. (51 mm) long upper and lower legs. Legs of clips fastened to bottom of beam (prior to application of spray-applied fire-resistive materials) and top of ceiling runner (or deflection channel) with steel fasteners or welds. Clips spaced max 16 in. (406 mm) OC.
- Studs Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 1/2 in. (13 mm) to 1-1/4 in. (32 mm) less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner (Item 2A) with sheet metal screws located 1/2 in. (13 mm) below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment.





with spray applied fire resistive material to the minimum thickness of material required on the flanges of the steel beam.

The thickness of material applied to the expanded steel lath shall be sufficient to completely fill the spaces between the

side of the wall. The min total thickness of material applied to each side of the steel beam web shall be 13/16 in. (21 mm)

bar/channel attachment clip above the wall. Additional material shall be applied to the web of the steel beam on each

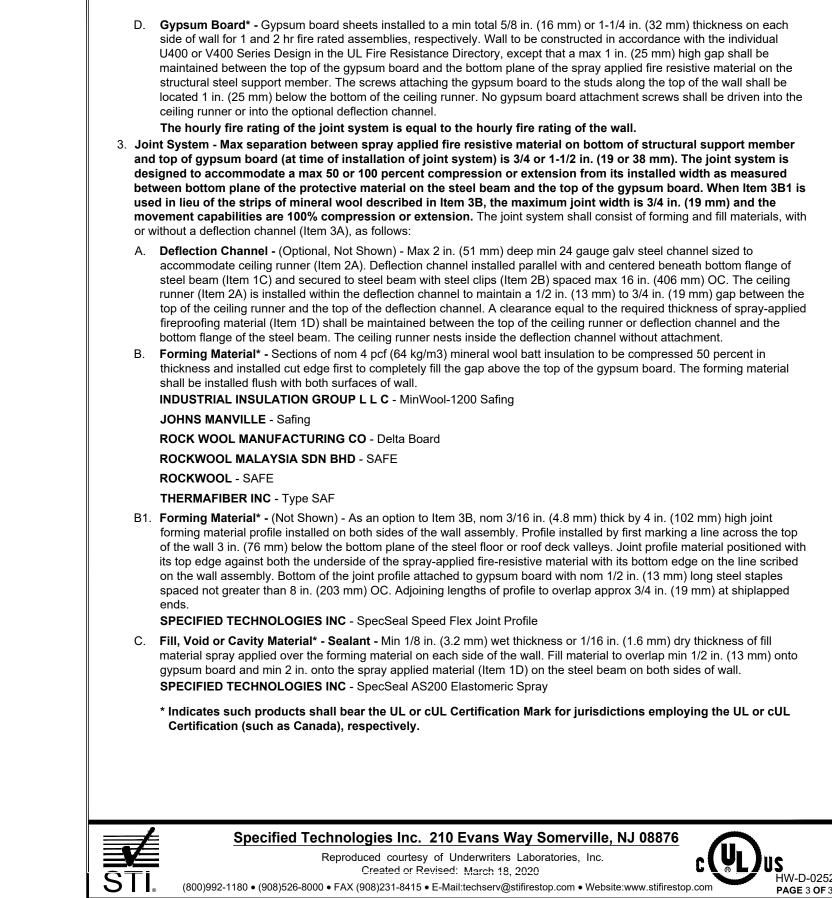
for 1 hr fire rated assemblies and 1-3/8 in. (35 mm) for 2 hr fire rated assemblies. GCP APPLIED TECHNOLOGIES INC - Type MK-6/HY, MK-6/HYES, MK-65 and RG **ISOLATEK INTERNATIONAL** - Type 300 or Type II

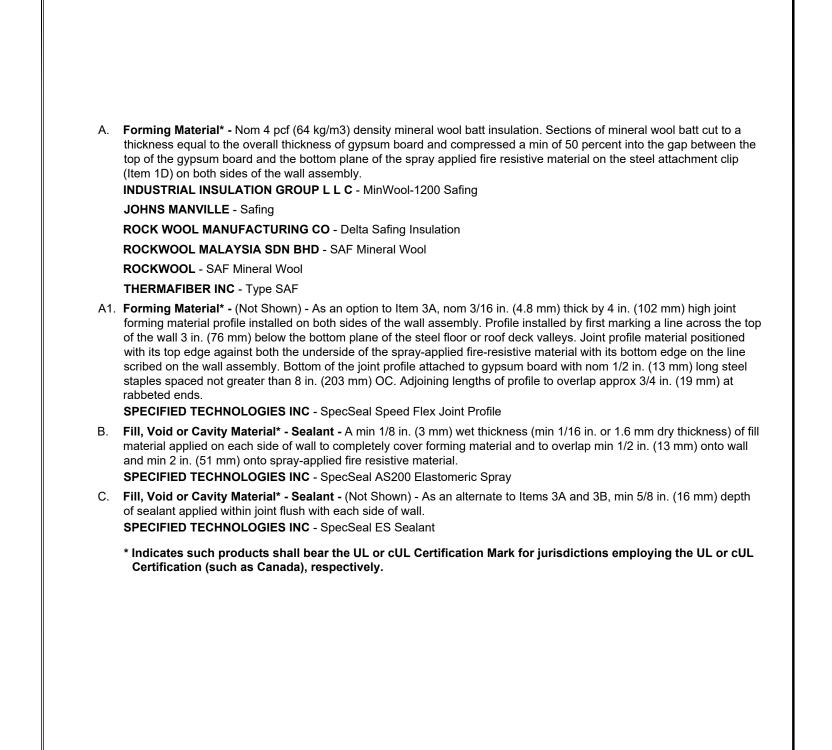
- **SOUTHWEST FIREPROOFING PRODUCTS CO** Type 5, Type 5GP The hourly fire rating of the roof assembly shall be equal or greater than the hourly fire rating of the wall
- Wall Assembly The 1 or 2 hr fire rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features: A. Steel Floor and Ceiling Runners - Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with min 1-1/4 in. (32 mm) to max 3 in. (76 mm) flanges. Flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width. Ceiling runner

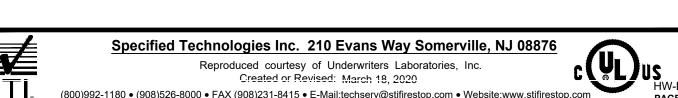
is secured to steel attachment clip (Item 1D) with steel fasteners or welds spaced max 24 in. (610 mm) OC. Ceiling

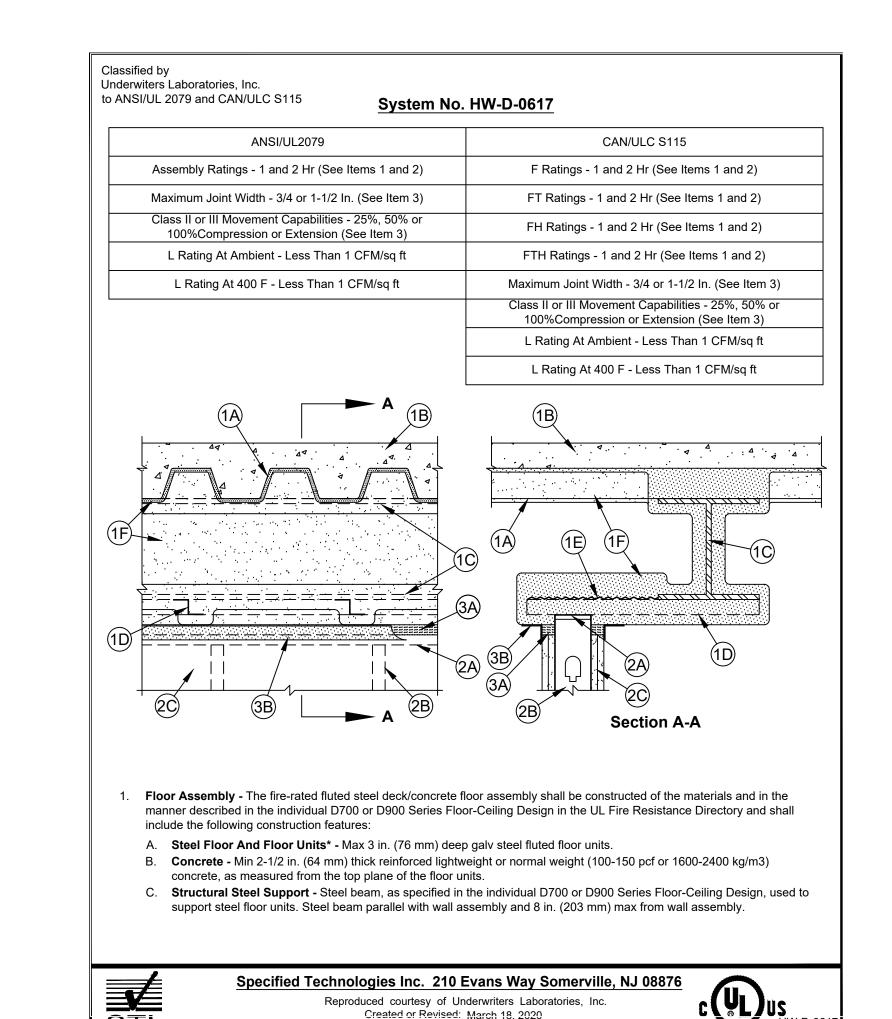
- runner to be installed parallel with structural steel support and located such that a max clearance of 8 in. (203 mm) is present between the finished wall and the flange of the steel beam (Item 1C). A1. Light Gauge Framing\* - Slotted Ceiling Runner - Slotted ceiling runner may be used as an alternate to the ceiling runner in Item 2A. Slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel masonry anchors spaced max 24 in. (610 mm) OC.
- BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS SLP-TRK, SLPTRK325 CALIFORNIA EXPANDED METAL PRODUCTS CO - CST, CST325 B. Studs - Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 1/2 in. to 1-1/4 in. (13 to 32 mm) less in length than assembly height with bottom nesting in and secured to floor runner. Studs to nest in ceiling runner without attachment.
- Gypsum Board\* Gypsum board sheets installed to a min total 5/8 in. (16 mm) or 1-1/4 in. (32 mm) thickness on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual U400, V400 or W400 Series Design in the UL Fire Resistance Directory except that a max 1-1/2 in. (38 mm) gap shall be maintained between the top of the gypsum board and the bottom plane of the spray applied fire resistive material on the steel attachment clip (Item 1D) on both sides of the wall assembly. The hourly fire rating of the joint system is equal to the hourly fire rating of the wall.
- Joint System Max separation between bottom plane of spray-applied fire resistive material on the steel attachment clip (Item 1D) and the top of the gypsum board is 3/4 or 1-1/2 in. (19 or 38 mm). When Item 3A1 is used in lieu of the mineral wool strips described in Item 3A, the maximum joint width is 3/4 in. (19 mm) and the movement capability of the joint system is 100 percent compression or extension. Otherwise, the movement capability of the joint system is 50 percent compression or extension when spray sealant (Item 3B) is used or 25 percent compression only when sealant (Item 3C) is used. The joint system shall consist of forming and fill materials, as follows:











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#### **GENERAL NOTES:**

- . Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
  - UL Fire Resistance Directory; Current Edition
  - NFPA 101 Life Safety Code
  - All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing** 

**DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

#### PROJECT NAME:

PROJECT\_NAME:

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### ARCHITECT/CONSULTANT:

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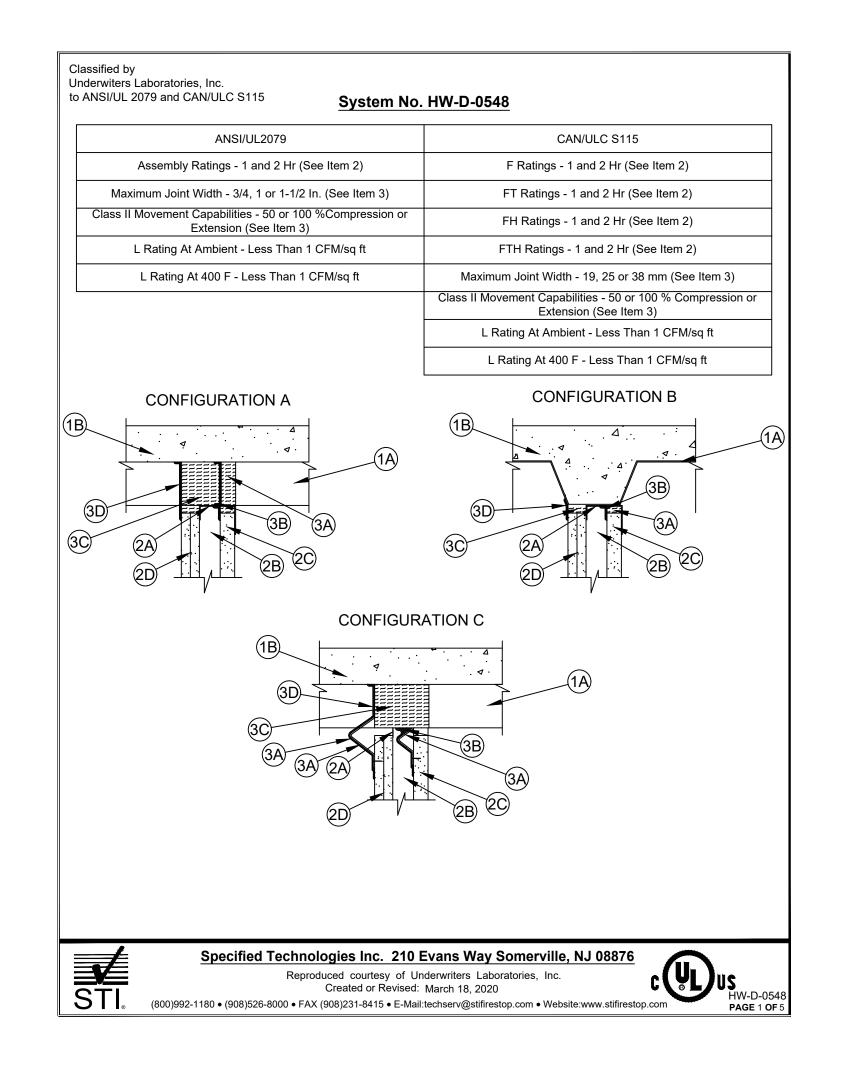
STI FIRESTOP SYSTEMS

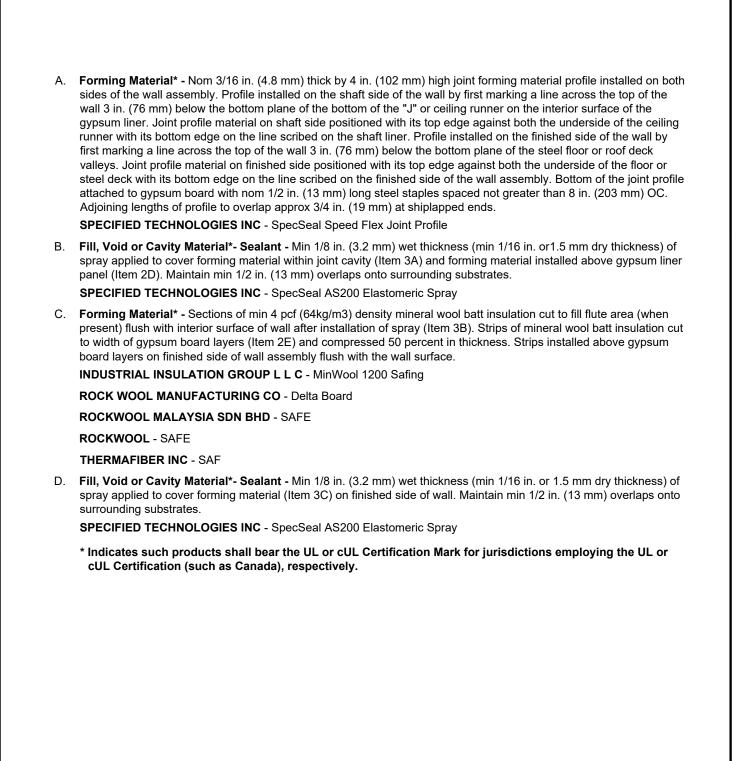
# Specified Technologies Inc.

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Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

Created or Revised: March 18, 2020

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Floor Assembly - The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the floor assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The floor assembly shall include the following construction features:

A. Steel Floor and Form Units\* - Max 3 in. (76 mm) deep galv steel fluted floor units. B. Concrete - Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units.

1A. Roof Assembly - (Not Shown) - As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction A. Steel Roof Deck - Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. Roof Insulation - Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the steel 1B. Floor Assembly - As an alternate to the floor assembly (Item 1), min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Floor may also be constructed of any UL Classified

hollow-core Precast Concrete Units\*. See Precast Concrete Units (CFTV) in Fire Resistance Directory for names of manufacturers. Shaft Wall Assembly - The 1 or 2 hr fire rated shaft wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

A. Floor and Ceiling Runners - "J"-shaped runner, min 2-1/2 in. (64 mm) wide with unequal legs of min 1-1/2 in. (38

mm) and min 2 in. (51 mm), fabricated from min 24 MSG galv steel. Runners positioned with short leg toward finished side of wall. Flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width. Runners attached to walls and floor with steel fasteners spaced max 24 in. (610 mm) OC. As an alternate to the "J"-shaped runner, a min 2-1/2 in (64 mm) wide by 1 in or 1 1/4 in (25 or 32 mm) deep channel formed from min 24 MSG galv steel may be used for the floor runner. Ceiling runner installed parallel with or perpendicular to direction of fluted steel deck and secured to steel deck valley withy steel fasteners or welds spaced max 24 in. (610 mm) OC.

A1. Floor And Ceiling Runners - As an alternate to Item 2A, floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel "C-H" studs. Flange height of ceiling runner shall be min 1/2 in. (13 mm) greater than nom joint width. Ceiling runner installed parallel with or perpendicular to direction of fluted steel deck and secured with steel masonry anchors or welds spaced max 24 in. (610 mm) OC. A2. Light Gauge Framing\* - Slotted Ceiling Track - (for use in Configuration A Only) As an alternate to Item 2A,

slotted ceiling track shall consist of galv steel channels with slotted flanges. Slotted ceiling track sized to accommodate steel "C-H" studs (Item 2C). Attached to concrete at ceiling with steel fasteners spaced max 12 in. OC BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS - SLP-TRK, SLPTRK325 CALIFORNIA EXPANDED METAL PRODUCTS CO - CST, CST325

MARINO/WARE, DIV OF WARE INDUSTRIES INC - Type SLT RAM SALES L L C - RAM Slotted Track SCAFCO STEEL STUD MANUFACTURING CO

**CLARKDIETRICH BUILDING SYSTEMS - Type SLT, SLT-H** 

TELLING INDUSTRIES L L C - True-Action Deflection Track A3. Light Gauge Framing\* - Slotted Ceiling Runner - As an alternate to the ceiling runner in Items 2A through 2A3, slotted ceiling runner to consist of galv steel channel with 3-1/4 in. (83 mm) high slotted flanges sized to accommodate steel studs (Item 2B). Ceiling runner installed parallel or perpendicular with direction of fluted steel deck and secured to steel deck valley with steel fasteners or welds spaced max 24 in. (610 mm) OC. BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS - SLPTRK325

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end panels attached to long leg of "J" runner (Item 2A) with 1-5/8 in. (41 mm) long Type S steel screws spaced max . **Gypsum Board\*** - Gypsum board sheets, 1/2 or 5/8 in. (13 or 16 mm) thick, applied vertically or horizontally in one or two layers on finished side of wall as specified in the individual U400 or V400-Series Wall and Partition Design. A max 1 in. (25 mm) gap shall be maintained between the top of the gypsum board and the bottom surface of the concrete floor. The screws attaching the gypsum board layers to the C-H studs shall be located 1 in. (25 mm) below the bottom of the slotted ceiling track (Item 2C). No gypsum board attachment screws are to penetrate the slotted ceiling track. The hourly fire rating of the joint system is equal to the hourly fire rating of the wall. Joint System - Max separation between bottom of floor and top of liner panel (Item 2C) and between bottom of floor and top of gypsum board sheets (Item 2D) at time of installation of joint system 1-1/2 in. (38 mm). The joint system is designed to accommodate a maximum 50 percent compression or extension from its installed width. The joint system consists of forming material and sealant, as follows: A. Forming Material\* - In floor or roof assembly constructed with steel fluted floor units, compression-fit a minimum 1 in. (25 mm) depth of nom 4 pcf (64 kg/m3) mineral wool batt insulation into far recess of flute valley as a permanent form. Strips of mineral wool batt insulation cut to width of gypsum liner panel (Item 2C) and compressed 50 percent in thickness. Strip installed between top of gypsum liner panel and bottom of steel ceiling runner. INDUSTRIAL INSULATION GROUP L L C - MinWool 1200 Safing JOHNS MANVILLE - Safing **ROCK WOOL MANUFACTURING CO - Delta Board ROCKWOOL MALAYSIA SDN BHD** - SAFE **ROCKWOOL** - SAFE THERMAFIBER INC - SA B. Fill, Void or Cavity Material\*- Sealant - Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or 1.5 mm dry thickness) of spray applied to cover mineral wool batt insulation within joint cavity (when present; Item 3A) and mineral wool batt installed above gypsum liner panel (Item 2C). Maintain min 1/2 in. (13 mm) overlaps onto surrounding substrates. SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray Forming Material\* - Sections of min 4 pcf (64kg/m3) density mineral wool batt insulation cut to fill flute area (when present) flush with interior surface of wall after installation of spray (Item 3B). Strips of mineral wool batt insulation cut to width of gypsum board layers (Item 2D) and compressed 50 percent in thickness. Strips installed above gypsum board layers on finished side of wall assembly flush with the wall surface. INDUSTRIAL INSULATION GROUP L L C - MinWool 1200 Safing JOHNS MANVILLE - Safing **ROCK WOOL MANUFACTURING CO - Delta Board ROCKWOOL MALAYSIA SDN BHD** - SAFE ROCKWOOL - SAFE **THERMAFIBER INC - SAF** 

B. Steel Studs - "C-H"-shaped steel studs to be min 2-1/2 in. (64 mm) wide and formed of min 24 MSG galv steel. For

configuration A studs cut 1/2 to 1-1/4 in. (13 to 32 mm) less in length than assembly height or for configuration B studs

cut 1 to 1-1/2 in. (25 to 38 mm) less in length than assembly height with bottom nesting in and resting on floor runner

gypsum board liner panels (Item 2D), studs secured to flange of floor runner on finished side of wall with No. 6 by 1/2

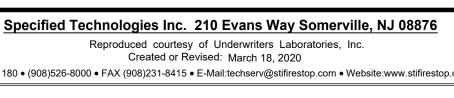
in. (13 mm) long self-drilling, self-tapping steel screws. Studs secured to flange of slotted ceiling track on finished side

and with top nesting in ceiling runner or slotted ceiling track. Studs spaced 24 in. (610 mm) OC. After installation of

of wall only with No. 8 by 1/2 in. (13 mm) long self-drilling, self-tapping wafer head steel screws at slot midheight.

Gypsum Board\* - 1 in. (25 mm) thick by 24 in. (610 mm) wide gypsum board liner panels. Panels cut 1 in. (25 mm)

less in length than floor to ceiling height. Vertical edges inserted in "H"-shaped section of "C-H" studs. Free edge of



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surrounding substrates SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray C. Forming Material\* - Strips of min 4 pcf (64kg/m3) density mineral wool batt insulation cut to width of gypsum board layers (Item 2D) and compressed 50 percent in thickness. Strips installed above gypsum board layers on finished side of wall assembly flush with the wall surface. INDUSTRIAL INSULATION GROUP L L C - MinWool 1200 Safing JOHNS MANVILLE - Safing **ROCK WOOL MANUFACTURING CO - Delta Board ROCKWOOL MALAYSIA SDN BHD** - SAFE **ROCKWOOL** - SAFE THERMAFIBER INC - SAF D. Fill, Void or Cavity Material\*- Sealant - Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or 1.5 mm dry thickness) of spray applied to cover mineral wool batt insulation on finished side of wall. Maintain min 1/2 in. (13 mm) overlaps onto SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray Joint System - Max separation between bottom of floor and top of liner panel (Item 2C) and between bottom of floor and top of gypsum board sheets (Item 2D) at time of installation of joint system is 3/4 or 1 in. (19 or 25 mm). The joint system is designed to accommodate a maximum 100 percent compression or extension for 3/4 in. (19 mm) wide joints and a maximum 100 percent compression only for 1 in. (25 mm) wide joints, from its installed width. The joint system consists of the following: Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876 Reproduced courtesy of Underwriters Laboratories Inc. Created or Revised: March 18, 2020 (800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techserv@stifirestop.com • Website:www.stifirestop.com

D. Fill, Void or Cavity Material\*- Sealant - Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or 1.5 mm dry thickness) of

Joint System - Max separation between bottom of floor and top of liner panel (Item 2C) and between bottom of

system is designed to accommodate a maximum 50 percent compression or extension from its installed width.

A. Forming Material\* - Strips of min 4 pcf (64kg/m3) density mineral wool batt insulation cut to width of gypsum liner

panel (Item 2C) and compressed 50 percent in thickness. Strip installed between top of gypsum liner panel and

B. Fill, Void or Cavity Material\*- Sealant - Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or 1.5 mm dry thickness) of

spray applied to cover mineral wool batt insulation within joint cavity. Maintain min 1/2 in. (13 mm) overlaps onto

floor and top of gypsum board sheets (Item 2D) at time of installation of joint system is 1-1/2 in. (38 mm). The joint

SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray

The joint system consists of forming material and sealant, as follows:

**ROCK WOOL MANUFACTURING CO - Delta Board** 

**ROCKWOOL MALAYSIA SDN BHD** - SAFE

JOHNS MANVILLE - Safing

THERMAFIBER INC - SAF

**ROCKWOOL** - SAFE

INDUSTRIAL INSULATION GROUP L L C - MinWool 1200 Safing

spray applied to cover mineral wool batt insulation on finished side of wall. Maintain min 1/2 in. (13 mm) overlaps onto

D. Gypsum Board\* - Gypsum board sheets, 1/2 or 5/8 in, (13 or 16 mm) thick, applied vertically or horizontally in one or two layers on finished side of wall as specified in the individual U400 or V400-Series Wall and Partition Design. A max 1 in. (25 mm) gap shall be maintained between the top of the gypsum board and the bottom surface of the concrete floor, for max 3/4 in. joints. A max 1-1-/2 in. (38 mm) gap shall be maintained between the top of the gypsum board and the bottom surface of the concrete floor for max 1-1/2 in. joints. The screws attaching the gypsum board layers to the C-H studs shall be located 1 in. (25 mm) below the bottom of the ceiling runner. No gypsum board attachment screws are to

Joint System - Max separation between bottom of floor and top of gypsum board (Item 4D) is 3/4 in. (19 mm). The joint system is designed to accommodate a max 25, 50 or 100 percent compression or extension from its installed width. When Item 5A1 is used in lieu of the strips of mineral wool described in Item 5A, the movement capabilities are 100% compression or extension. When Item 5C & 5D are used in lieu of the strips of mineral wool described in Item 5A, the movement capabilities are 25% compression or extension. The joint system consists of a forming material and a fill

material between the top of the gypsum board and the bottom of the floor, as follows: A. Forming Material\* - Min 4 pcf (64 kg/m3) density mineral wool batt insulation cut into strips to fill the gap between the top of gypsum liner panel and bottom of the ceiling runner or track (Item 4 or 4A). The width of the strips shall be equal to the total thickness of the gypsum board liner panel. The strips of mineral wool are compressed 50 percent. Strips of mineral wool batt insulation cut to width of gypsum board layers (Item 4D) and compressed 50 percent in thickness and firmly packed into the gap between the top of the gypsum board and the bottom of the mineral wool batt sections (Item 3) or steel floor or roof units (Item 1A or 1AA). Strips installed above gypsum board layers on finished side of wall assembly flush with the wall surface.

INDUSTRIAL INSULATION GROUP L L C - MinWool-1200 Safing

SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray

Certification (such as Canada), respectively.

JOHNS MANVILLE - Safing ROCK WOOL MANUFACTURING CO - Delta Board **ROCKWOOL MALAYSIA SDN BHD** - SAFE

**ROCKWOOL** - SAFE

3/4 in. (19 mm) at shiplapped ends.

THERMAFIBER INC - Type SAF A1. Forming Material\* - (not shown) Nom 3/16 in. (4.8 mm) thick by 4 in. (102 mm) high joint forming material profile installed on both sides of the wall assembly. Profile installed on the shaft side of the wall by first marking a line across the top of the wall 3 in. (76 mm) below the bottom plane of the bottom of the "J" or ceiling runner on the interior surface of the gypsum liner. Joint profile material on shaft side positioned with its top edge against both the underside of the ceiling runner with its bottom edge on the line scribed on the shaft liner. Profile installed on the finished side of the wall by first marking a line across the top of the wall 3 in. (76 mm) below the bottom plane of the mineral wool batt sections (Item 3) or steel floor or roof units (Item 1A or 1AA). Joint profile material on finished side positioned with its top edge against both the underside of the mineral wool (Item 3) or steel floor or roof units (Item 1A) with its bottom edge on the line scribed on the finished side of the wall assembly. Bottom of the joint profile attached to gypsum board with nom 1/2

SPECIFIED TECHNOLOGIES INC - SpecSeal Speed Flex Joint Profile B. Fill, Void or Cavity Material\* - Sealant - Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or 1.6 mm dry thickness) applied to cover forming material (Item 5A or 5A1) with a min 1/2 in. (13 mm) overlap onto the gypsum board, steel strapping and steel deck on both sides of wall. Spray applied to cover mineral wool batt insulation on finished side of

in. (13 mm) long steel staples spaced not greater than 8 in. (203 mm) OC. Adjoining lengths of profile to overlap approx

C. Bond Breaker Tape (Optional, Not Shown) - When Item 5D is used, polyethylene tape supplied in rolls. Tape applied to flanges of slotted ceiling track (Item 2D) to prevent bonding of the sealant at points other than the top and bottom of

D. Fill, Void or Cavity Material\* - Sealant (Optional, Not Shown) - As an alternate to Item 5A or 5A1, min 1 in. (25 mm) depth of sealant to be installed to fill linear gap between top of gypsum board liner panel (Item 4C) and top inside surface of slotted ceiling runner or track (Item 4A or 4A1) prior to installation of gypsum board sheets on finished side of wall. SPECIFIED TECHNOLOGIES INC - SpecSeal ES Elastomeric Sealant. When sealant is used, the movement capability of the joint is limited to 25 percent in compression or extension. \* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL

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 Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.

3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

**GENERAL NOTES:** 

1. Refer to section 07 84 00 of the

specifications. For Quality Control

requirements, refer to the Quality

Control portion of the specification.

approved alternate details shall be

dimensions need to be verified for

compliance with the details, including

2. Details shown are typical details. If

field conditions do not match

utilized. Field conditions and

but not limited to the following:

requirements of typical details,

 UL Fire Resistance Directory; Current Edition

NFPA 101 Life Safety Code

 All governing local and regional building codes

5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing** 

**DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

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ARCHITECT/CONSULTANT:

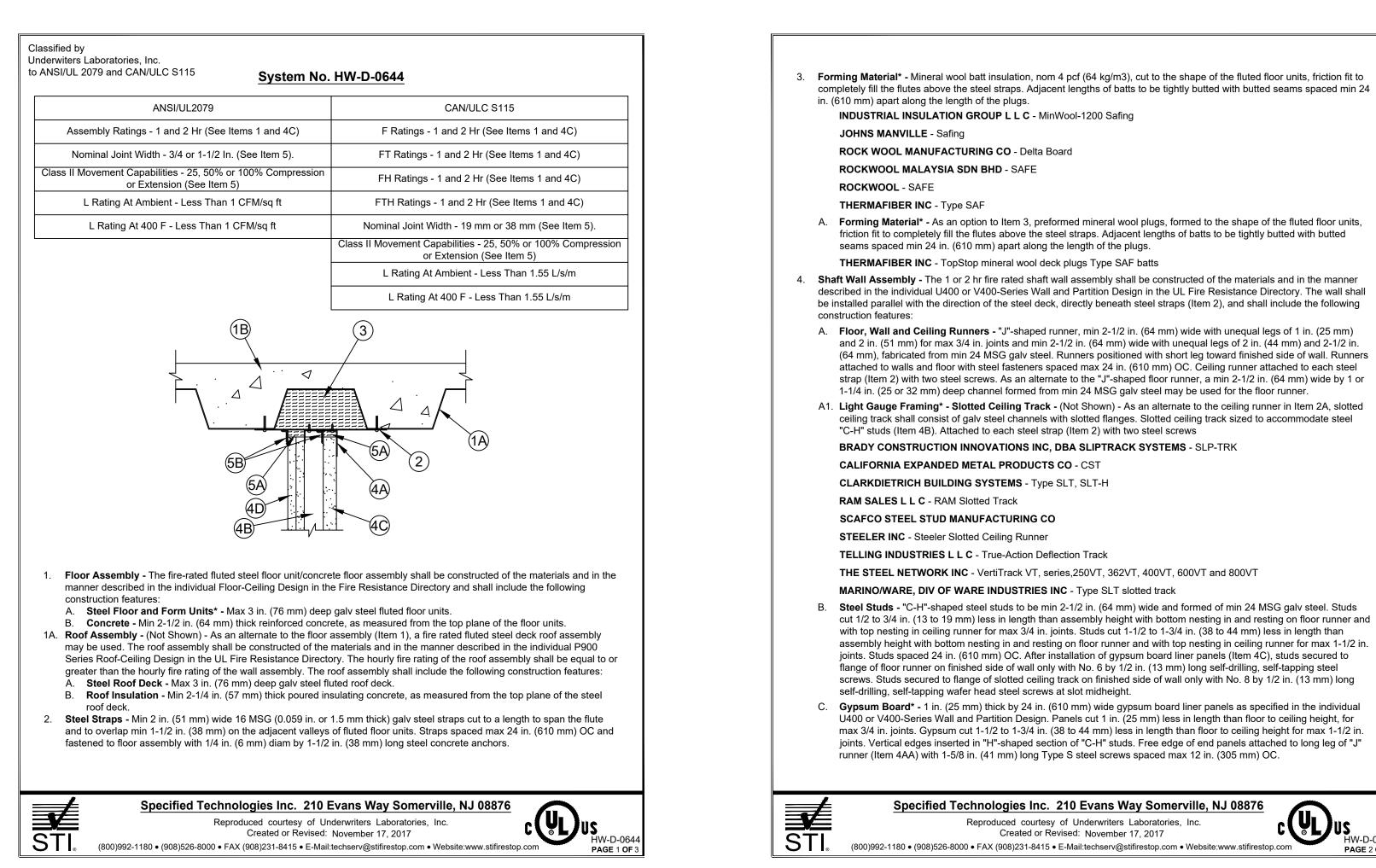
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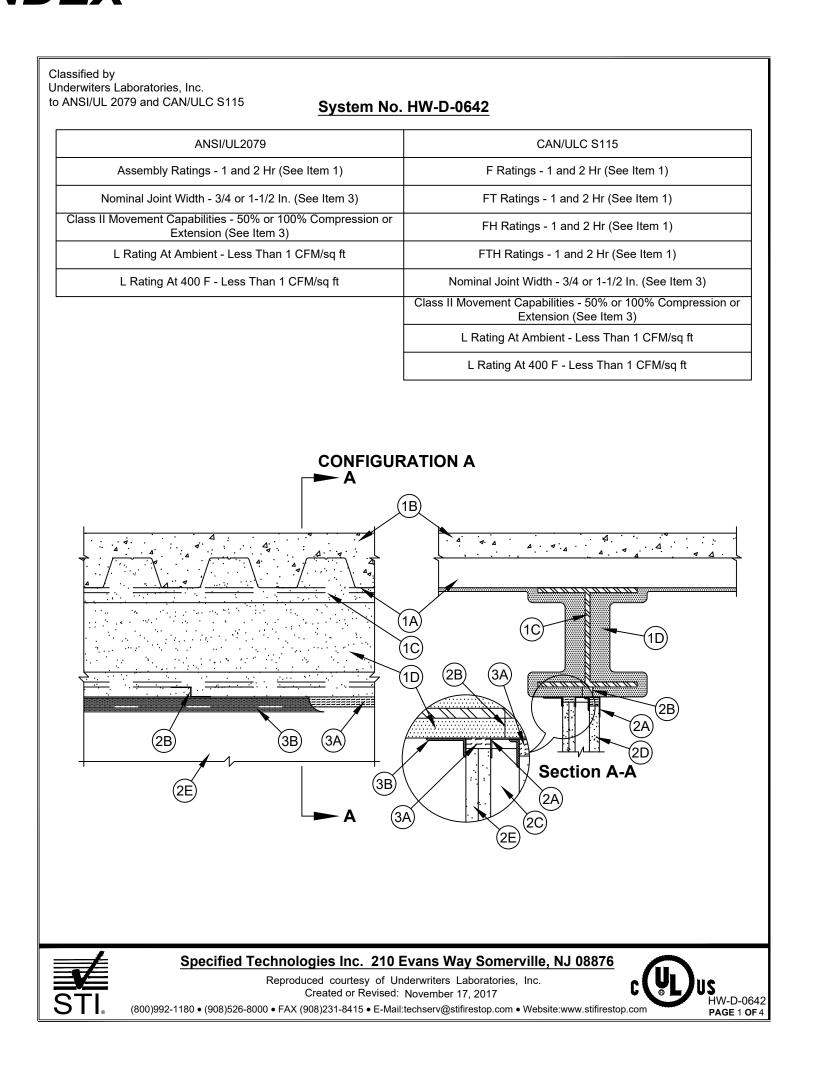
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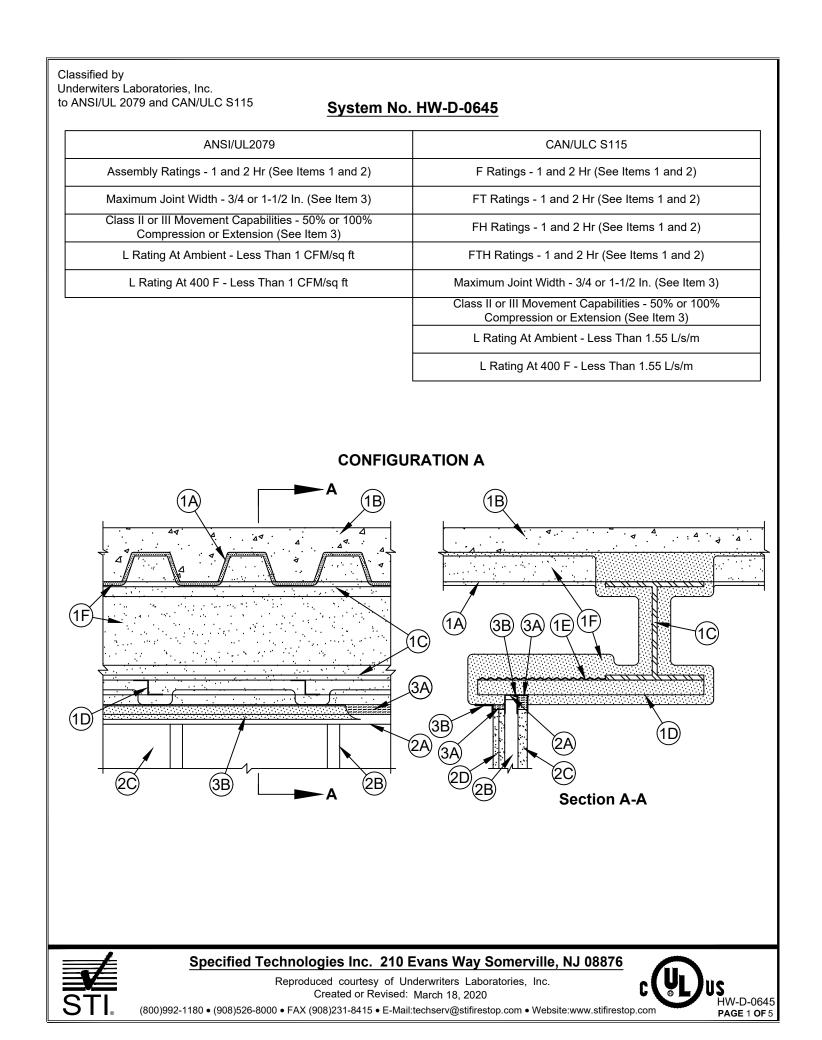
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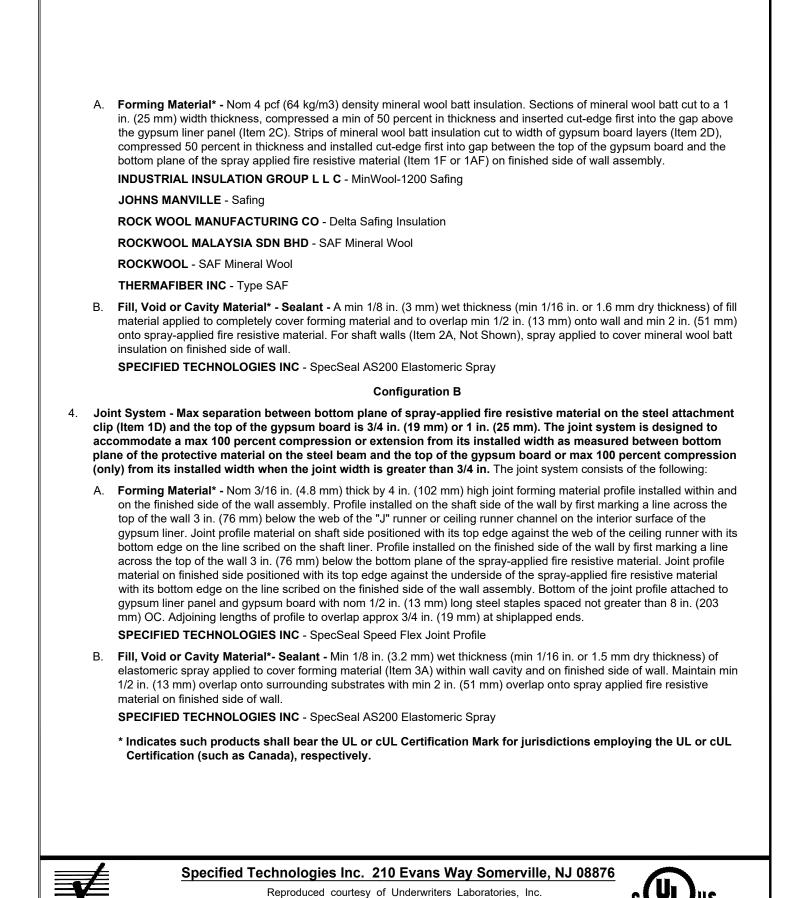


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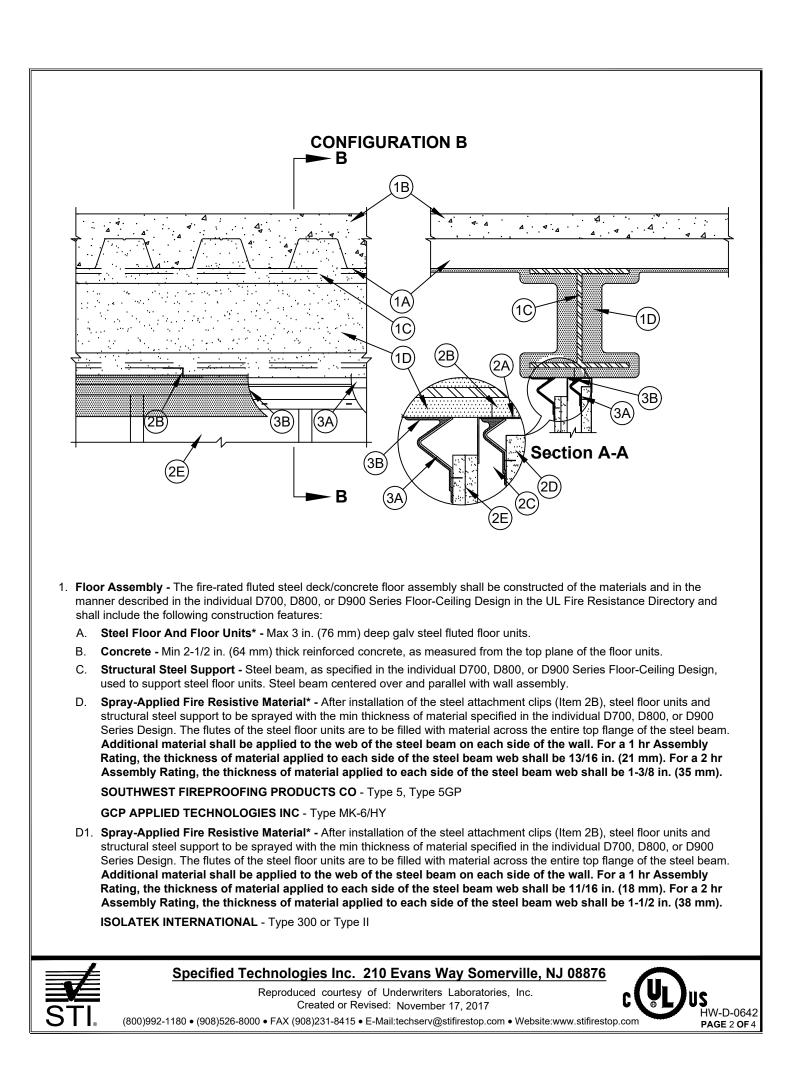


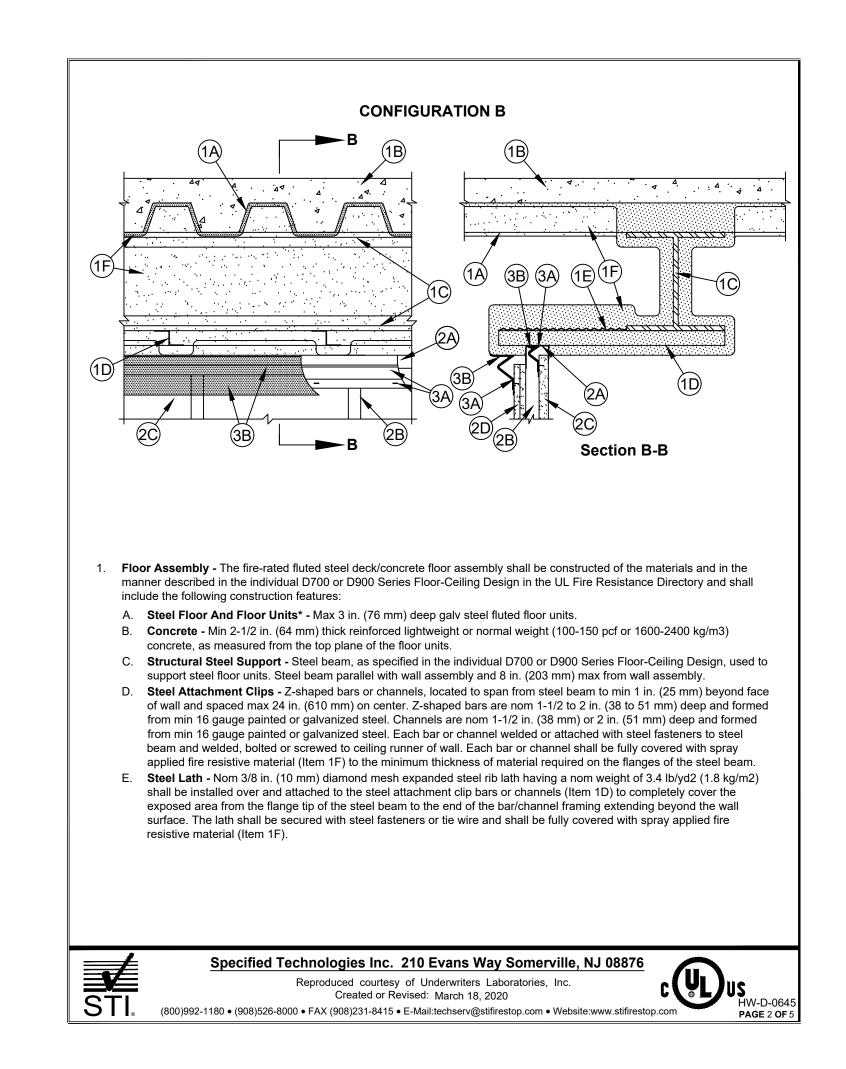


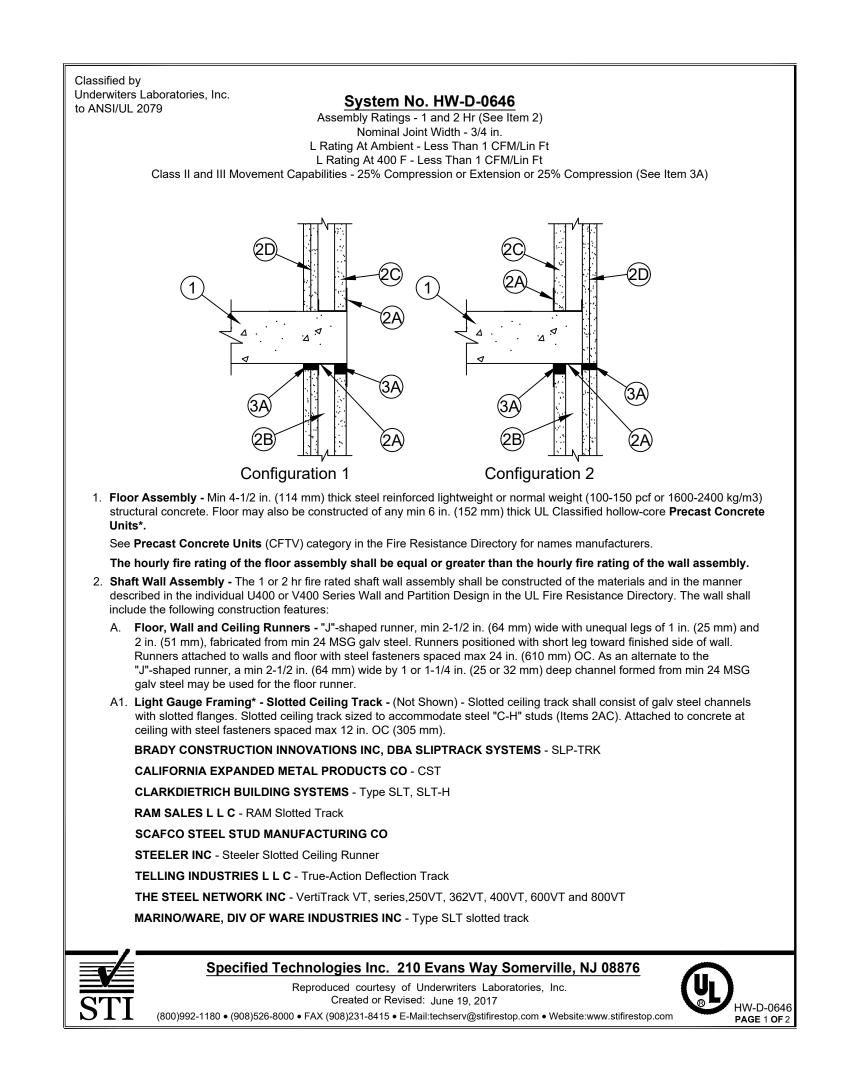


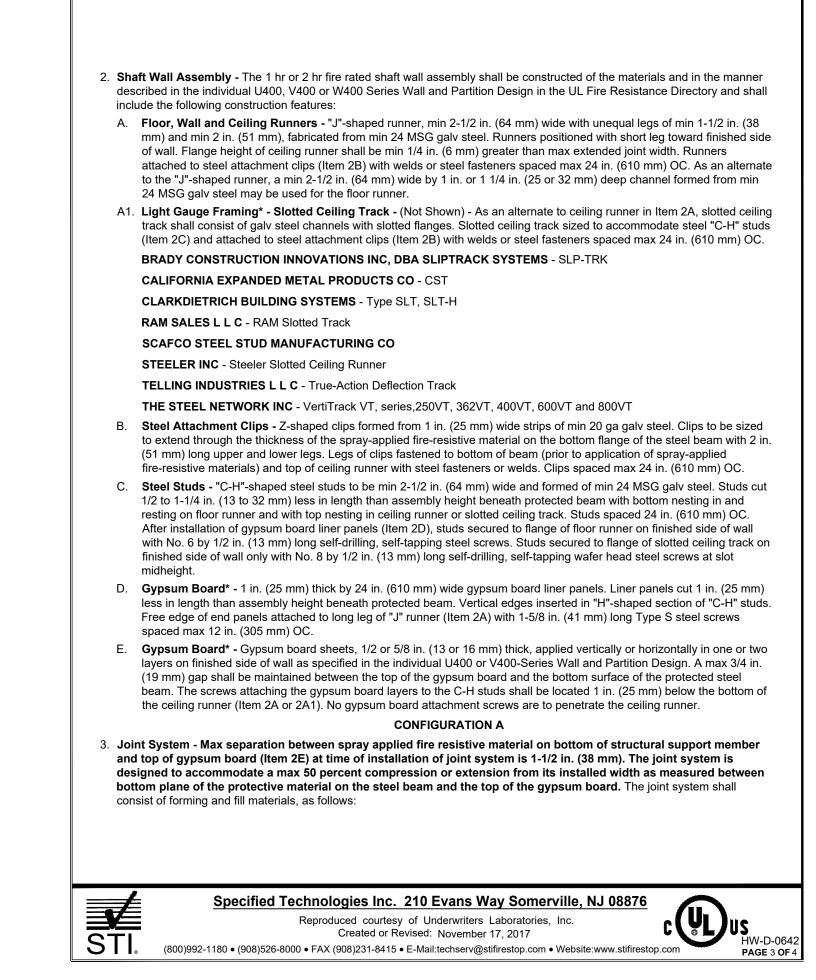


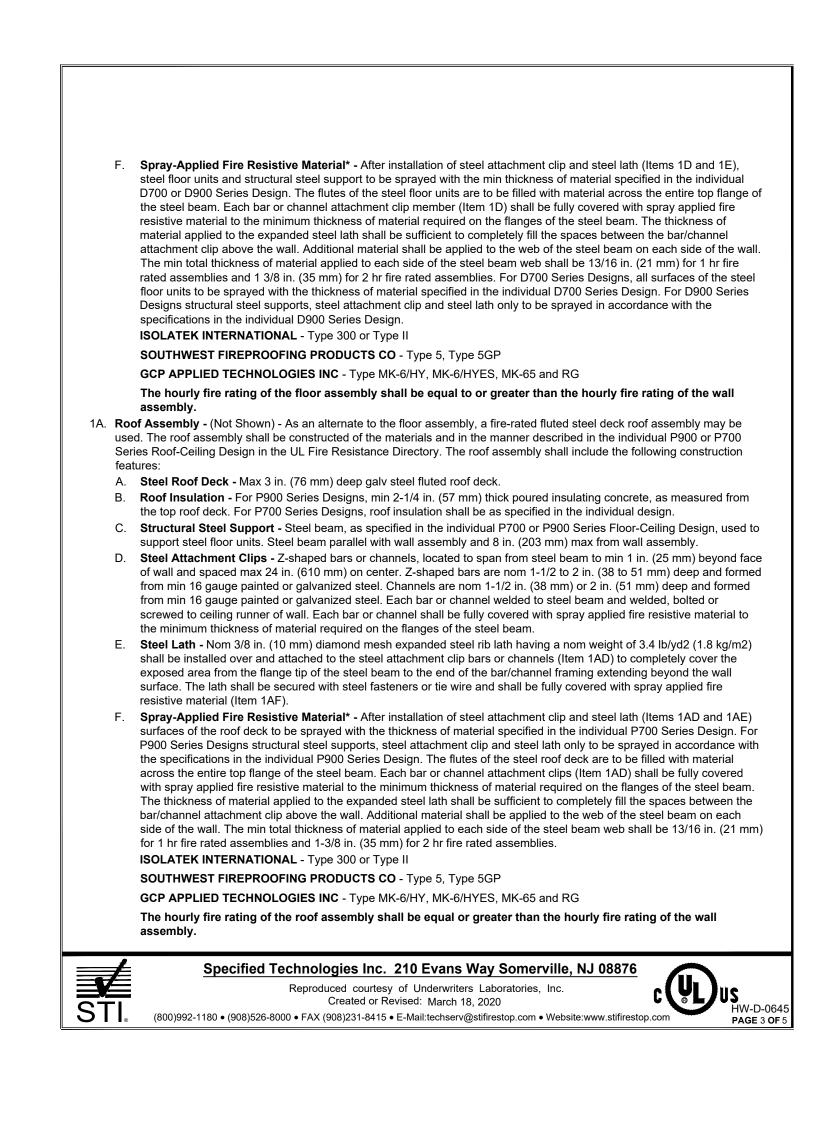
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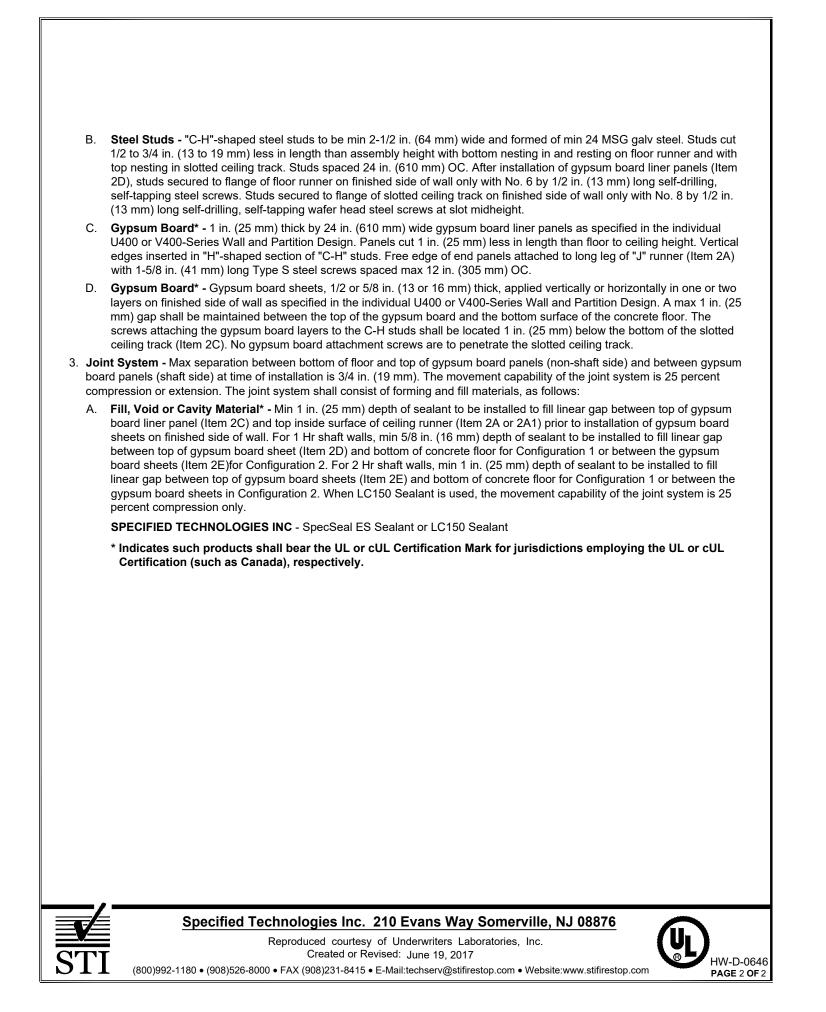












A. Forming Material\* - Sections of nom 4 pcf (64 kg/m3) mineral wool batt insulation to be compressed 50 percent in thickness and installed cut edge first to completely fill the gap above the top of the liner panels (Item 2D) and the gap above the top of the gypsum board (Item 2E). INDUSTRIAL INSULATION GROUP L L C - MinWool-1200 Safing JOHNS MANVILLE - Safing ROCK WOOL MANUFACTURING CO - Delta Board **ROCKWOOL MALAYSIA SDN BHD** - SAF ROCKWOOL - SAFE **THERMAFIBER INC** - Type SAF B. Fill, Void or Cavity Material\* - Sealant - Min 1/8 in. (3.2 mm) wet thickness or 1/16 in. (1.6 mm) dry thickness of fill material spray applied over the forming material within the stud cavity prior to installing the finished surface gypsum board and on the finished side of the wall. Fill material to overlap min 1/2 in. (13 mm) onto gypsum board liner panel and ceiling runner within wall cavity, min 1/2 in. (13 mm) onto the finished surface gypsum board and min 2 in. (51 mm) onto the spray applied material (Item 1D) on the steel beam. SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray . Joint System - Max separation between bottom plane of spray-applied fire resistive material on the steel attachment clip (Item 1D) and the top of the gypsum board is 3/4 in. (19 mm) or 1 in. (25 mm). The joint system is designed to accommodate a max 100 percent compression or extension from its installed width as measured between bottom plane of the protective material on the steel beam and the top of the gypsum board or max 100 percent compression (only) from its installed width when the joint width is greater than 3/4 in. The joint system consists of the following: A. Forming Material\* - Nom 3/16 in. (4.8 mm) thick by 4 in. (102 mm) high joint forming material profile installed within and on the finished side of the wall assembly. Profile installed on the shaft side of the wall by first marking a line across the top of the wall 3 in. (76 mm) below the web of the "J" runner or ceiling runner channel on the interior surface of the gypsum liner. Joint profile material on shaft side positioned with its top edge against the web of the ceiling runner with its bottom edge on the line scribed on the shaft liner. Profile installed on the finished side of the wall by first marking a line across the top of the wall 3 in. (76 mm) below the bottom plane of the spray-applied fire resistive material. Joint profile material on finished side positioned with its top edge against the underside of the spray-applied fire resistive material with its bottom edge on the line scribed on the finished side of the wall assembly. Bottom of the joint profile attached to gypsum liner panel and gypsum board with nom 1/2 in. (13 mm) long steel staples spaced not greater than 8 in. (203 mm) OC. Adjoining lengths of profile to overlap approx 3/4 in. (19 mm) at shiplapped ends. SPECIFIED TECHNOLOGIES INC - SpecSeal Speed Flex Joint Profile B. Fill, Void or Cavity Material\*- Sealant - Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or 1.5 mm dry thickness) of elastomeric spray applied to cover forming material (Item 3A) within wall cavity and on finished side of wall. Maintain min 1/2 in. (13 mm) overlap onto surrounding substrates with min 2 in. (51 mm) overlap onto spray applied fire resistive material on finished side of wall. SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray \* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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Shaft Wall Assembly - The 1 or 2 hr fire rated shaft wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory. The wall shall include the following construction features: A. Floor, Wall and Ceiling Runners - "J"-shaped runner, min 2-1/2 in. (64 mm) wide with unequal legs of 1 in. (25 mm) and 2 in. (51 mm), fabricated from min 24 MSG galv steel. Runners positioned with short leg toward finished side of wall. Runners attached to walls and floor with steel fasteners spaced max 24 in. (610 mm) OC. Flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width. Ceiling runner is secured to steel attachment clip (Item 1D or 1AD) with steel fasteners or welds spaced max 24 in. (610 mm) OC. Ceiling runner to be installed parallel with structural steel support and located such that a max clearance of 8 in. (203 mm) is present between the finished wall and the flange of the steel beam (Item 1C). As an alternate to the "J"-shaped floor runner, a min 2-1/2 in. (64 mm) wide by 1 or 1-1/4 in. (25 or 32 mm) deep channel formed from min 24 MSG galv steel may be used. A1. Light Gauge Framing\* - Slotted Ceiling Track - (Not Shown) - As an alternate to ceiling runner in Item 2A, slotted ceiling track shall consist of galv steel channels with slotted flanges. Slotted ceiling track sized to accommodate steel "C-H" studs (Items 2B). Slotted ceiling track is secured to steel attachment clip (Item 1D or 1AD) with steel fasteners or welds spaced max 24 in. (610 mm) OC. Ceiling runner to be installed parallel with structural steel support and located such that a max clearance of 8 in. (203 mm) is present between the finished wall and the flange of the steel beam (Item BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS - SLP-TRK, SLPTRK325 CALIFORNIA EXPANDED METAL PRODUCTS CO - CST, CST325 CLARKDIETRICH BUILDING SYSTEMS - Type SLT, SLT-H RAM SALES L L C - RAM Slotted Track SCAFCO STEEL STUD MANUFACTURING CO STEELER INC - Steeler Slotted Ceiling Runner TELLING INDUSTRIES L L C - True-Action Deflection Track THE STEEL NETWORK INC - VertiTrack VT, series, 250VT, 362VT, 400VT, 600VT and 800VT MARINO/WARE, DIV OF WARE INDUSTRIES INC - Type SLT slotted track B. Steel Studs - "C-H"-shaped steel studs to be min 2-1/2 in. (64 mm) wide and formed of min 24 MSG galv steel. Studs cut 1/2 to 1-1/4 in. (13 to 32 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in slotted ceiling track. Studs spaced 24 in. (610 mm) OC. After installation of gypsum board liner panels (Item 2AD), studs secured to flange of floor runner on finished side of wall only with No. 6 by 1/2 in. (13 mm) long self-drilling, self-tapping steel screws. Studs secured to flange of slotted ceiling track on finished side of wall only with No. 8 by 1/2 in. (13 mm) long self-drilling, self-tapping wafer head steel screws at slot midheight. C. Gypsum Board\* - 1 in. (25 mm) thick by 24 in. (610 mm) wide gypsum board liner panels as specified in the individual U400 or V400-Series Wall and Partition Design. Panels cut 1 in. (25 mm) less in length than floor to ceiling height. Vertical edges inserted in "H"-shaped section of "C-H" studs. Free edge of end panels attached to long leg of "J" runner (Item 2AA) with 1-5/8 in. (41 mm) long Type S steel screws spaced max 12 in. (305 mm) OC. D. **Gypsum Board\* -** Gypsum board sheets, 1/2 or 5/8 in. (13 or 16 mm) thick, applied vertically or horizontally in one or two layers on finished side of wall as specified in the individual U400 or V400-Series Wall and Partition Design. A max 1 in. (25 mm) gap shall be maintained between the top of the gypsum board and the bottom surface of the concrete floor. The screws attaching the gypsum board layers to the C-H studs shall be located 1-1/2 in. (38 mm) below the bottom of the slotted ceiling track (Item 2AC). No gypsum board attachment screws are to penetrate the slotted ceiling track. The hourly fire rating of the joint system is equal to the hourly fire rating of the wall. Joint System - Max separation between bottom plane of spray-applied fire resistive material on the steel attachment clip (Item 1D) and the top of the gypsum board is 1-1/2 in. (38 mm). The movement capability of the joint system is 50 percent compression or extension. The joint system shall consist of forming and fill materials, as follows:

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#### **GENERAL NOTES:**

- . Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
  - UL Fire Resistance Directory; Current Edition
  - NFPA 101 Life Safety Code
  - All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing** 

**DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

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PROJECT\_LOCATION:

ARCHITECT/CONSULTANT:

ARCHITECT/CONSULTANT:

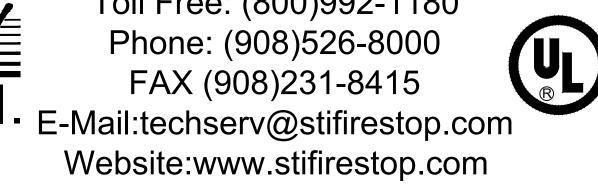
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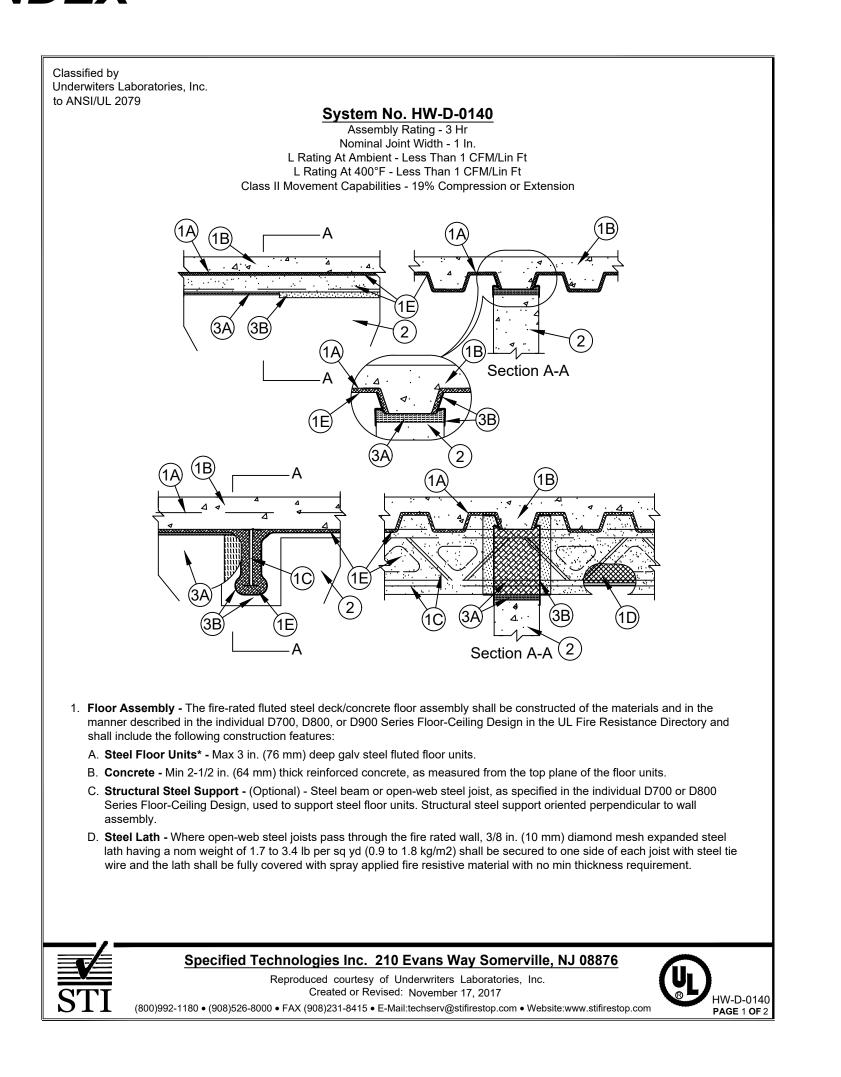
STI FIRESTOP SYSTEMS

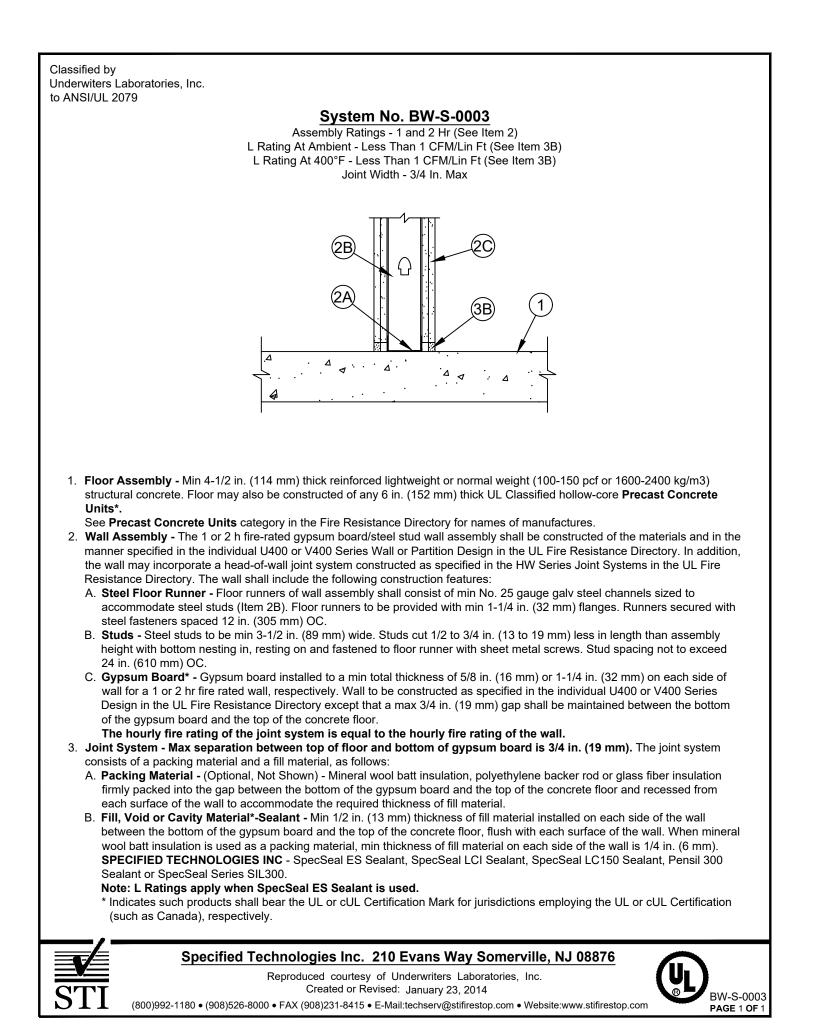
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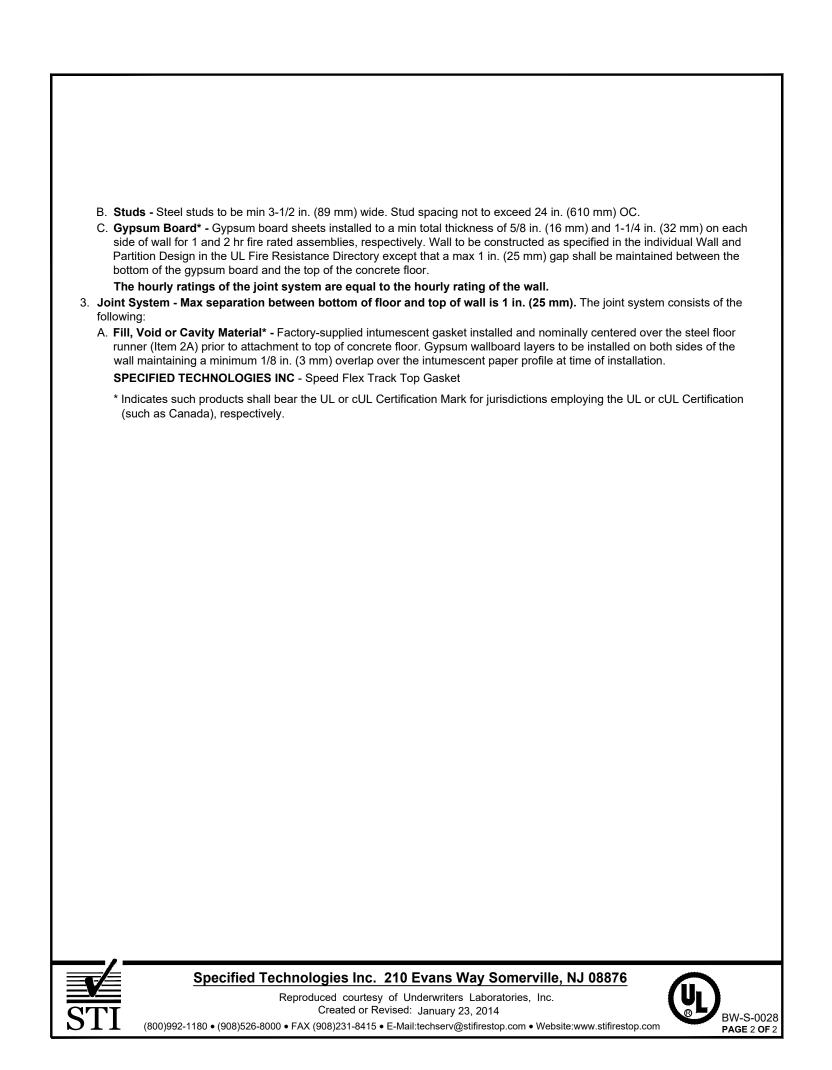


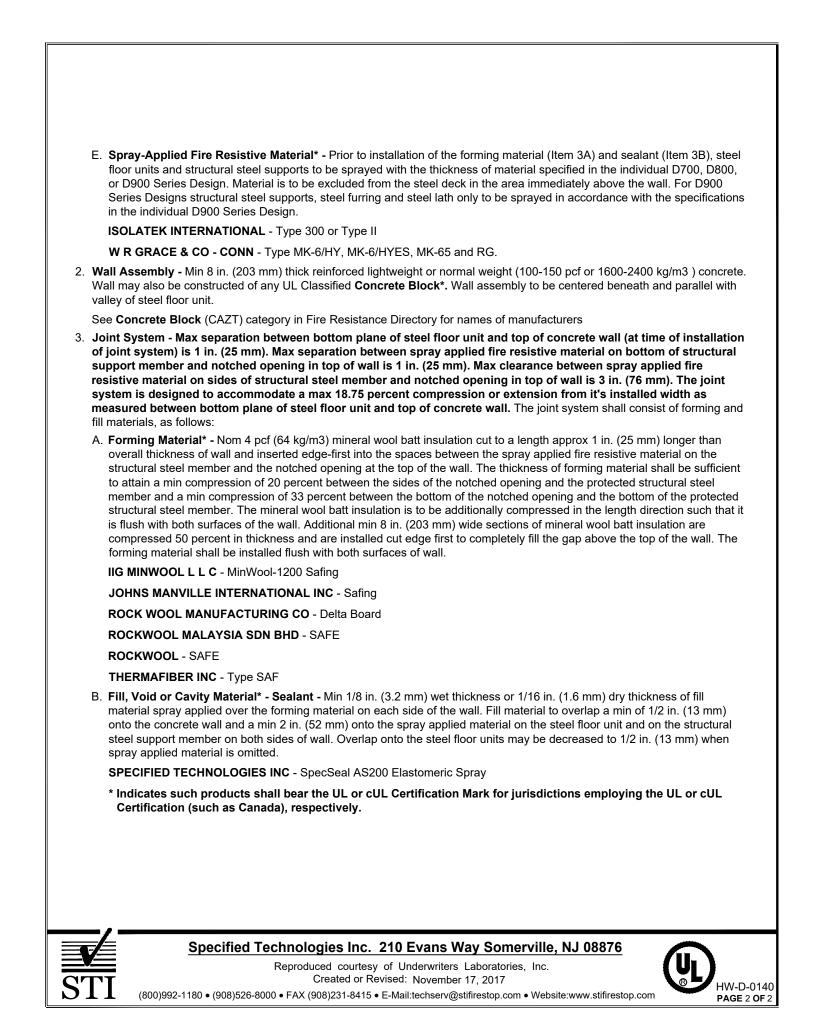
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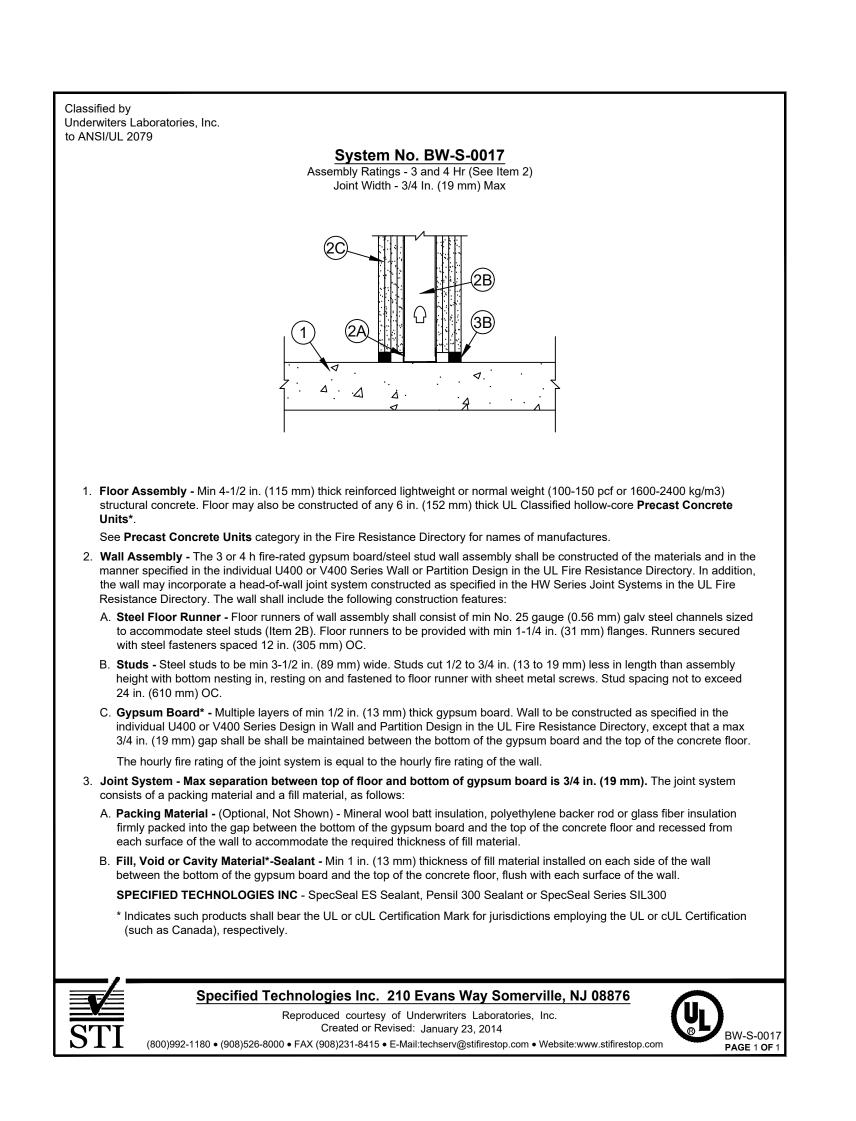


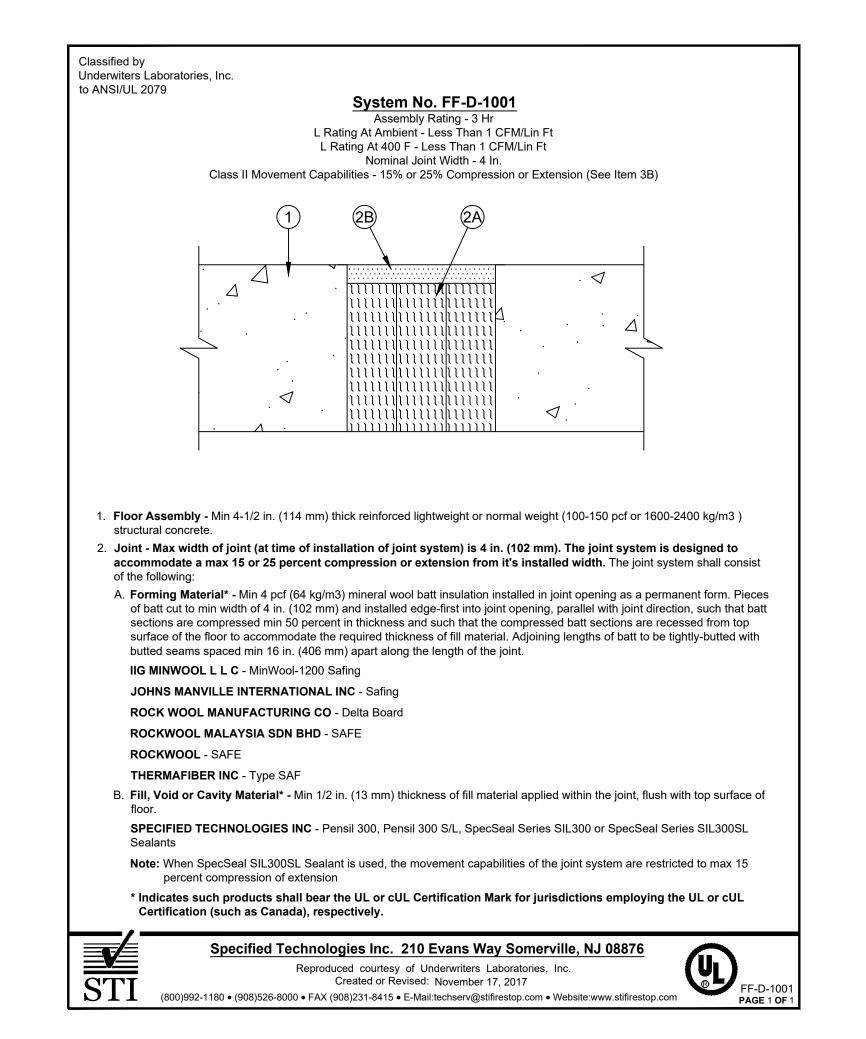


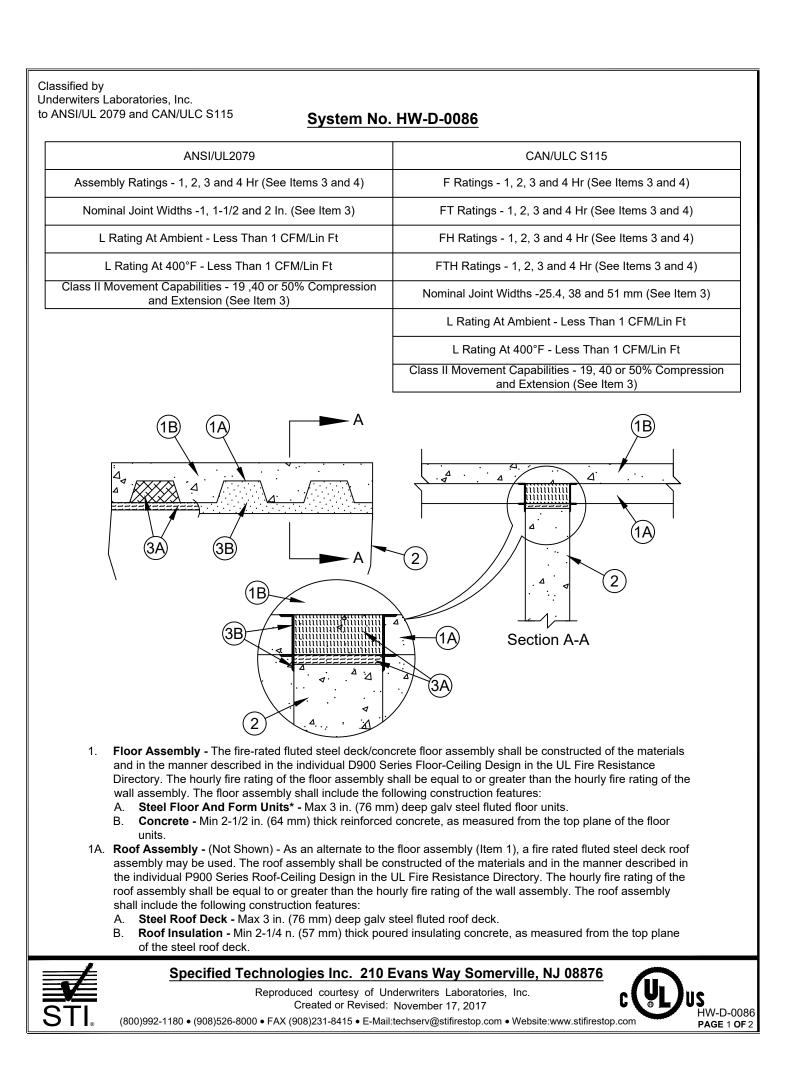


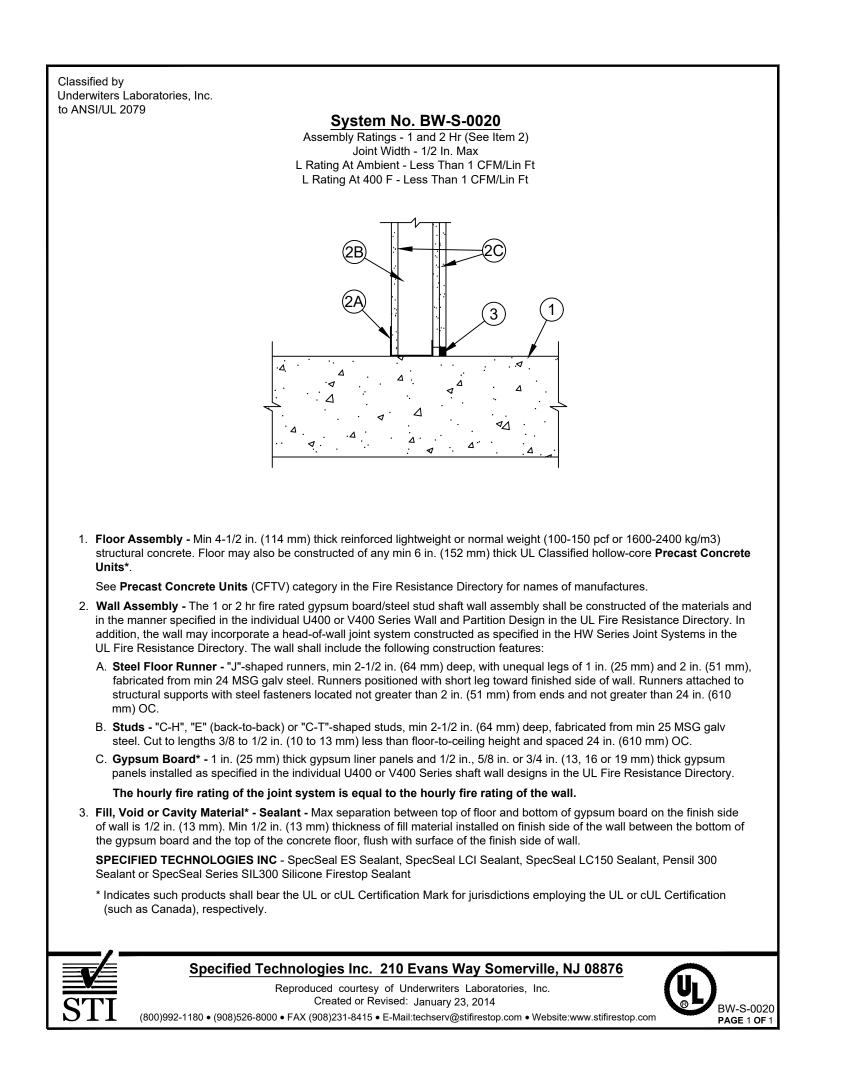


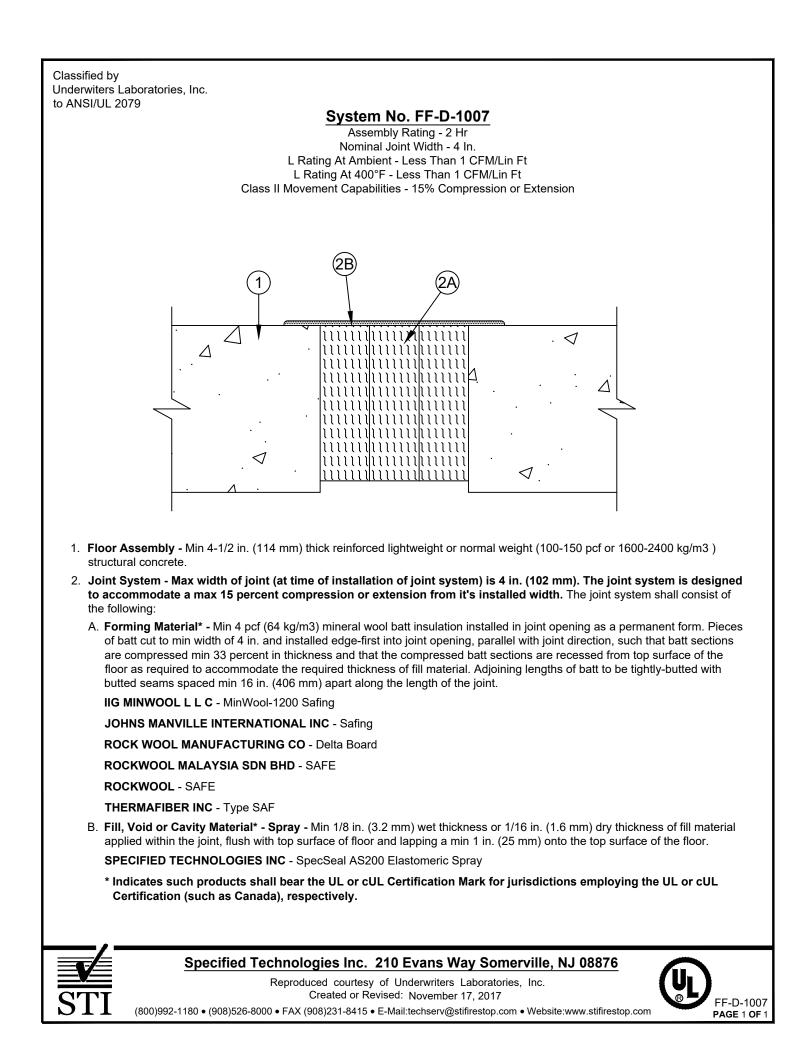


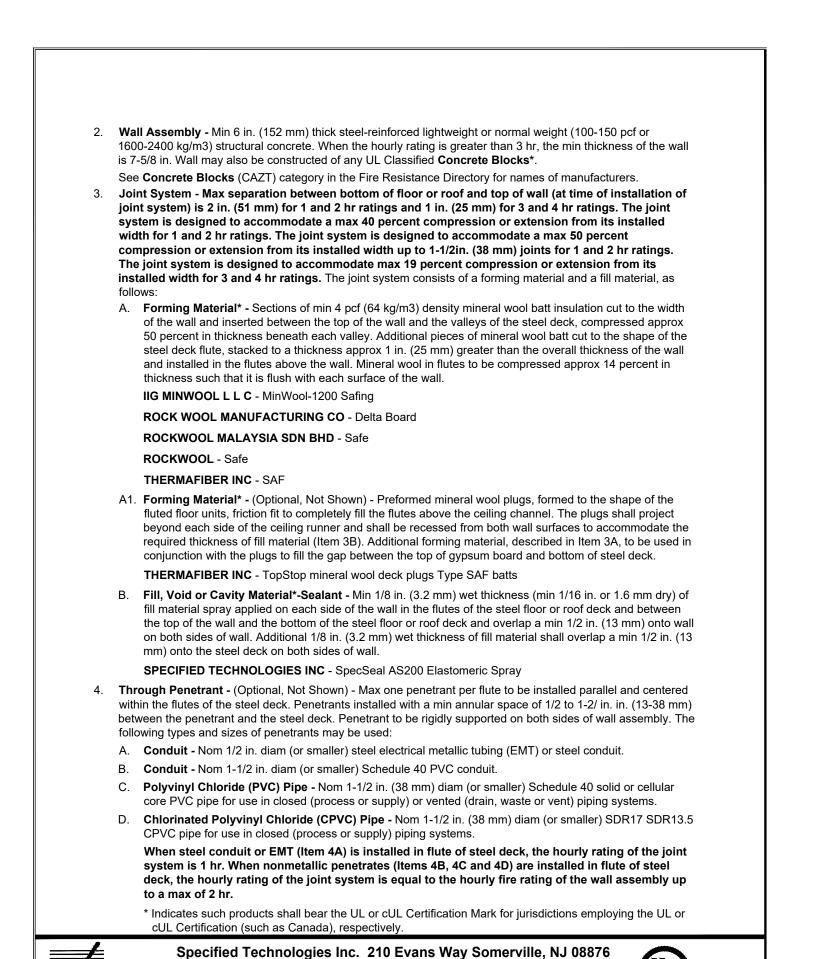








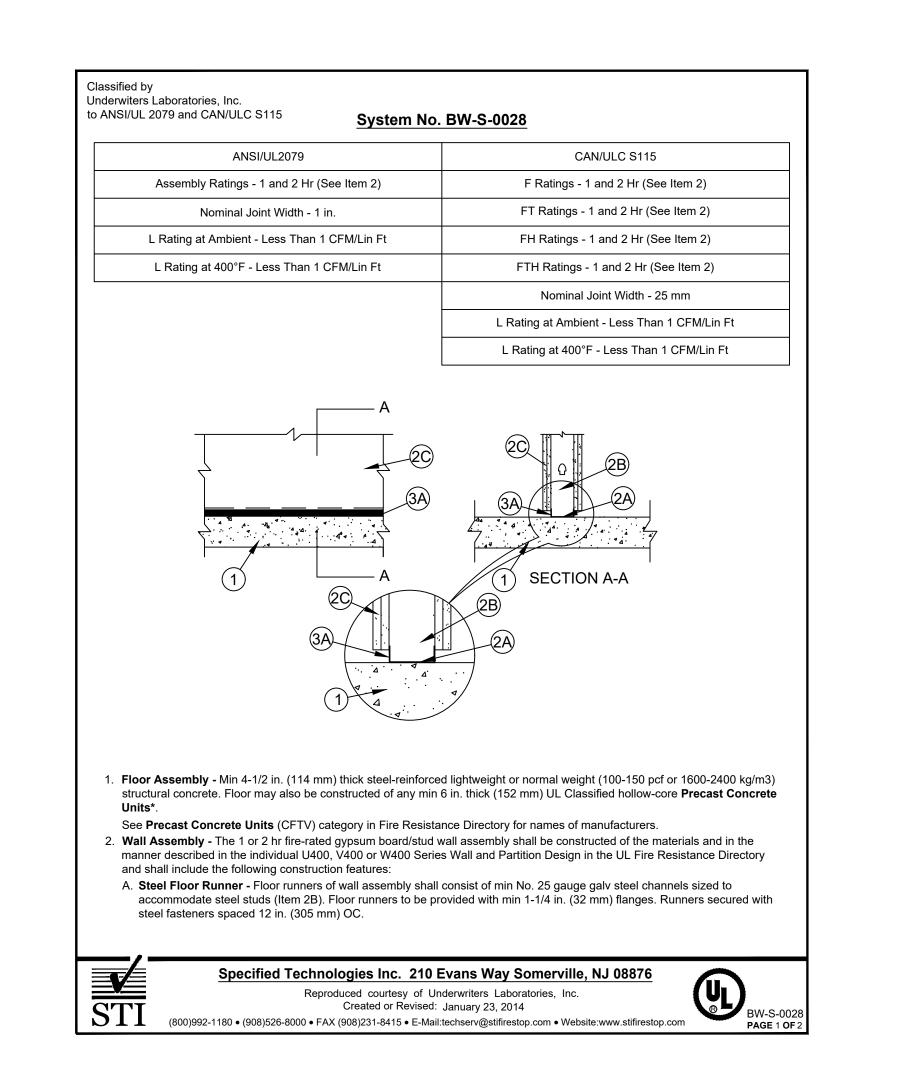




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Created or Revised: November 17, 2017



#### **GENERAL NOTES:**

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DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

**DIVISION** 9: Finishes

DIVIDION 3. I IIIISIIES

DIVISION 22: Plumbing

DIVISION 23: HVAC

**DIVISION 26: Electrical** 

**DIVISION 27: Communications** 

#### PROJECT NAME:

PROJECT\_NAME:

# PROJECT LOCATION:

PROJECT\_LOCATION:

# ARCHITECT/CONSULTANT:

ARCHITECT/CONSULTANT:

### TITLE:

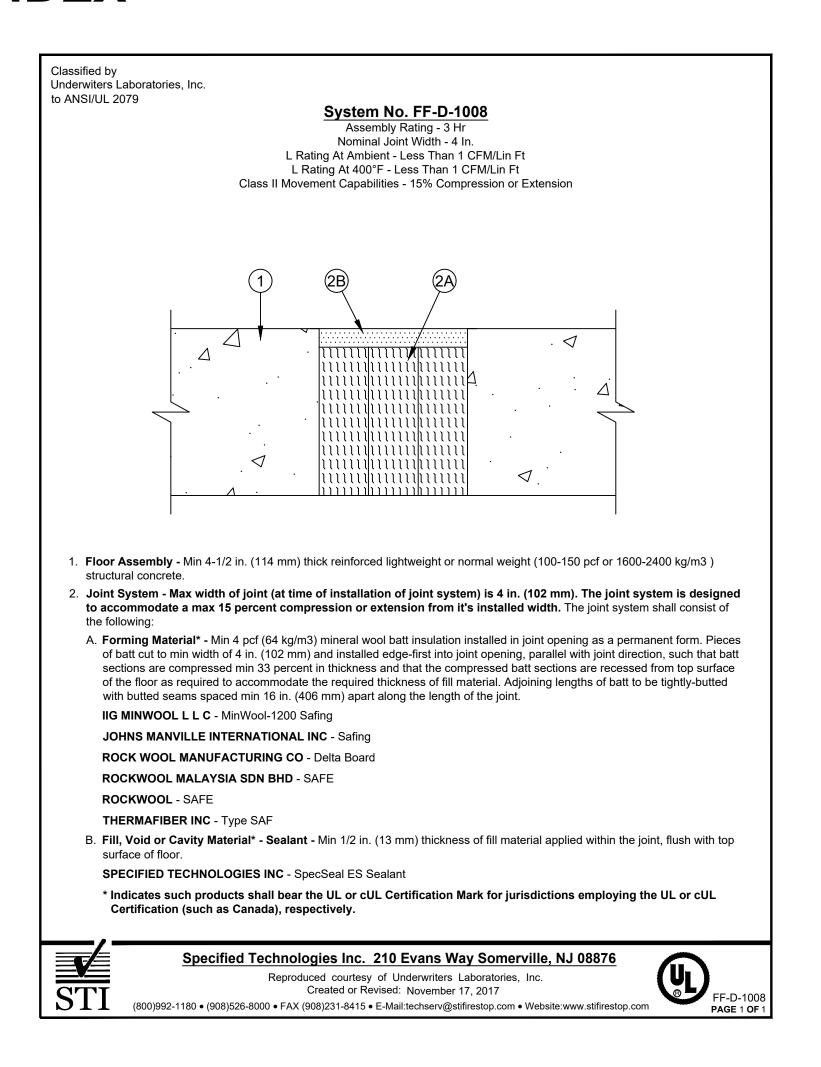
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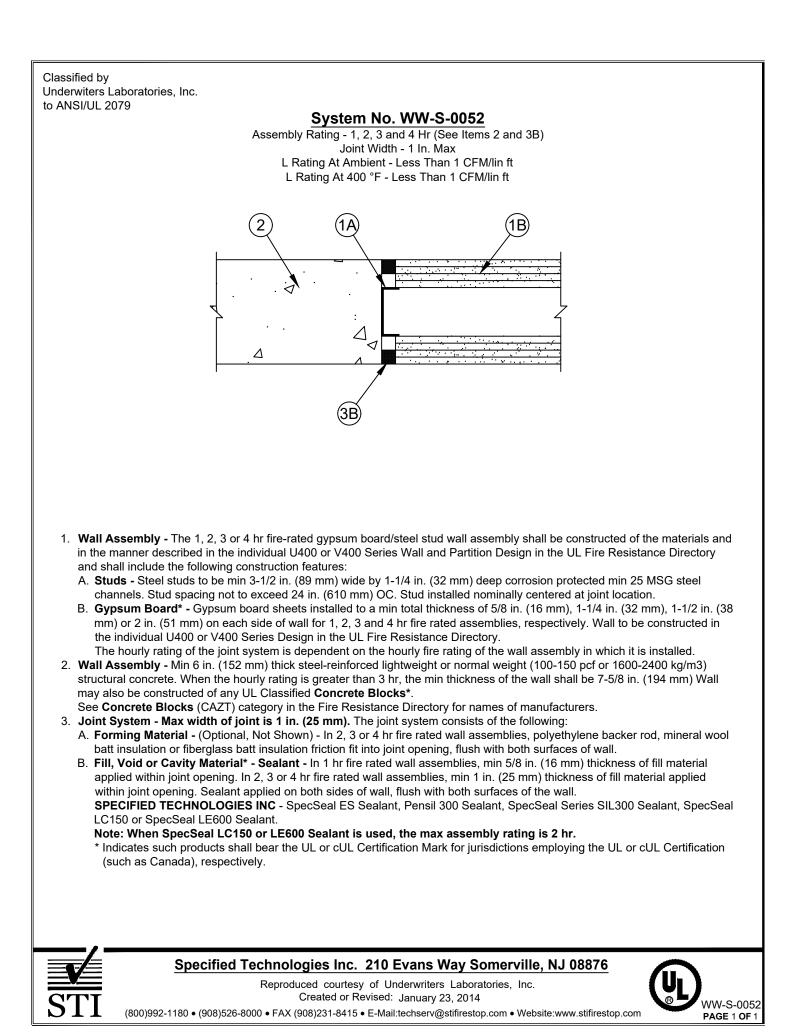
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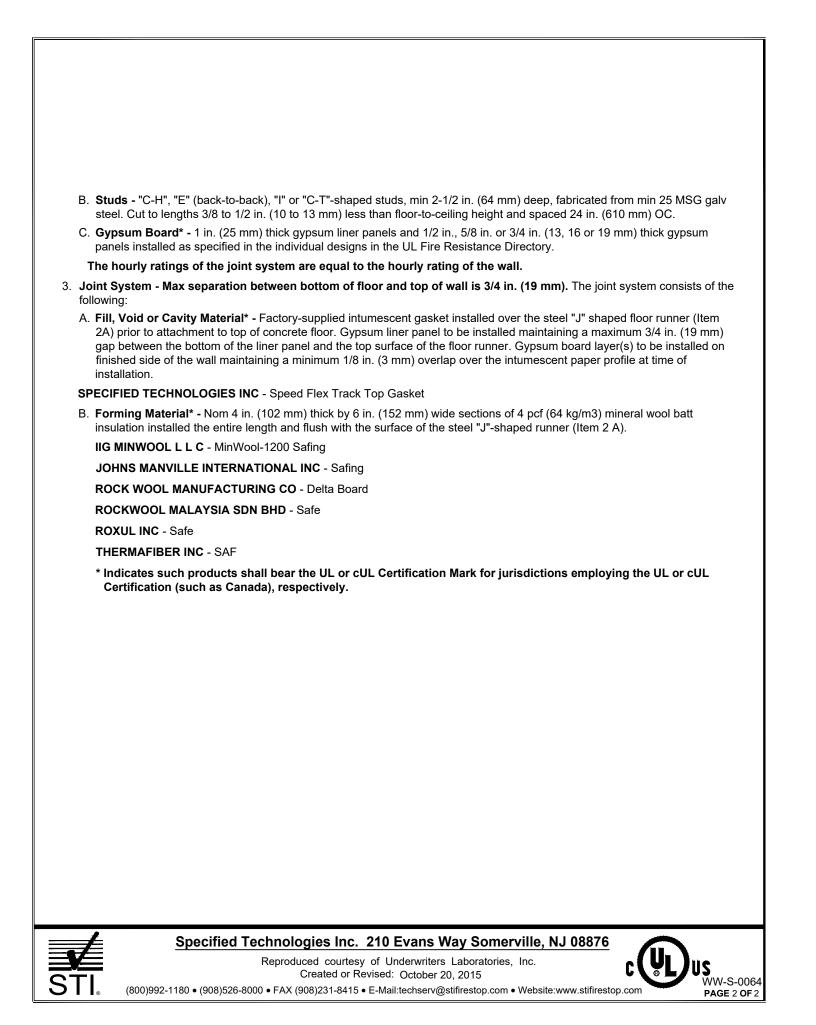
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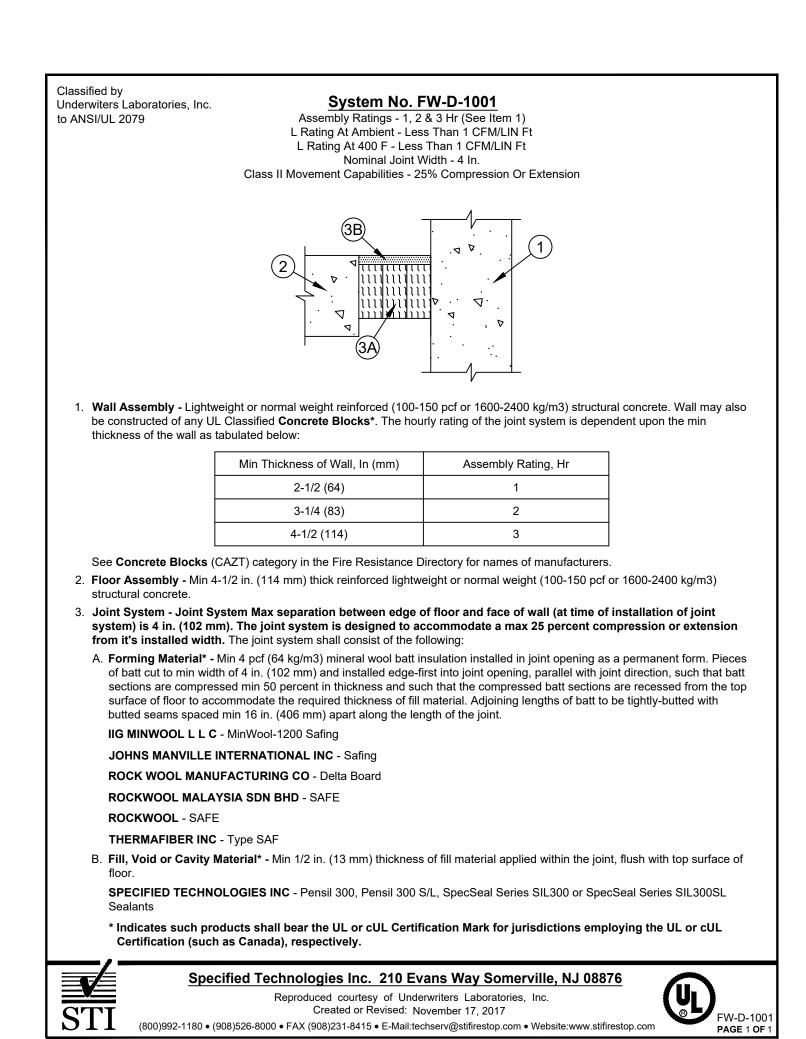


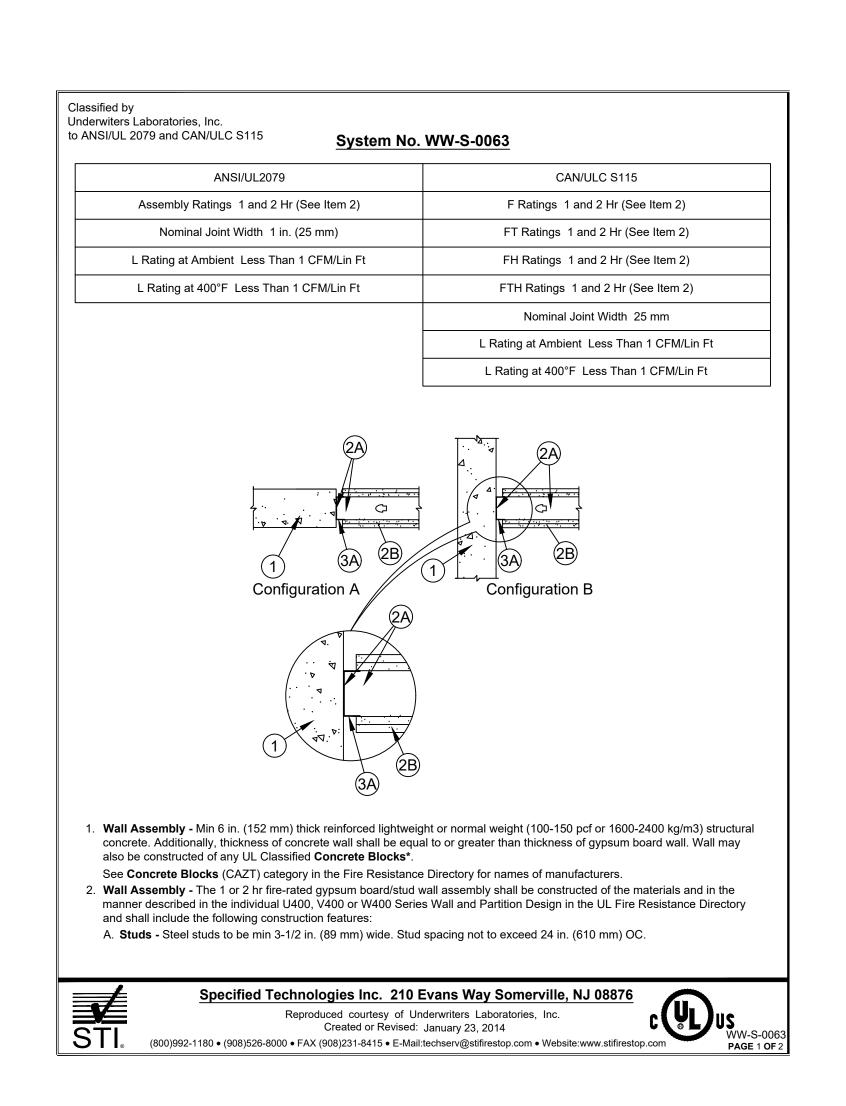
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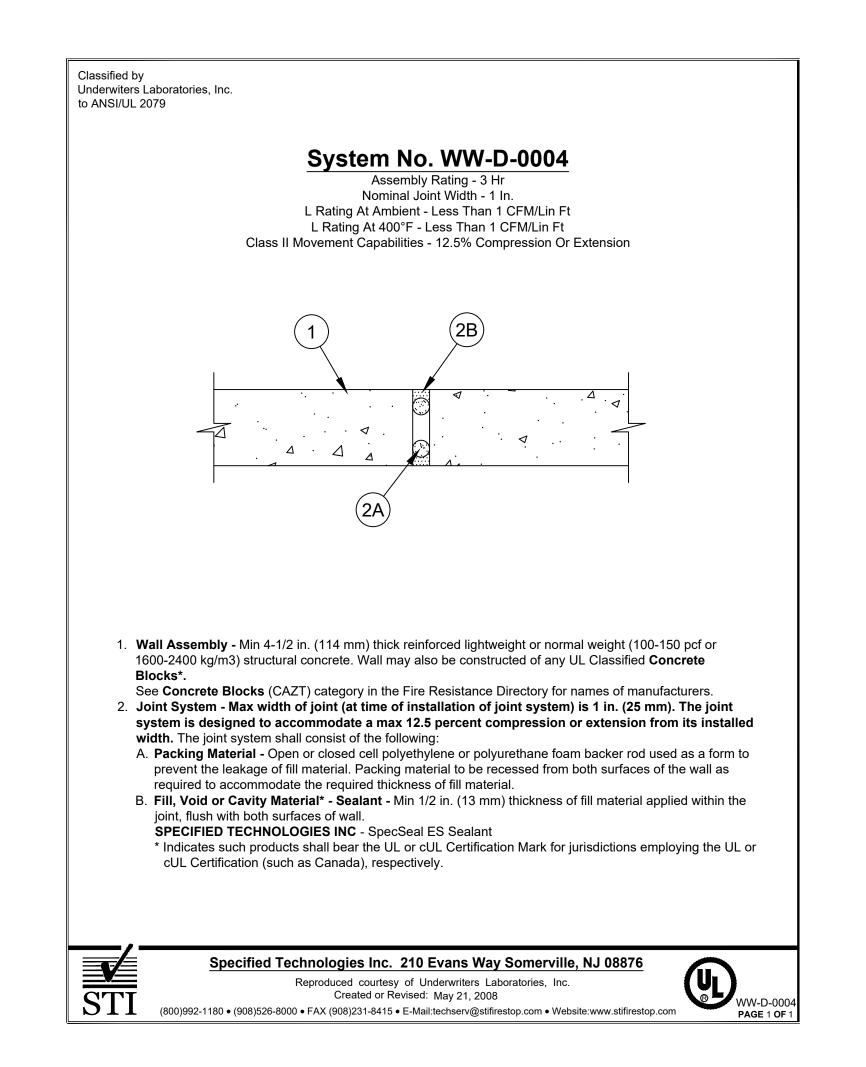


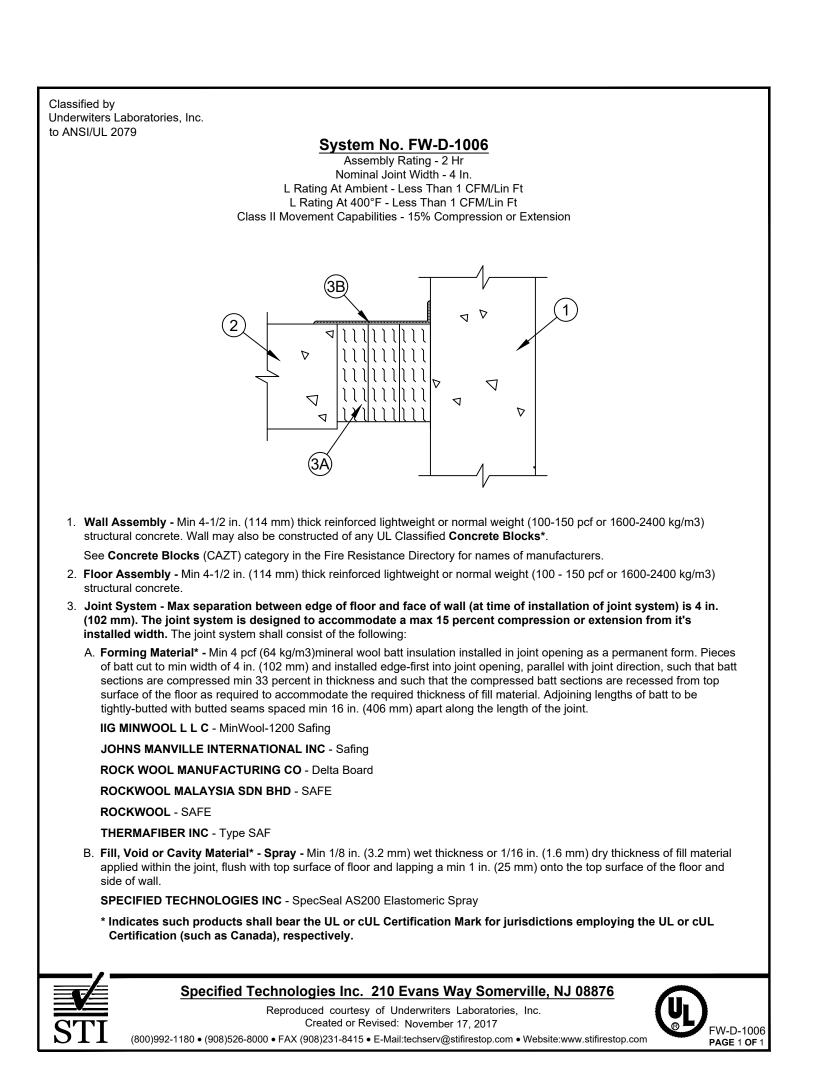


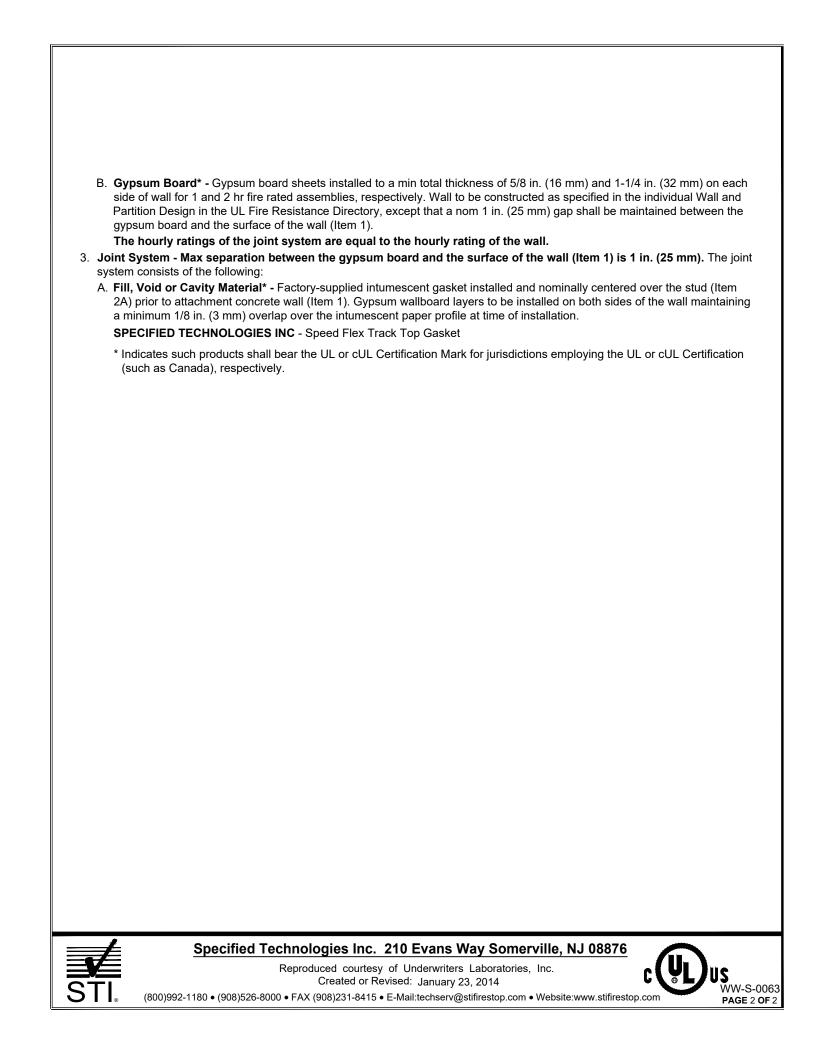


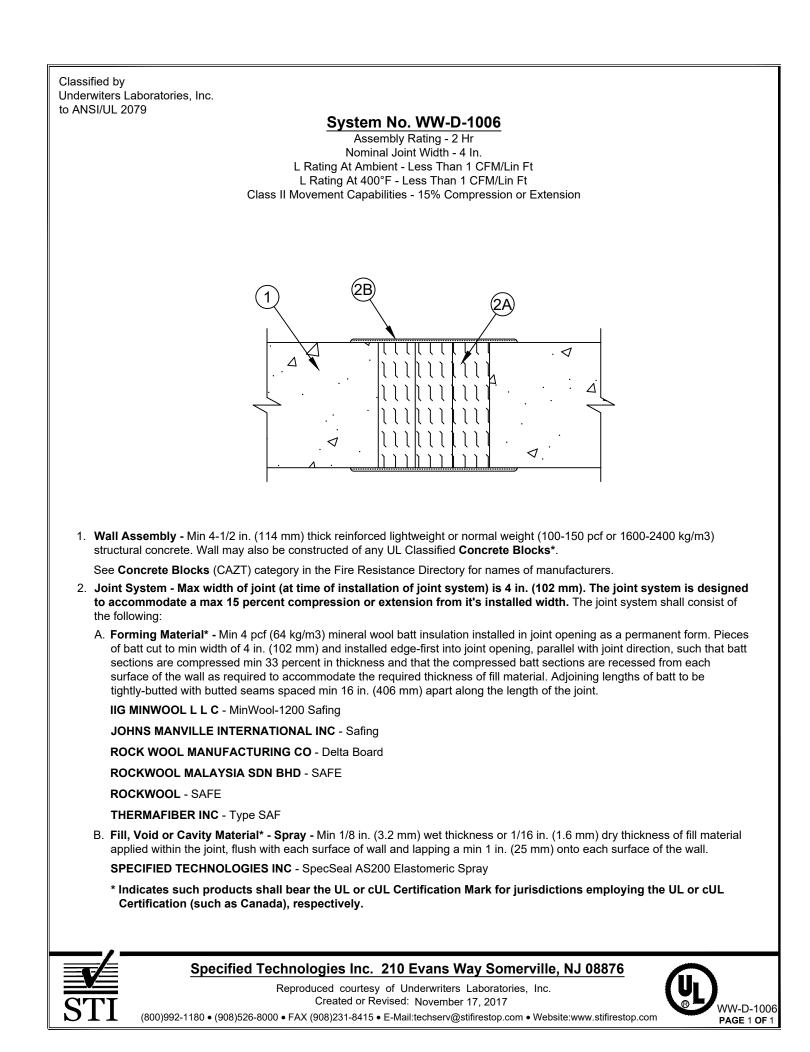


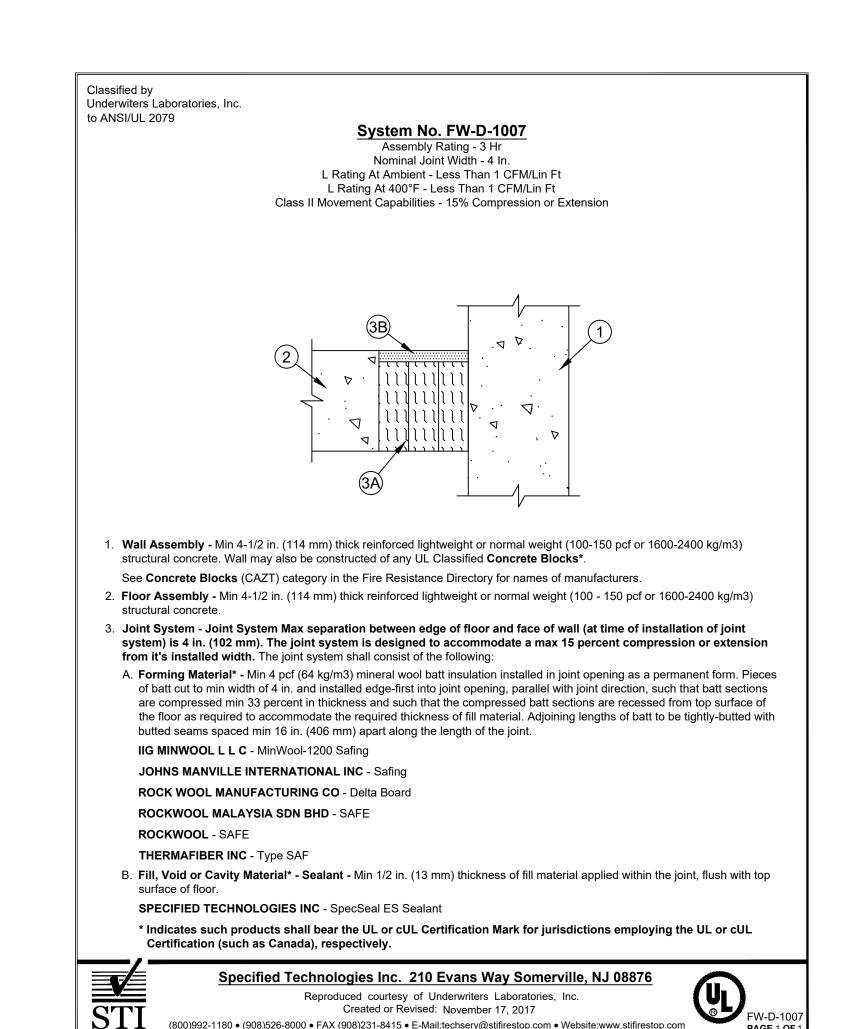


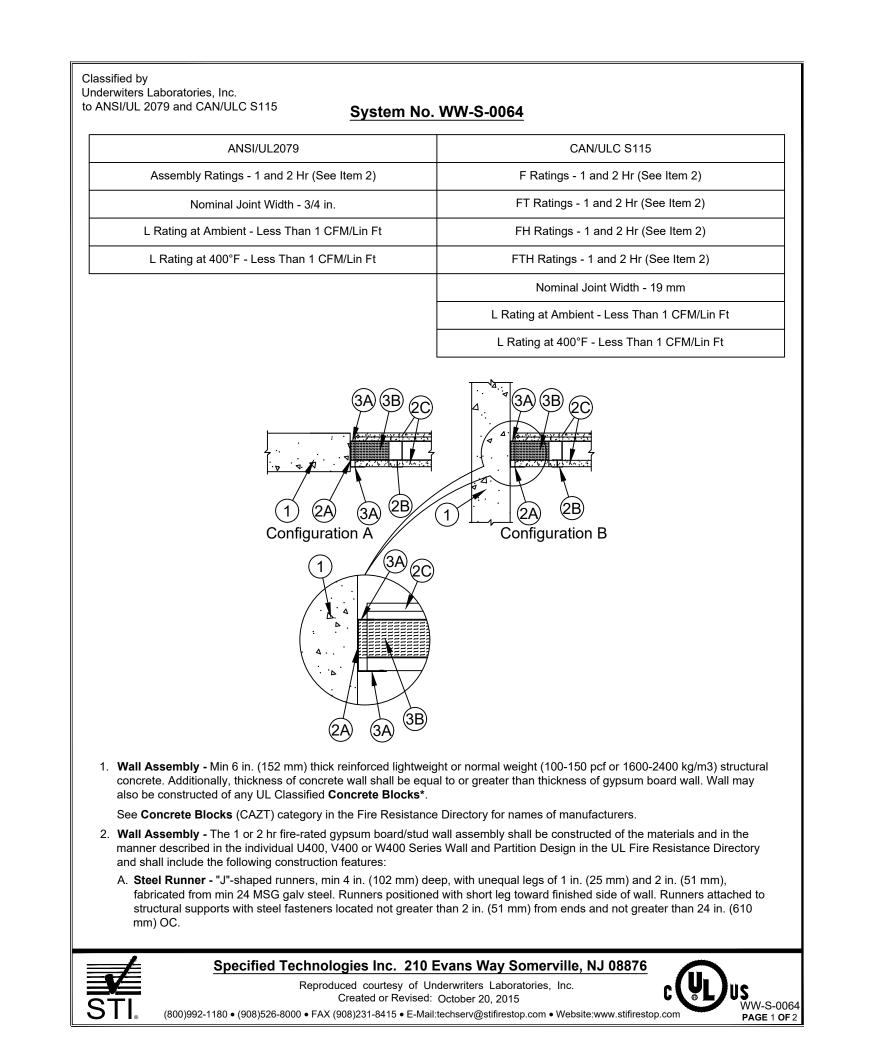












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Protection

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**DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

#### PROJECT NAME:

PROJECT\_NAME:

PROJECT LOCATION:

PROJECT\_LOCATION:

ARCHITECT/CONSULTANT:

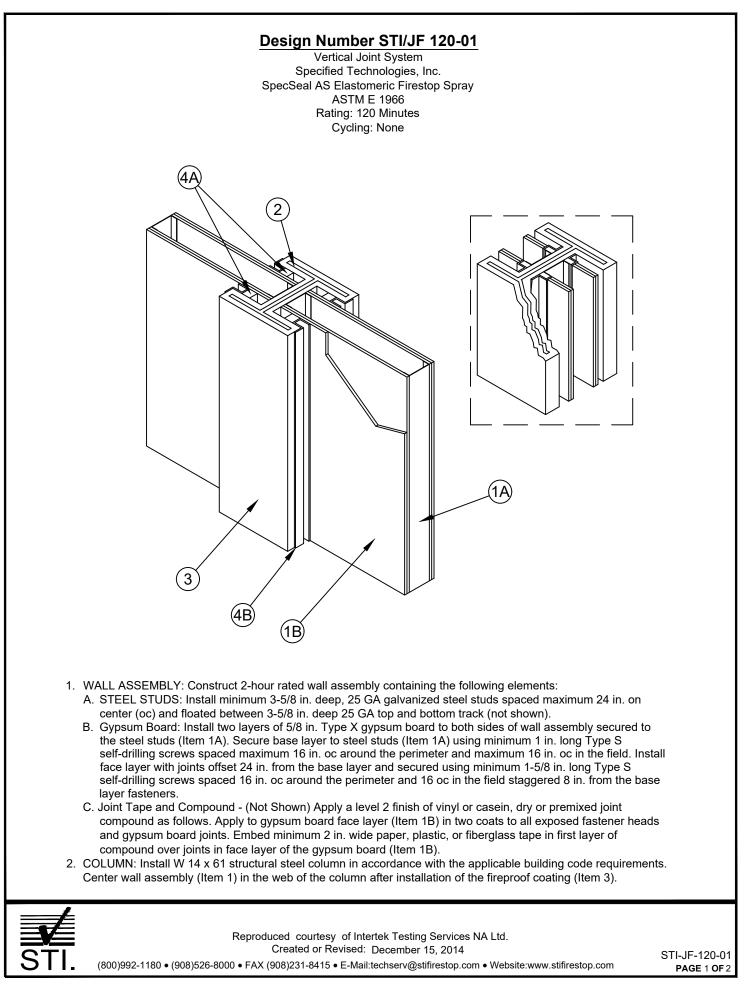
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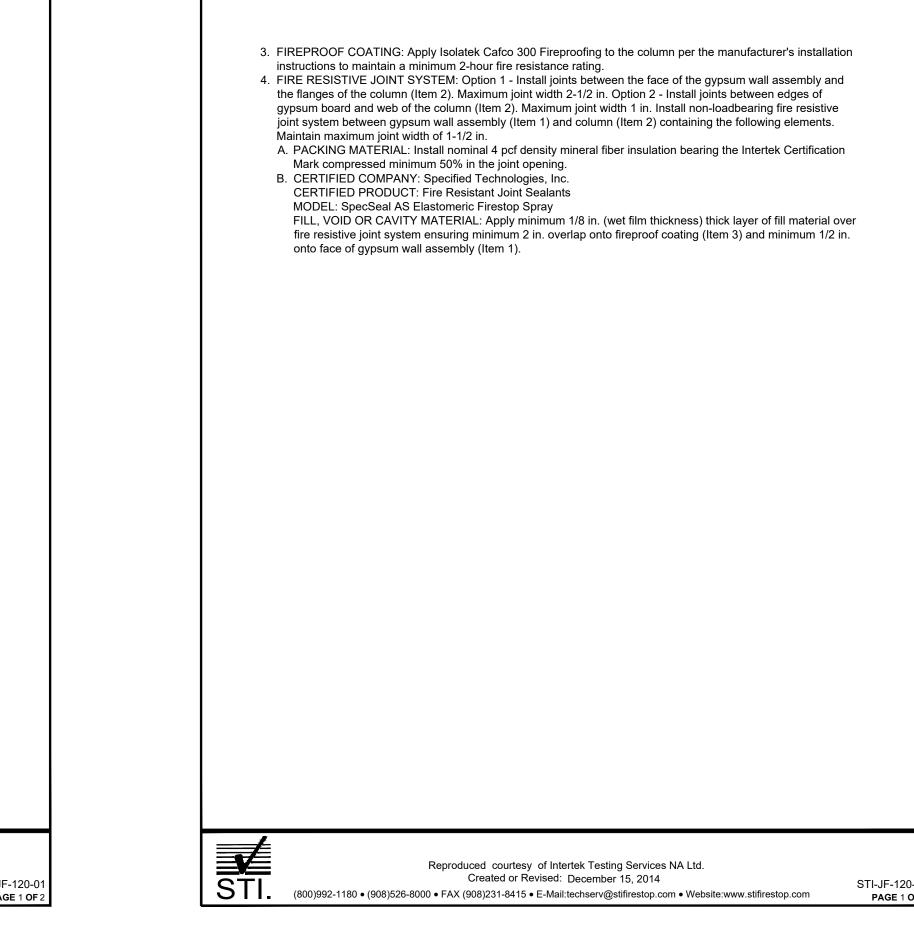
STI FIRESTOP SYSTEMS

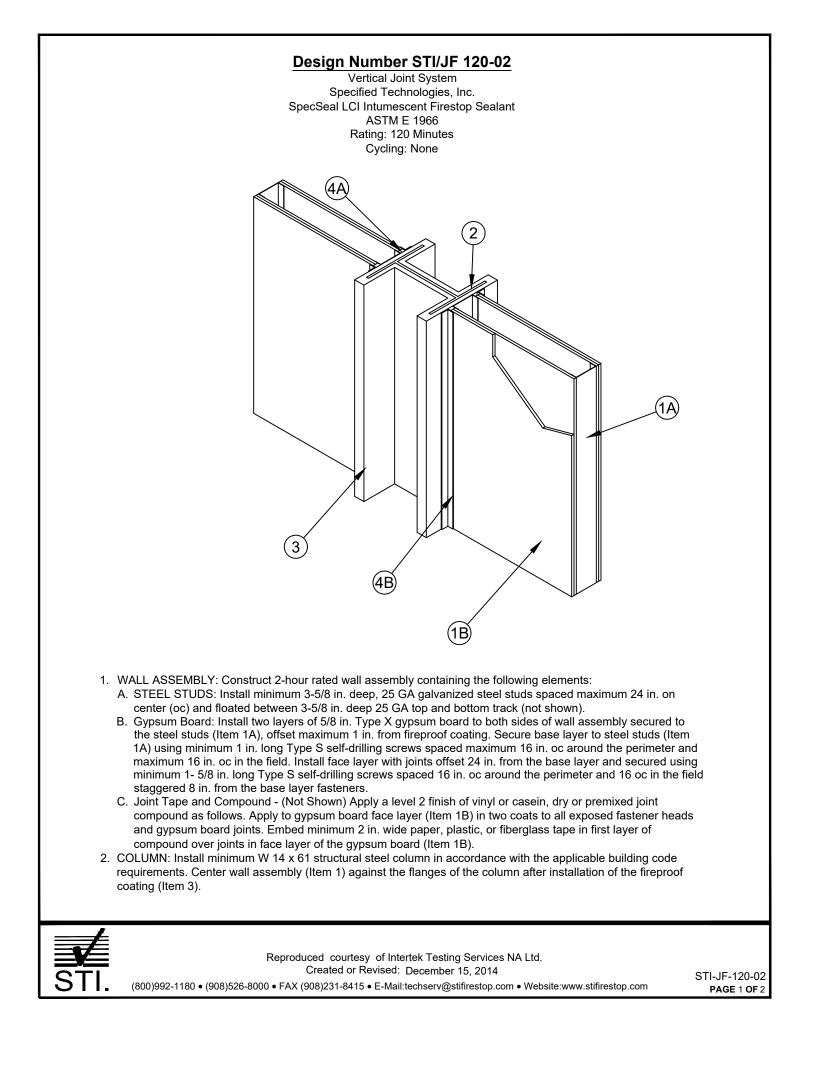
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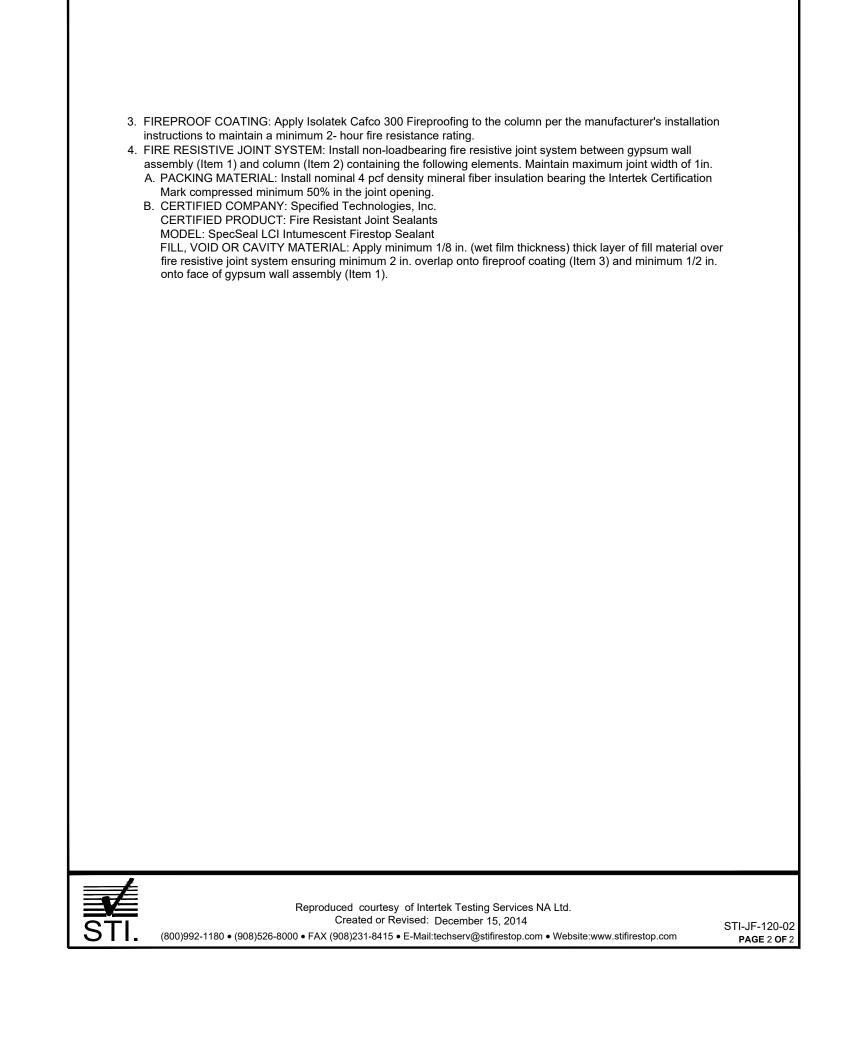
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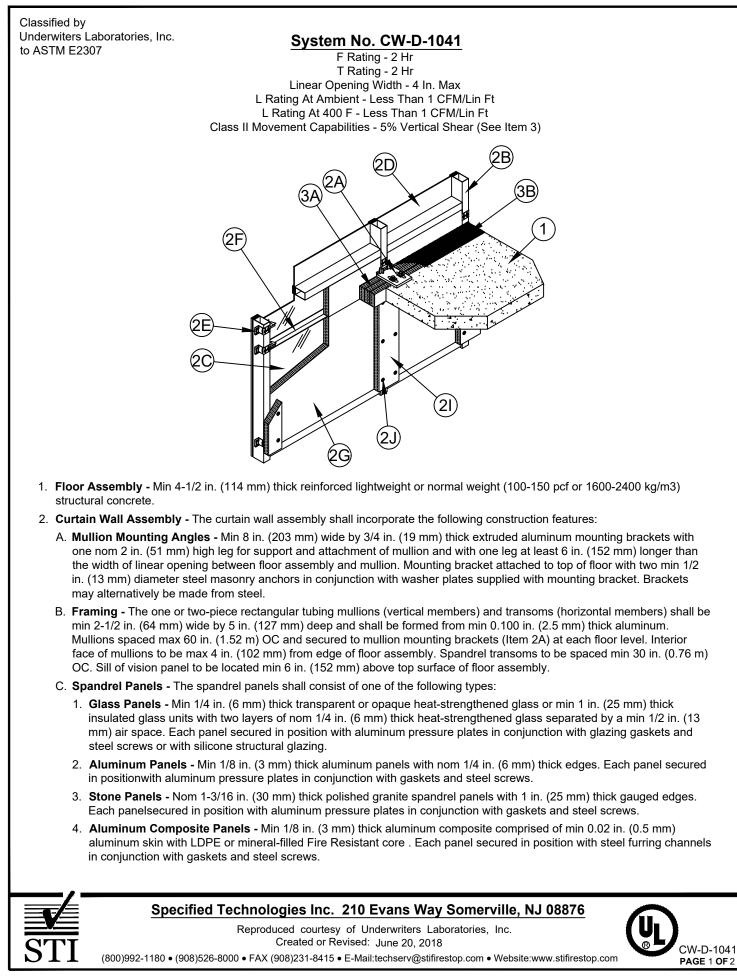


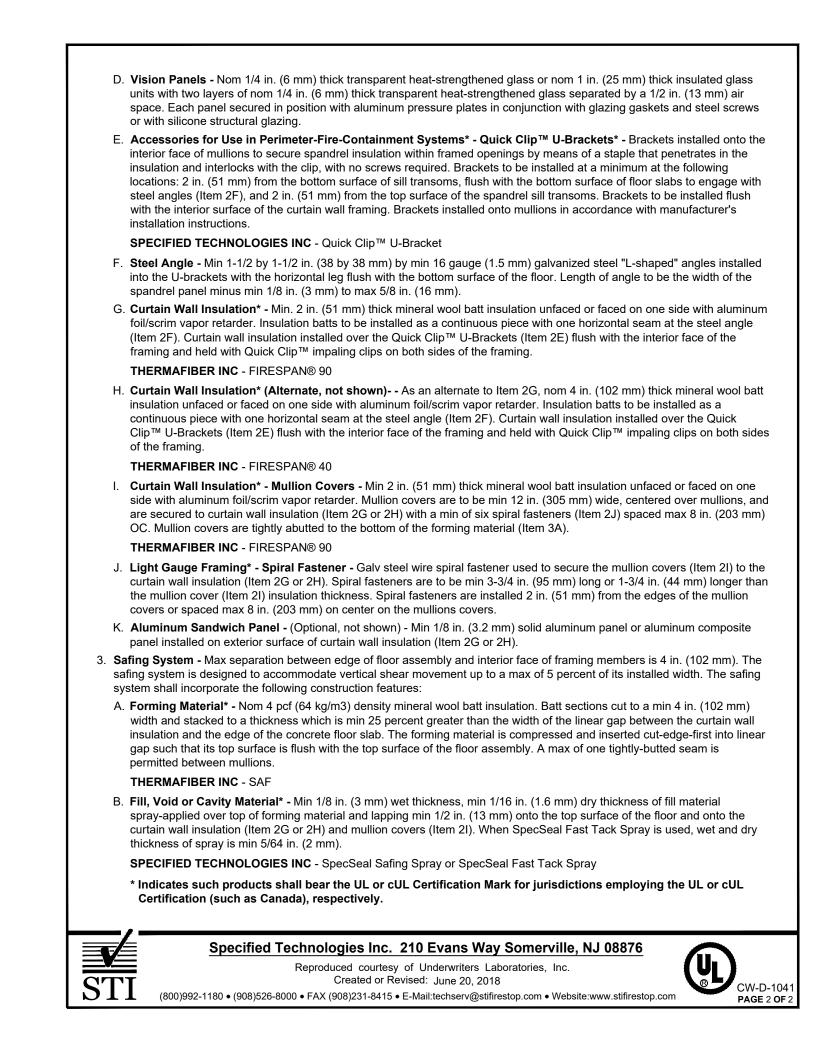


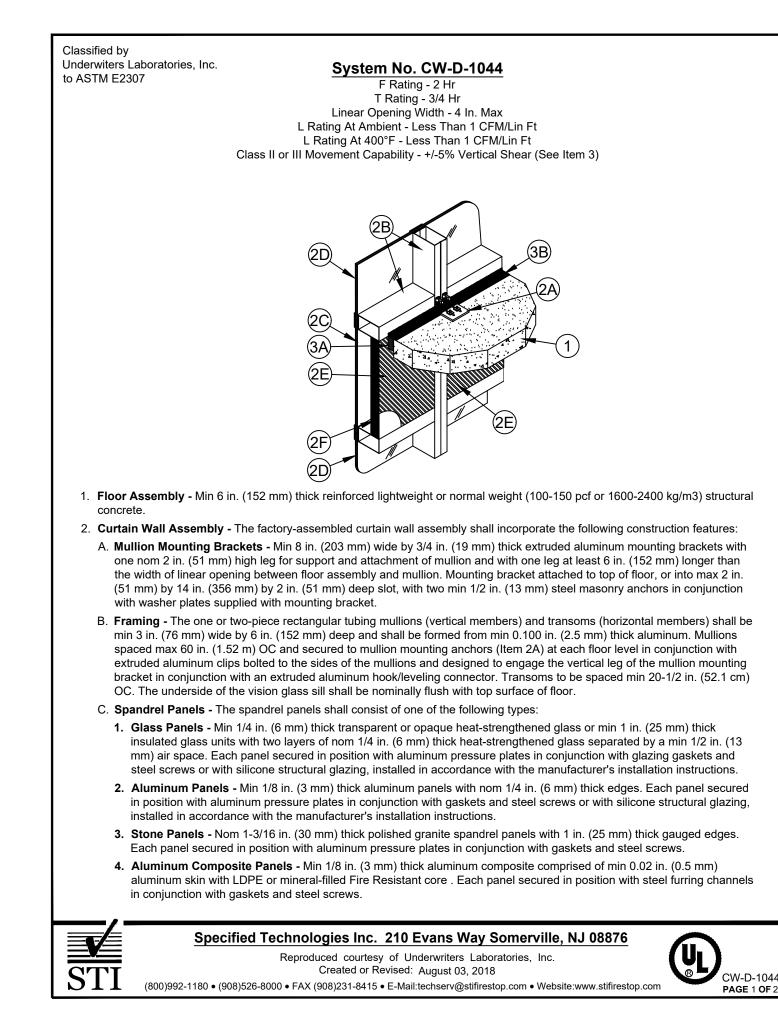


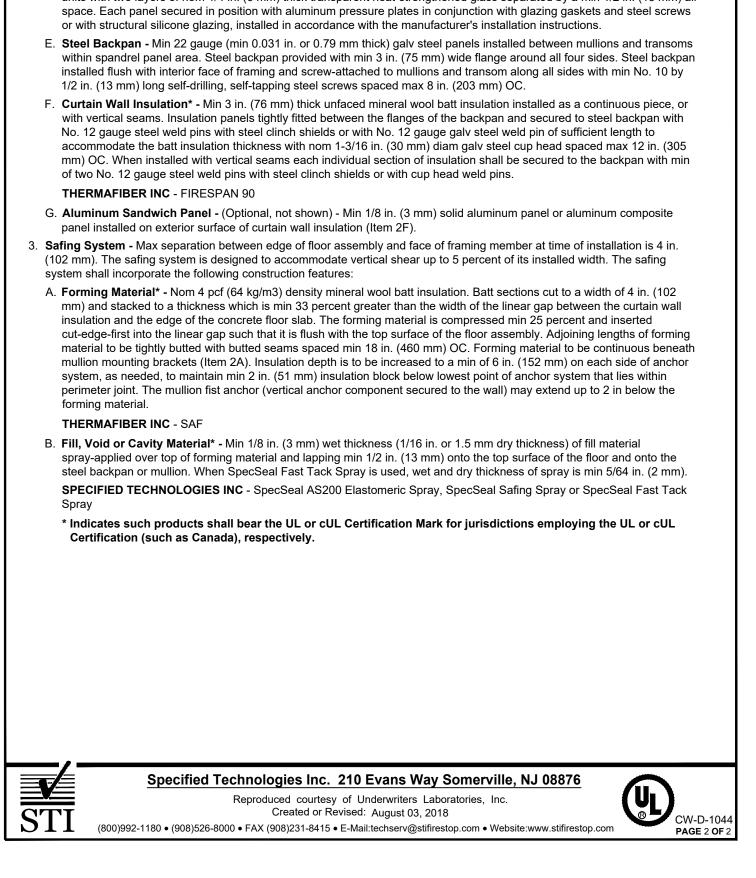


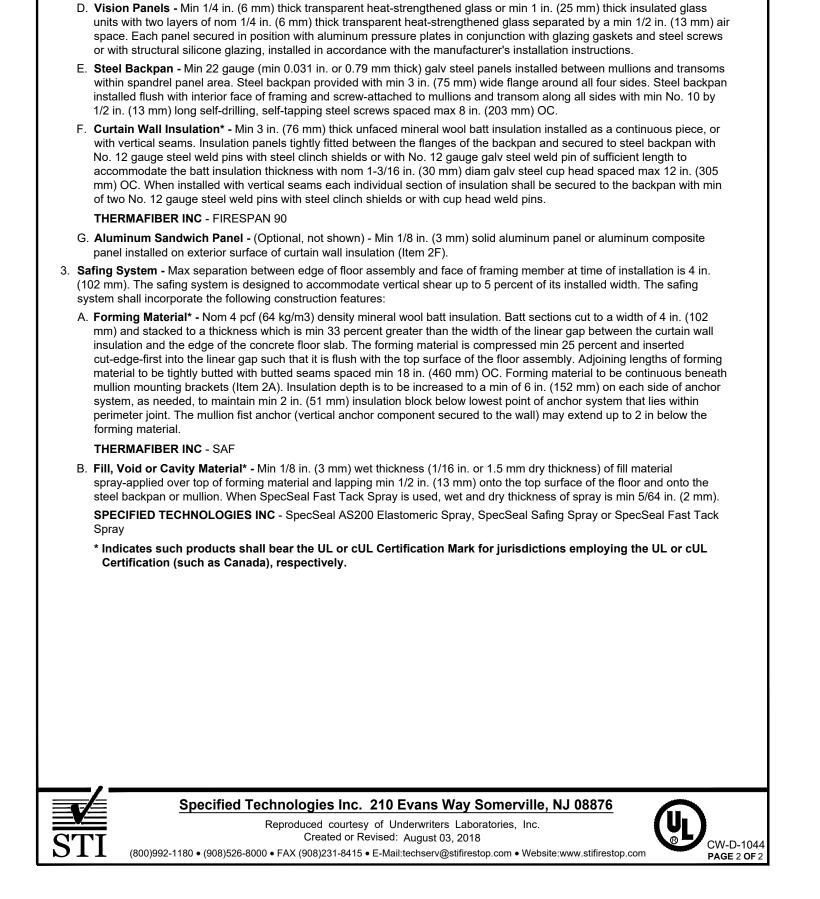


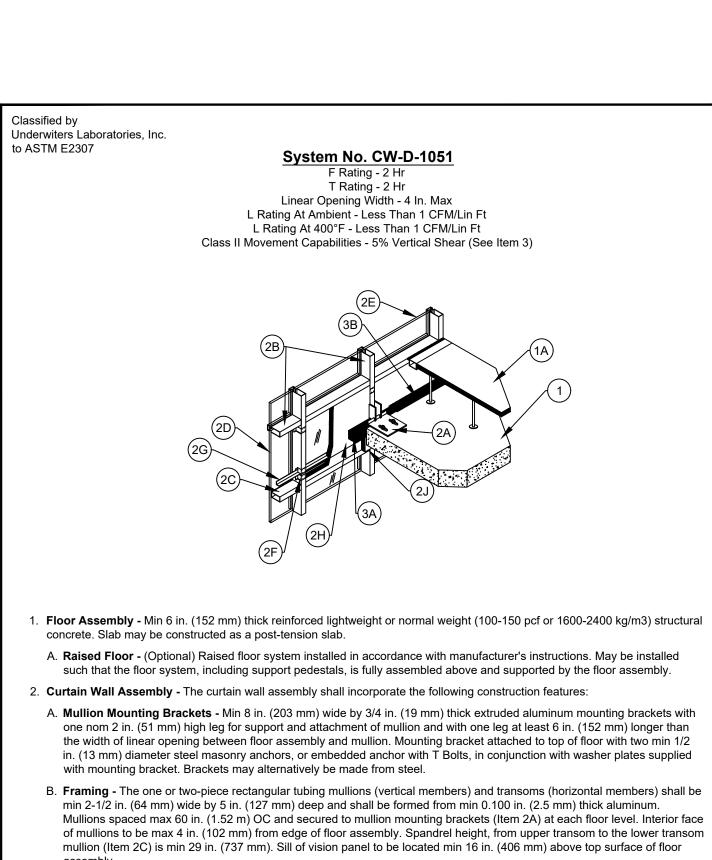












C. Continuous Glazing Frame (Kiss Mullion) - As an option when glass spandrel panels (Item 2D-1) are continuous, the

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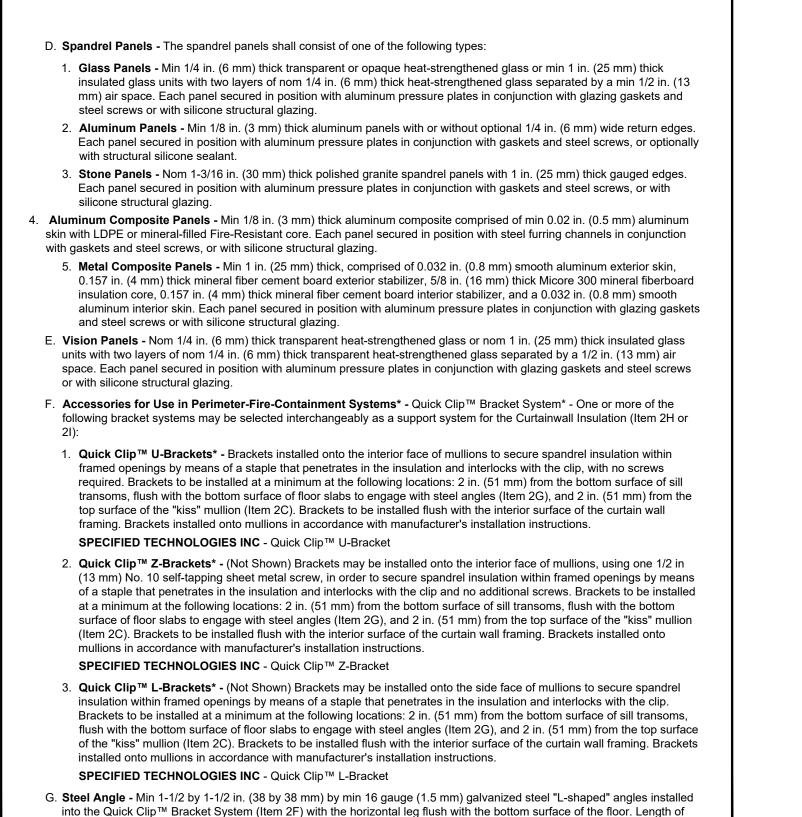
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panel surface touches the gasketing on the exterior edge of the "kiss" mullion.

lower transom may consist of one or two-piece rectangular tubing "kiss" mullions and shall be min 2-1/2 in. (64 mm) wide by

max 4 in. (102 mm) from edge of floor assembly. The top surface of the "kiss" mullion shall be spaced a minimum 5 in. (127 mm) from the underside of the floor. The interior face of the glass spandrel panel is positioned so that the interior spandrel

4 in. (102 mm) deep and shall be formed from min 0.100 in. (2.5 mm) thick aluminum. Interior face of kiss mullions to be

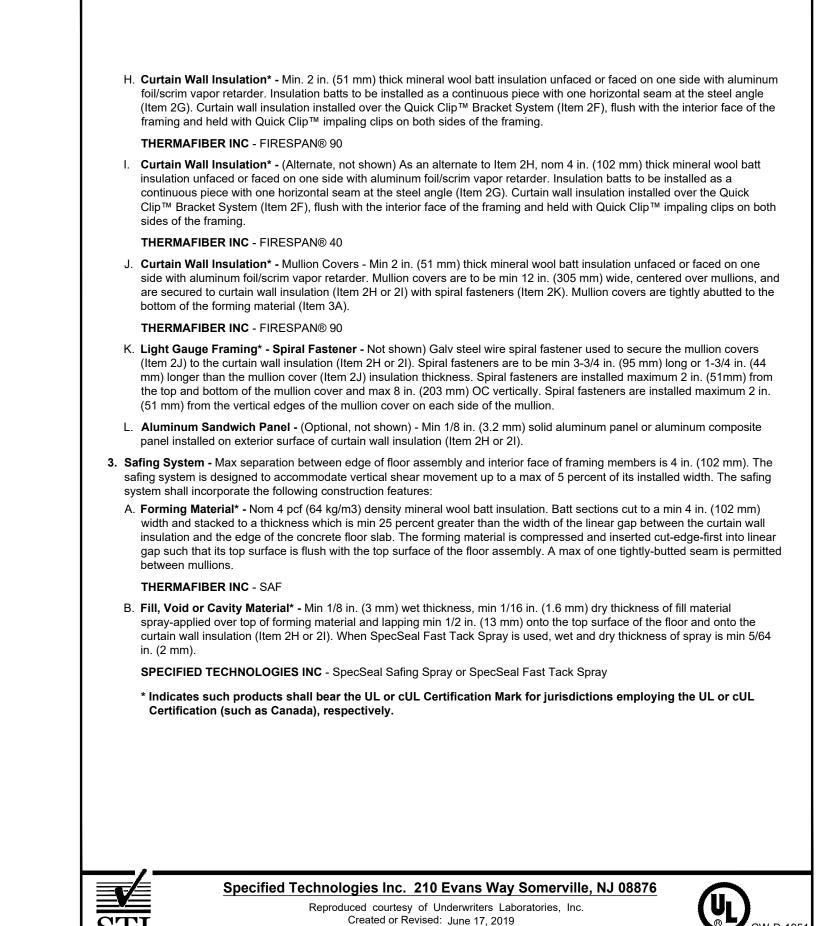


angle to be the width of the spandrel panel minus min 1/8 in. (3 mm) to max 5/8 in. (16 mm).

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**DIVISION 27: Communications** 

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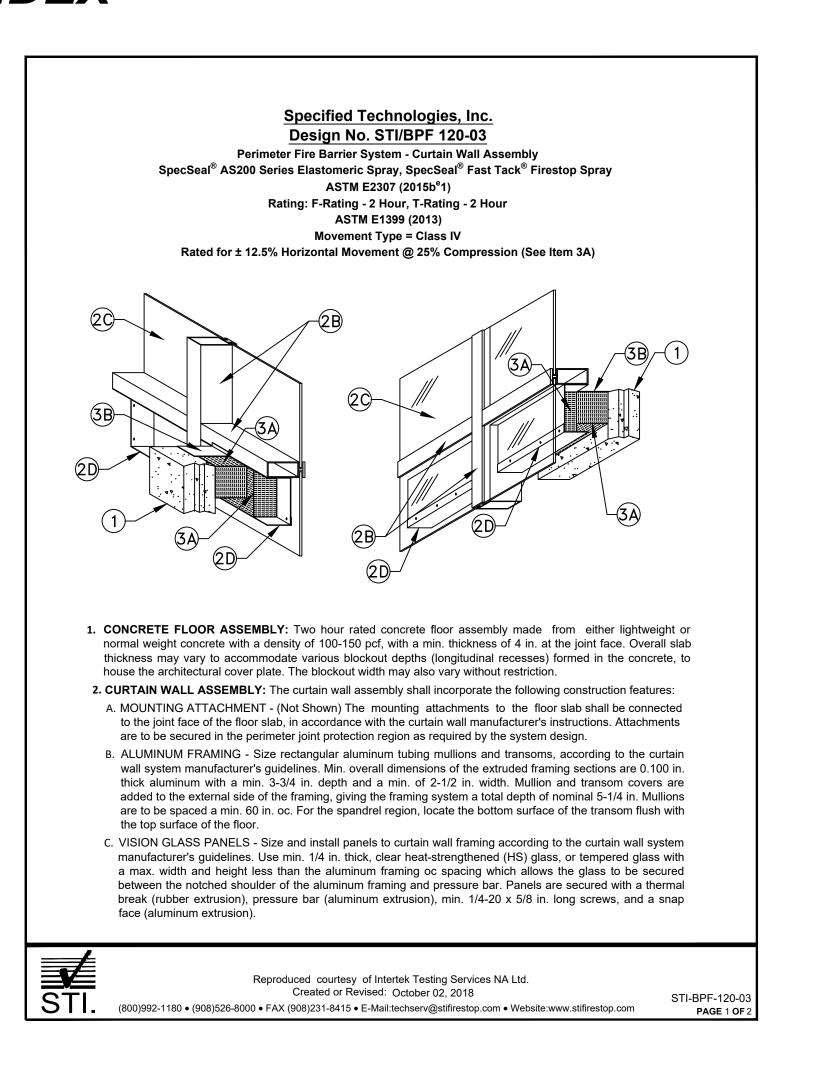
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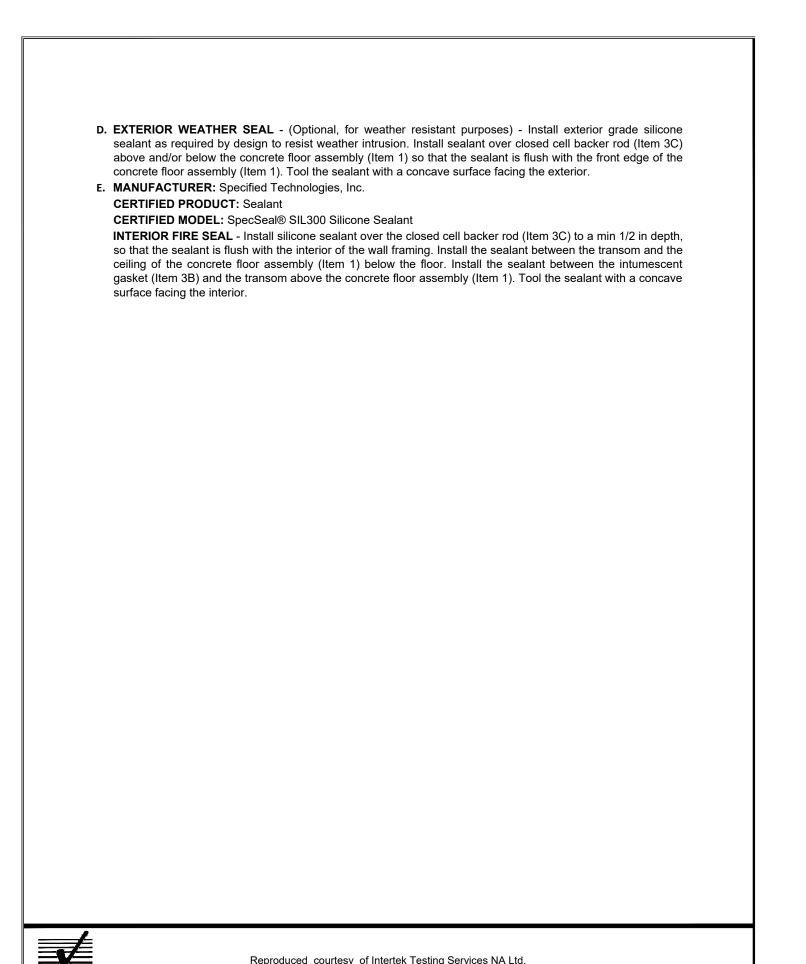
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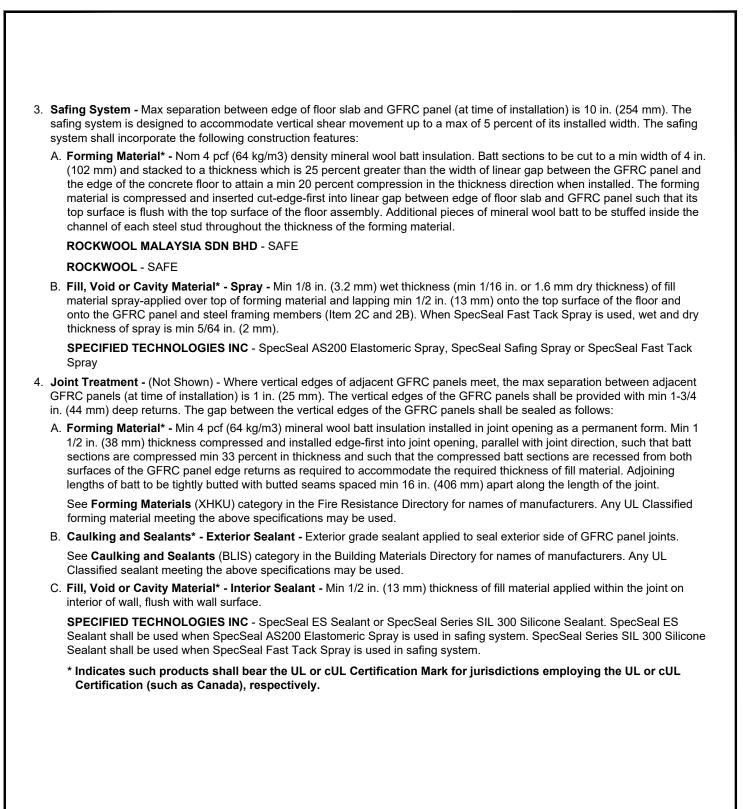
STI FIRESTOP SYSTEMS

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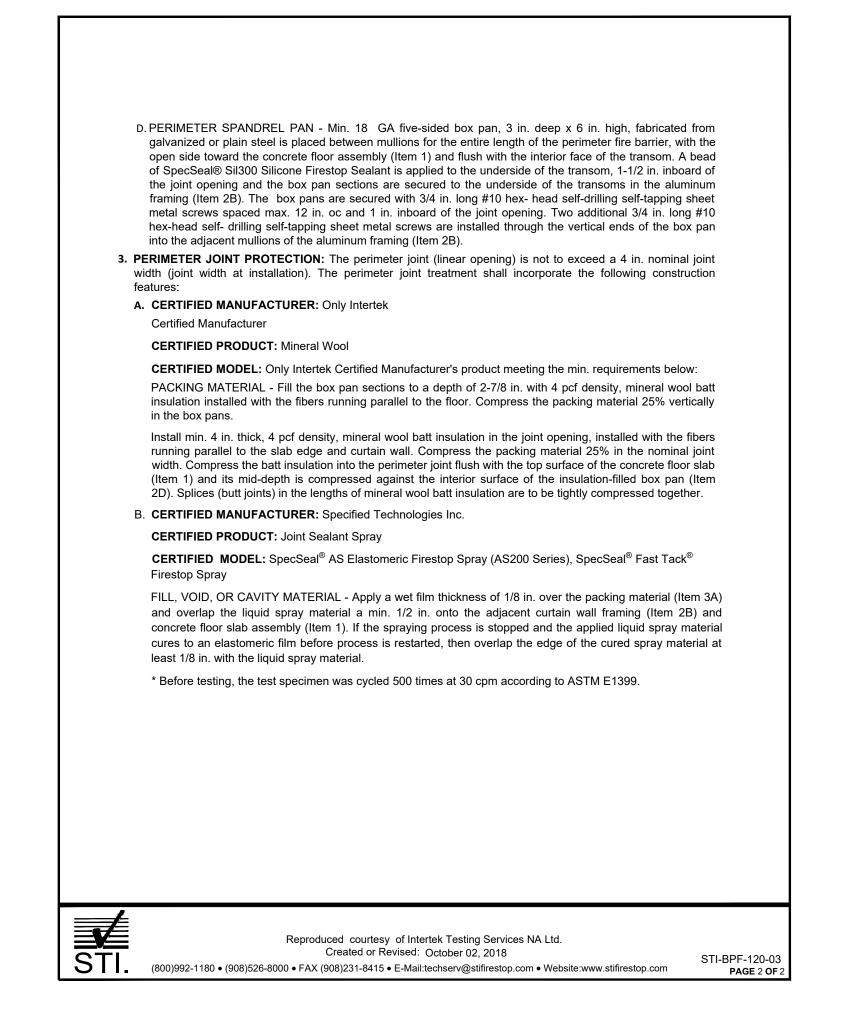
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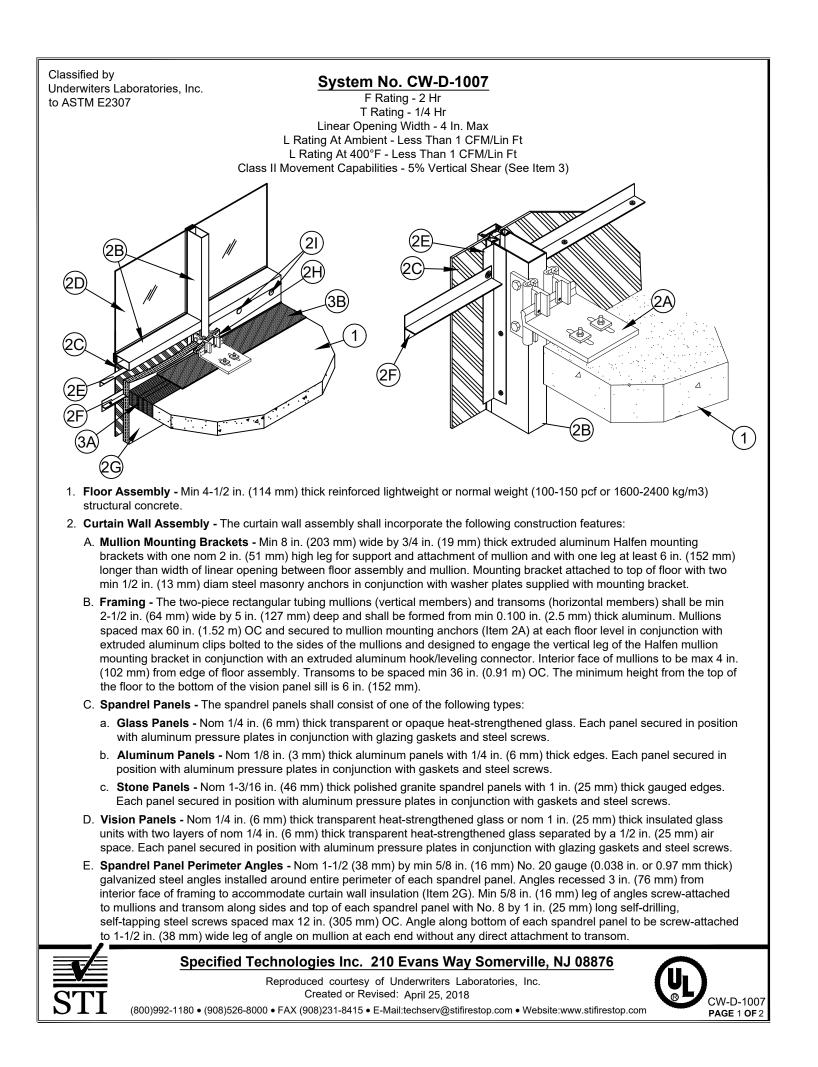
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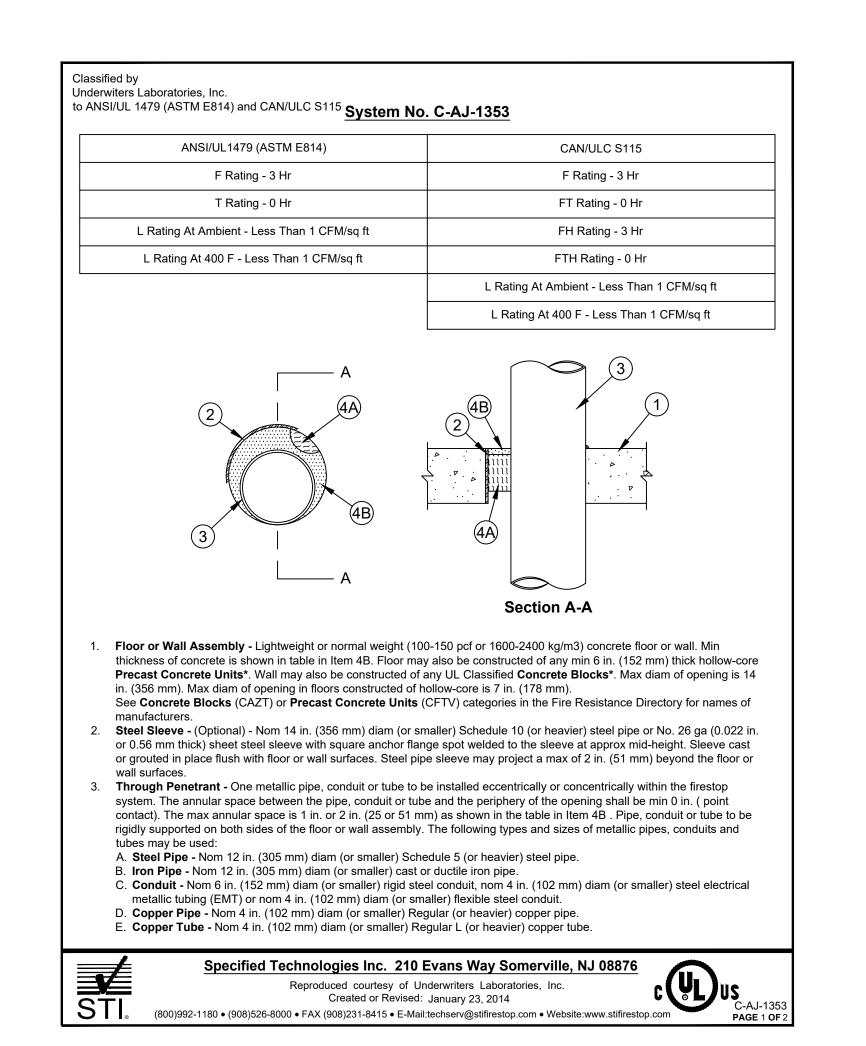
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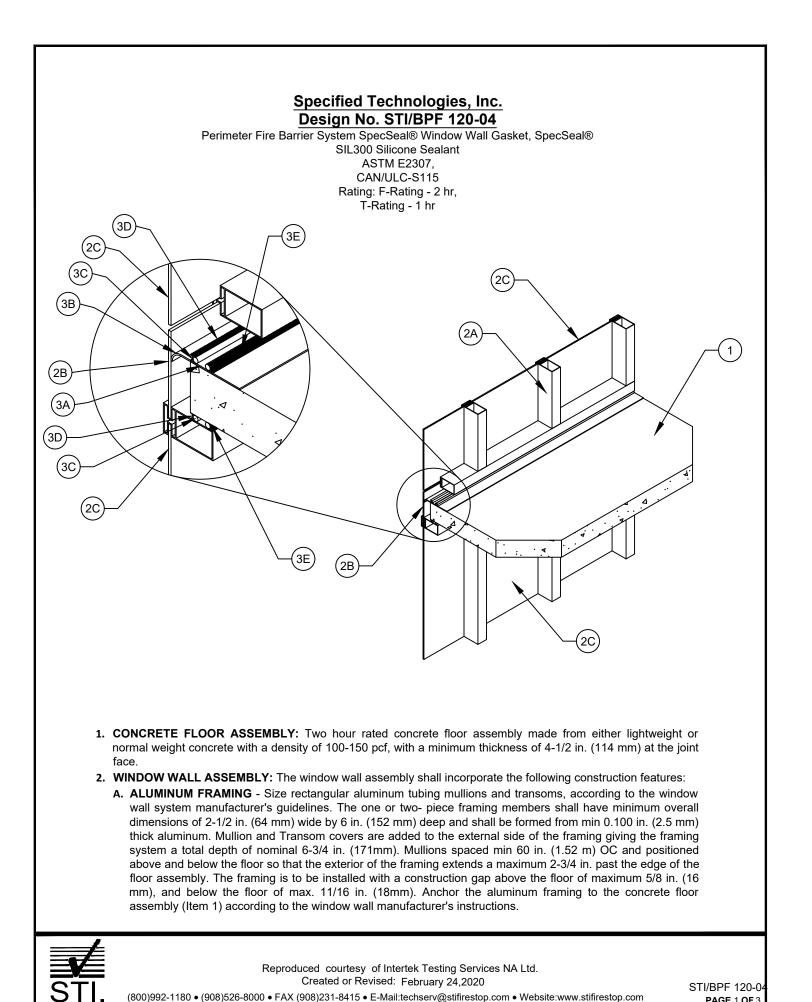
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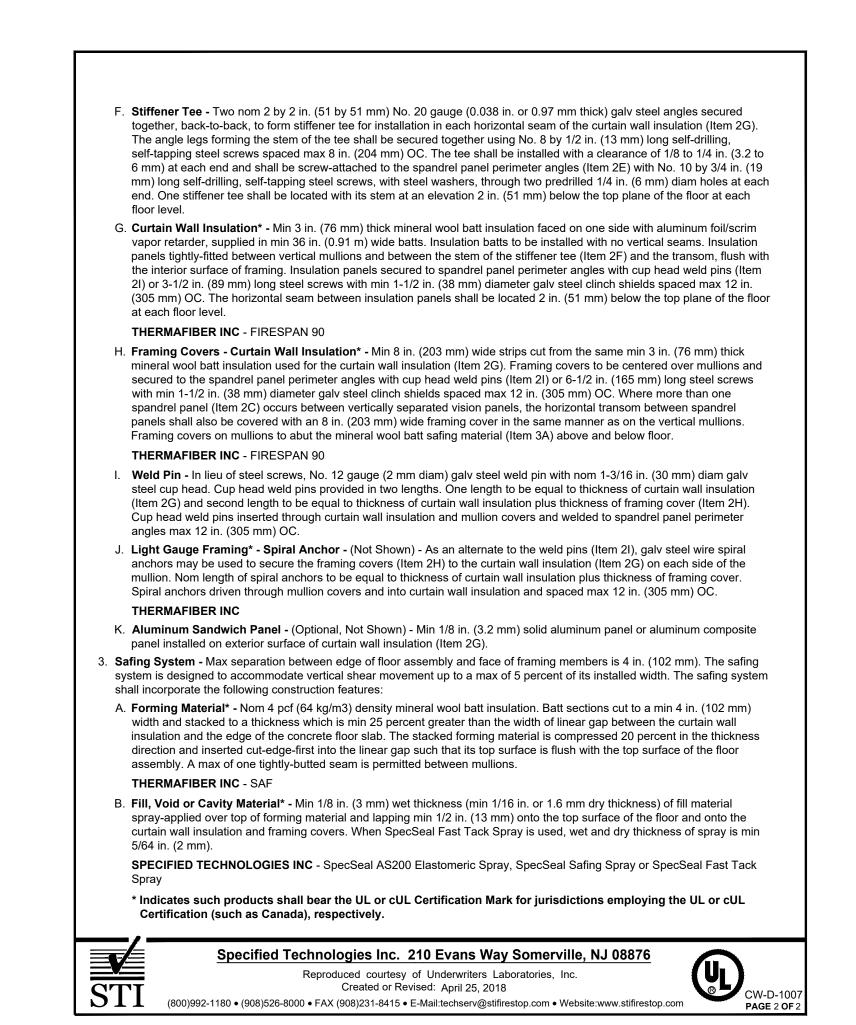
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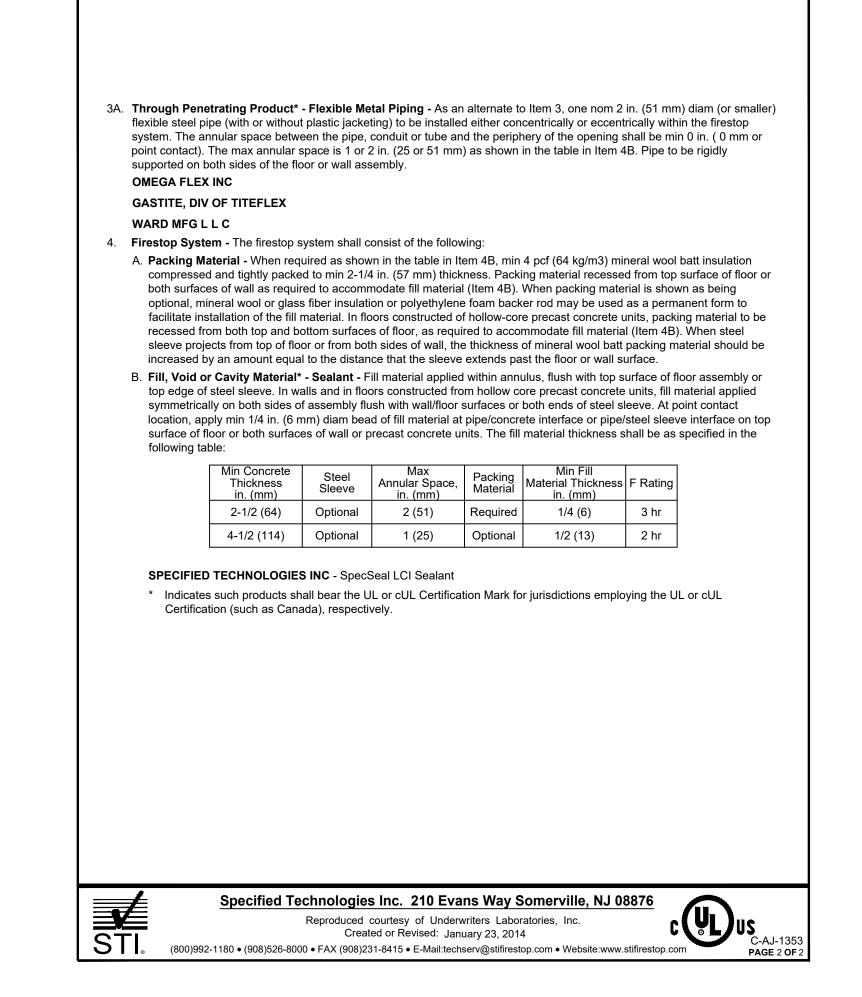












B. SPANDREL PANELS - - The spandrel panels shall consist of one of the following types. i. GLASS PANELS - Min 1/4 in. (6 mm) thick transparent or opaque heat- strengthened glass or min 1 in. (25 mm) thick insulated glass units with two layers of nom 1/4 in. (6 mm) thick heat-strengthened glass separated by a min 1/2 in. (13 mm) air space. Each panel secured in position with aluminum pressure plates in conjunction with glazing gaskets and steel screws or with silicone structural glazing. ii. ALUMINUM PANELS (Not Shown) - Min 1/8 in. (3 mm) thick aluminum panels with nom 1/4 in. (6 mm) thick edges. Each panel secured in position with aluminum pressure plates in conjunction with gaskets and iii. STONE PANELS (Not Shown) - Nominal 1-3/16 in. (30 mm) thick polished granite spandrel panels with 1 in. (25 mm) thick gauged edges. Each panel secured in position with aluminum pressure plates in conjunction with gaskets and steel screws iv. ALUMINUM COMPOSITE PANELS (Not Shown) - Min 1/8 in. (3 mm) thick aluminum composite comprised of min 0.02 in. (0.5 mm) aluminum skin with LDPE or mineral-filled Fire- Resistant core. Each panel secured in position with steel furring channels in conjunction with gaskets and steel screws. v. METAL COMPOSITE PANELS (Not Shown) - Min 1 in. (25 mm) thick, comprised of 0.032 in. (0.8 mm) smooth aluminum exterior skin, 0.157 in. (4 mm) thick mineral fiber cement board exterior stabilizer, 5/8 in. (16 mm) thick Micore 300 mineral fiberboard insulation core, 0.157 in, (4 mm) thick mineral fiber cement board interior stabilizer, and a 0.032 in. (0.8 mm) smooth aluminum interior skin. Each panel secured in position with aluminum pressure plates in conjunction with glazing gaskets and steel screws or with silicone structural glazing vi. INSULATED STEEL OR ALUMINUM BACKPAN (Not Shown) - Min 22 GA (min 0.031 in. or 0.79 mm thick) galvanized steel or aluminum panels installed behind glass panel (Item 2Bi) between mullions and transoms within spandrel panel area. Backpan provided with min 2 in. (51 mm) wide flange around all four sides Backpan installed flush with interior face of framing and screw-attached to mullions and transom along all sides with min No. 10 by 1 in. (25 mm) long self-drilling, self-tapping steel screws spaced max 8 in. (203 mm) OC. The backpan flanges may be offset with up to a 3/8 in. (10 mm) gap between the pan and the aluminum framing. Nom 5/16 in. (8 mm) wide by 5/16 in. (8 mm) thick adhesive backed polyurethane foam glazing tape installed between the pan and the framing. Tape is recessed nom 1/4 in. (6 mm) to accommodate one-part silicone sealant to be applied at nom 1/4 in. (6 mm) depth over the recessed tape, around the perimeter of the pan. Backpan may be filled with nom 4 pcf (64 kg/m3) density, or heavier, mineral wool batt insulation VISION PANELS - Nominal 1/4 in. (6 mm) thick transparent heat-strengthened glass or nominal 1 in. (25 mm) thick insulated glass units with two layers of nom 1/4 in. (6 mm) thick transparent heat-strengthened glass separated by a 1/2 in. (13 mm) air space. Each panel secured in position with aluminum pressure plates in conjunction with glazing gaskets and steel screws or with silicone structural glazing. 3. CONSTRUCTION GAP SEAL - Maximum separation between top of concrete floor assembly (Item 1) and underside of the transom is 5/8 in. (16 mm). Maximum separation between the underside of the concrete floor assembly (Item 1) and the transom is 11/16 in. (18mm). The seal system shall incorporate the following A. WEATHER SEAL - (optional for weather resistant purposes) - A nominal 1/4 in. (6mm) bead of silicone sealant is applied to the top of the concrete floor assembly (Item 1) surface before the Intumescent gasket (Item 3B) is placed on the slab and secured in place B. MANUFACTURER: Specified Technologies, Inc. **CERTIFIED PRODUCT:** Intumescent Wrap Strip CERTIFIED MODEL: SpecSeal® Window Wall Gasket Intumescent Gasket nominal 1/8 in. (3mm) thick and 8 in. (203mm) wide intumescent gasket is positioned so that a min. 3 in. (76mm) portion of the width extends past the slab edge. The intumescent gasket is secured to the concrete floor assembly (Item 1) with nominal 1-1/4 in. (32mm), 1/4 in. (6mm) diameter concrete screws and fender washer spaced 12 in. (305mm) OC. Alternatively, the intumescent gasket can be applied to the underside of the transom above the concrete floor assembly (Item 1) with self-tapping screws and fender washers on 12 in. centers.

C. CLOSED-CELL BACKER ROD - Install appropriately sized closed cell backer rod into the gap space on the

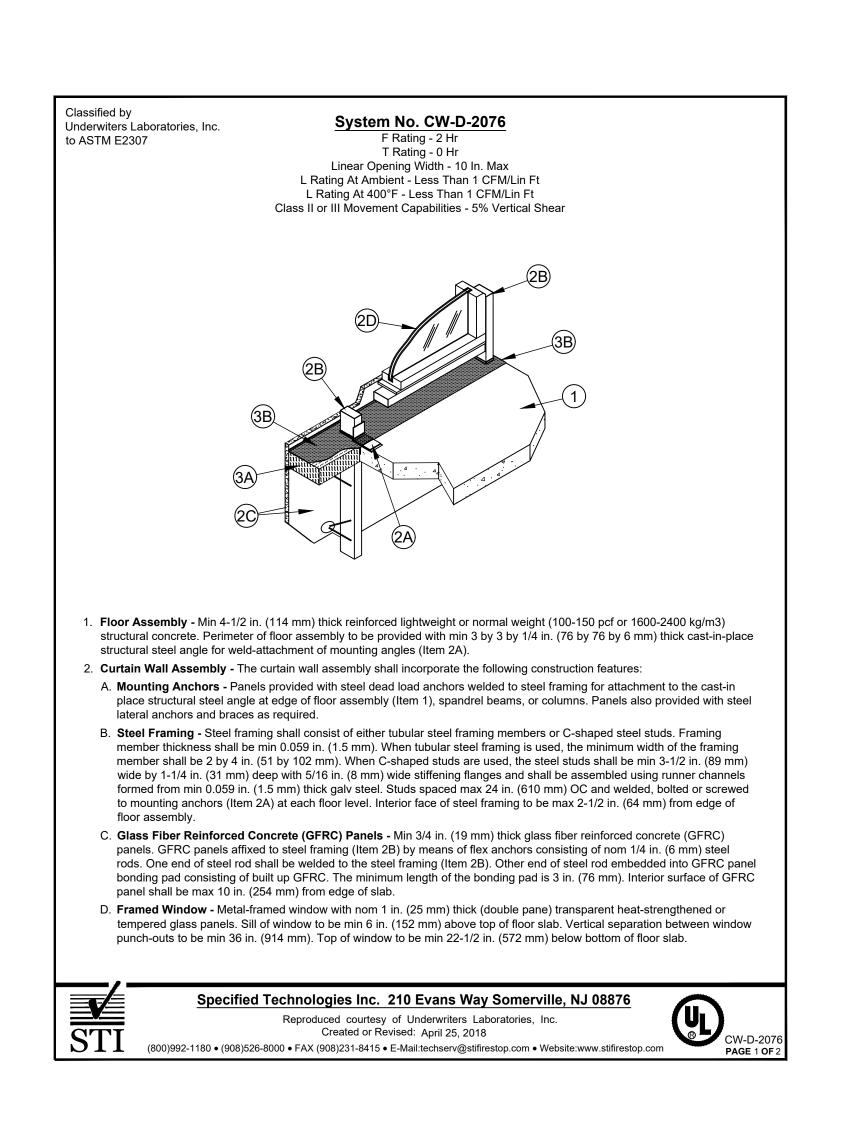
floor assembly (Item 1). Recess the backer rod to receive a 1/2 in. (13mm) depth of weather seal sealant.

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interior side of the wall (required), and exterior side of the wall (optional), both above and below the concrete



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#### PROJECT NAME:

PROJECT\_NAME:

## PROJECT LOCATION:

PROJECT\_LOCATION:

#### ARCHITECT/CONSULTANT:

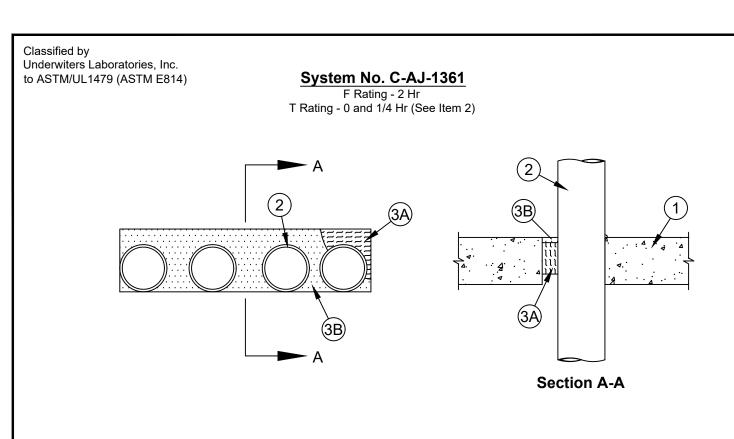
ARCHITECT/CONSULTANT:

#### TITLE:

STI FIRESTOP SYSTEMS

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- . Floor or Wall Assembly Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete floor. Floor may also be constructed of any min 6 in, thick hollow-core Precast Concrete Units\*, Wall may also be constructed of any UL Classified Concrete Blocks\*. Max area of opening is 144 sq in. with a max diam of 24 in. Max area of opening in floors constructed of hollow-core concrete is 49 sq in. with a max diam of 7 in. See Concrete Blocks (CAZT) or Precast Concrete Units (CFTV) categories in the Fire Resistance Directory for names of
- . Through Penetrants One or more pipes, conduits or tubing to be installed within the opening. The space between the pipes, conduits or tubes shall be min 1 in. to max 2 in. The annular space between the pipes, conduits or tubing and the periphery of the opening shall be min 0 in. (point contact) to max 2 in. Pipes, conduits or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
- B. Iron Pipe Nom 4 in. diam (or smaller) cast or ductile iron pipe. C. Conduit - Nom 4 in. diam (or smaller) rigid steel conduit, steel electrical metallic tubing (EMT) or flexible aluminum or steel
- D. Copper Pipe Nom 4 in. diam (or smaller) regular (or heavier) copper pipe.

A. Steel Pipe - Nom 4 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.

- E. Copper Tube Nom 4 in. diam (or smaller) Type L (or heavier) copper tube. When Through Penetrant A, B or C is used, the T Rating is 1/4 hr. When Through Penetrant D or E is used, the T
- 5. Firestop System The firestop system shall consist of the following:

SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

A. Packing Material - Min 4 pcf mineral wool batt insulation compressed and tightly packed to min 3 in. thickness. Packing material recessed from top surface of floor or both surfaces of wall or precast concrete unit as required to accommodate fill B. Fill, Void or Cavity Material\*-Sealant - Min 1/2 in. thickness of fill material applied within annulus, flush with top surface of floor assembly or both surfaces of wall assembly. In floors constructed of hollow-core precast concrete, fill material installed

symmetrically on both sides of floor assembly. At point contact locations, min 1/4 in. diam bead of fill material applied at

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

metallic pipe/concrete interface on top surface of floor or on both surfaces of wall or precast concrete units.

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- 2B. Firestop Device\* (Not Shown) When the concrete floor slab or concrete topping thickness over steel deck exceeds 8 in. (203 mm), a nonmetallic extension tube shall be used in conjunction with Item 2. The extension tube shall be installed in accordance with the accompanying installation instructions. The extension tube may be cut flush with the top surface of the floor or extend beyond the top surface of the floor. SPECIFIED TECHNOLOGIES INC - SpecSeal CD200X, CD300X, CD400X or CD600X Cast In Firestop Device Extension

Through Penetrant - One metallic pipe, tube or conduit to be centered within the firestop system. Pipe, conduit or tube to be

rigidly supported on both sides of the floor assembly. The following types and sizes of through penetrant may be used:

- A. Steel Pipe Nom 6 in. (152 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe. B. Iron Pipe - Nom 6 in. (152 mm) diam (or smaller) cast or ductile iron pipe. C. Conduit - Nom 6 in. (152 mm) rigid steel conduit or steel electrical metallic tubing (EMT).
- D. Copper Pipe or Tubing Nom 4 in. (102 mm) diam (or smaller) Type M (or heavier) copper tubing or Regular (or heavier)

Nom Pipe Diam (a)	Firestop Device
1-1/2 or 2 in. (38 or 51 mm )	CD200, CD201, CD201C, CD202, CD200M
2-1/2 or 3 in. (64 or 76 mm )	CD300, CD301, CD301C, CD302, CD300M
3-1/2 or 4 in. (89 or 102 mm )	CD400, CD401, CD402, CD400M
6 in. (152 mm )(b)	CD600, CD600M (b)

- (a) When metallic pipe, conduit, or tubing with diam smaller than those shown in the table above are used, packing material and/or fill material shall be installed into the device as described in Items 4 and 5. L Ratings for these penetrants only apply when the fill material is used. Otherwise, the L Rating for each firestop device is less than 1 CFM/ft2 (5.1 L/s/m2) at ambient and 400F.
- (b) When Firestop Device CD600 or CD600M are used, the concrete thickness (See Items 1 and 1A) shall be min 4-1/2 in. (114 mm). Packing Material - (Not Shown) - When required under Item 3, min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool firmly packed into device flush with top edge of device (Item 2), and extending a min 1 in. (25 mm) below the top surface
- of the floor. When W Ratings for penetrants are required, min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool firmly packed into device recessed 1/4 in. (6 mm) from top edge of device (Item 2) to accommodate sealant (Item 6). When L Ratings for penetrants with a diam smaller than those shown in the table above are required, recess mineral wool 1/4 in. (6 mm) from top edge of device to accommodate sealant (Item 6).
- Fill, Void, or Cavity Material\* Putty (Not Shown) When required under Item 3, as an option to Item 4, min 1 in. (25 mm) depth of fill material applied to fill annulus between penetrant and throat of firestop device at top of floor. SPECIFIED TECHNOLOGIES INC - SpecSeal Putty
- 6. Fill, Void, or Cavity Material\* (Optional, Not Shown) To achieve W Ratings for penetrants or to achieve L Ratings for penetrants with a diam smaller than those shown in the table of Item 3, apply min 1/4 in. (6 mm) depth of sealant atop packing material (Item 4) flush with top edge of device (Item 2)
- SPECIFIED TECHNOLOGIES INC SpecSeal Series SIL300 Sealant or SpecSeal Series SIL300SL Pipe Tee Fitting System - (Optional, Not Shown) - For use with Iron Pipe (Item 3B) only, One nom 6 in. (152 mm) diam (or smaller) PVC TESTRITE TEE Fitting (matched to penetrant diameter). The PVC TESTRITE TEE Fitting is secured to metallic penetrant (Item 3B) with compression type pipe coupling elastomeric gasket with stainless steel jacket and stainless steel band clamps for use in vented (drain, waste or vent) iron pipe systems. Installed (Item 3B) penetrant shall extend a minimum

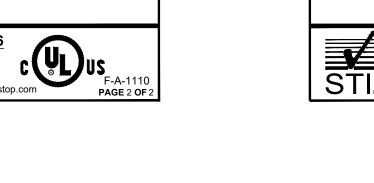
of 6 in. (152 mm) above the surface of the floor and minimum 12 in. (302 mm) below the bottom surface of the floor above

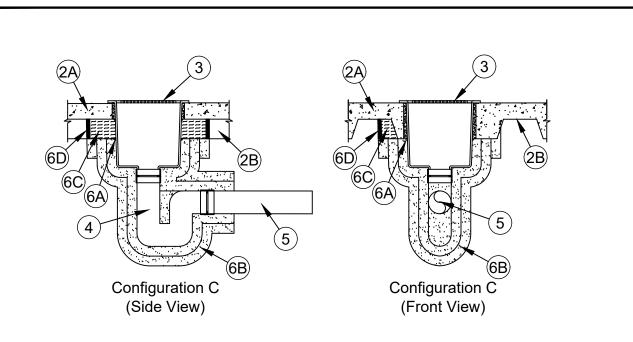
\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

+Bearing the UL Listing Mark

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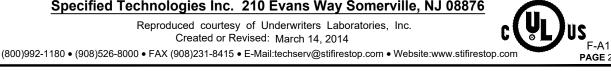
- 1. Floor Assembly Min 2-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf or 1600 2400 kg/m3) concrete floor. Floor may also be constructed of any min 6 in. (152 mm) thick hollow core UL Classified Precast Concrete Units\*. 2. Floor Assembly - As an alternate to Item 1. the fire-rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D700, D800 or D900 Series designs in the UL Fire Resistance
- Directory and as summarized below: A. Concrete - Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete topping, as measured from the top of the steel floor units.
- B. Steel Floor and Form Units\* Composite or noncomposite 1-1/2, 2 or 3 in. (38, 51 or 76 mm) deep fluted galv units as specified in the individual Floor-Ceiling design.
- 3. Floor Sink Max 12 in. wide by 12 in. long by 10 in. (305 by 305 by 254 mm) deep cast iron floor sink with cast iron grate. Sink cast or grouted into floor assembly. Metal dome strainer may be used in sink drain. Sink flanges overlap top of floor assembly. 4. P-Trap - (Optional) - Max 4 in. (102 mm) diam cast or ductile iron p-trap secured to outlet of floor sink using compression type pipe coupling with elastomeric gasket and a stainless steel jacket with stainless steel band clamps.

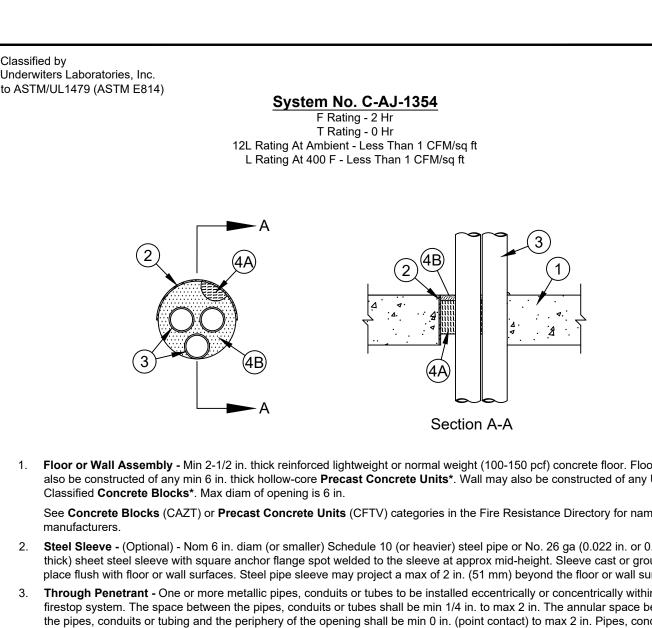
5. Drain Pipe - Max 4 in. (102 mm) diam steel pipe or cast or ductile iron pipe secured to outlet of floor sink or p-trap (when

present) using compression type pipe coupling with elastomeric gasket and a stainless steel jacket with stainless steel band

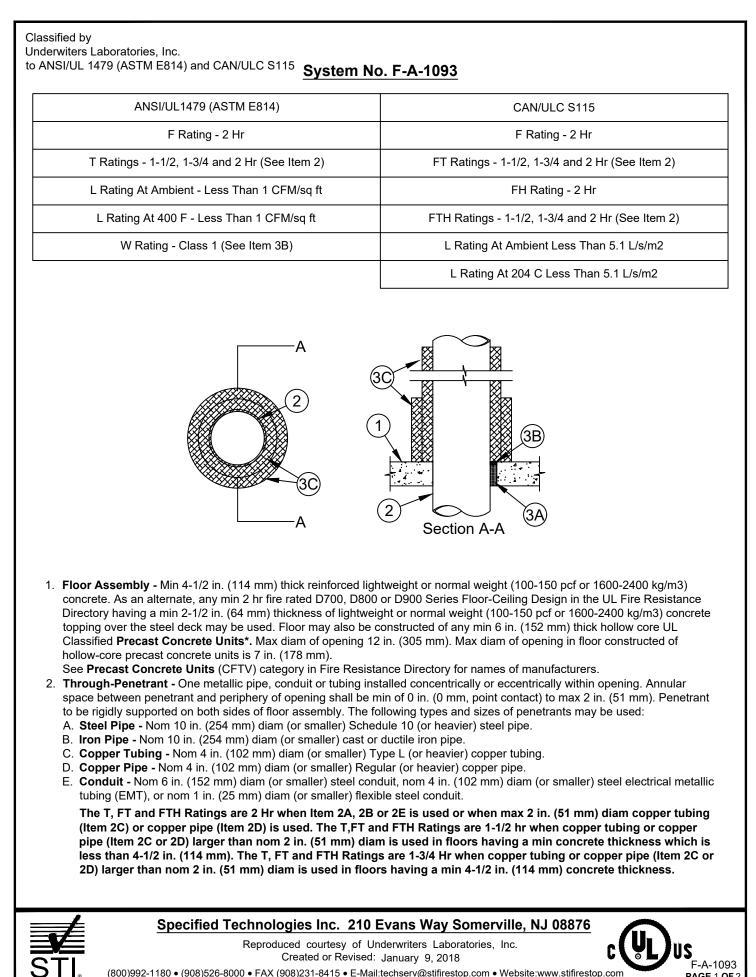
- **6. Firestop System -** The firestop system shall consist of the following: A. Fill, Void or Cavity Material\* - Sealant - Min 1/2 in. (13 mm) bead of sealant applied at sink/floor interface.
- SPECIFIED TECHNOLOGIES INC SpecSeal SSS Sealant, SpecSeal LCI Sealant B. Duct Wrap Materials\* - Two layers of nom 1-1/2 in. (38 mm) thick faced or unfaced duct wrap to be tightly wrapped around sink and drain pipe. Both layers of duct wrap shall extend from bottom of floor and cover a minimum of 24 in. (610 mm) length of p-trap and/or drain pipe. An additional 6 in. (152 mm) wide layer of nominal 1-1/2 in. (38 mm) thick duct wrap (faced or unfaced) tightly wrapped around the first two layers flush with bottom of floor. Duct wrap layers are held in position using min 24 GA steel wire spaced max 4 in. (102 mm) on center and max 1 in. (25 mm) from ends of layers. THERMAL CERAMICS INC - FireMaster FastWrap XL, or Pyroscat Duct Wrap XL

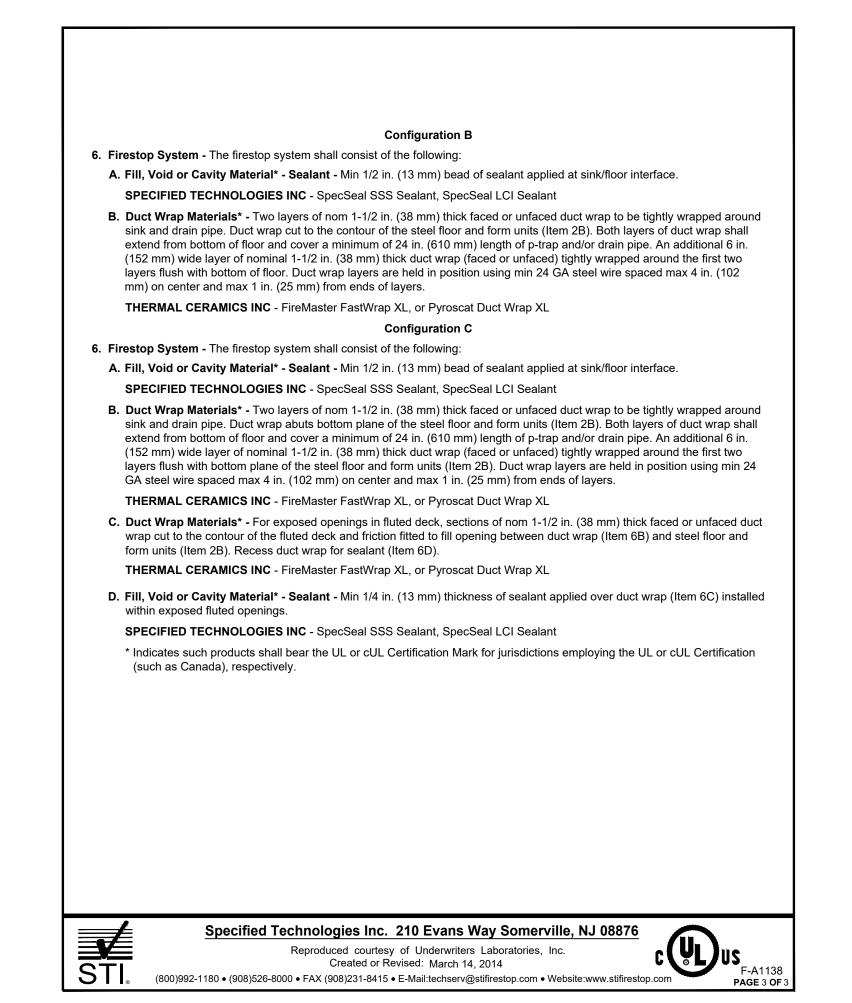
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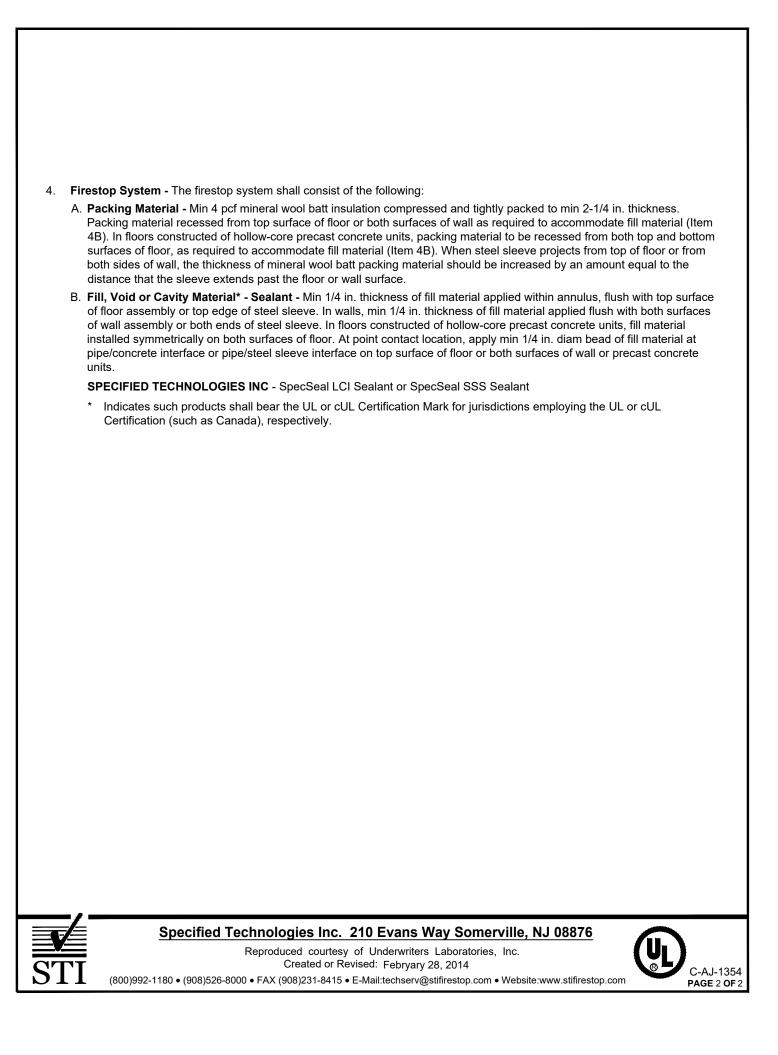


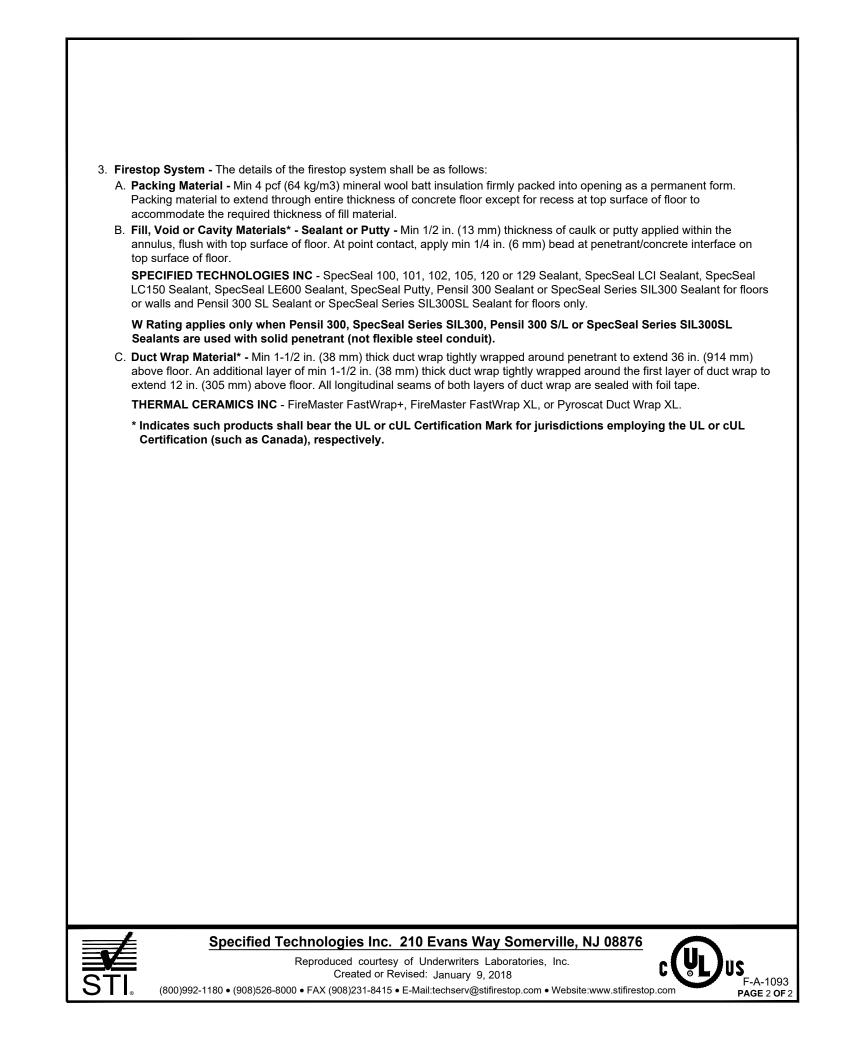


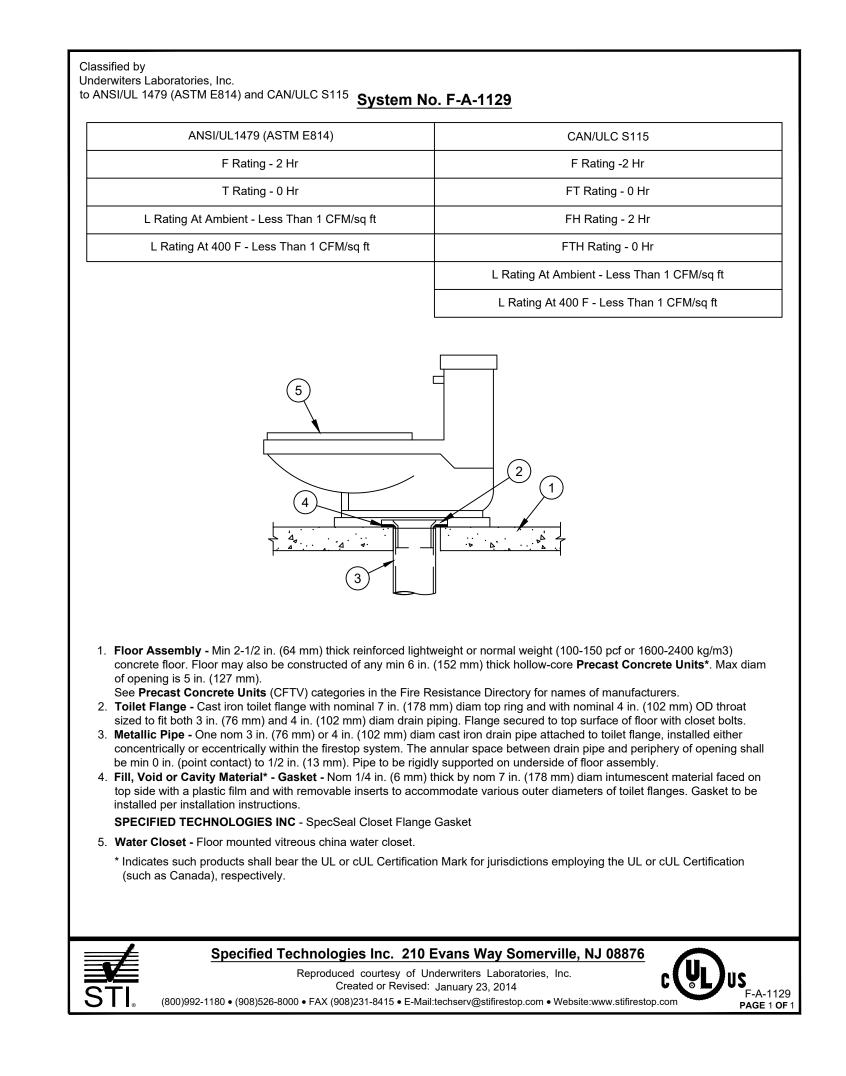
Floor or Wall Assembly - Min 2-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete floor. Floor may also be constructed of any min 6 in. thick hollow-core Precast Concrete Units\*. Wall may also be constructed of any UL See Concrete Blocks (CAZT) or Precast Concrete Units (CFTV) categories in the Fire Resistance Directory for names of Steel Sleeve - (Optional) - Nom 6 in. diam (or smaller) Schedule 10 (or heavier) steel pipe or No. 26 ga (0.022 in. or 0.56 mm thick) sheet steel sleeve with square anchor flange spot welded to the sleeve at approx mid-height. Sleeve cast or grouted in place flush with floor or wall surfaces. Steel pipe sleeve may project a max of 2 in. (51 mm) beyond the floor or wall surfaces. Through Penetrant - One or more metallic pipes, conduits or tubes to be installed eccentrically or concentrically within the firestop system. The space between the pipes, conduits or tubes shall be min 1/4 in, to max 2 in. The annular space between the pipes, conduits or tubing and the periphery of the opening shall be min 0 in. (point contact) to max 2 in. Pipes, conduits or tubes to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of metallic pipes, conduits and tubes may be used: A. **Steel Pipe -** Nom 2 in. diam (or smaller) Schedule 5 (or heavier) steel pipe. B. Iron Pipe - Nom 2 in. diam (or smaller) cast or ductile iron pipe. C. Conduit - Nom 2 in. diam (or smaller) rigid steel conduit, steel electrical metallic tubing (EMT) or flexible aluminum or steel D. Copper Pipe - Nom 2 in. diam (or smaller) Regular (or heavier) copper pipe. E. Copper Tube - Nom 2 in. diam (or smaller) Regular L (or heavier) copper tube. 3A. Through Penetrating Product\* - Flexible Metal Piping - As an alternate to Item 3, one or more nom 2 in. diam (or smaller) steel flexible metal pipes to be installed either concentrically or eccentrically within the firestop system. The space between the pipes shall be min 1/4 in. to max 2 in. The annular space between the pipes and the periphery of the opening shall be min 0 in, (point contact) to max 2 in. Pipes to be rigidly supported on both sides of the floor or wall assembly OMEGA FLEX INC **GASTITE, DIV OF TITEFLEX** WARD MFG L L C Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876 Reproduced courtesy of Underwriters Laboratories, Inc Created or Revised: Febryary 28, 2014 (800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techserv@stifirestop.com • Website:www.stifirestop.com

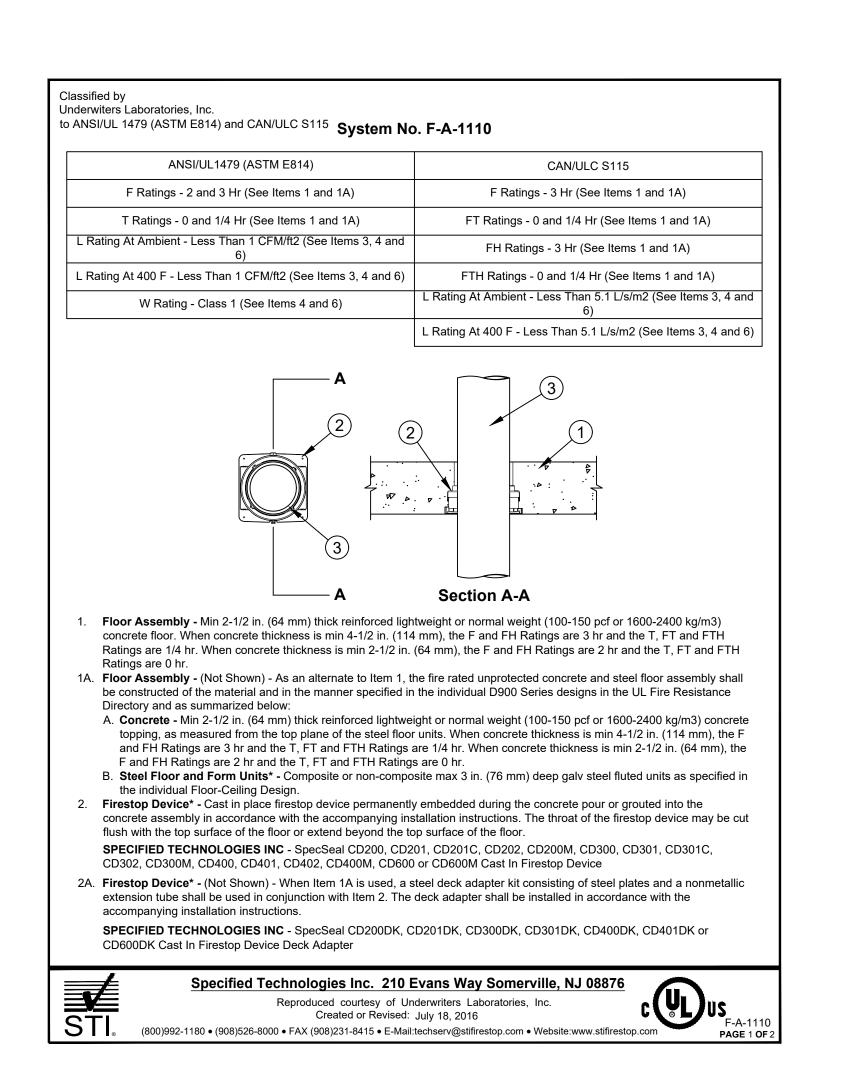


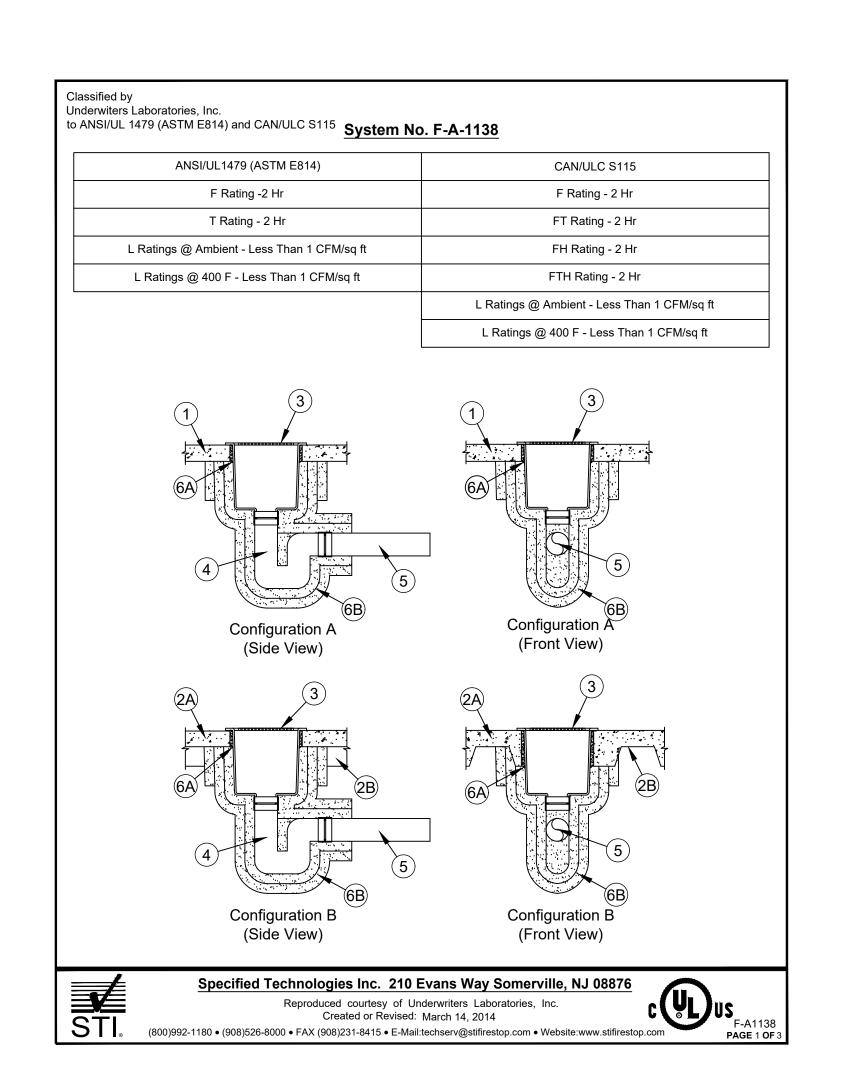












#### **GENERAL NOTES:**

- Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
  - UL Fire Resistance Directory; Current Edition
  - NFPA 101 Life Safety Code
  - All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

#### PROJECT NAME:

PROJECT\_NAME:

PROJECT LOCATION:

PROJECT\_LOCATION:

#### ARCHITECT/CONSULTANT:

ARCHITECT/CONSULTANT:

### TITLE:

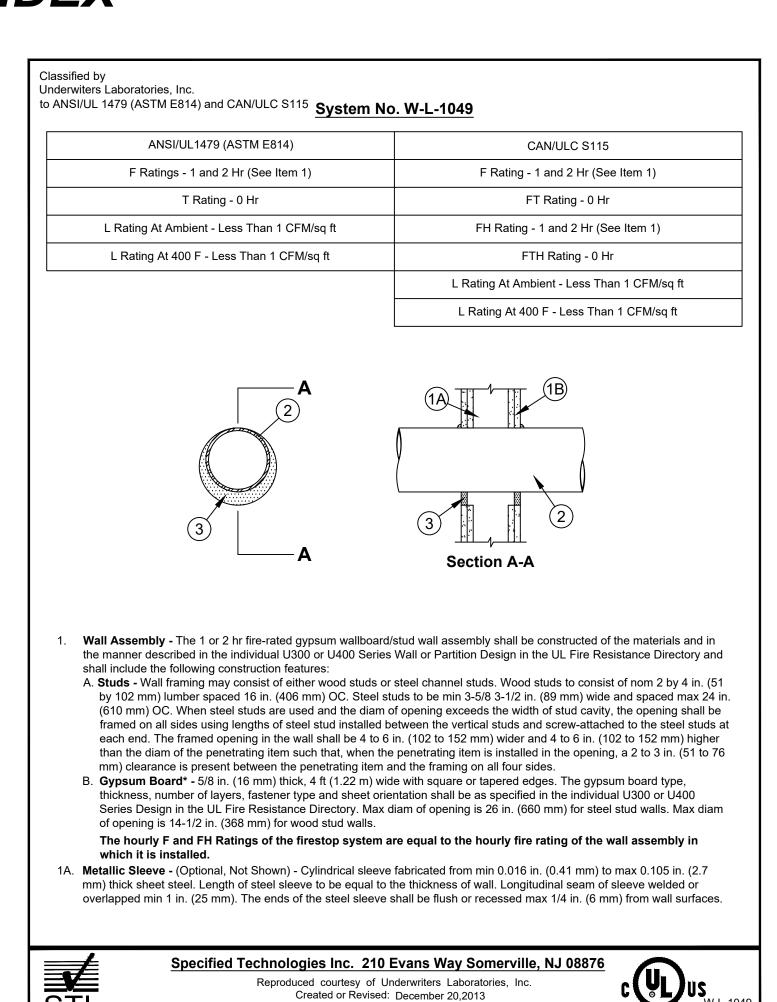
STI FIRESTOP SYSTEMS

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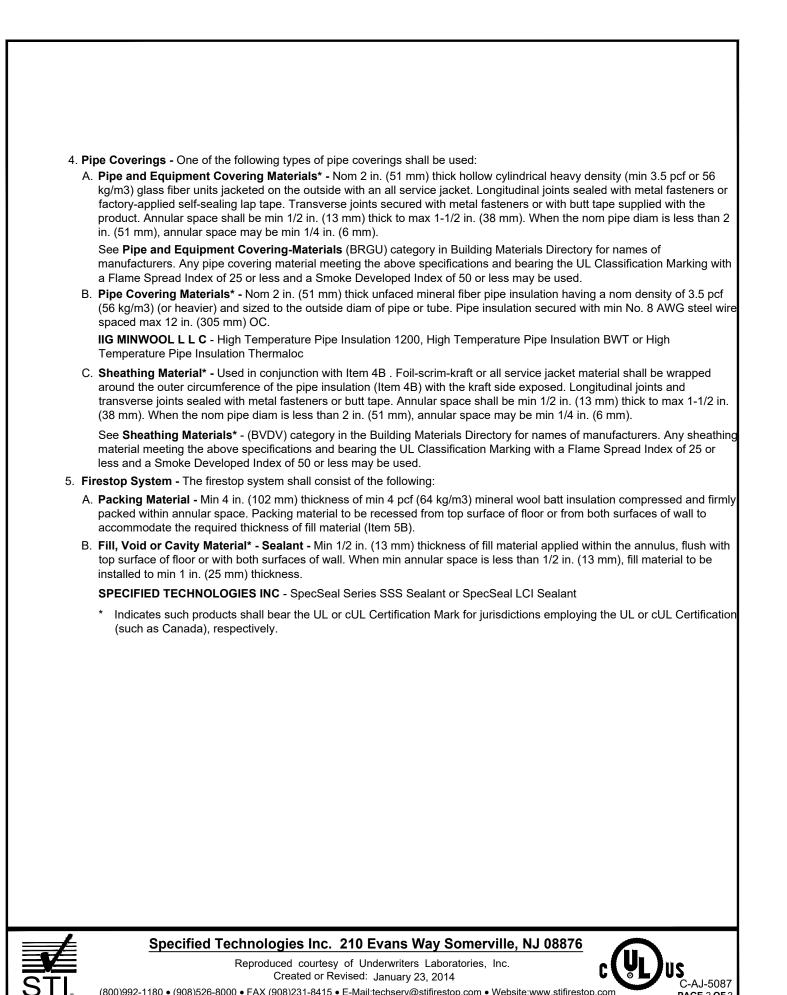


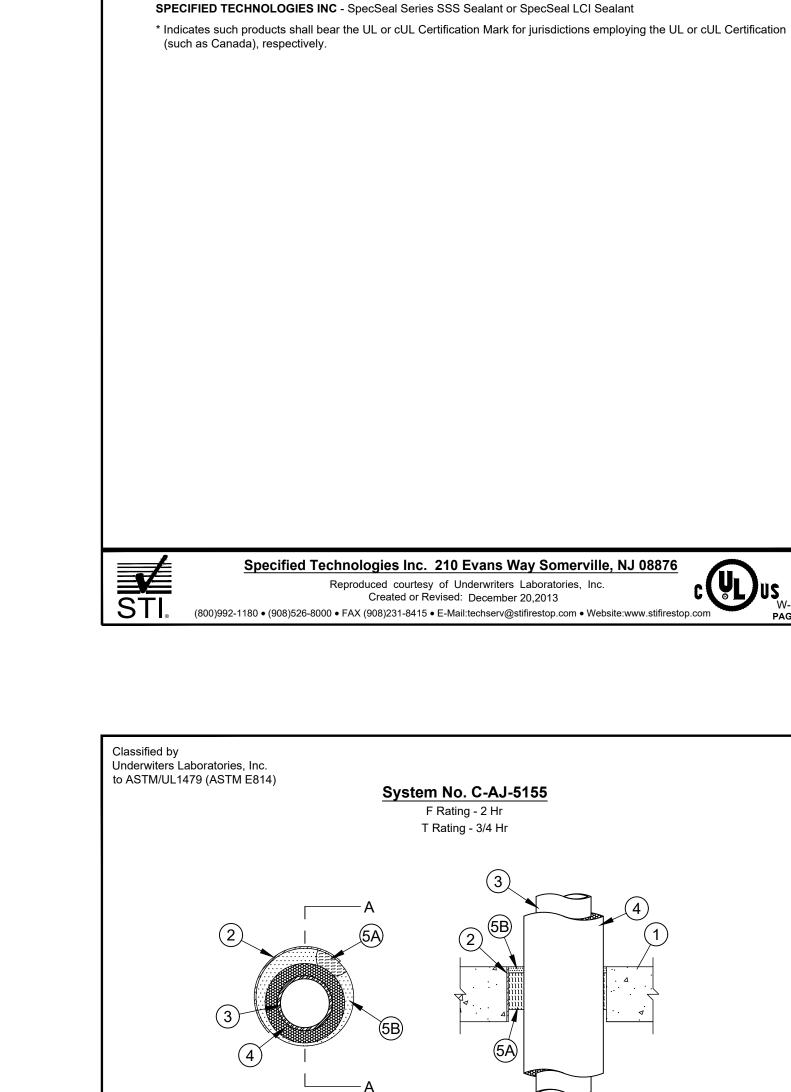
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sizes of metallic pipes, conduits or tubing may be used:

Through Penetrant - One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. The

annular space between pipe, conduit or tubing and periphery of opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). For maximum 16 in. (406 mm) diam (or smaller) pipes, annular space shall be min 0 in. (0 mm, point contact) to

C. Conduit - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing, nom 6 in. (152 mm) diam (or smaller) steel

Fill, Void or Cavity Material\* - Sealant - Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall. At the point contact location between through penetrant and gypsum board, a min 3/8 in. (10 mm) diam bead

max 2 in. (51 mm). Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and

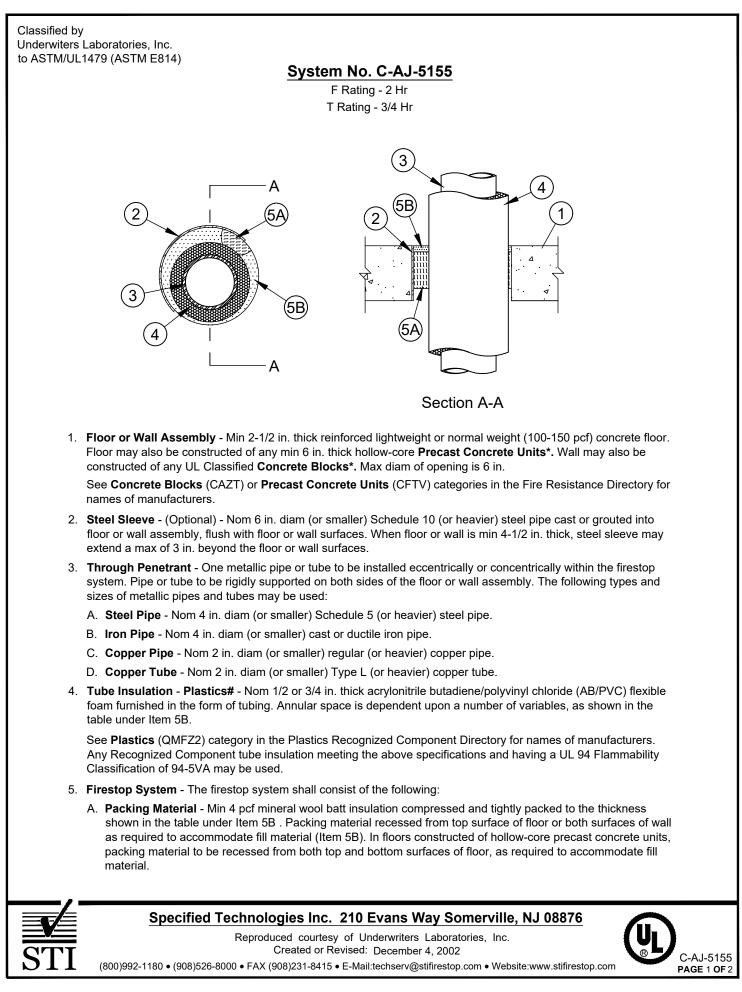
A. Steel Pipe - Nom 36 in. (914 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

D. Copper Tubing - Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing. E. Copper Pipe - Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.

of fill material shall be applied at the gypsum board/through penetrant interface on both surfaces of wall.

B. Iron Pipe - Nom 36 in. (914 mm) diam (or smaller) cast or ductile iron pipe.

conduit or nom 1 in. (25 mm) diam (or smaller) flexible steel conduit.



6. Fill, Void, or Cavity Material\* - Putty - (Not Shown) - When required under Item 3, as an option to Item 5, min 1

7. Fill, Void, or Cavity Material\* - (Optional, Not Shown) - To achieve L or W Ratings, apply min 1/4 in. (6 mm)

SPECIFIED TECHNOLOGIES INC - SpecSeal Series SIL300 Sealant or SpecSeal Series SIL300SL Sealant

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL

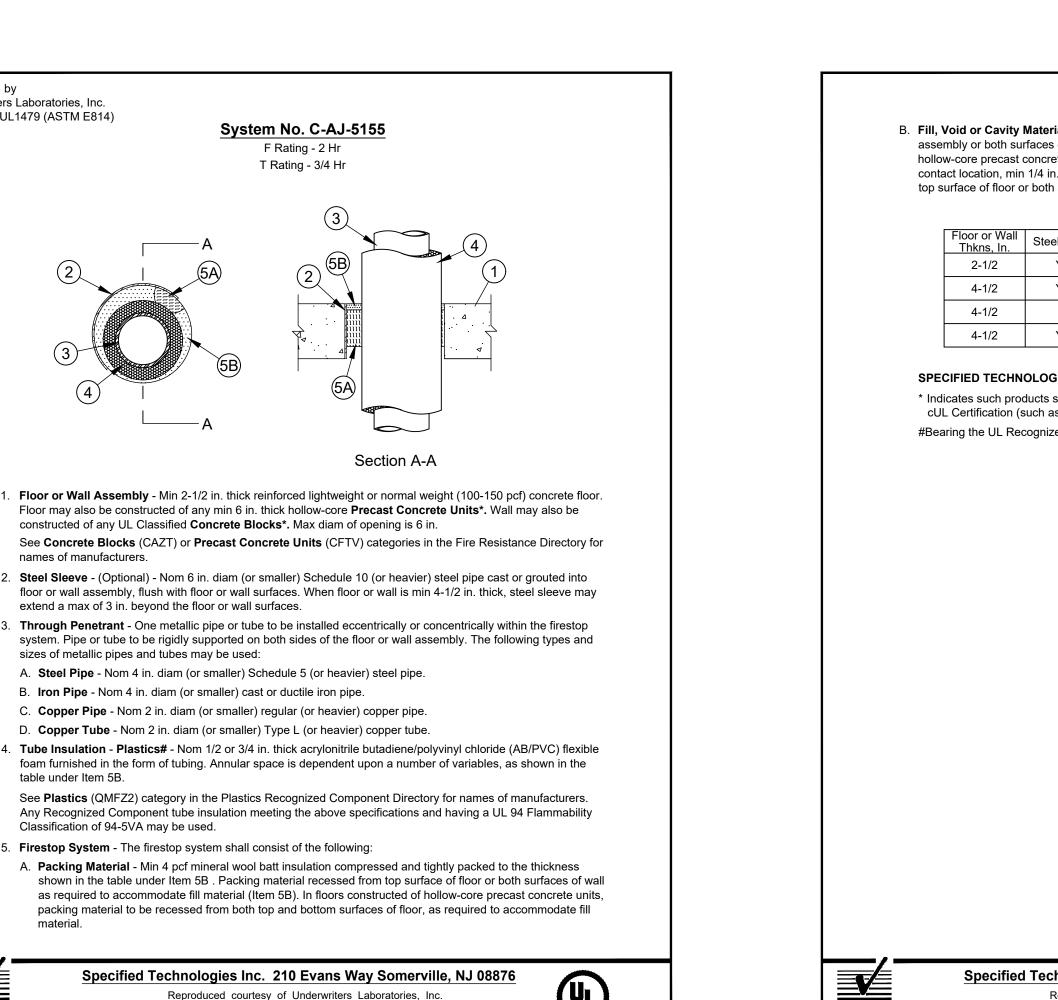
SPECIFIED TECHNOLOGIES INC - SpecSeal Putty

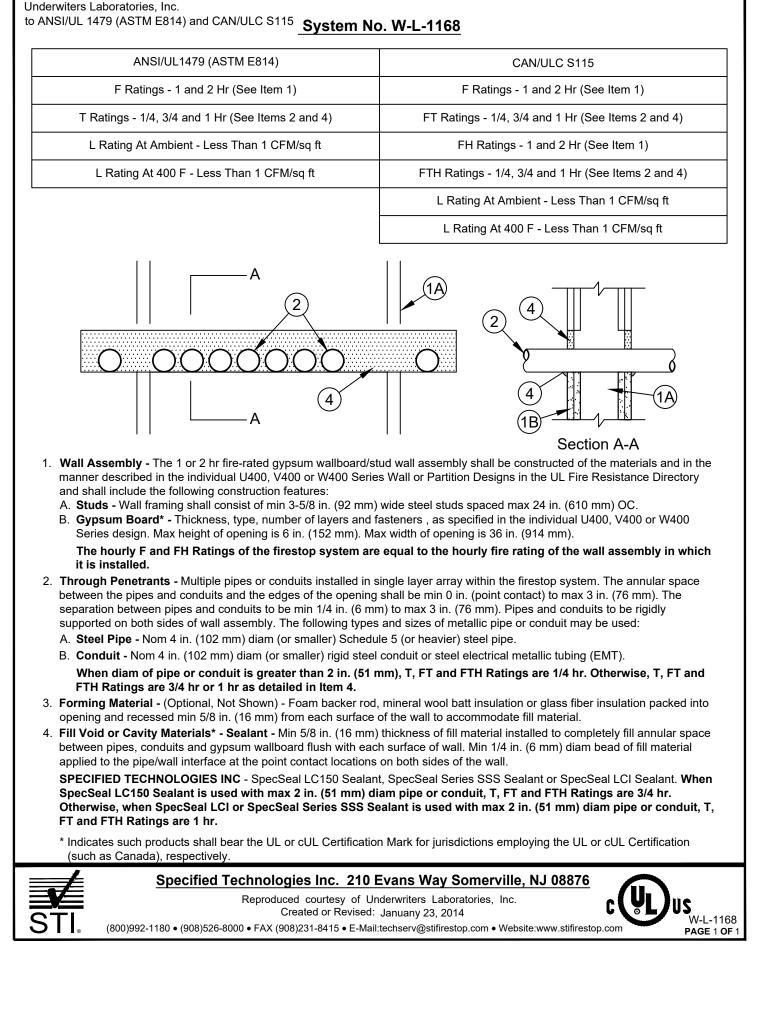
or cUL Certification (such as Canada), respectively.

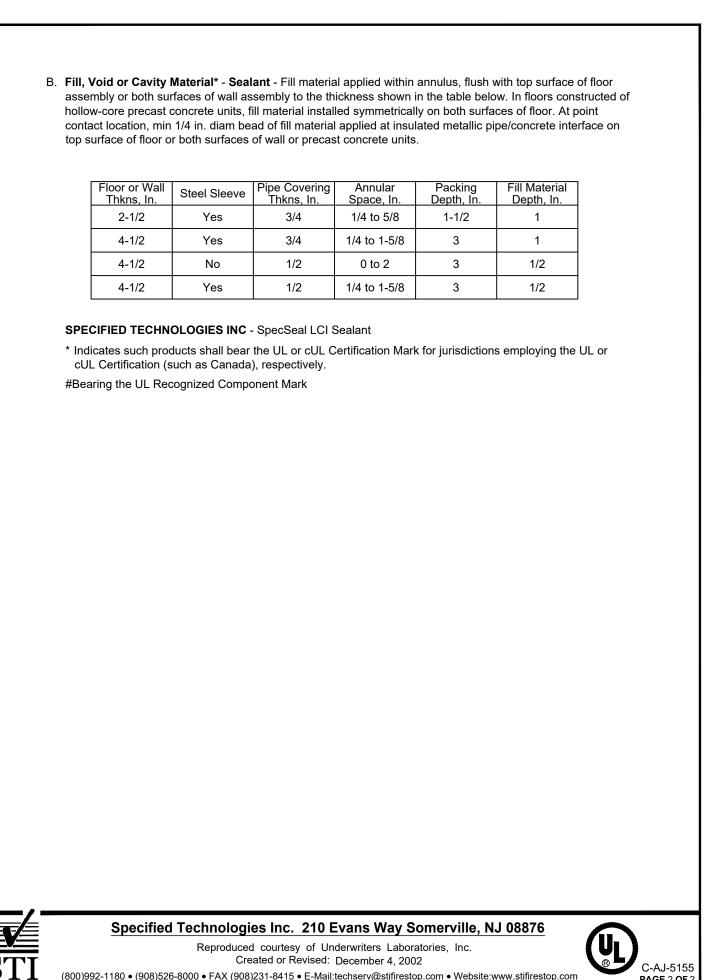
+Bearing the UL Listing Mark

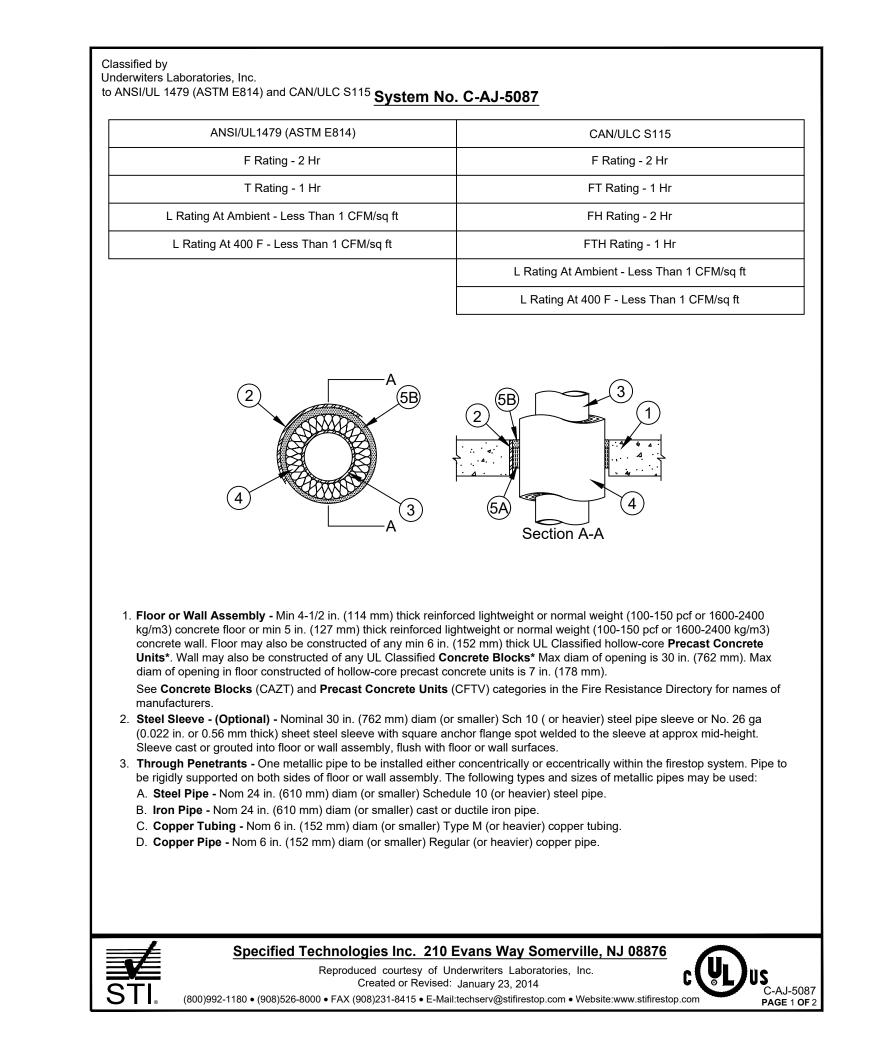
depth of sealant atop packing material (Item 5) flush with top edge of device.

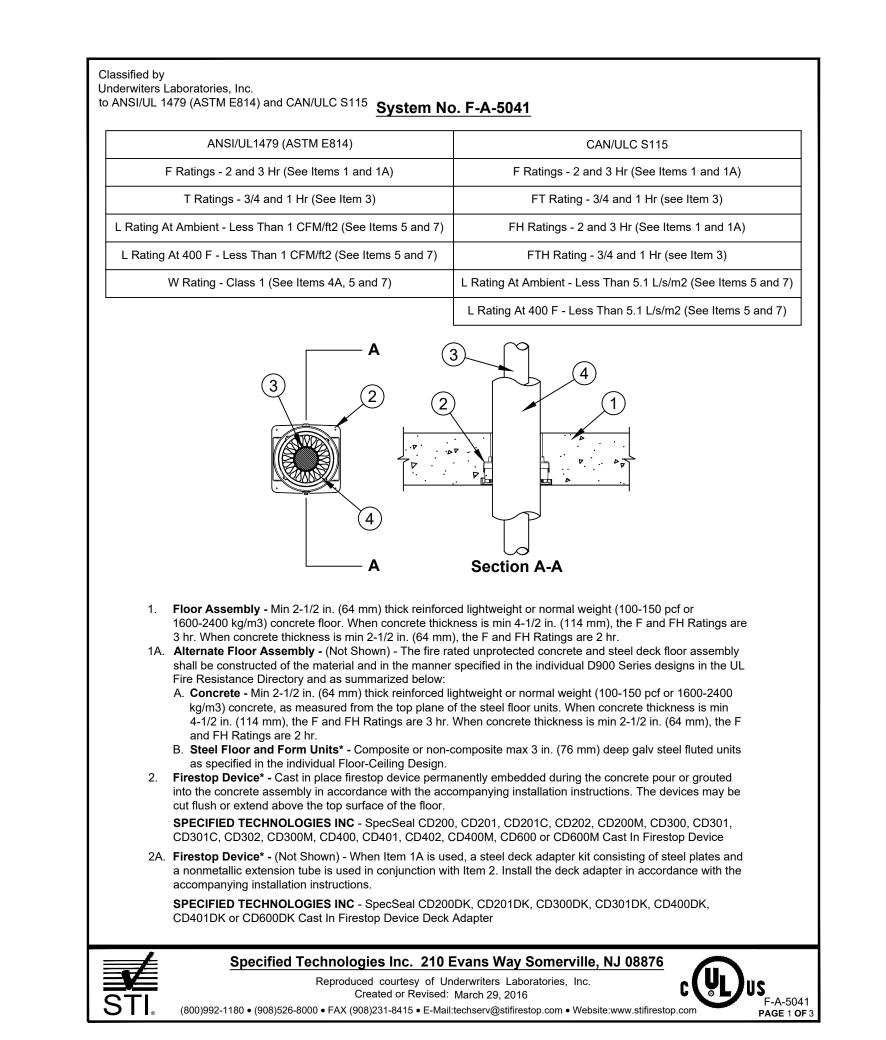
in. (25 mm) depth of fill material applied to fill annulus between penetrant and throat of firestop device at top of











#### **GENERAL NOTES:**

- . Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
- UL Fire Resistance Directory; Current Edition
- NFPA 101 Life Safety Code
- All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing** 

**DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

#### PROJECT NAME:

PROJECT\_NAME:

PROJECT LOCATION:

PROJECT\_LOCATION:

#### ARCHITECT/CONSULTANT:

ARCHITECT/CONSULTANT:

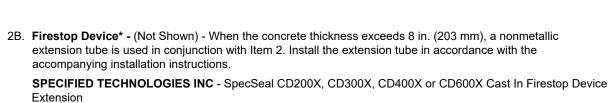
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3. Through Penetrants - One metallic pipe or tube to be installed within the firestop system. Penetrants to be rigidly supported on both sides of floor assembly. The following types and sizes of penetrants may be used. A. Steel Pipe - Nom 4 in. (102 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 Pipe - Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe. D. Copper Tube - Nom 4 in. (102 mm) diam (or smaller) Type M (or heavier) copper tube.

Nom Thickness of Pipe Firestop Device Insulation, in. (mm) in. (mm) 1/2 (13) 1 (25) 1 (25) 1-1/4 (32) 2 (51) 1 (25) CD402 or CD400M 1 (25) 4 (102) (b) CD600 and CD600M (b)

(a) When nom diam of metallic pipe or tubing is smaller than that shown in the table, fill material or packing material shall be installed into the device as described within Item 5 and 6. When nom diam of metallic pipe or tube is 2 in. (51 mm) or smaller, T, FT and FTH Ratings are 1 hr. When nom diam of metallic pipe or tube is larger than 2 in. (51 mm), T, FT and FTH Ratings are 3/4 hr. (b) When Firestop Device CD600 or CD600M are used, the concrete thickness (See Items 1 and 1A) shall be min 4-1/2 in. (114).

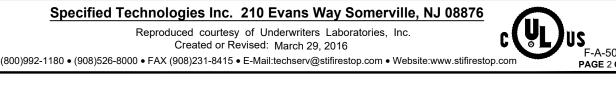
4. Pipe or Tube Covering\* - Nom 1 in. (25 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 56 kg/m3) glass fiber units, jacketed on the outside with an all service jacket. See Pipe and Equipment Covering-Materials\* (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 50 or less may be used.

4A. **PVC Jacket+ -** (Optional, Not Shown) - When W Ratings are required, an additional PVC jacket, supplied in sheet form, shall be tightly wrapped around the all service jacket on the pipe covering. The longitudinal seam of the PVC jacket shall be continuously sealed using the adhesive supplied with the jacket. The jacket is to be nom 48 in. (1.22 m) wide by nom 20 or 30 mil (0.5 or 0.8 mm) thick. The PVC jacket shall be positioned with its top edge located 37 in. to 40 in. (0.94 to 1.02 m) above the top surface of the floor assembly and shall extend downward into and/or through the floor opening. See Plastics+ (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers.

Any Recognized Component plastic material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used. 5. Packing Material - (Not Shown) - When required under Item 3, min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool firmly packed into device flush with top edge of device (Item 2) and extending a min 1 in (25 mm) below the top surface of the floor. When L or W Ratings are required, min 4 in. (102 mm) thickness of

min 4 pcf (64 kg/m3) mineral wool firmly packed into the top of the device (Item 2) and recessed min 1/4 in. (6

mm) from top edge of device to accommodate sealant (Item 7).

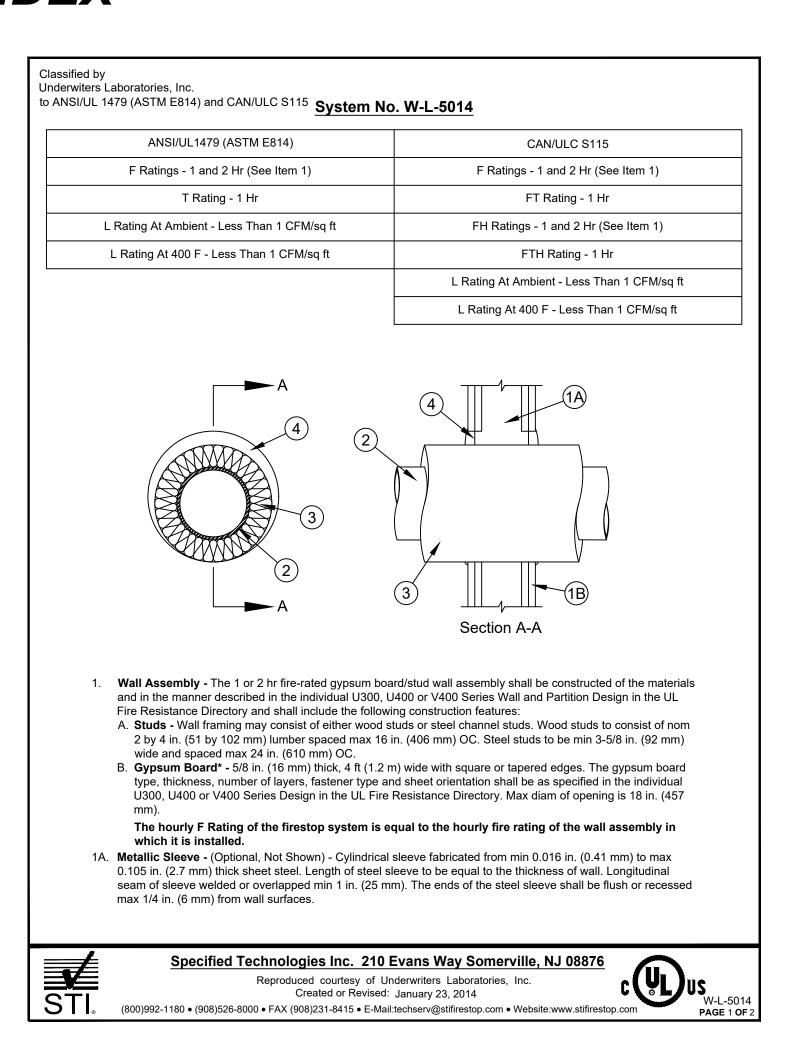


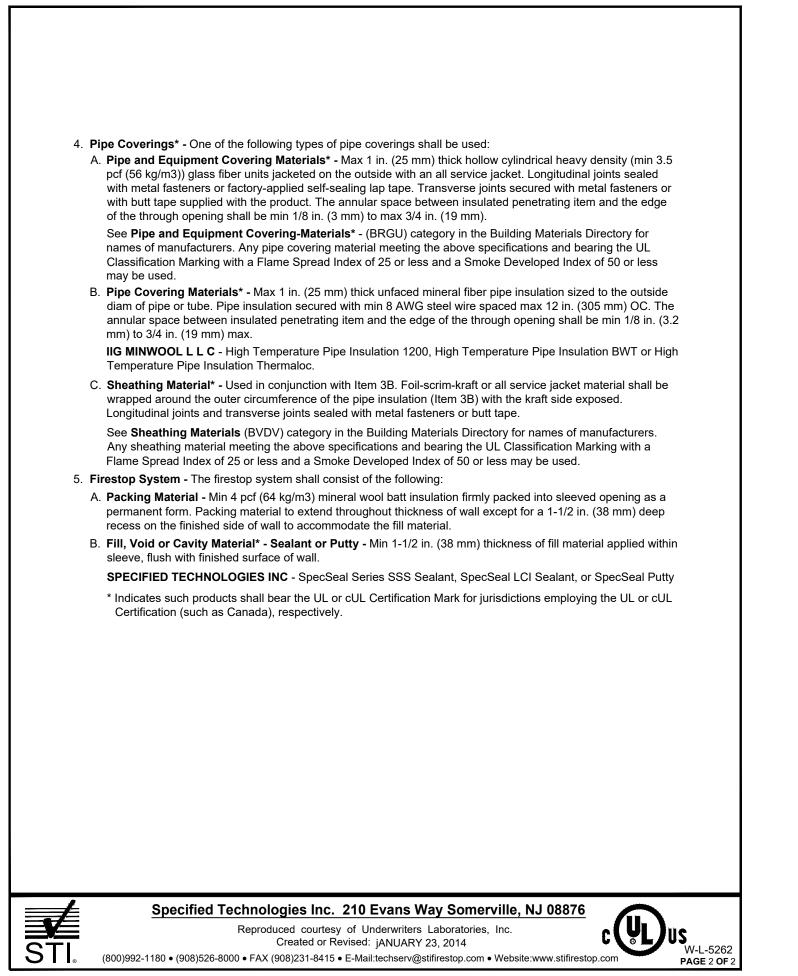
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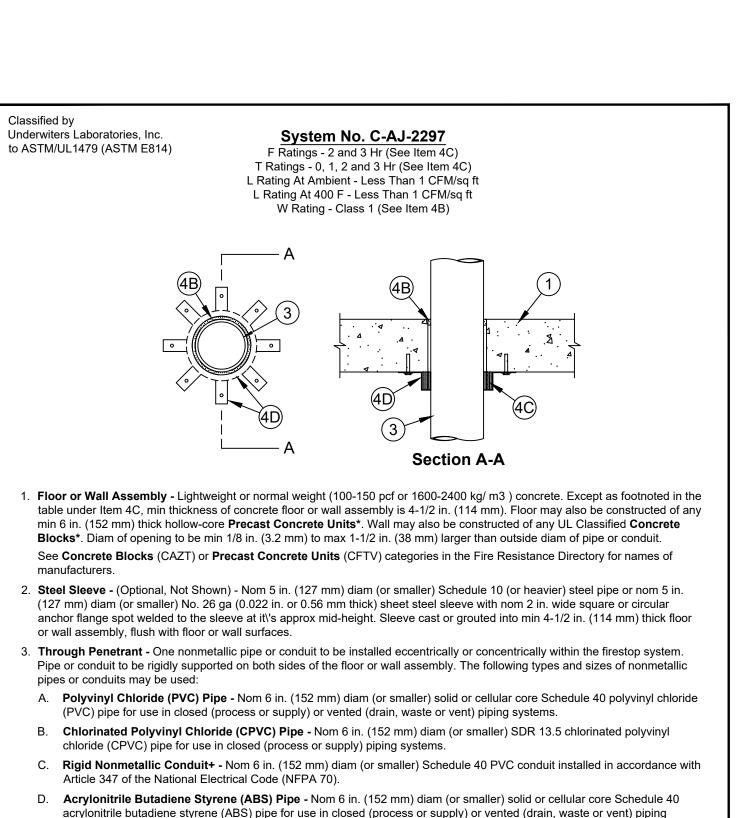


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E. Fire Retardant Polypropylene (FRPP) Pipe - Nom 6 in. (152 mm) diam (or smaller) solid or cellular core Schedule 40 fire retardant polypropylene (FRPP) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

F. High Density Polyethylene (HDPE) Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 HDPE pipe for use in closed

installed to the thickness specified in the table under Item 4C. Packing material to be recessed from top surface of floor or

A. Packing Material - (Not Shown) - When required, min 4 pcf (64 kg/m3) mineral wool batt insulation compressed and

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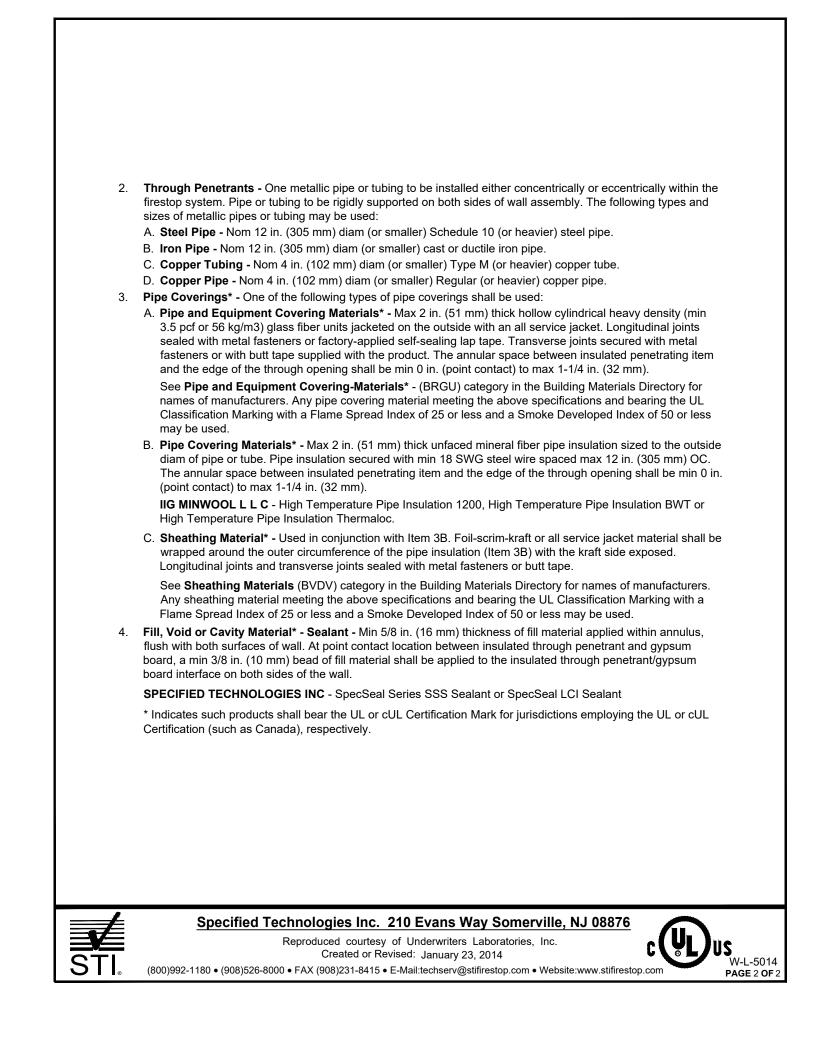
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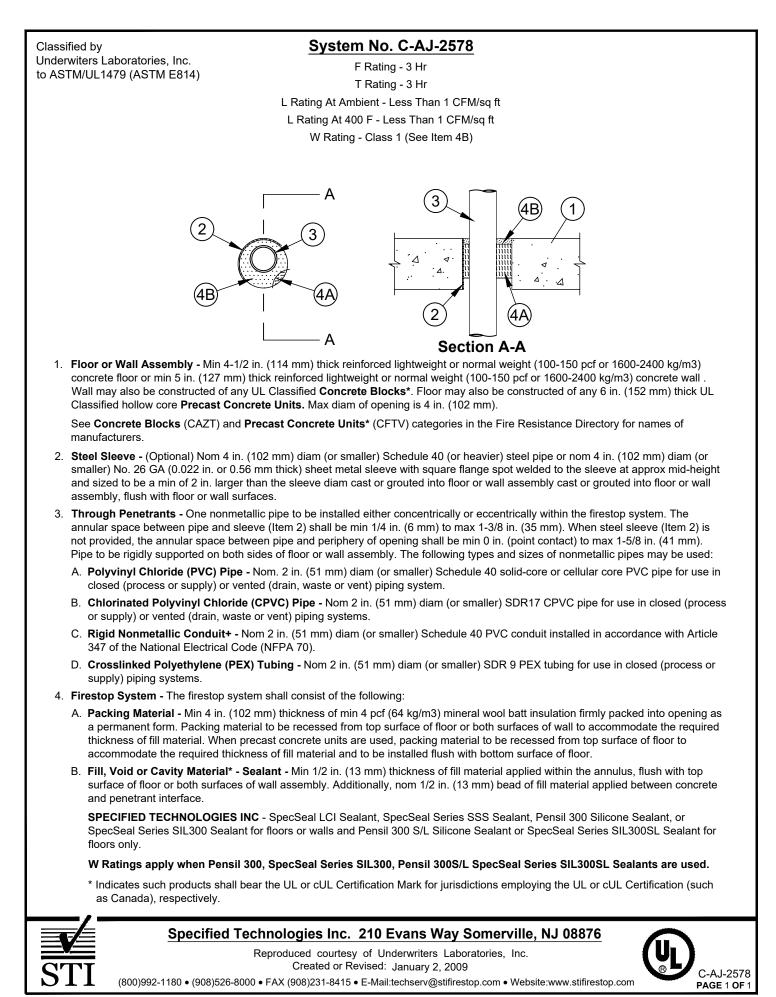
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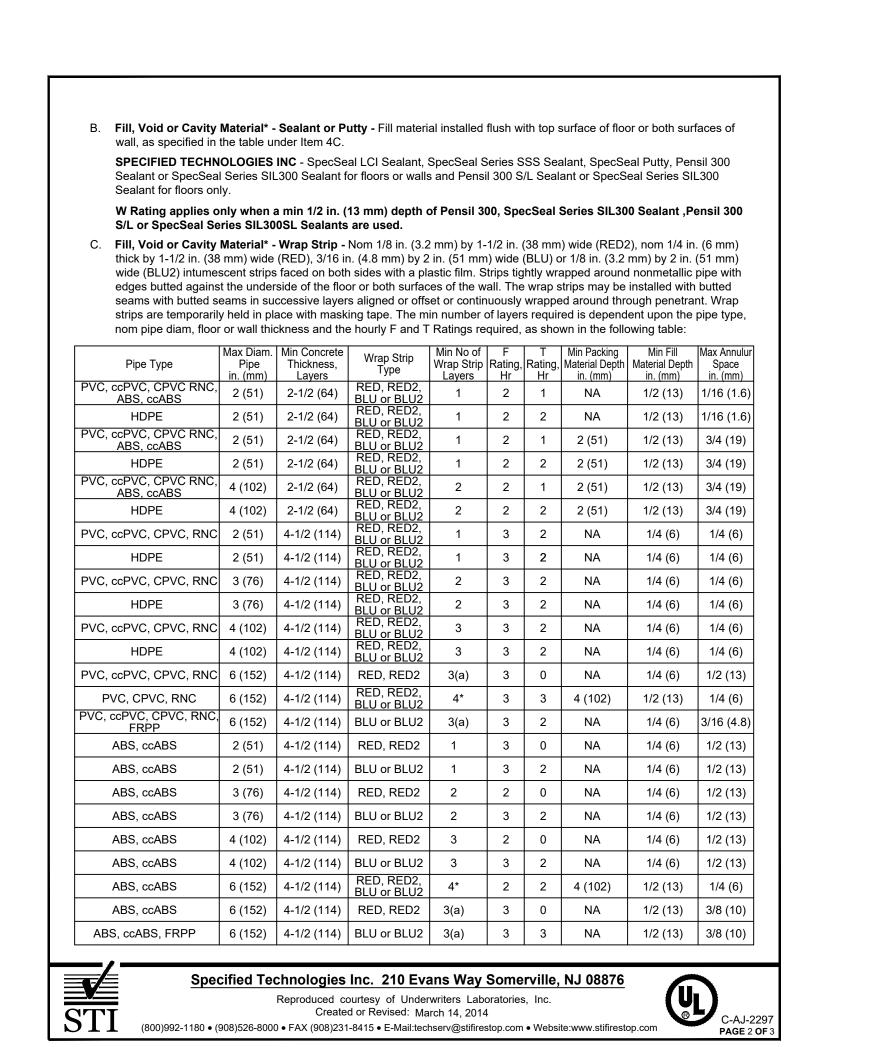
(process or supply) piping systems.

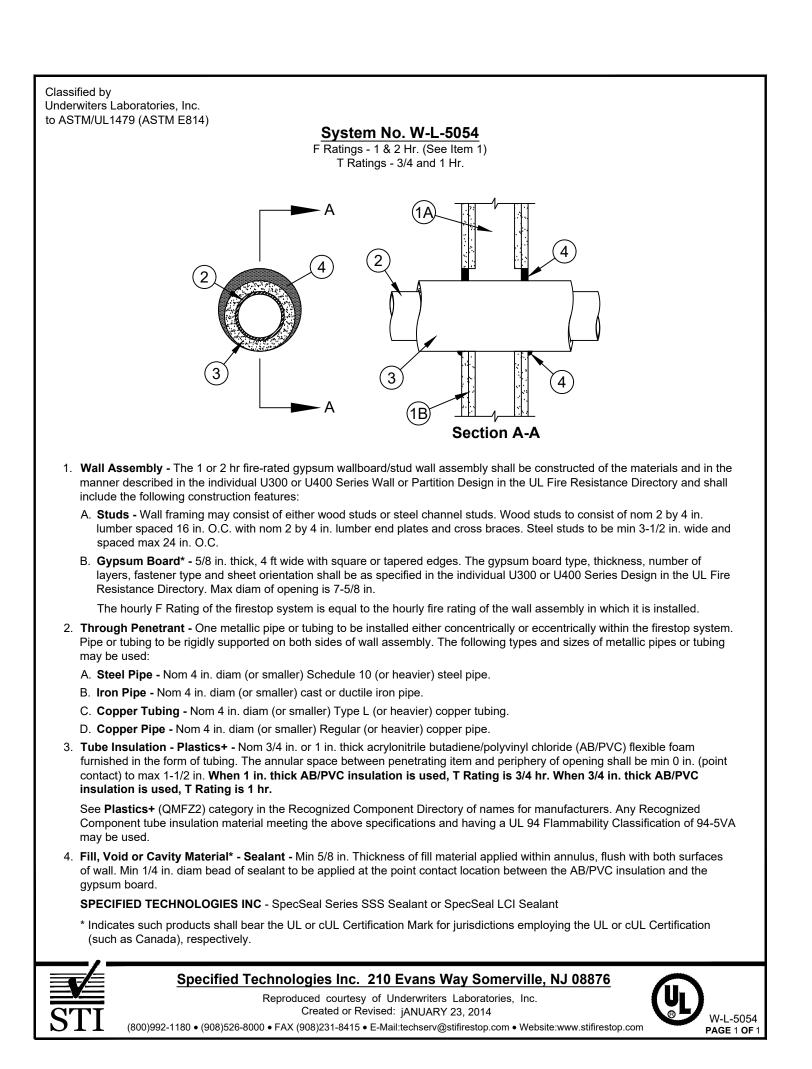
4. **Firestop System -** The firestop system shall consist of the following:

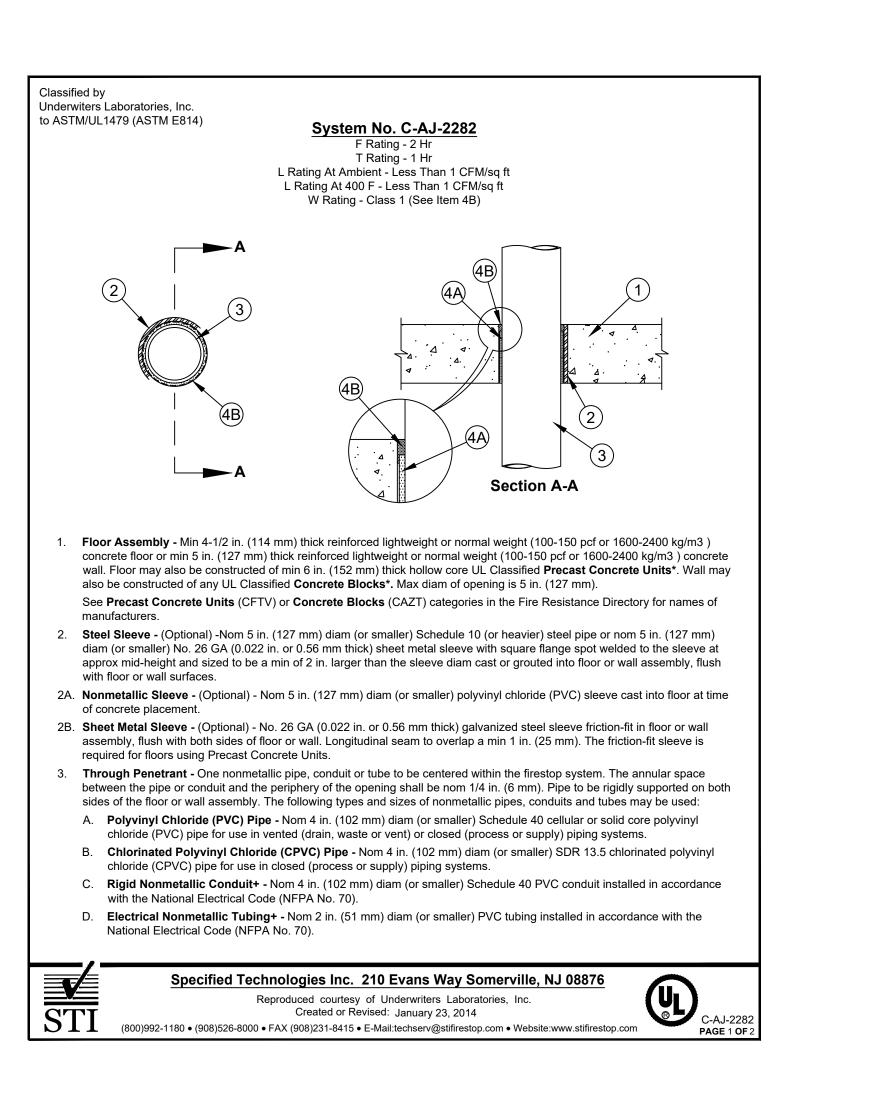
both surfaces of wall as required to accommodate sealant (Item 4B).

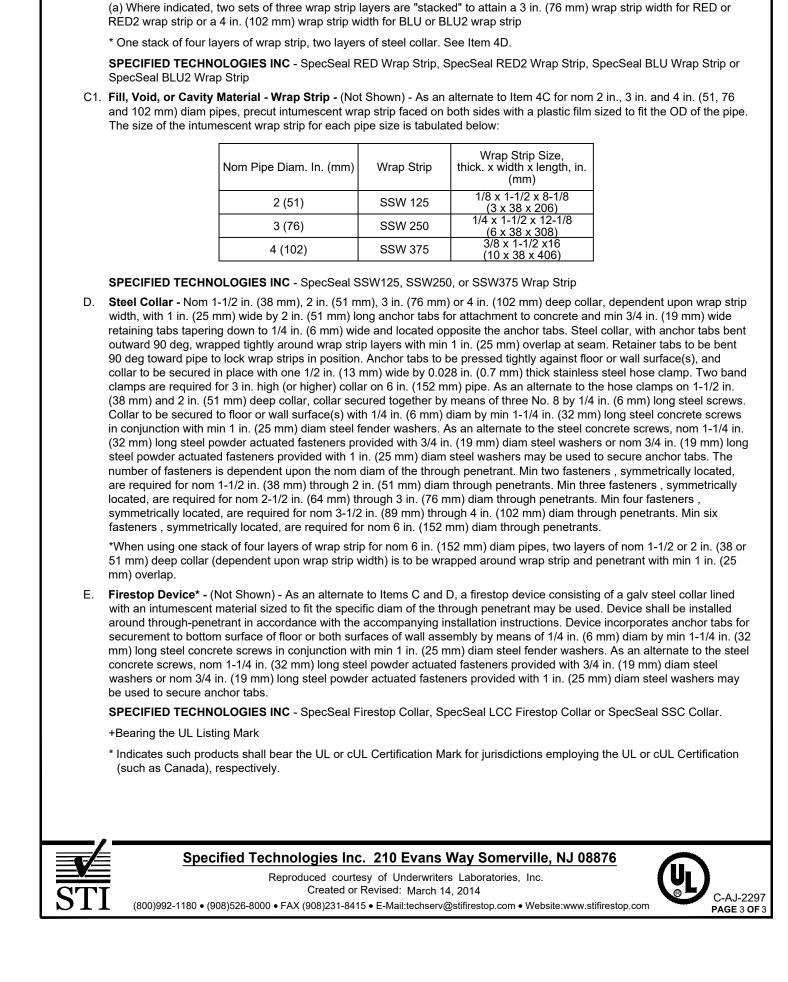


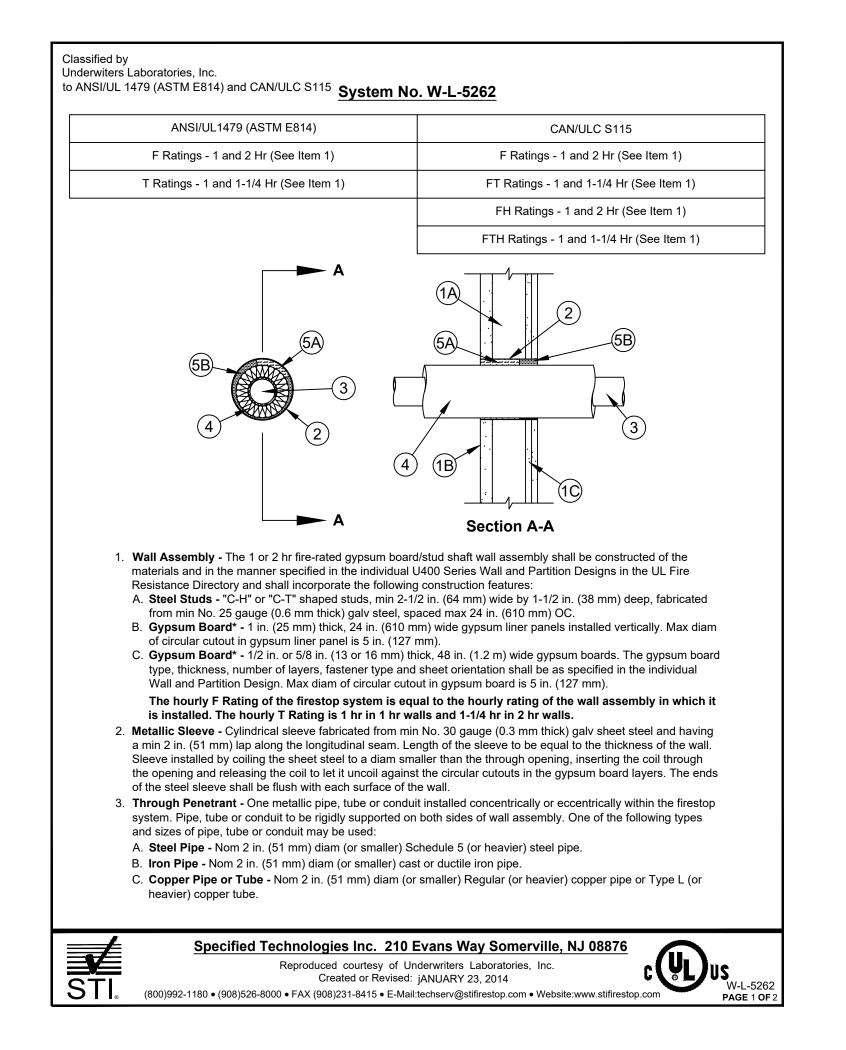


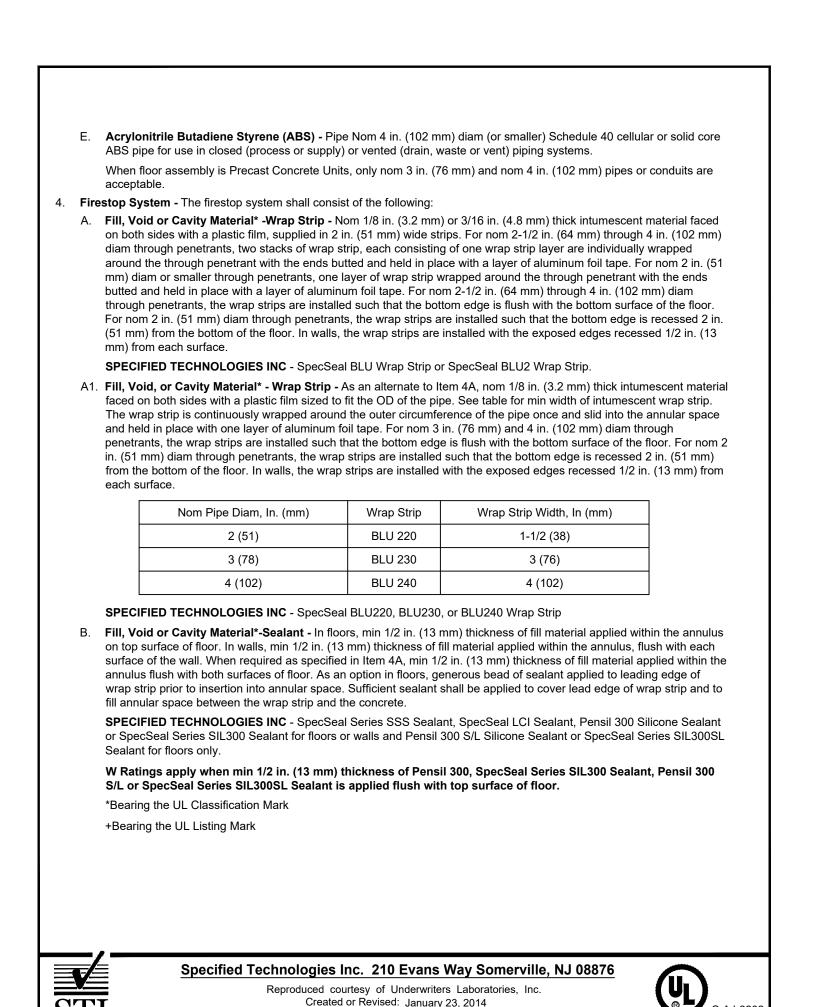












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#### GENERAL NOTES:

- . Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
  - UL Fire Resistance Directory; Current Edition
  - NFPA 101 Life Safety Code
  - All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing** 

**DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

### PROJECT NAME:

PROJECT\_NAME:

PROJECT LOCATION:

PROJECT\_LOCATION:

ARCHITECT/CONSULTANT:

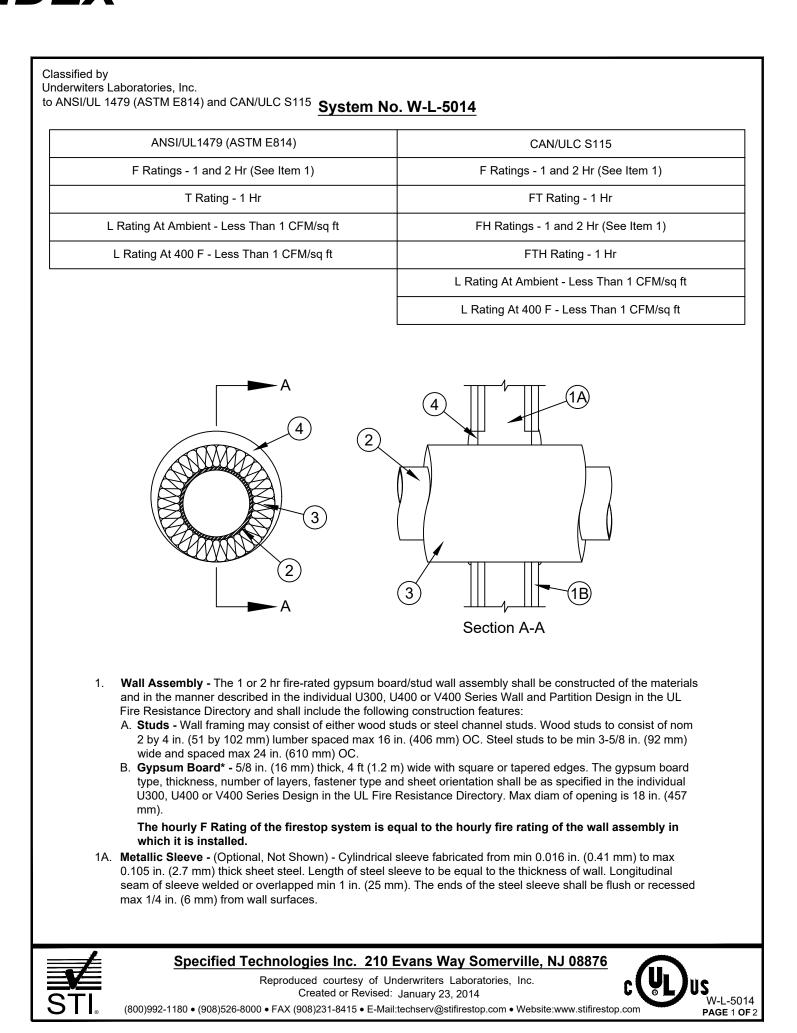
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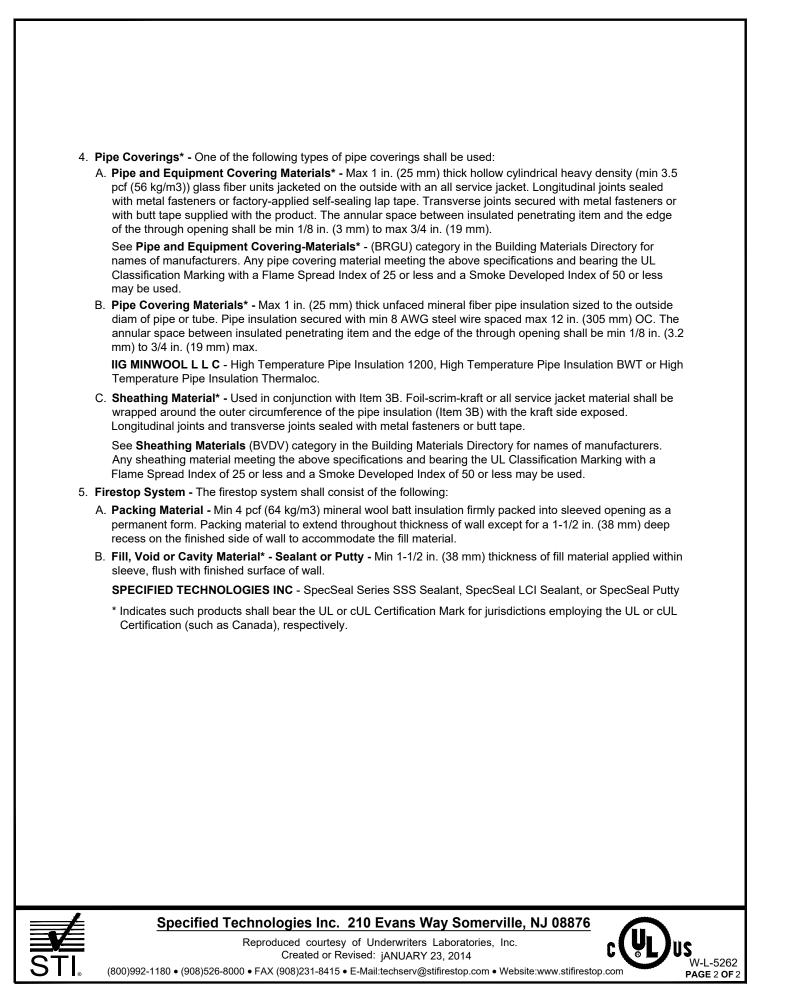
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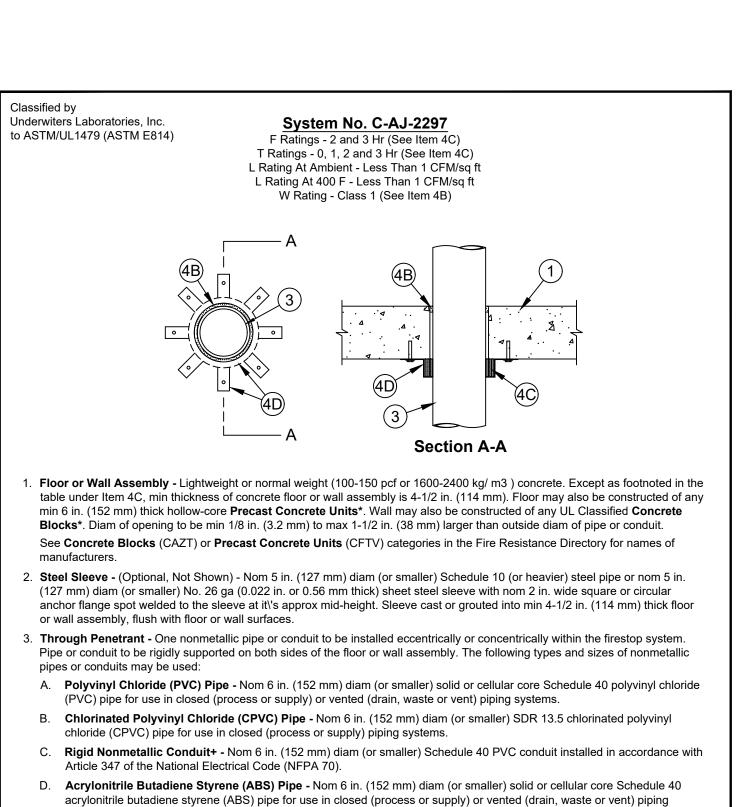
STI FIRESTOP SYSTEMS

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876









E. Fire Retardant Polypropylene (FRPP) Pipe - Nom 6 in. (152 mm) diam (or smaller) solid or cellular core Schedule 40 fire retardant polypropylene (FRPP) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

F. High Density Polyethylene (HDPE) Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 HDPE pipe for use in closed

installed to the thickness specified in the table under Item 4C. Packing material to be recessed from top surface of floor or

A. Packing Material - (Not Shown) - When required, min 4 pcf (64 kg/m3) mineral wool batt insulation compressed and

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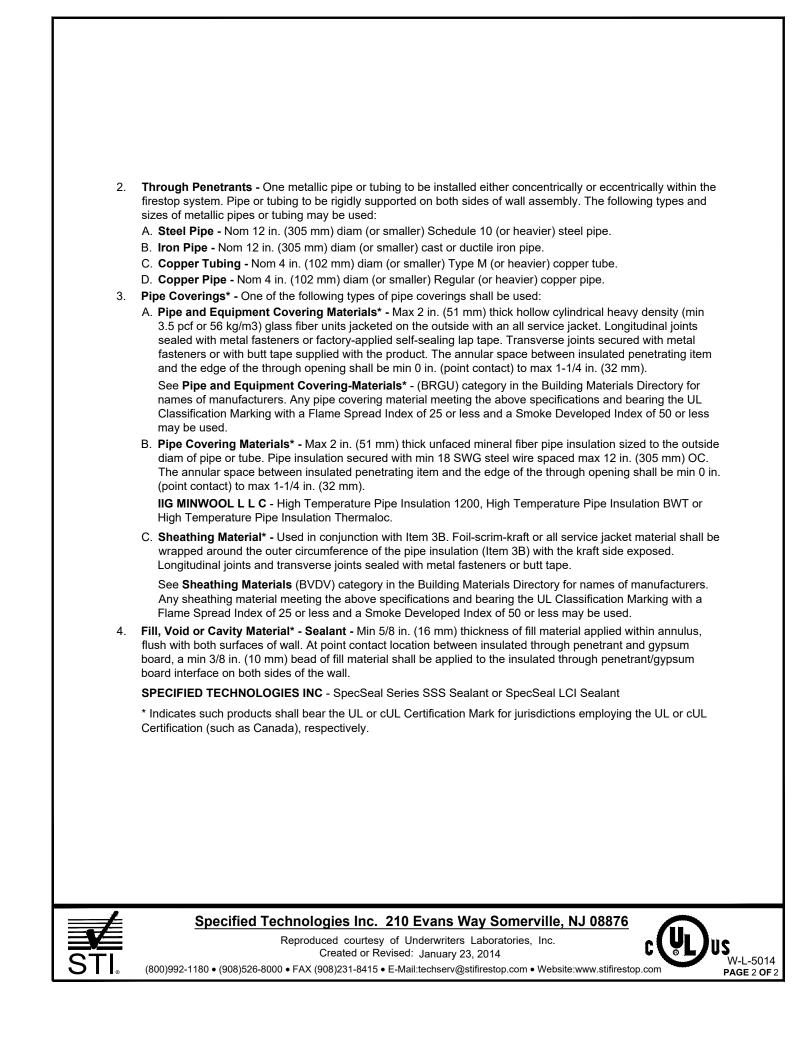
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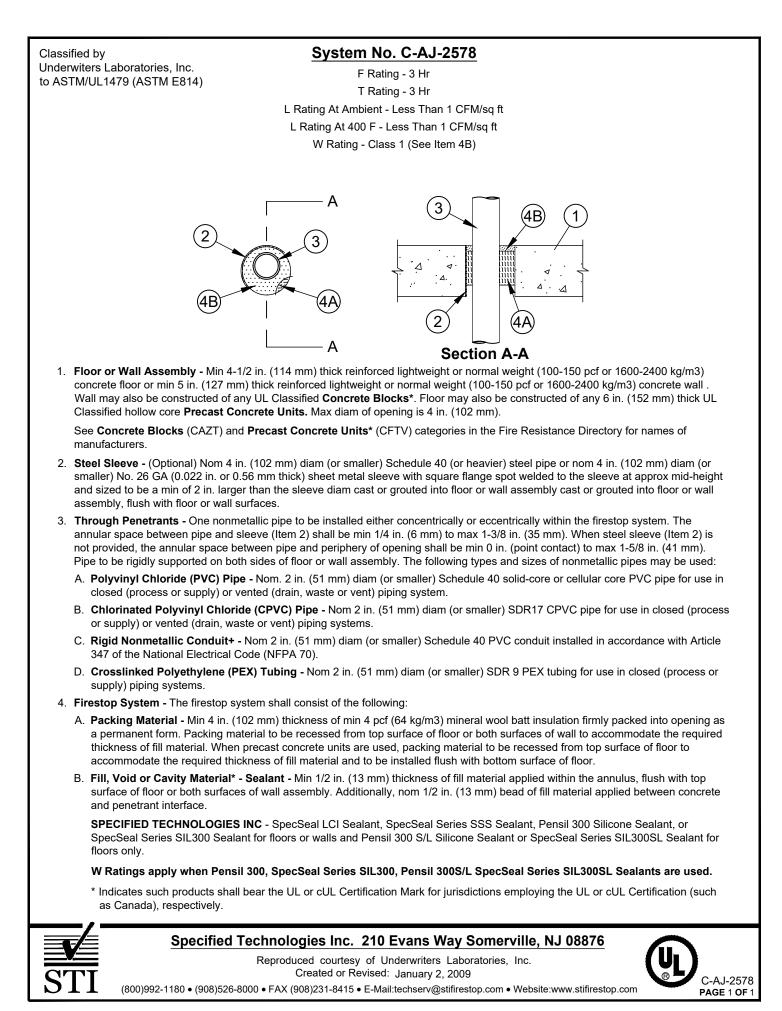
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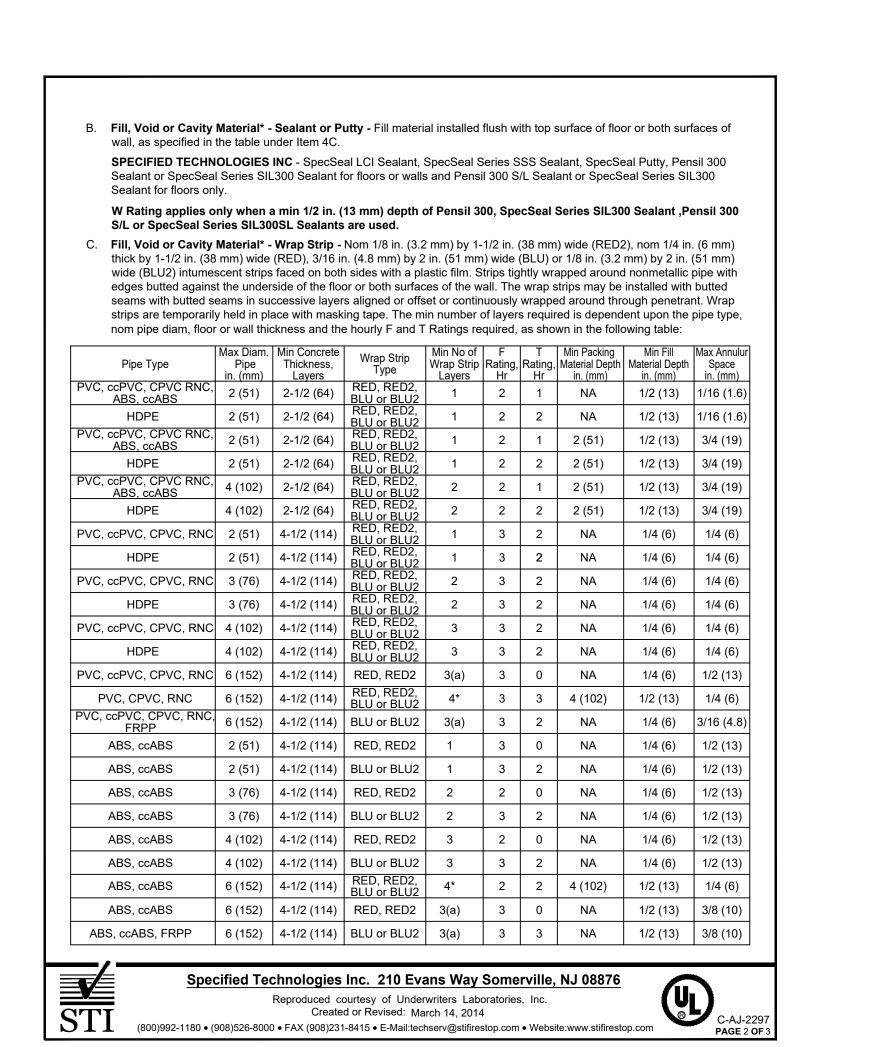
(process or supply) piping systems.

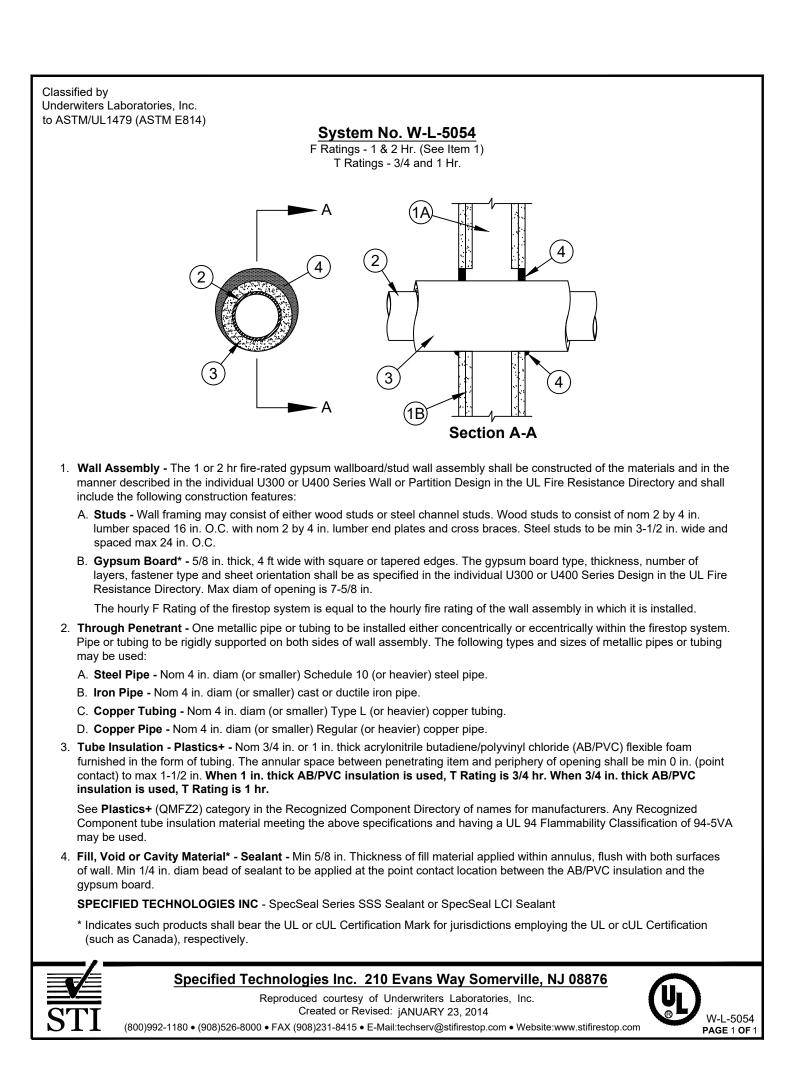
4. **Firestop System -** The firestop system shall consist of the following:

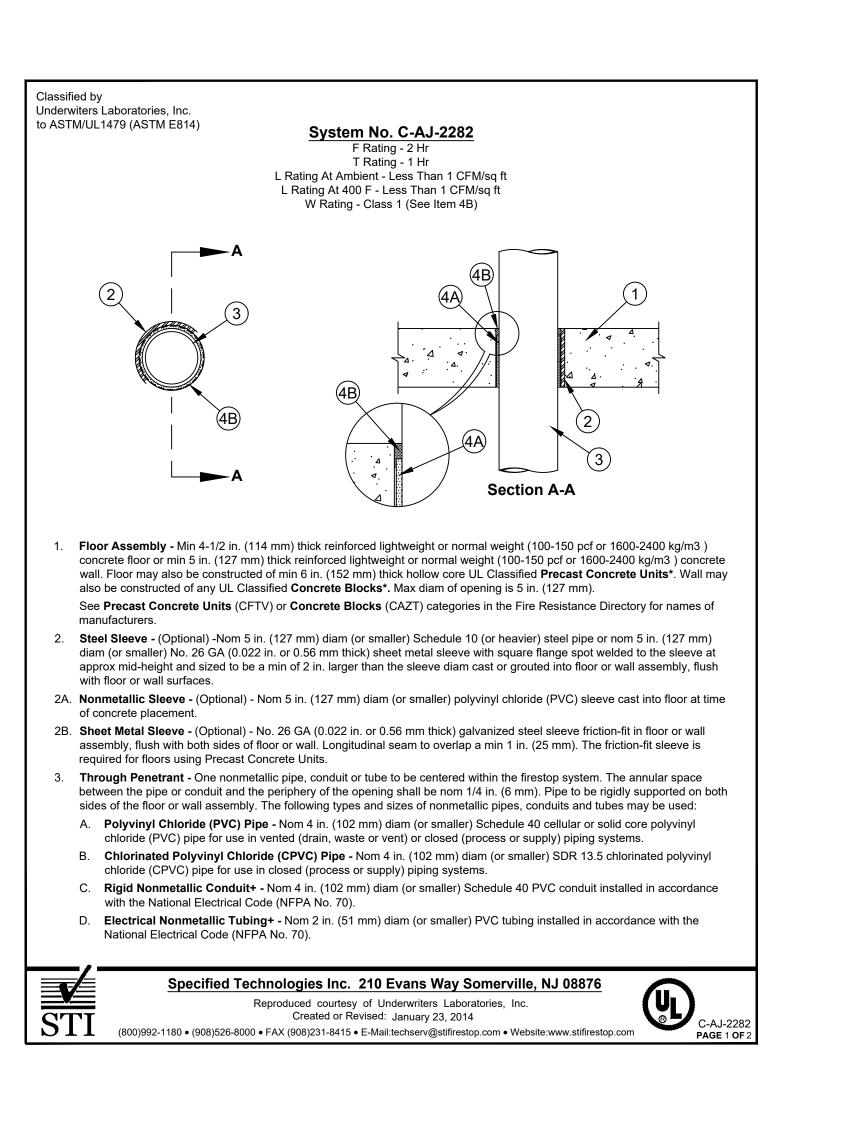
both surfaces of wall as required to accommodate sealant (Item 4B).

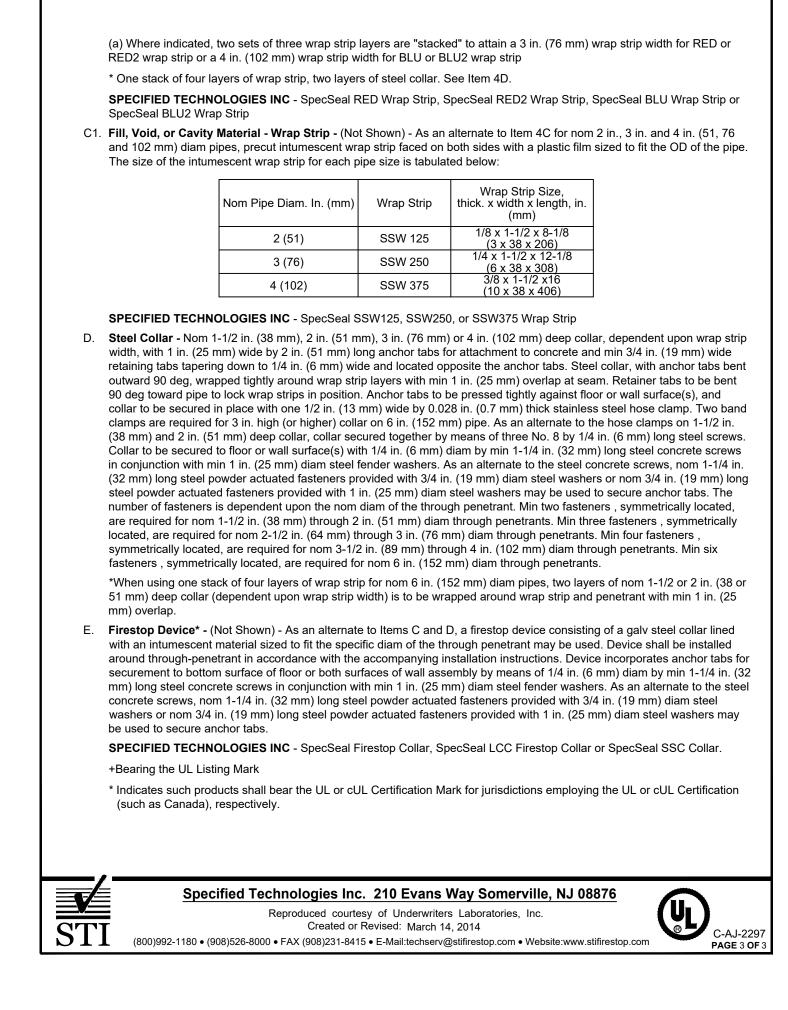


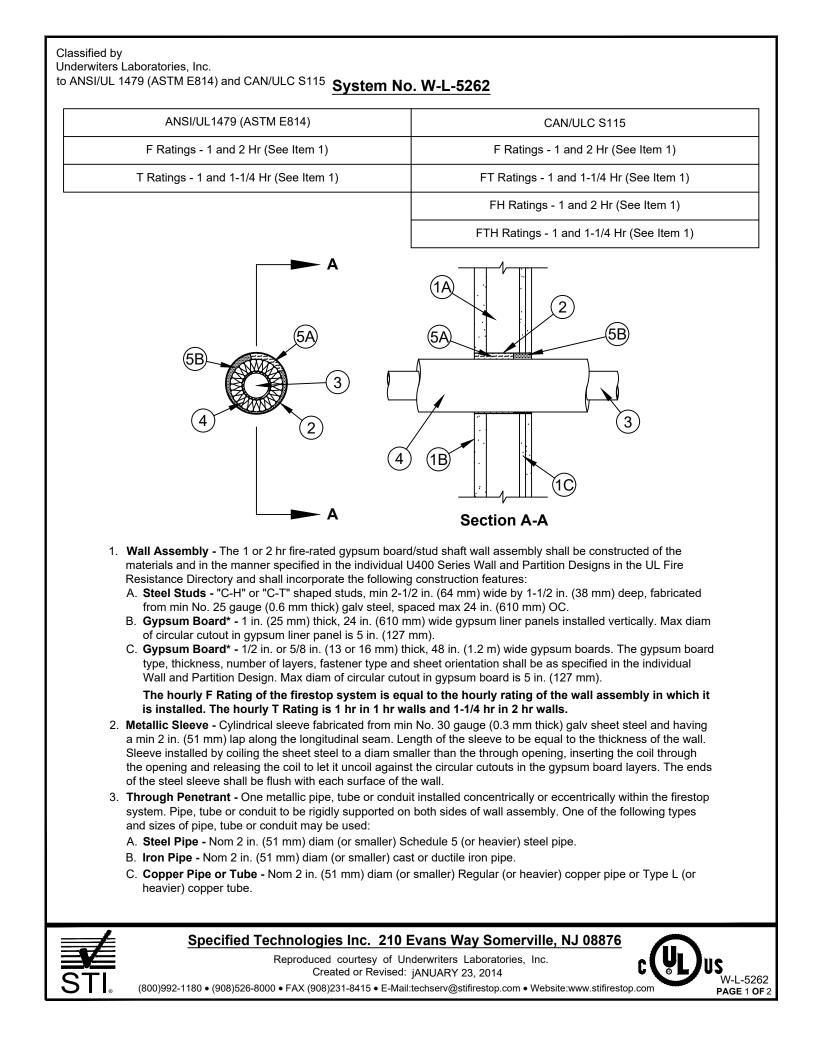


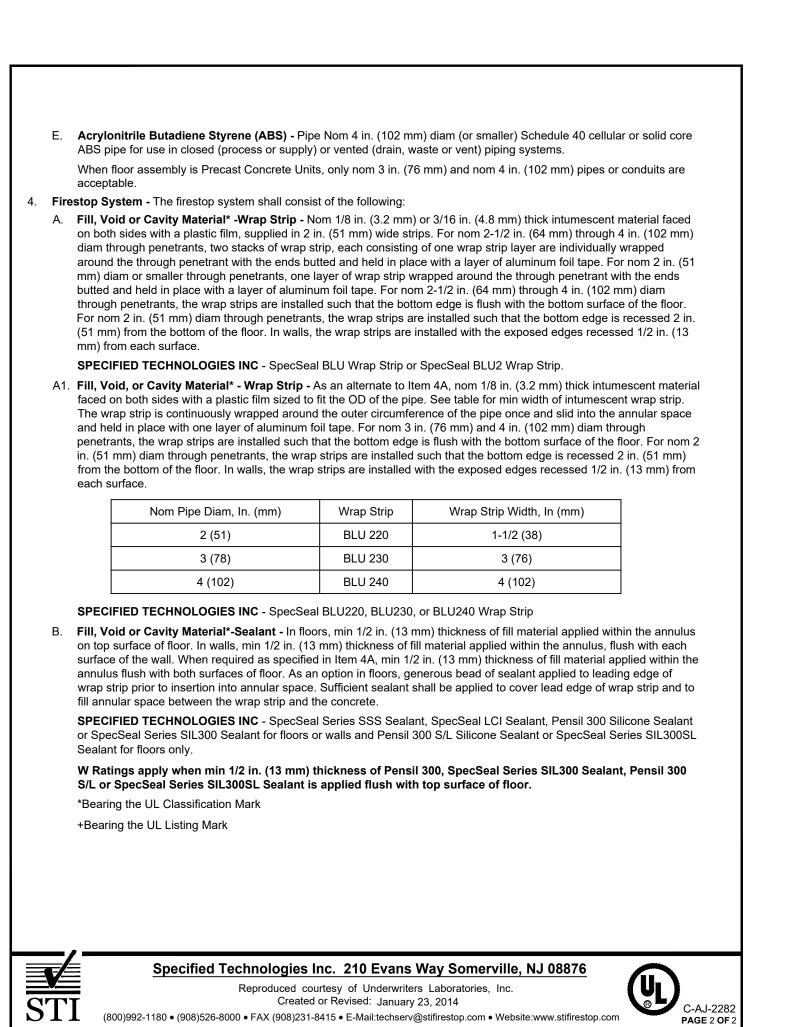












#### GENERAL NOTES:

- . Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
  - UL Fire Resistance Directory; Current Edition
  - NFPA 101 Life Safety Code
  - All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing** 

**DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

#### PROJECT NAME:

PROJECT\_NAME:

#### PROJECT LOCATION:

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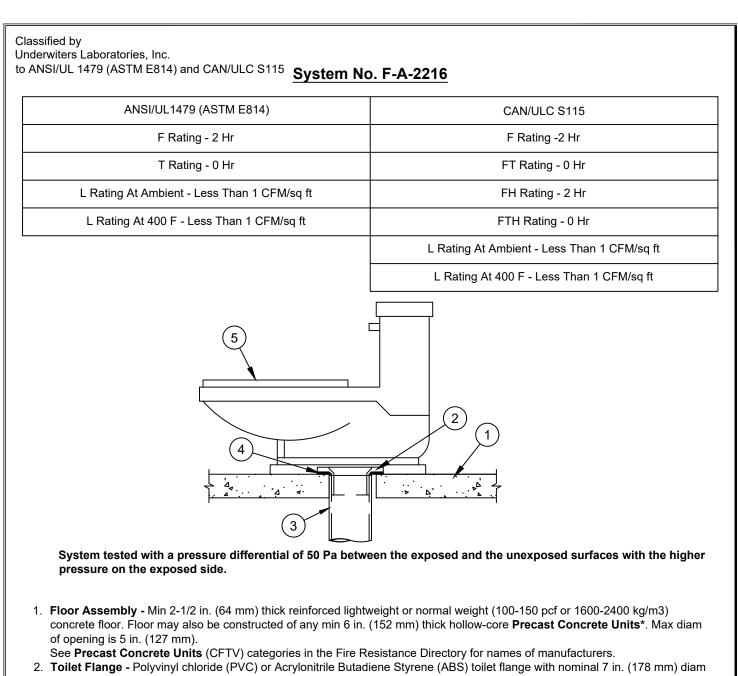
ARCHITECT/CONSULTANT:

### TITLE:

STI FIRESTOP SYSTEMS

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876



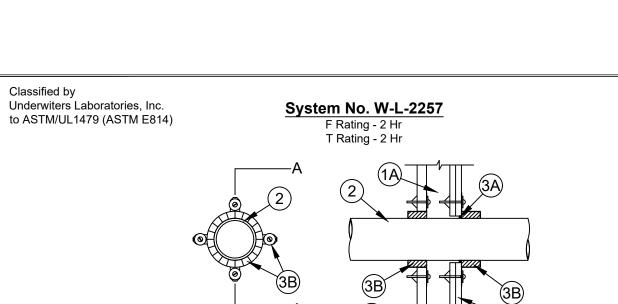


top ring and with nominal 4 in. (102 mm) OD throat sized to fit both 3 in. (76 mm) and 4 in. (102 mm) diam drain piping. Flange secured to top surface of floor with closet bolts. . Nonmetallic Pipe - One nom 3 in. (76 mm) or 4 in. (102 mm) diam nonmetallic drain pipe cemented to toilet flange, installed either concentrically or eccentrically within the firestop system. The annular space between drain pipe and periphery of opening shall be min 0 in. (point contact) to 1/2 in. (13 mm). Pipe to be rigidly supported on underside of floor assembly. The following

types and sizes of nonmetallic pipe may be used: A. Polyvinyl Chloride (PVC) Pipe - Nom 3 in. (76 mm) or 4 in. (102 mm) diam Schedule 40 solid core or cellular core PVC pipe for use in vented (drain, waste or vent) piping system. B. Acrylonitrile Butadiene Styrene (ABS) Pipe - Nom 3 in. (76 mm) or 4 in. (102 mm) diam Schedule 40 cellular core or solid core ABS pipe for use in vented (drain, waste or vent) piping systems. 4. Fill, Void or Cavity Material\* - Gasket - Nom 1/4 in. (6 mm) thick by nom 7 in. (178 mm) diam intumescent material faced on top side with a plastic film and with removable inserts to accommodate various outer diameters of toilet flanges. Gasket to be

installed per installation instructions SPECIFIED TECHNOLOGIES INC - SpecSeal Closet Flange Gasket 5. Water Closet - Floor mounted vitreous china water closet.

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Wall Assembly - The 1 or 2 hr fire-rated gypsum board/stud shaft wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall incorporate the following construction features:

A. Steel Studs - "C-H" or "C-T" shaped studs, min 2-1/2 in. (64 mm) wide by 1-1/2 in. (38 mm) deep, fabricated from min No. 25 gauge (0.6 mm thick) galv steel, spaced max 24 in. (610 mm) OC. B. Gypsum Board\* - 1 in. (25 mm) thick, 24 in. (610 mm) wide gypsum liner panels installed vertically. Diam of circular cutout

in gypsum liner panel to be equal to outside diam of firestop device (Item 3B). C. Gypsum Board\* - 1/2 in. or 5/8 in. (13 to 16 mm) thick, 48 in. (1.2 m) wide gypsum boards. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Diam of circular cutout in gypsum board to be max 1/2 in. (13 mm) larger than diam of through penetrant (Item 2).

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

. Through Penetrant - One nonmetallic pipe or conduit installed centered within the firestop system. Pipe or conduit to be rigidly supported on both sides of wall assembly. One of the following types and sizes of nonmetallic pipe or conduit may be used: A. Polyvinyl Chloride (PVC) Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVC solid or cellular core PVC pipe

for use in vented (drain, waste or vent) or closed (process or supply) piping systems.

B. Acrylonitrile Butadiene Styrene (ABS) Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 ABS solid or cellular core PVC pipe for use in vented (drain, waste or vent) or closed (process or supply) piping systems. C. Chlorinated Polyvinyl Chloride (CPVC) Pipe - Nom 4 in. (102 mm) diam (or smaller) SDR17 CPVC pipe for use in vented (drain, waste or vent) or closed (process or supply) piping systems.

D. Rigid Nonmetallic Conduit+ - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70). 3. Firestop System - The firestop system consist of the following items

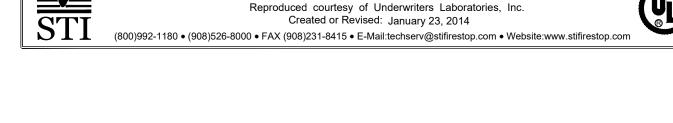
A. Fill Void or Cavity Materials\* - Sealant or Putty - (Optional) - Min 1/4 in. (6 mm) thickness of fill material applied within annulus of gypsum board on finished side of wall.

SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant or SpecSeal Putty B. Firestop Device\* - Firestop device sized to the specific diam of the through penetrant to be friction fit into circular cutout in gypsum liner panel from the interior of the wall. Diam of circular cutout in gypsum liner panel to be equal to outside diam of firestop device. Device shall be secured to the gypsum liner panel with min 3/16 in. (5 mm) diam steel toggle bolts or molly bolts in conjunction with 1-1/4 in. (32 mm) diam steel fender washers in accordance with the accompanying installation

instructions. Second firestop device sized to the specific diam of the through penetrant installed around the through penetrant on the finished side of the wall and secured to the gypsum board with min 3/16 in. (5 mm) diam steel toggle bolts or molly bolts in conjunction with 1-1/4 in. (32 mm) diam steel fender washers in accordance with the accompanying installation instructions.

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SPECIFIED TECHNOLOGIES INC - SpecSeal Firestop Collar, SpecSeal LCC Collar or SpecSeal SSC Collar \* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively

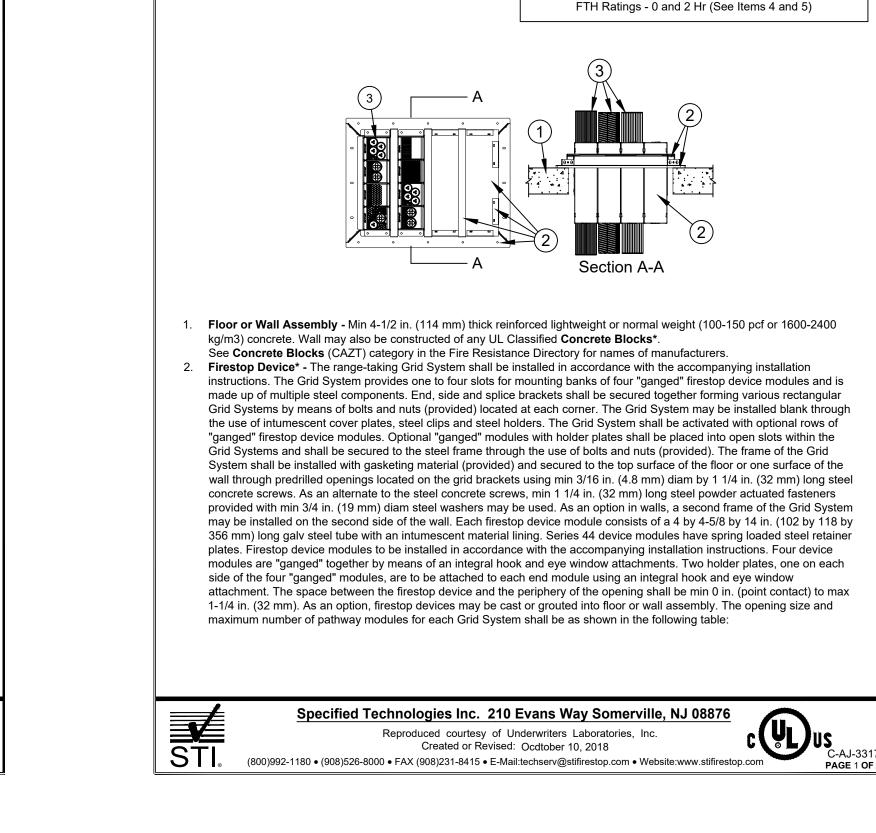


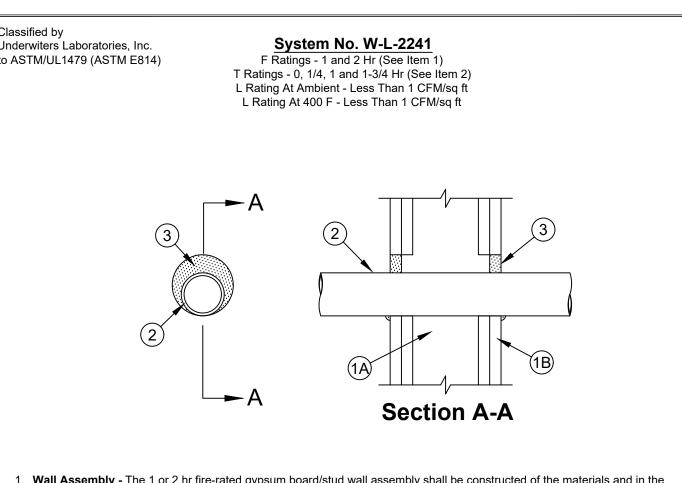
- x. Firestop Device\* Extension Module (Optional, Not Shown) Extension module attached to ends of firestop device (Item 3) to increase its length to facilitate installation in thicker floors or walls. Each module consists of a 4 by 4-5/8 by 6 in. (102 by 118 by 152 mm) long galv steel tube with an intumescent material lining. Extension module to be installed in accordance with the accompanying installation instructions. When module is used, firestop device (Item 3) and extension module(s) secured in place by means of steel plates installed with gasketing material supplied with product. Steel plates installed on both sides of floor or wall and secured to device or extension module by means of steel set screws provided with plates. Firestop device and extension module(s) assembly to be installed with ends projecting an equal distance beyond each surface of the floor or wall assembly. SPECIFIED TECHNOLOGIES INC - EZ PATH Series 44+ Extension
- Cables Cables may represent a 0 to max 100 percent visual fill within the loading area for the firestop device module. Cables to be rigidly supported on both sides of the floor or wall assembly. Any combination of the following types of cables may be used: A. Max 400 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) or plenum-rated
- B. Max 750 kcmil single copper conductor power cable with XLPE jacket and insulation
- C. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation. D. Max 3/C No. 2/0 AWG metal clad or armored cable with steel or aluminum jacket.
- E. Max 3/C No. 8 AWG NM cable (Romex) with PVC insulation and jacket.
- F. Max 4 pair No. 22 AWG (or smaller) copper conductor data cable with PVC or plenum rated jacketing and insulation. G. Coaxial cable with fluorinated ethylene or PVC insulation and jacketing having a max diam of 5/8 in. (16 mm).
- H. Optical fiber cable with PVC or polyethylene (PE) jacket and insulation and having a max diam of 5/8 in. (16 mm). When cable fill within the device is min 0 percent (empty) to max 20 percent, the T, FT and FTH Ratings are 0 Hr. When cable fill within the device is greater than 20 percent, the T, FT and FTH Ratings are 1/2 Hr.
- \* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively

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Created or Revised: January 23, 2014

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Wall Assembly - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall

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 max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. B. Gypsum Board\* - Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design.

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. When Item 2G or 2H is used, the hourly F Rating is 1 hr. Through Penetrant - One nonmetallic pipe, conduit or tube to be installed eccentrically or concentrically within the firestop system. Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of

Diam of opening to be 1 in. to 1-1/8 in. (25 to 29 mm) larger than outside diam of pipe.

nderwiters Laboratories, Inc

3-3/8 in. (86 mm).

to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 System No. C-AJ-3154

ANSI/UL1479 (ASTM E814)

F Ratings - 2, 3 and 4 Hr (See Item 5)

T Ratings - 0, 1/2 and 2-3/4 Hr (See Item 5)

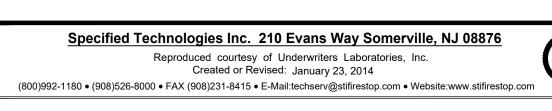
nonmetallic pipes, conduits and tubes may be used: A. Polyvinyl Chloride (PVC) Pipe - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Annular space shall be min 0 in. ( 0 mm, point contact) to max 1 in. (25 mm).

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 70). Annular space shall be min 0 in. ( 0 mm, point contact) to max 1 in.

B. Chlorinated Polyvinyl Chloride (CPVC) Pipe - Nom 2 in. (51 mm) diam (or smaller) SDR 13.5 or Schedule 80 CPVC pipe

for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25

D. Electrical Nonmetallic Tubing+ - Nom 2 in. (51 mm) diam (or smaller) PVC tubing installed in accordance with Article 331 of the National Electrical Code (NFPA 70). Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm). E. Cross Linked Polyethylene (PEX) Tubing - Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).



Floor or Wall Assembly - Min 2-1/2 in. (64 mm) or 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150

pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete blocks\*. Floor may also be

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

Sleeve - (Optional) - Nom 6 in. (152 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe sleeve, nom 6 in. (152 mm)

diam (or smaller) No. 26 ga (0.022 in. or 0.56 mm thick) sheet steel sleeve with square anchor flange spot welded to sleeve

grouted into floor or wall flush with floor or wall surfaces. Steel pipe sleeve may be installed to project a max of 6 in. (152 mr

grouted into floor. The annular space between sleeve and periphery of opening shall be min 0 in. (0 m, point contact) to max

Cables - Aggregate cross-sectional area of cables in sleeve to be max 45 percent of the cross-sectional area of the sleeve.

See Item 5 for specific cable fill requirements. Tight bundle of cables to be installed in the steel sleeve. The annular space

within the firestop system shall be a min of 0 in. (point contact) to a max of 2 in. (51 mm). In 4 hr fire rated assemblies, the

supported on both sides of the floor or wall assembly. Any combination of the following types and sizes of cables may be

A. Max 400 pair No. 24 AWG (or smaller) copper conductor cable with polyvinyl chloride (PVC) or plenum-rated jacketing and

B. Max 3/C No. 2/0 AWG (or smaller) aluminum or copper conductor service entrance cable with PVC insulation and jacket.

D. Max 3/C No. 8 AWG (or smaller) nonmetallic sheathed (Romex) cable with copper conductors, PVC insulation and jacket.

E. Max 1/C 1000 kcmil (or smaller) copper conductor power cable with XLPE or PVC insulation and XLPE or PVC jacket.

C. Max 3/C No. 2/0 AWG (or smaller) copper conductor PVC jacketed aluminum clad or steel clad TECK 90 cable.

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to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 System No. C-AJ-3317

ANSI/UL1479 (ASTM E814)

F Rating - 3 Hr

T Ratings - 0 and 2 Hr (See Items 4 and 5)

annular space within the firestop system shall be a min of 1/4 in. (6 mm) to a max of 1 in. (25 mm). Cables to be rigidly

beyond the floor or wall surfaces. Steel sleeve to be supported on top side of floor and both sides of wall when not cast or

at approx mid-height or nom 6 in. (152 mm) diam (or smaller) Schedule 40 polyvinyl chloride (PVC) pipe sleeve cast or

constructed of any UL Classified hollow-core Precast Concrete Units\*. Max diam of opening is 10 in. (254 mm).

CAN/ULC S115

F Ratings - 2, 3 and 4 Hr (See Item 5)

FT Ratings - 0, 1/2 and 2-3/4 Hr (See Item 5)

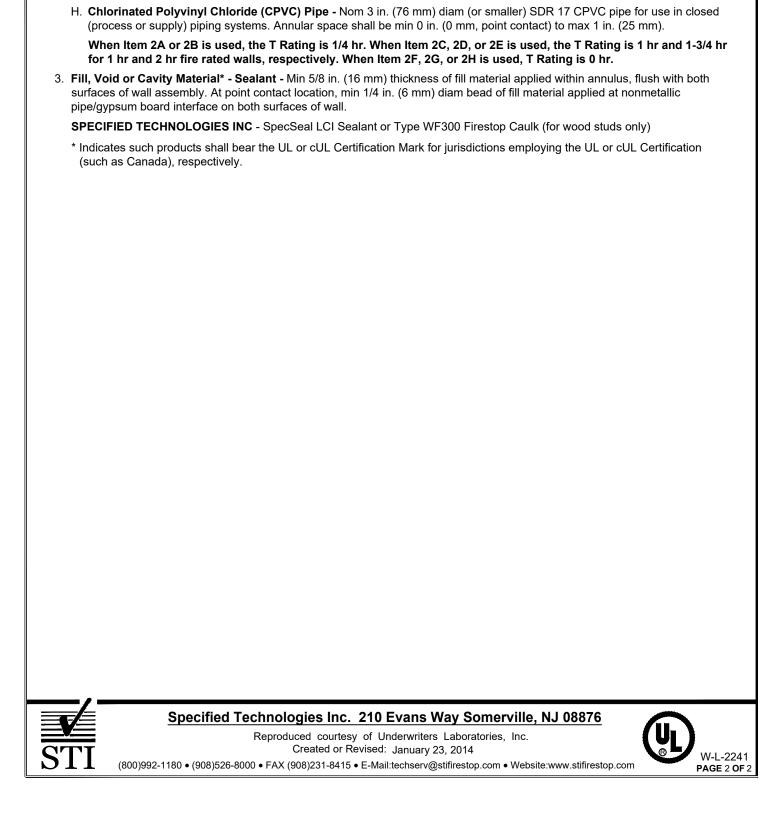
FH Ratings - 2, 3 and 4 Hr (See Item 5)

FTH Ratings - 0, 1/2 and 2-3/4 Hr (See Item 5)

CAN/ULC S115

F Rating - 3 Hr

FT Ratings - 0 and 2 Hr (See Items 4 and 5)



F. 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. Annular space shall be

G. Polyvinyl Chloride (PVC) Pipe - Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use

in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).

min 1/4 in. (6 mm) to max 3/4 in. (19 mm)

F. Max RG59/U (or smaller) coaxial cable with fluorinated ethylene or plenum-rated insulation and jacketing. G. Max 62.5/48 fiber optic cable with PVC or plenum-rated insulation and jacketing. H. Max 4 pair No. 24 AWG (or smaller) copper conductor data cable with PVC or plenum-rated insulation and jacket. A. Through Penetrating Product\* - (Not Shown) - Max 4/C No. 2/0 AWG (or smaller) steel or aluminum Armored Cable+ or Metal Clad Cable+ with copper or aluminum conductors. Diam of cable bundle (Item 3) including armored cable not to exceed

Packing Material - Min 2, 3 or 4 in. (51, 76 or 102 mm) thickness of min 4 pcf (64 kg/m3) density mineral-wool batt insulation tightly packed into opening as a permanent form for 2, 3 or 4 hr fire rated assemblies, respectively. Packing material to be recessed from top edge of sleeve or from top surface of concrete in cast concrete floor assemblies to accommodate the required thickness of fill material. Packing material to be recessed from both edges of sleeve or from both surfaces of assembly in walls and in floor constructed with hollow-core precast concrete units to accommodate the required thickness of fill material. When the annular space between the sleeve and the periphery of the opening exceeds 2 in. (51 mm), mineral-wool batt insulation tightly packed to a 3 in. depth and recessed from the top surface of the floor or both surfaces of the wall in order to accommodate the required thickness of sealant (Item 5, not shown). Otherwise, packing material is optional in annular space between the sleeve and the periphery of the opening.

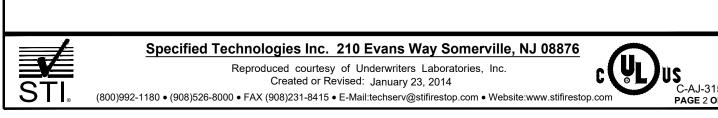
4 in. Through penetrating product to be rigidly supported on both sides of a floor or wall assembly.

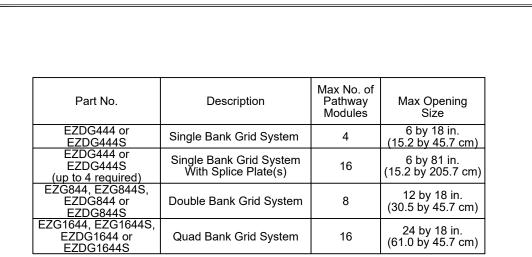
AFC CABLE SYSTEMS INC

Fill, Void or Cavity Material\* - Sealant or Putty - Min 1/2 in. (13 mm) thickness of sealant applied within the annulus between steel sleeve and periphery of the opening, flush with the top surface of the floor or both surfaces of the wall. Min 1/2 in. (13 mm) diam bead of sealant shall be applied at point contact locations between sleeve and concrete interface on top surface of floor or both surfaces of the wall. Min 1/2 in. (13 mm) thickness of fill material applied within the annulus for 2 and 3 hr F Ratings. Min 3/4 in. (19 mm) thickness of fill material applied with the annulus for 4 hr F Rating. In floors, fill material to be installed flush with top edge of sleeve or top surface of floor. In walls and in floor constructed of hollow-core precast concrete units, fill material to be installed flush with both ends of sleeve or both surfaces of assembly. F and T Ratings of firestop system are dependent upon the through opening size, thickness of concrete, sleeve type and percent cable fill, as

Max Opening Diam	Min Concrete Thickness	Optional	Cable Type	Percent Cable Fill	F Rating	T Rating
	2-1/2 in. (64mm)	Sleeve Type PVC	A to H, 3A	37	2 hr	0 hr
	, ,		,			
6 in. (152mm)	2-1/2 in. (64mm)	PVC	Н	45	2 hr	0 hr
6 in. (152mm)	2-1/2 in. (64mm)	Steel	A to H, 3A	37	2 hr	0 hr
6 in. (152mm)	2-1/2 in. (64mm)	Steel	Н	45	2 hr	0 hr
6 in. (152mm)	4-1/2 in. (114mm)	Steel	A to H, 3A	34	3 hr	1/2 hr
6 in. (152mm)	4-1/2 in. (114mm)	Steel	Н	45	3 hr	1/2 hr
2 in. (52mm)	4-1/2 in. (114mm)	Steel	Н	40	3 hr	2-3/4 hr
2 in. (52mm)	4-1/2 in. (114mm)	Steel	Н	40	4 hr	2-3/4 hr

SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant. When min floor or wall thickness is 4-1/2 in. (114 mm), SpecSeal Putty may be used. \* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively





SPECIFIED TECHNOLOGIES INC - EZ PATH Series 44 or Series 44+ Fire Rated Pathway 2A. Firestop Device\* - Extension Module - (Optional, Not Shown) - Module attached to ends of firestop device module (Item 2) to increase its length to facilitate installation in thicker floors or walls. Each module consists of a 4 by 4-5/8 by 6 in. (102 by 118 by 152 mm) long galv steel tube with an intumescent material lining. Extension module to be installed in accordance with the accompanying installation instructions. **SPECIFIED TECHNOLOGIES INC** - EZ PATH Series 44+ Extension

Cables - Cables may represent a 0 to 100 percent visual fill within the loading area for the firestop device modules. Cables to be rigidly supported on both sides of the floor or wall assembly. Any combination of the following types of cables may be

- A. Max 400 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) or plenum-rated jacketing and insulation.
- B. Max 750 kcmil single copper conductor power cable with XLPE jacket and insulation or plenum-rated jacketing and

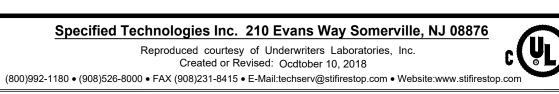
C. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation or plenum-rated jacketing

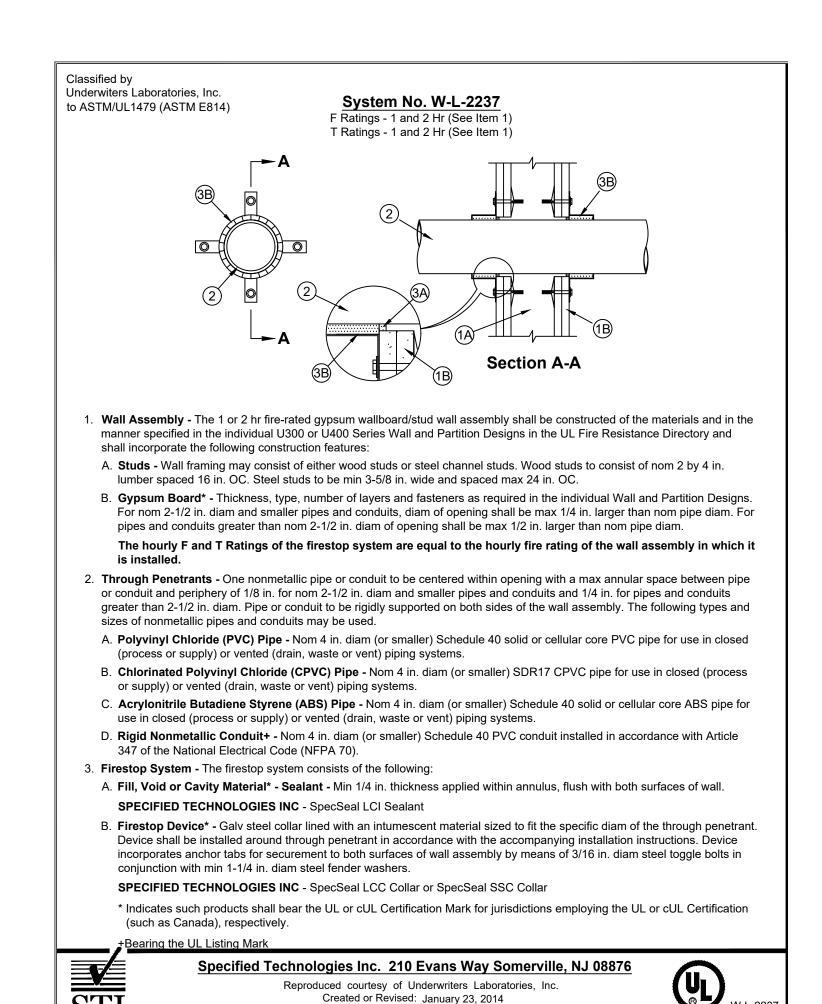
- D. Max 3/C No. 2/0 AWG metal clad or armored cable with steel or aluminum jacket. E. Max 3/C No. 8 AWG NM cable (Romex) with PVC insulation and jacket or plenum-rated jacketing and insulation.
- F. Max four pair No. 22 AWG (or smaller) copper conductor data cable with PVC or plenum rated jacketing and insulation. G. Coaxial cable with fluorinated ethylene or PVC insulation and jacketing or plenum rated jacketing and insulation having a H. Optical fiber cable with PVC or polyethylene (PE) jacket and insulation or plenum rated jacketing and insulation and having
- a max diam of 5/8 in. (16 mm). Firestop Device\* - Not Shown - Optional - Nom 2 in. (51 mm) thick blanket to be installed in accordance with the accompanying installation instructions. Blanket tightly wrapped around grouped cables and pathway devices to extend 36 in. (914 mm) above floor or both sides of the wall and secured with integral closure straps.
- Duct Wrap Material\* Not Shown Optional, for use in lieu of item 4 Nom 2 in. (51 mm) thick duct wrap tightly wrapped around grouped cables and pathway devices to extend 36 in. (914 mm) above floor or both sides of the wall. All longitudinal seams of duct wrap to be sealed with foil tape. THERMAL CERAMICS INC - FireMaster FastWrap XL or Pyroscat Duct Wrap XL

NOTE: When Item 4 or 5 is used the T, FT and FTH Ratings are 2 hr. Otherwise, the T, FT and FTH Ratings are 0 hr.

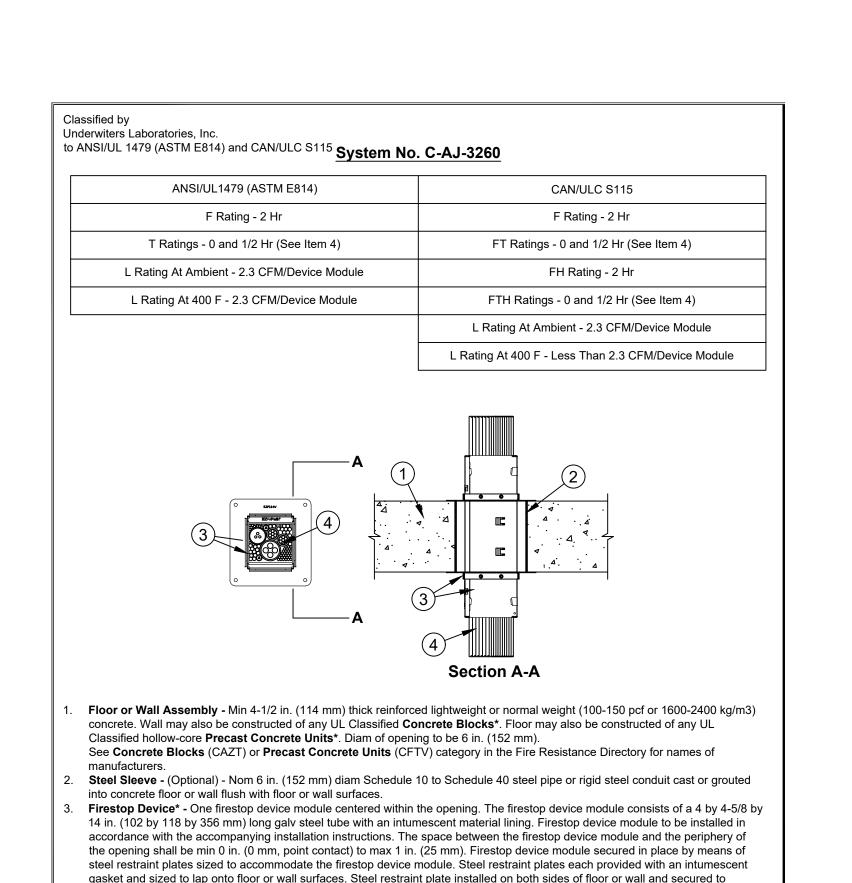
SPECIFIED TECHNOLOGIES INC - EZ PATH TRK444 Grid T Rating Kit

Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.





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firestop device module with steel set screws. The firestop device module is to be installed with its ends projecting an equal distance

beyond each surface of the floor or wall assembly. As an option, firestop device may be cast or grouted into floor wall assembly.

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When device is cast or grouted in place, the steel restraint plates are optional.

SPECIFIED TECHNOLOGIES INC - EZ PATH Series 44+ Fire Rated Pathway

#### **GENERAL NOTES:**

- . Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
  - UL Fire Resistance Directory; Current Edition
  - NFPA 101 Life Safety Code
  - All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing** 

**DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

#### PROJECT NAME:

PROJECT\_NAME:

### PROJECT LOCATION:

PROJECT\_LOCATION:

#### ARCHITECT/CONSULTANT:

ARCHITECT/CONSULTANT:

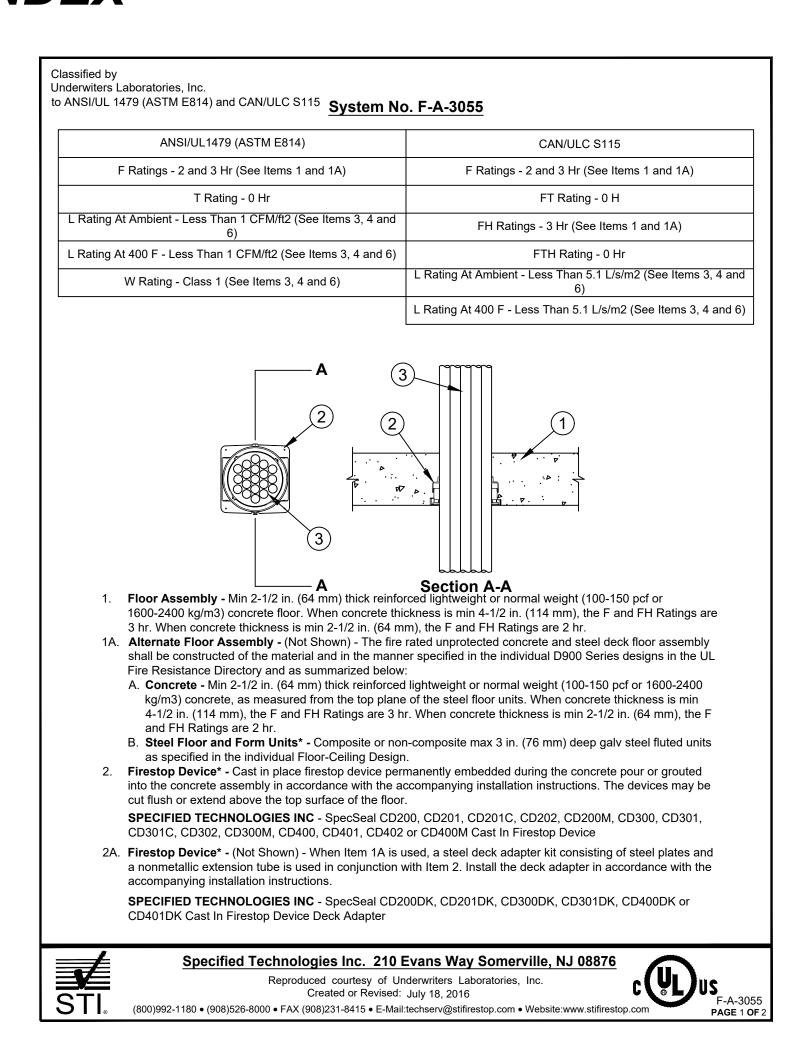
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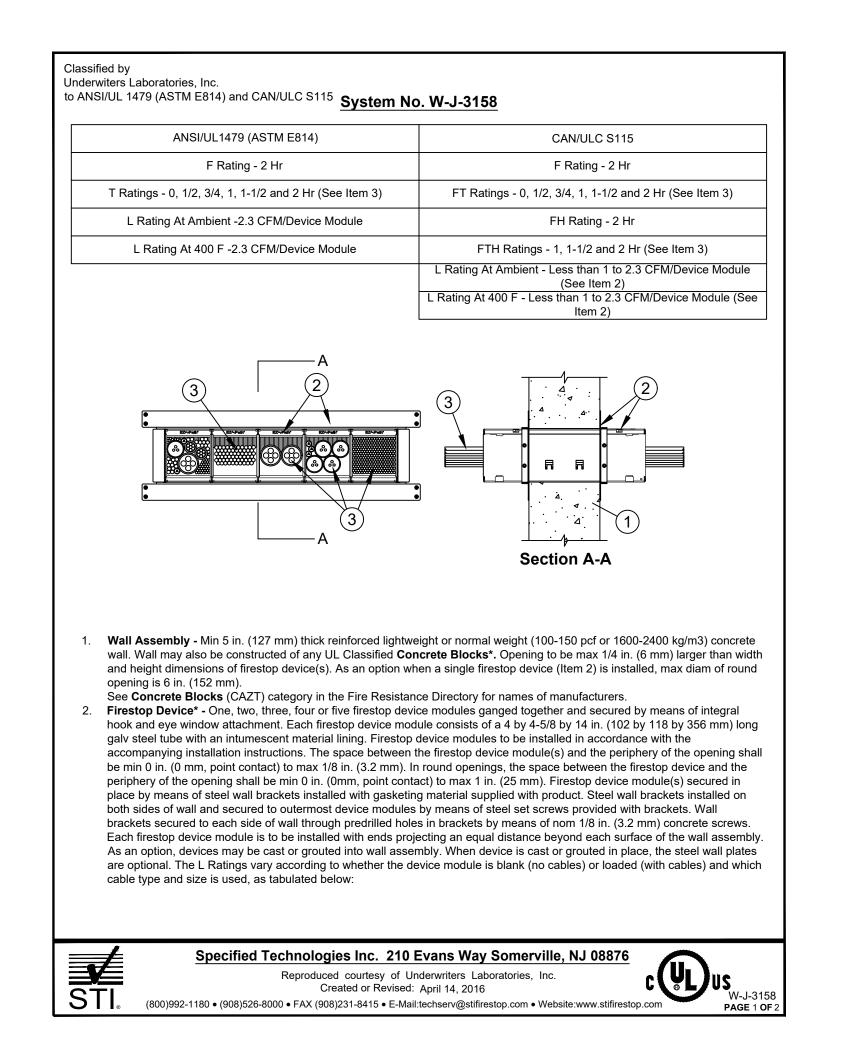
STI FIRESTOP SYSTEMS

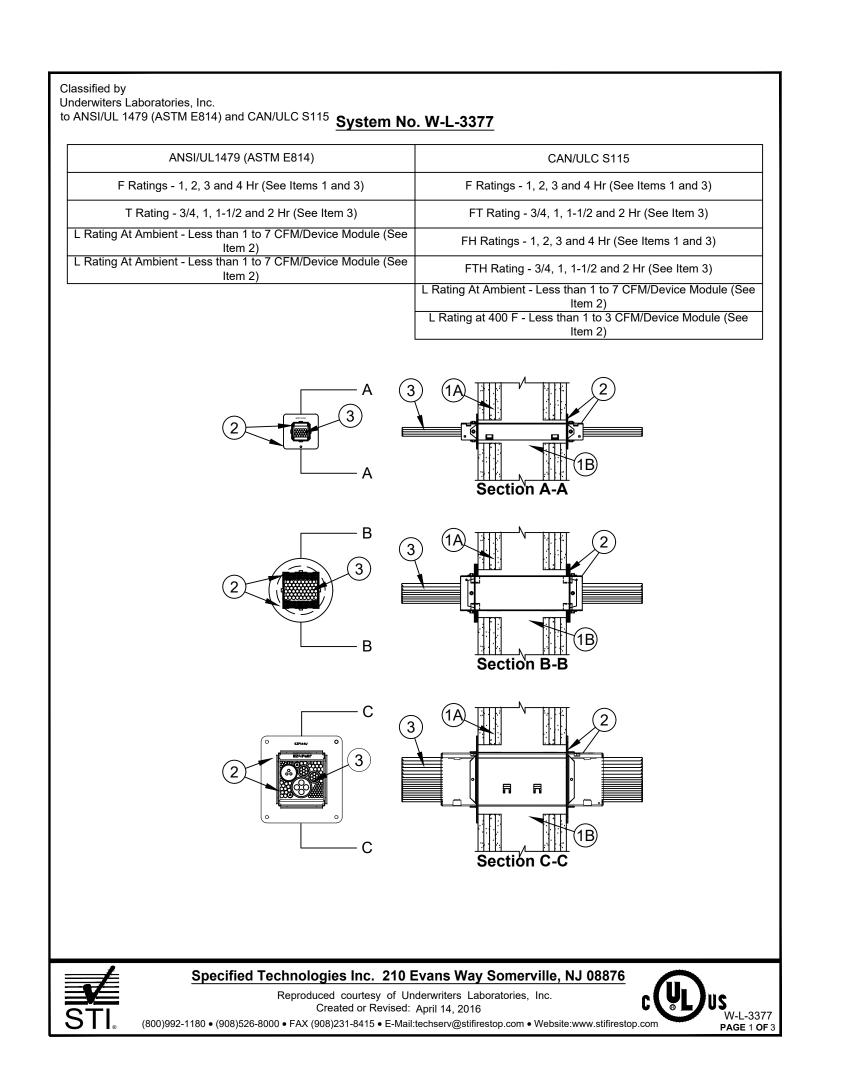
### Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

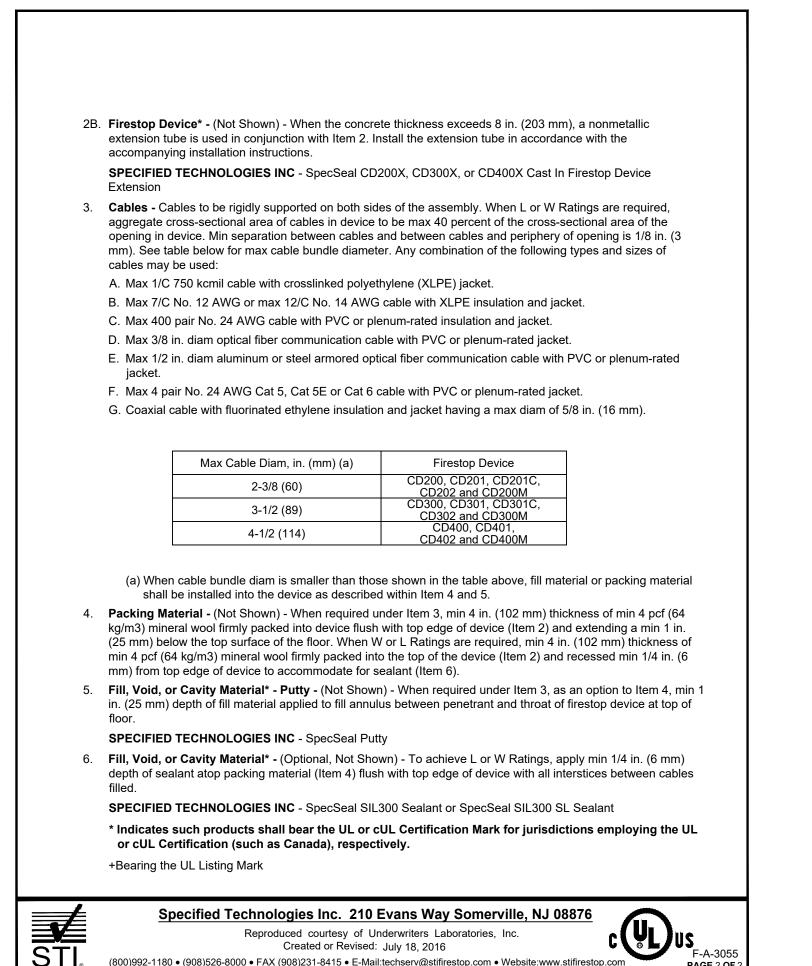


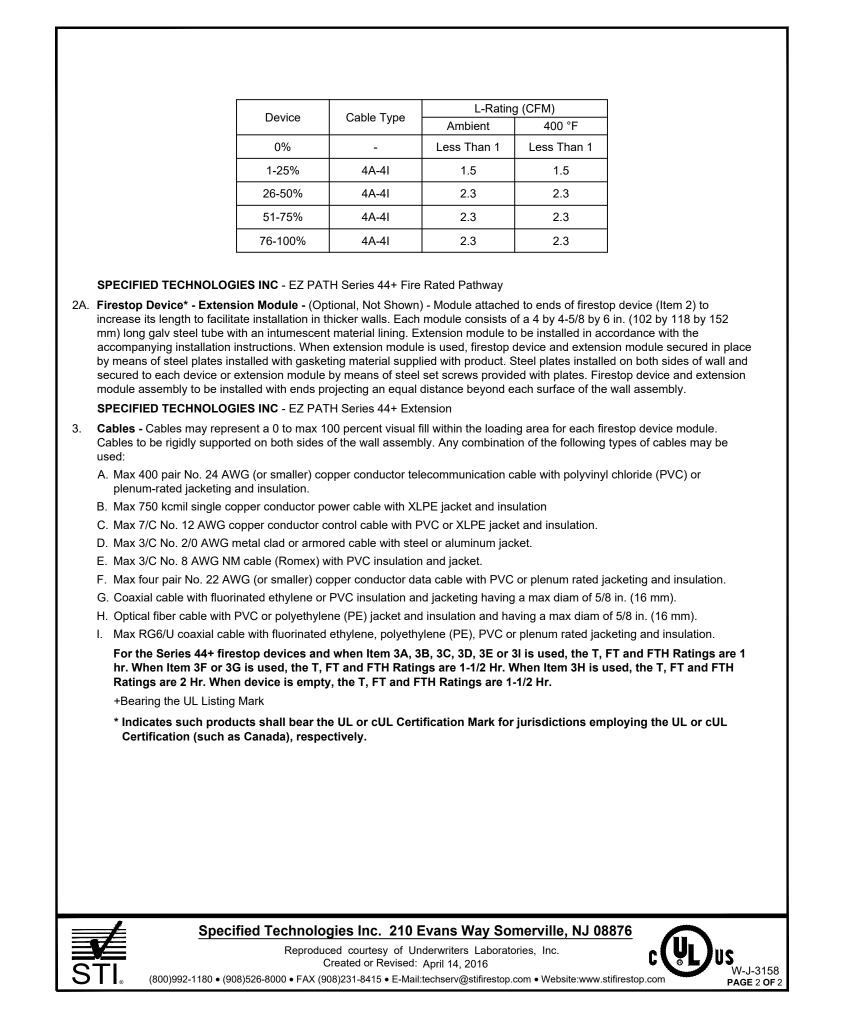


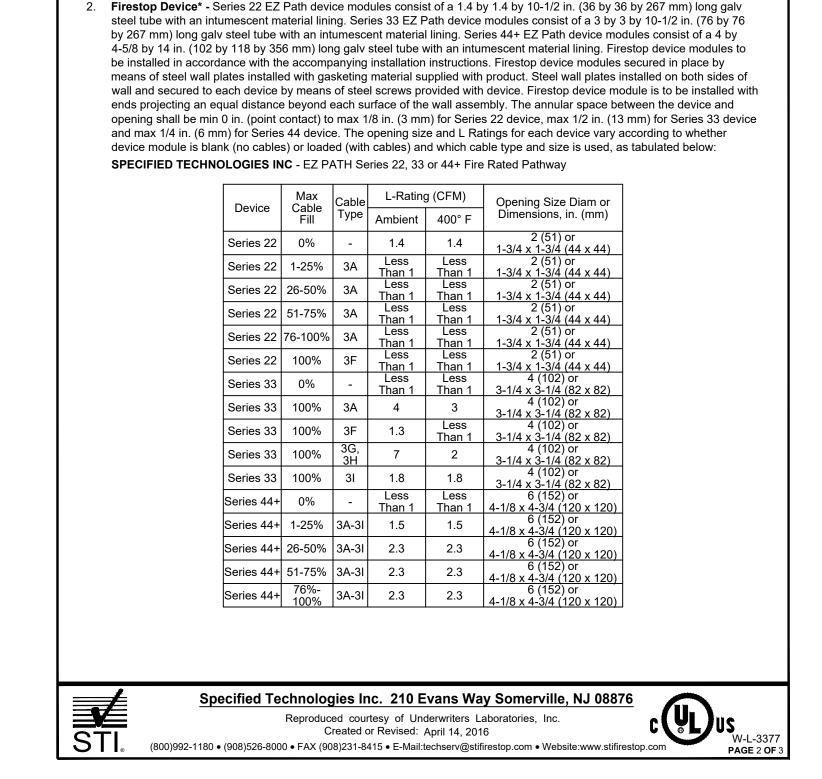












Wall Assembly - The 1, 2, 3 or 4 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in

A. Studs - Wall framing shall 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 max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in.

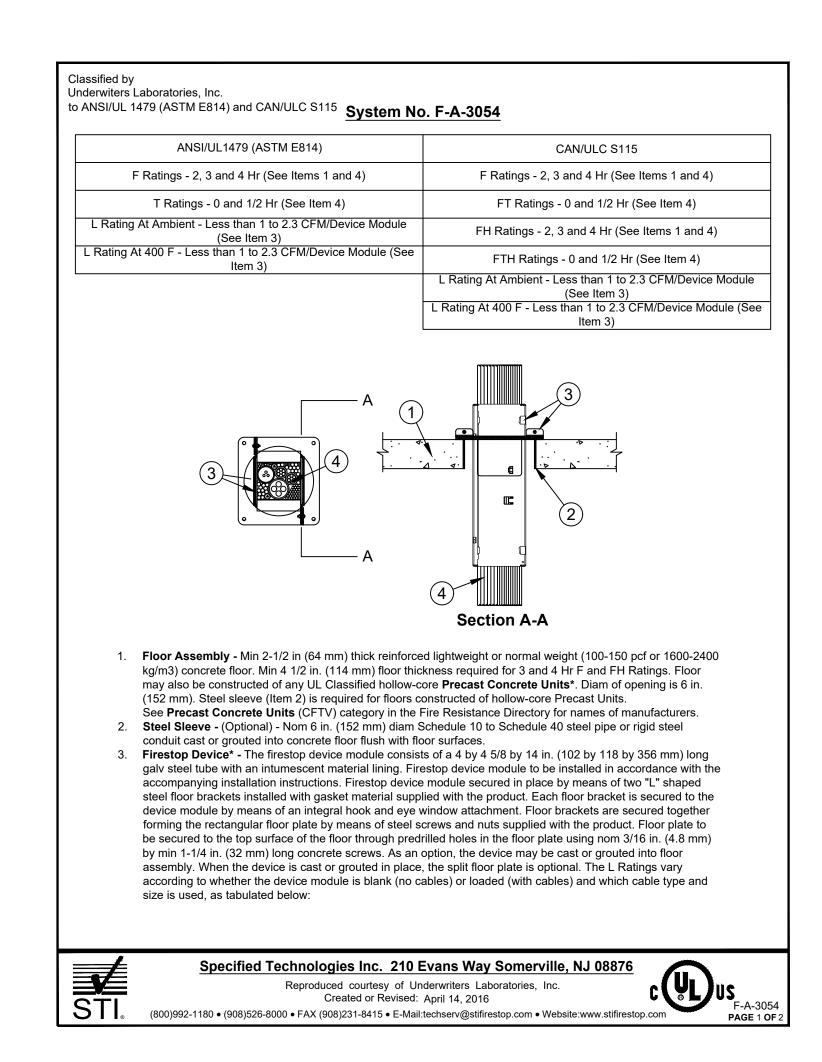
B. Gypsum Board\* - Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design.

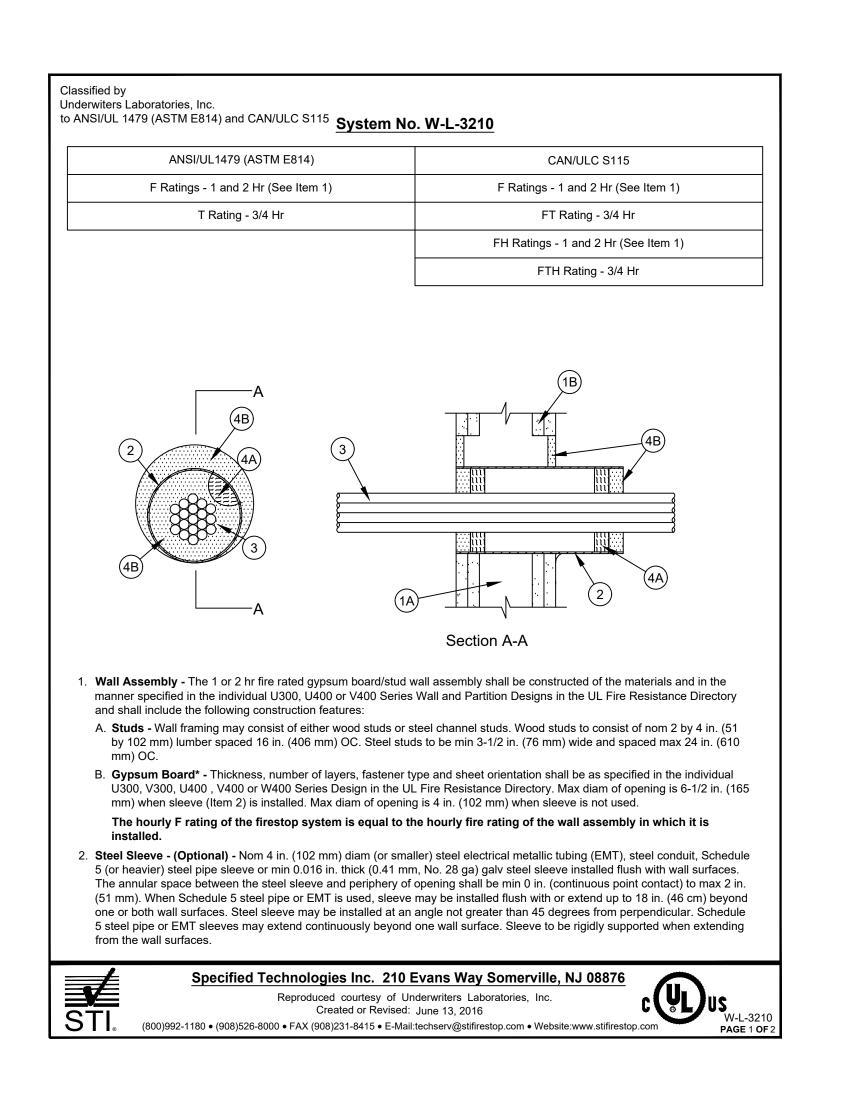
the manner described within the individual U300, U400, V400 or W400 Series Wall or Partition Designs in the UL Fire

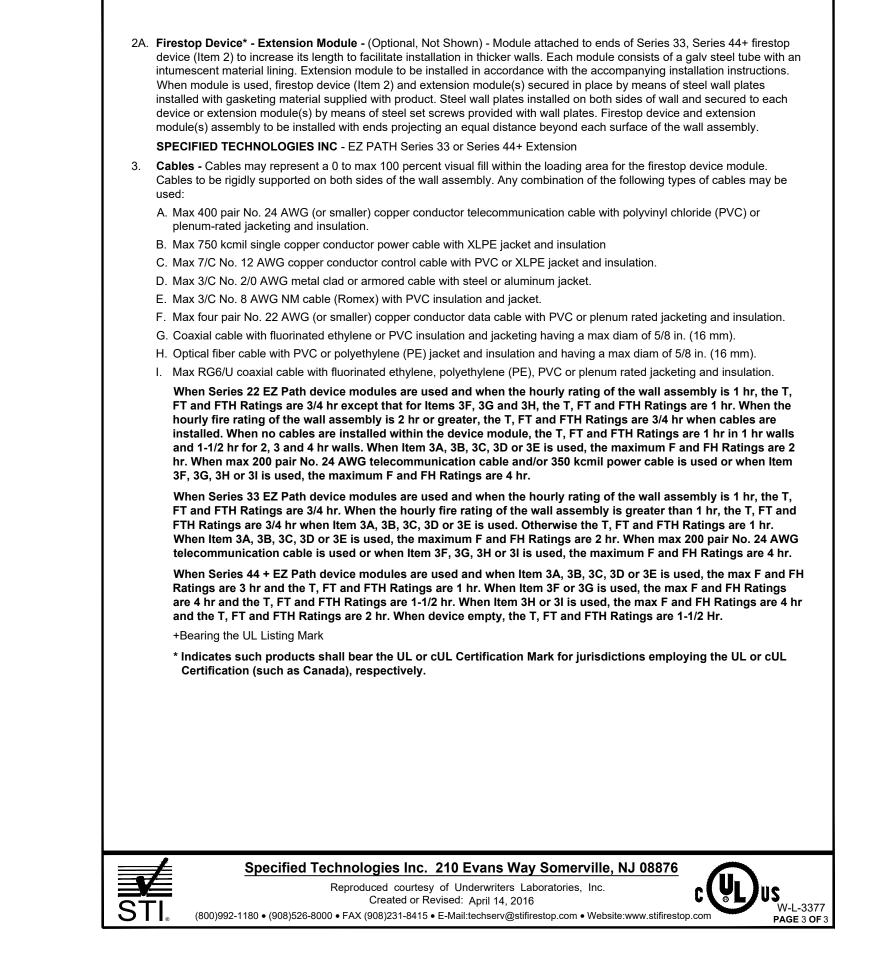
The hourly F and FH Ratings are dependent upon the hourly rating of the wall in which it is installed.

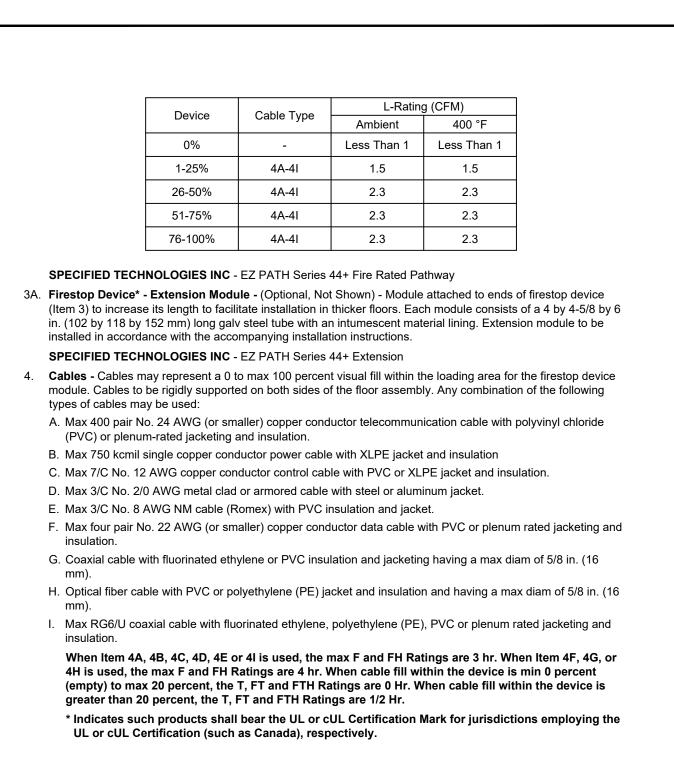
Resistance Directory and shall incorporate the following construction features

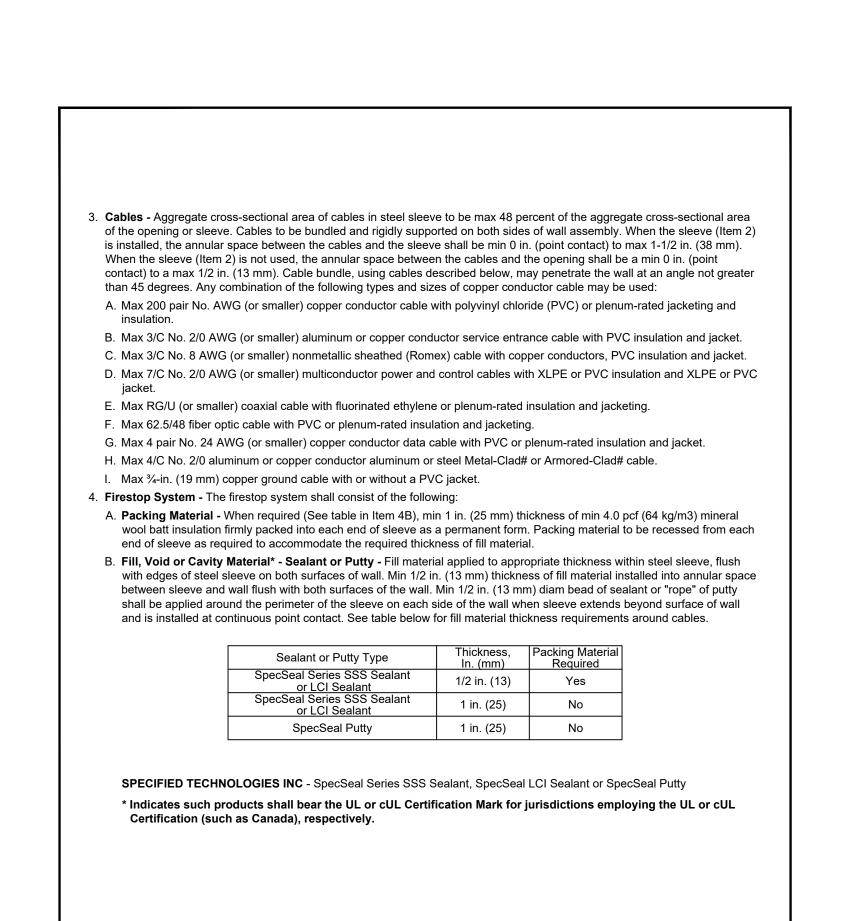
See Table for opening sizes.











Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

Created or Revised: June 13, 2016

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Created or Revised: April 14, 2016

#### GENERAL NOTES:

- . Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
  - UL Fire Resistance Directory; Current Edition
  - NFPA 101 Life Safety Code
  - All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing** 

**DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

PROJECT NAME:

PROJECT NAME:

PROJECT LOCATION:

PROJECT\_LOCATION:

#### ARCHITECT/CONSULTANT:

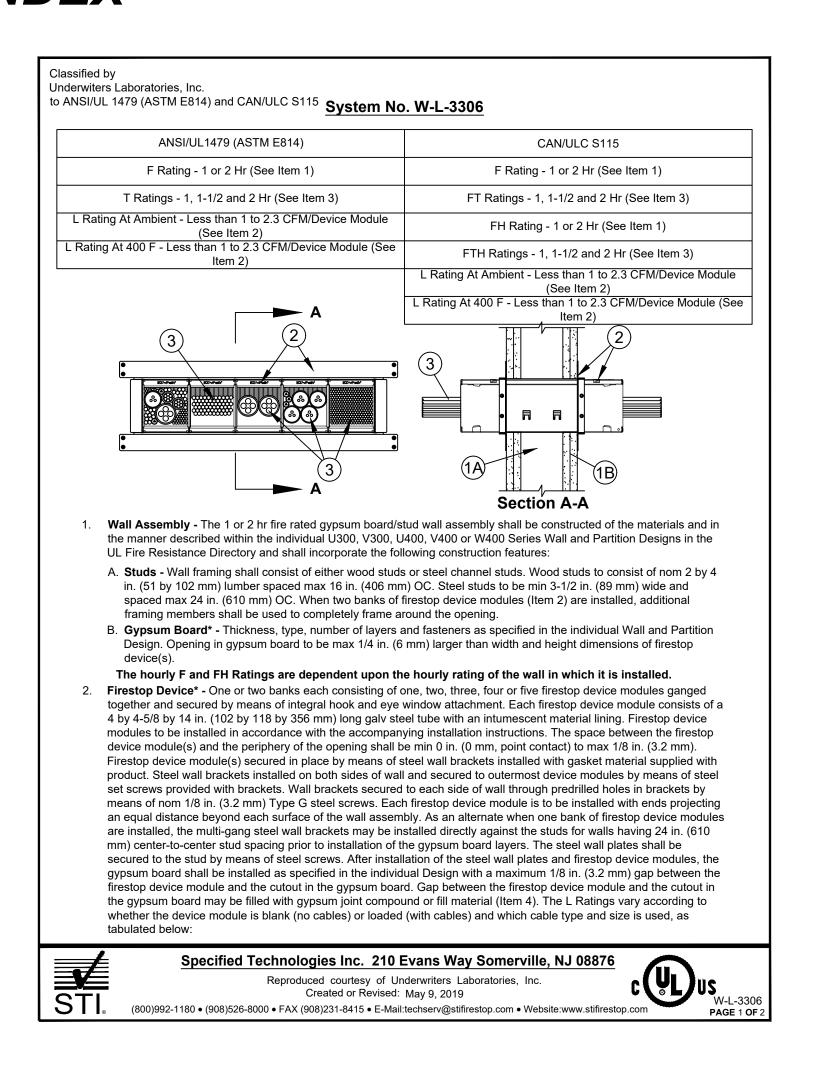
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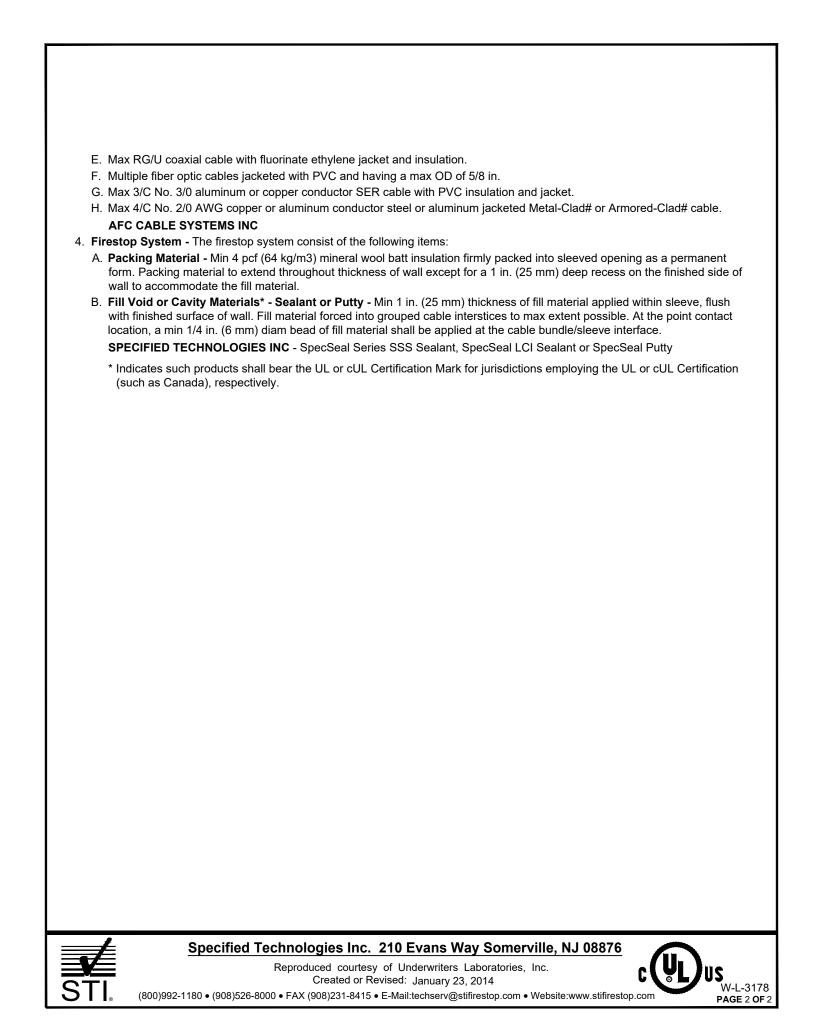
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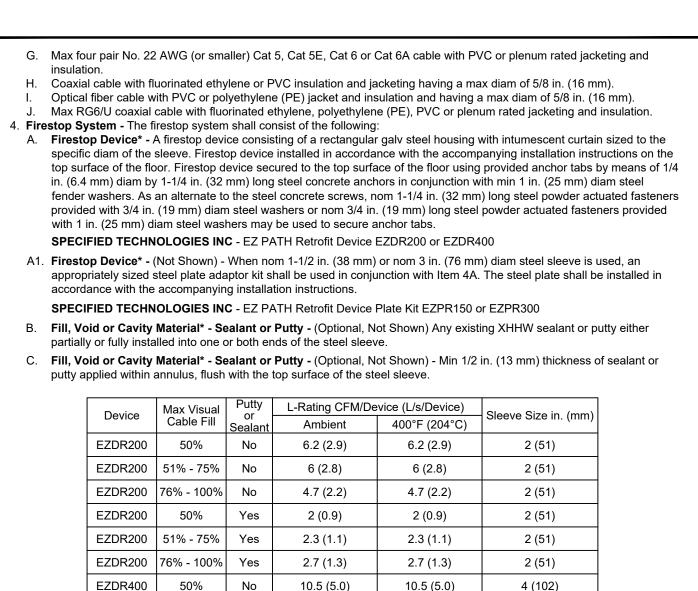
STI FIRESTOP SYSTEMS

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876









Device	Max Visual	Putty	L-Rating CFM/D	evice (L/s/Device)	Sloovo Sizo in (mm)
Device	Cable Fill	or Sealant	Ambient	400°F (204°C)	Sleeve Size in. (mm)
EZDR200	50%	No	6.2 (2.9)	6.2 (2.9)	2 (51)
EZDR200	51% - 75%	No	6 (2.8)	6 (2.8)	2 (51)
EZDR200	76% - 100%	No	4.7 (2.2)	4.7 (2.2)	2 (51)
EZDR200	50%	Yes	2 (0.9)	2 (0.9)	2 (51)
EZDR200	51% - 75%	Yes	2.3 (1.1)	2.3 (1.1)	2 (51)
EZDR200	76% - 100%	Yes	2.7 (1.3)	2.7 (1.3)	2 (51)
EZDR400	50%	No	10.5 (5.0)	10.5 (5.0)	4 (102)
EZDR400	51% - 75%	No	10.5 (5.0)	10.5 (5.0)	4 (102)
EZDR400	76% - 100%	No	14 (6.6)	14 (6.6)	4 (102)
EZDR400	50%	Yes	3.8 (1.8)	3.8 (1.8)	4 (102)
EZDR400	51% - 75%	Yes	6.8 (3.2)	6.8 (3.2)	4 (102)
EZDR400	76% - 100%	Yes	6.8 (3.2)	6.8 (3.2)	4 (102)

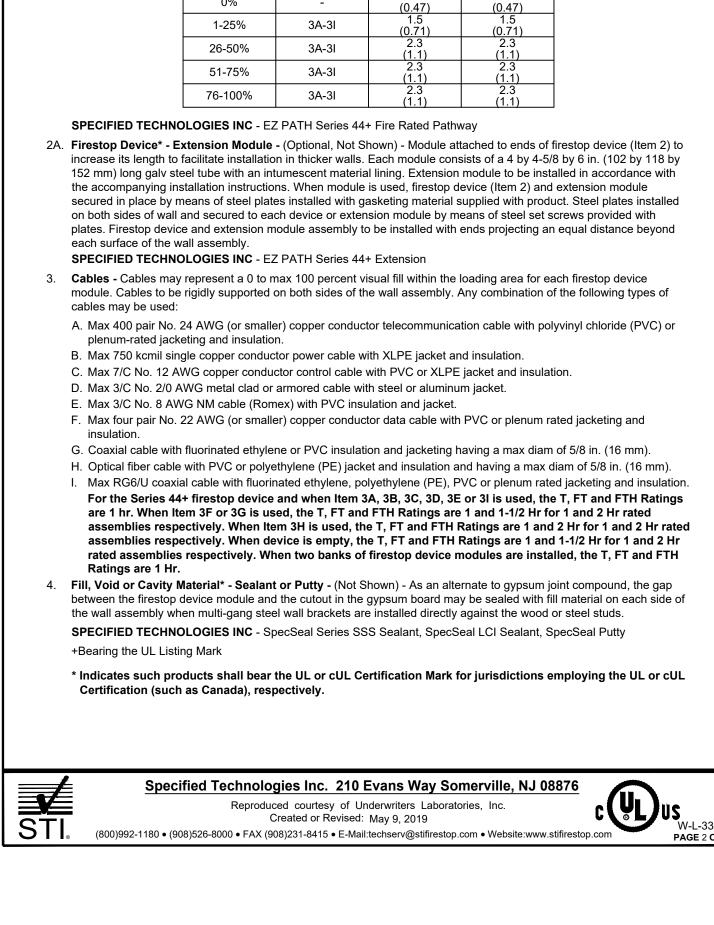
SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LC150 Sealant, SpecSeal LCI Sealant, SpecSeal SIL300 Sealant or SpecSeal Putty 5. Batts and Blankets\* - Two min 12 in. (305 mm) wide layers of nom 2 in. (51 mm) thick nom 1 pcf (16 kg/m3) fiberglass duct wrap insulation installed around device and cables. Insulation to be tightly butted to the top surface of the floor and all

longitudinal seams of duct wrap are to be sealed with foil tape. See Batts and Blankets (BKNV) category in the Building Materials Directory for names of manufacturers. Any batts and blankets material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

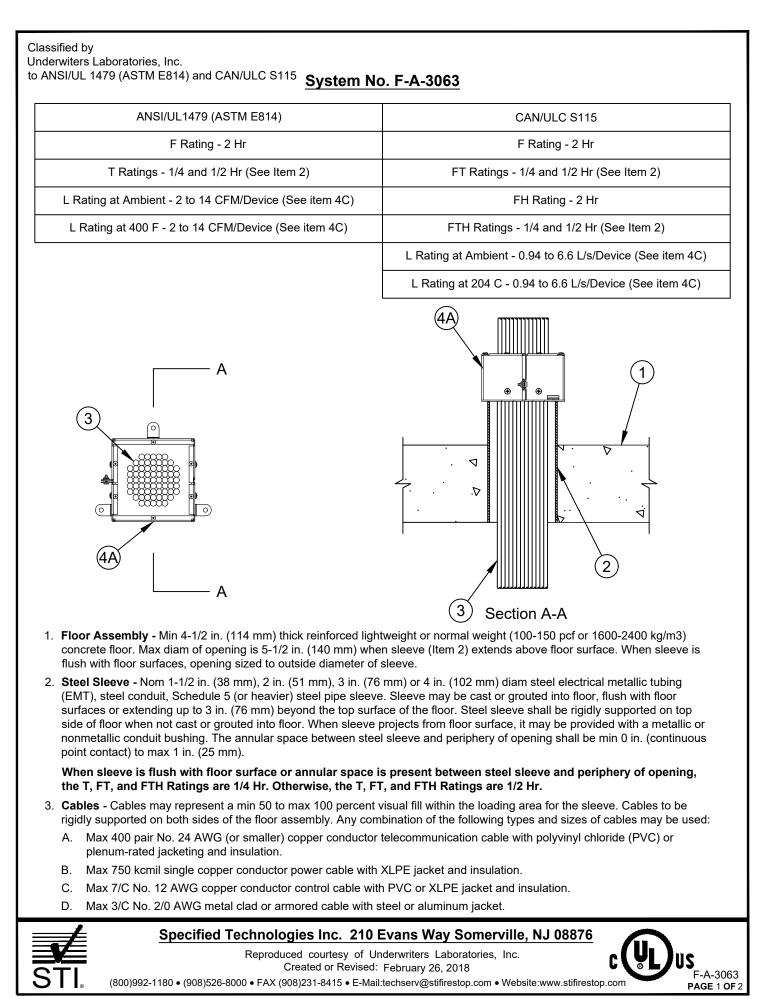
When Item 5 is used at a min height of 18 in. (457 mm) the T, FT and FTH Ratings are 1-1/4 Hr. When Item 5 is used at a min height of 36 in. (914 mm), the T, FT and FTH Ratings are 2 Hr. \* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL

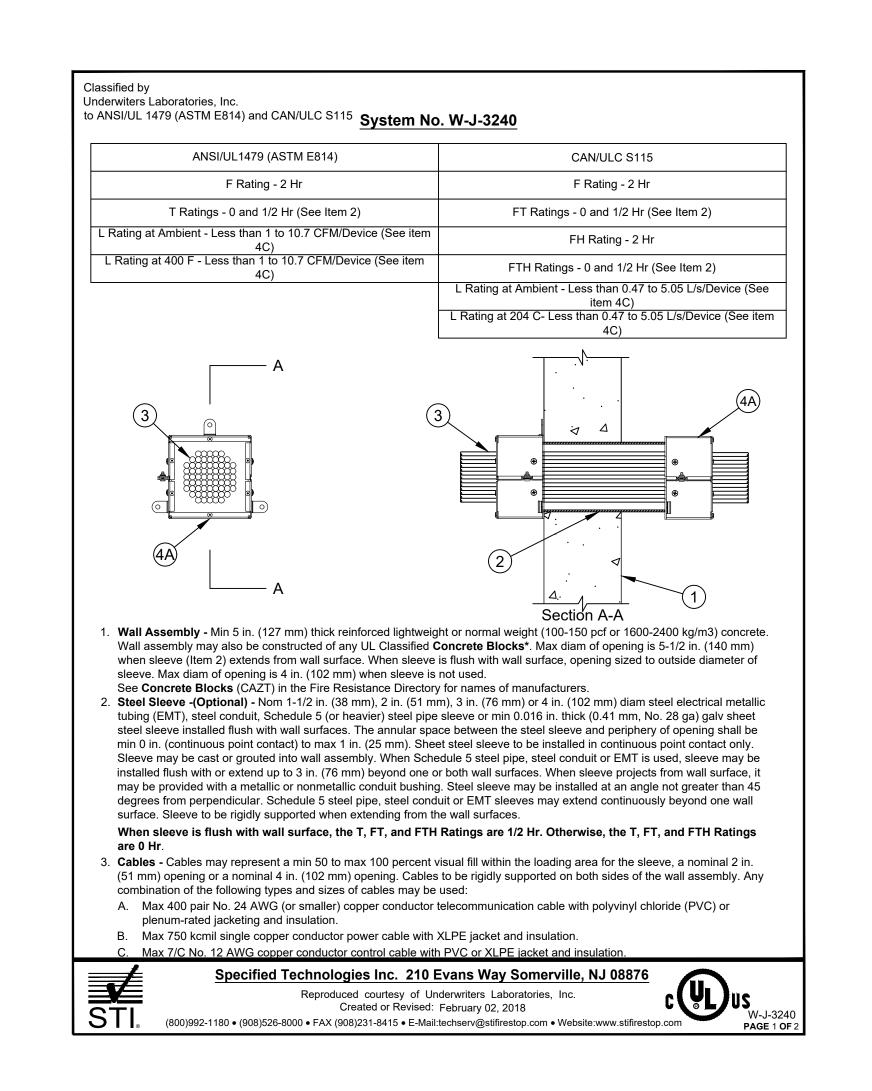
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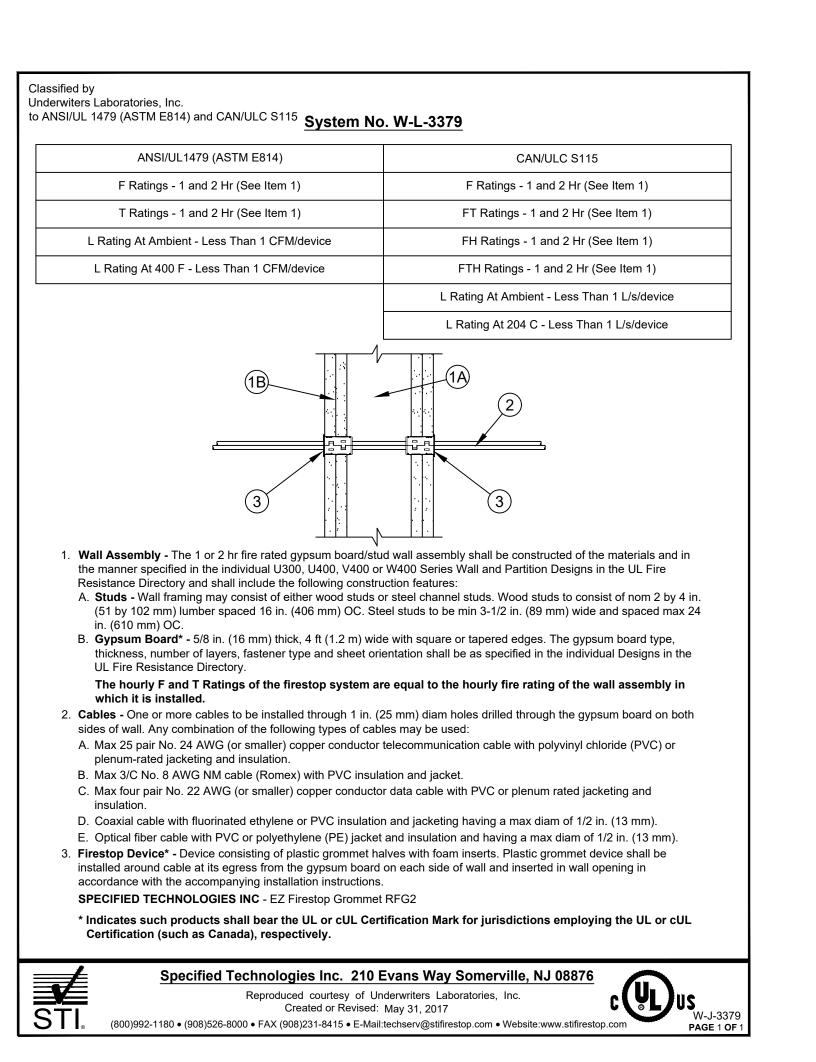
Certification (such as Canada), respectively.

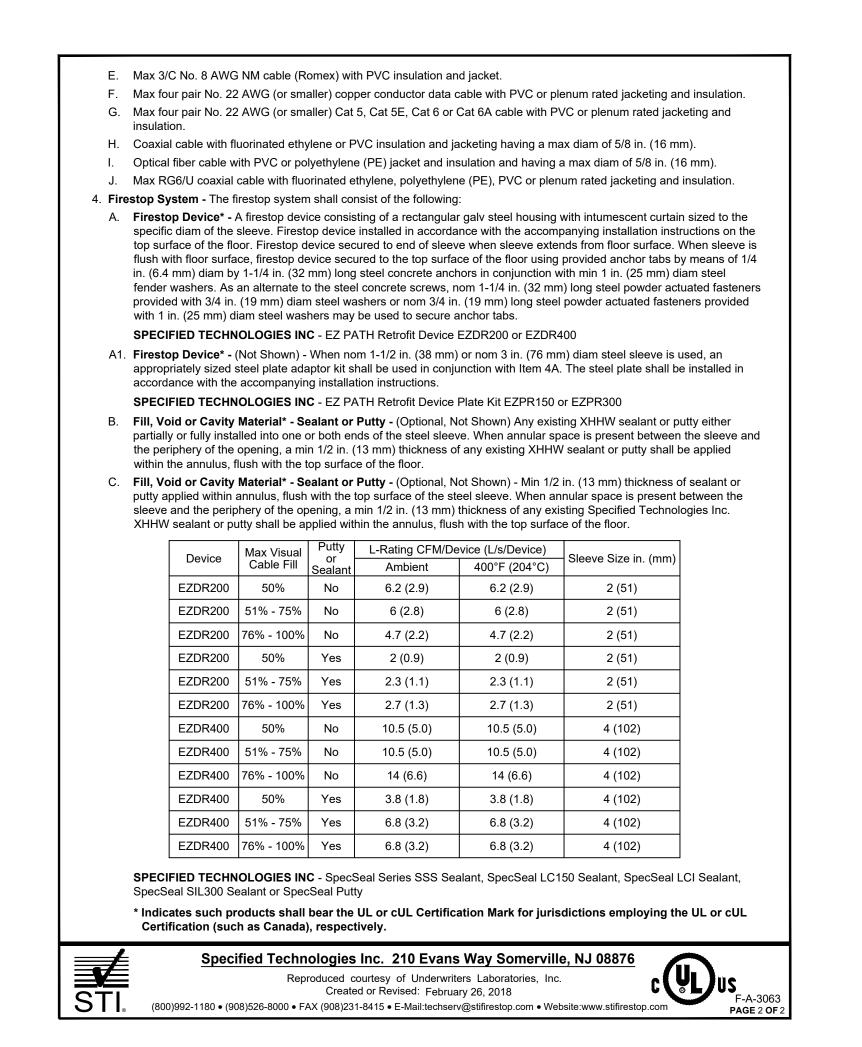


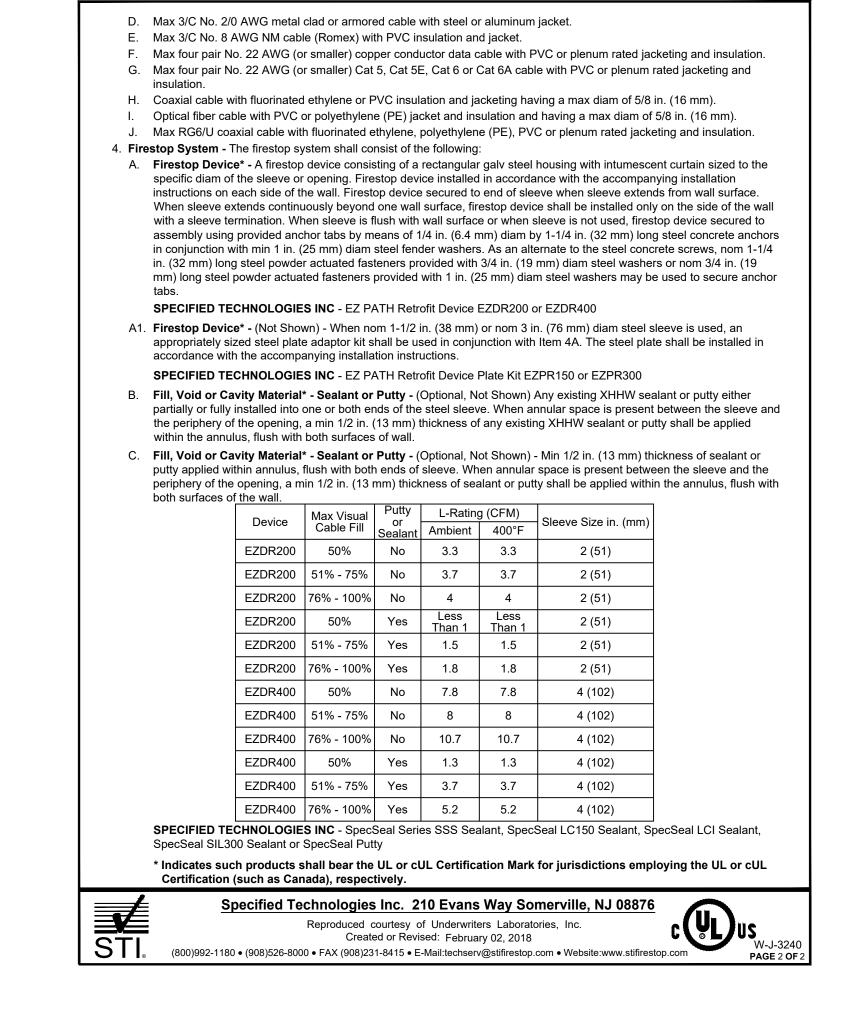
(L/s/Device Module)

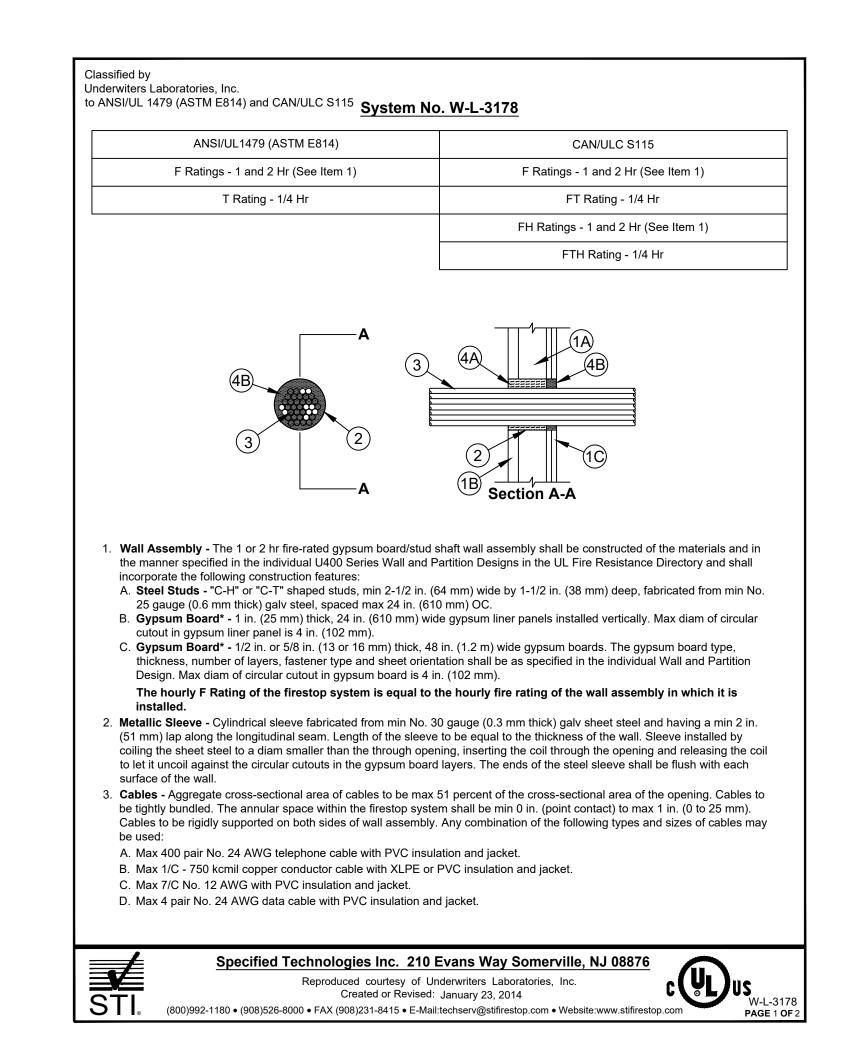


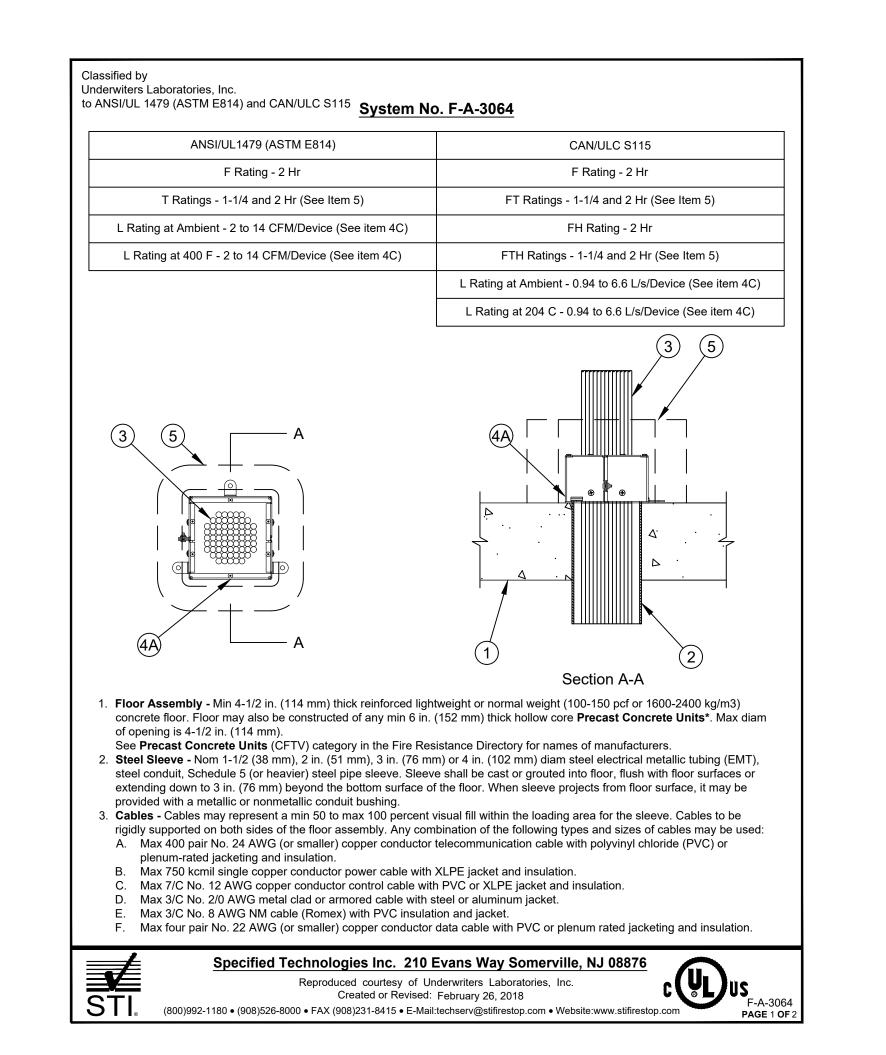












#### **GENERAL NOTES:**

- Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
  - UL Fire Resistance Directory; Current Edition
  - NFPA 101 Life Safety Code
  - All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing** 

**DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

#### PROJECT NAME:

PROJECT\_NAME:

# PROJECT LOCATION:

PROJECT\_LOCATION:

### ARCHITECT/CONSULTANT:

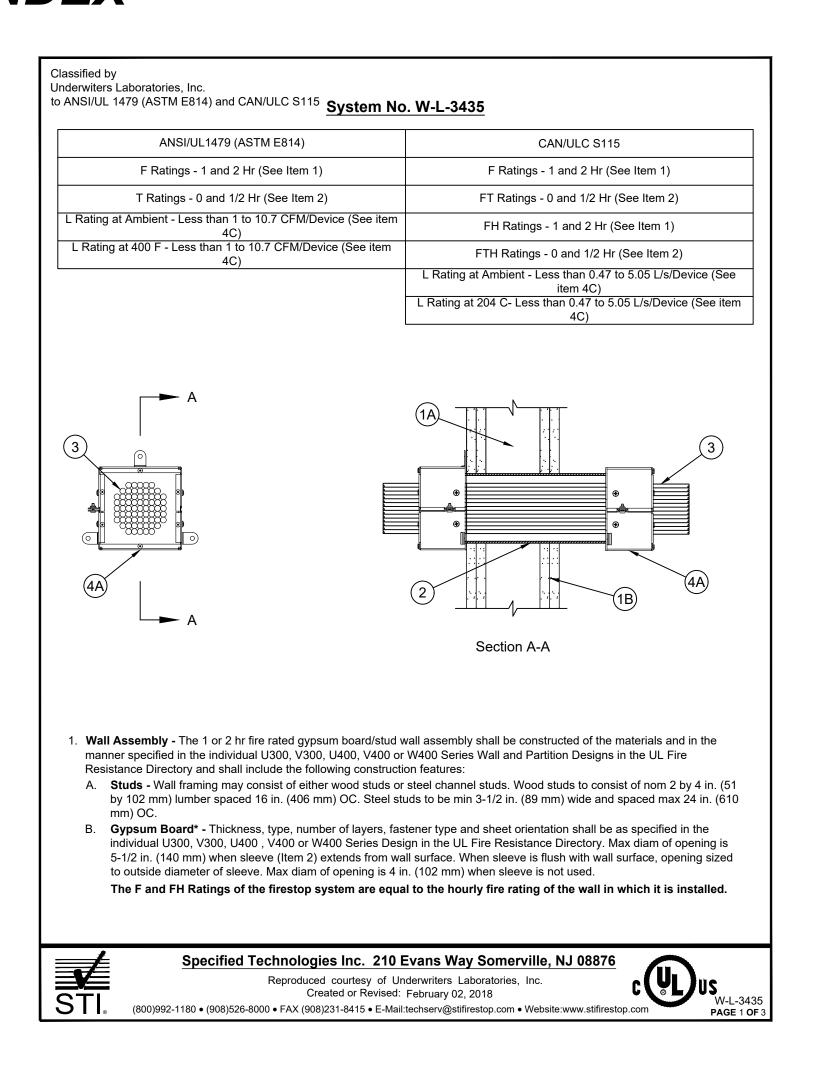
ARCHITECT/CONSULTANT:

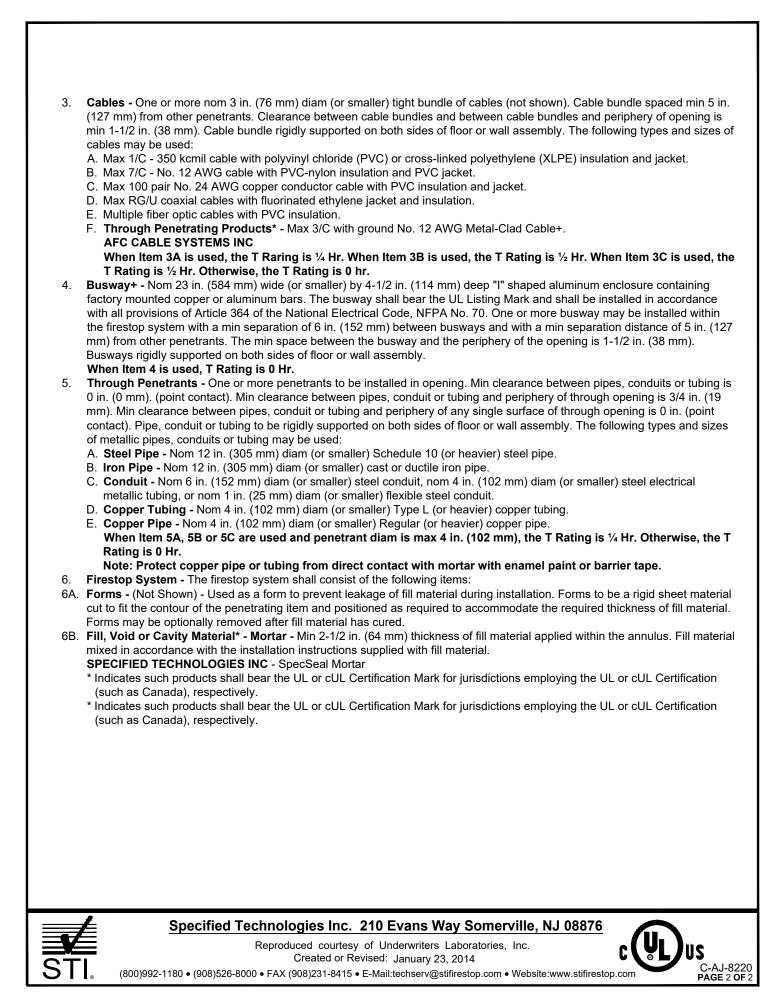
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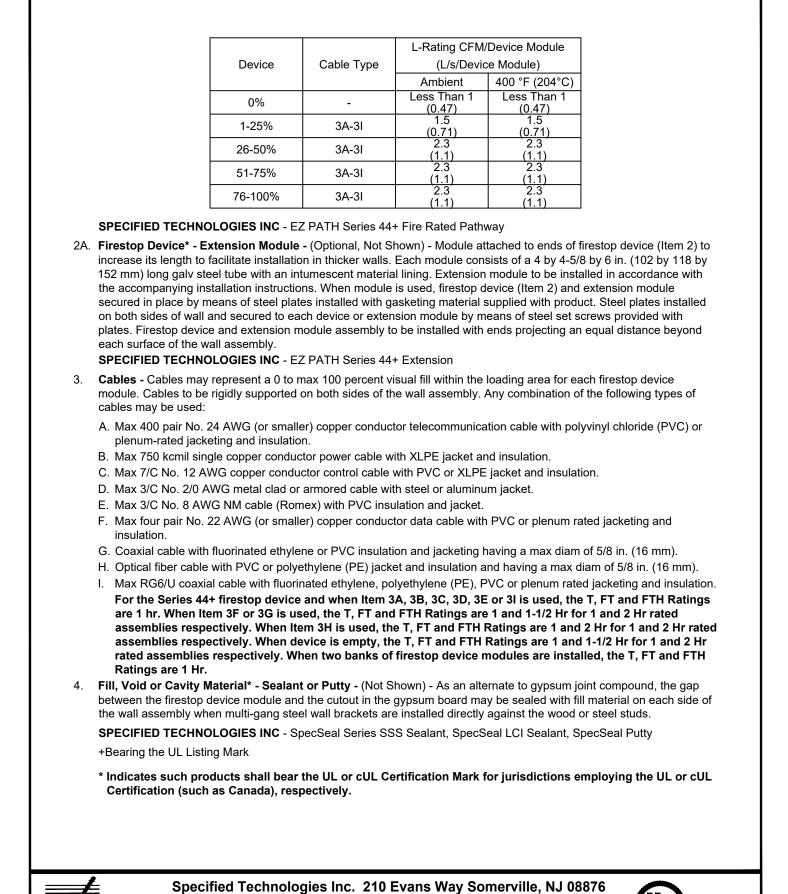
STI FIRESTOP SYSTEMS

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876







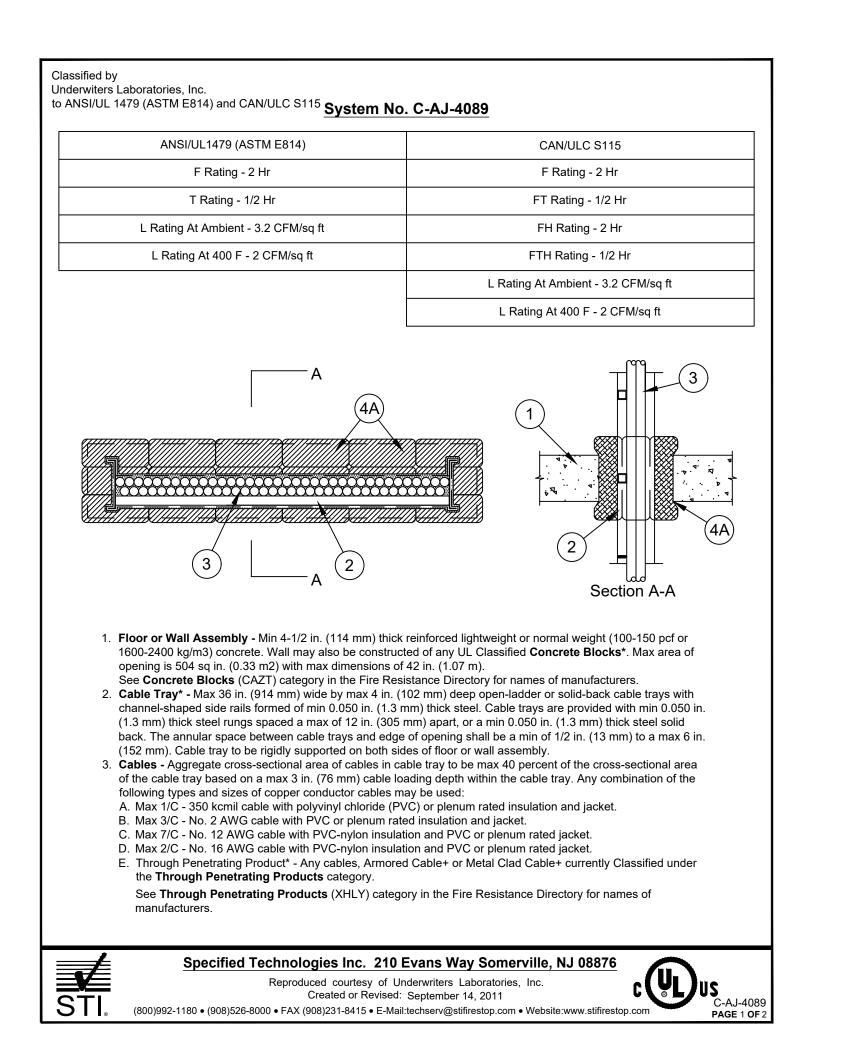


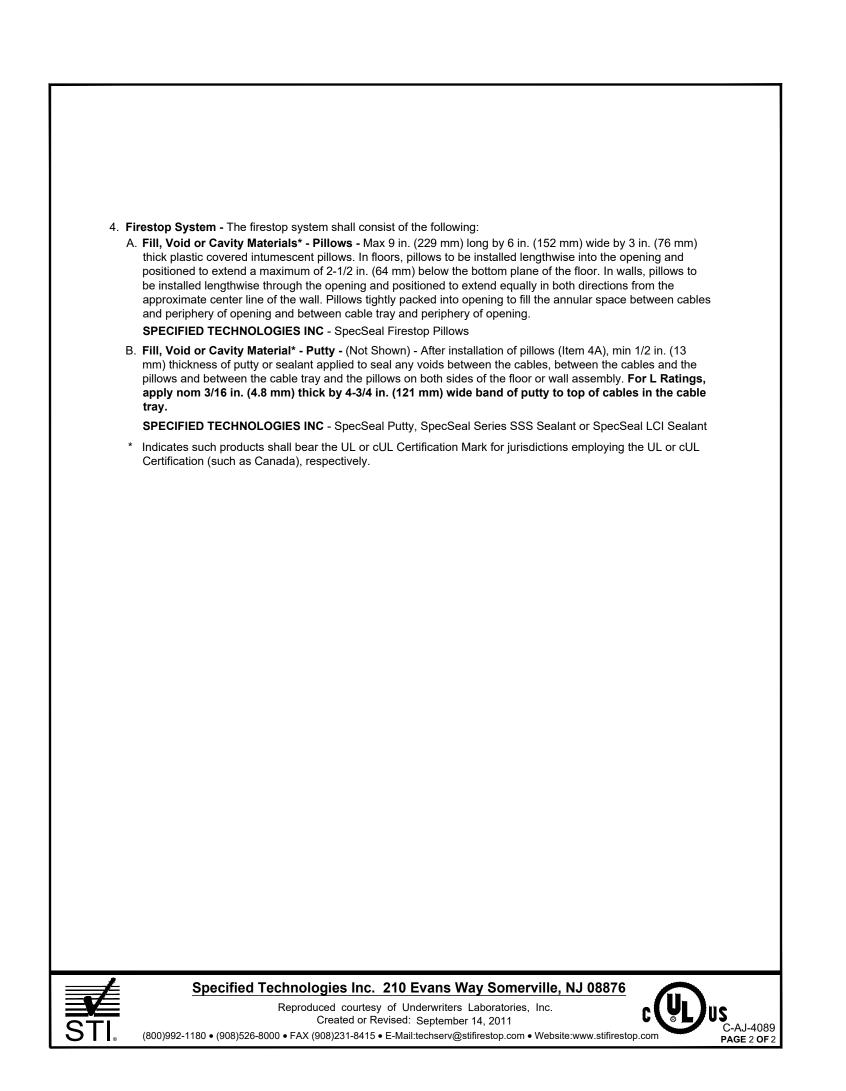
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. Steel Sleeve - (Optional) - Nom 1-1/2 in. (38 mm), 2 in. (51 mm), 3 in. (76 mm) or 4 in. (102 mm) diam steel electrical metallic tubing (EMT), steel conduit. Schedule 5 (or heavier) steel pipe sleeve or min 0.016 in, thick (0.41 mm, No. 28 ga) galy sheet steel sleeve installed flush with wall surfaces. The annular space between the steel sleeve and periphery of opening shall be min 0 in. (continuous point contact) to max 1 in. (25 mm). Sheet steel sleeve to be installed in continuous point contact only. When Schedule 5 steel pipe, steel conduit or EMT is used, sleeve may be installed flush with or extend up to 3 in. (76 mm) beyond one or both wall surfaces. When sleeve projects from wall surface, it may be provided with a metallic or nonmetallic conduit bushing. Steel sleeve may be installed at an angle not greater than 45 degrees from perpendicular. Schedule 5 steel pipe, steel conduit or EMT sleeves may extend continuously beyond one wall surface. Sleeve to be rigidly supported when When sleeve is flush with wall surface in 2 Hr rated assemblies, the T, FT, and FTH Ratings are 1/2 Hr. Otherwise, the T, FT, and FTH Ratings are 0 Hr. . Cables - Cables may represent a min 50 to max 100 percent visual fill within the loading area for the sleeve, a nom 2 in. (51 mm) diam opening or a nom 4 in. (102 mm) diam opening. Cables to be rigidly supported on both sides of the wall assembly. Any combination of the following types and sizes of cables may be used: A. Max 400 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) or plenum-rated jacketing and insulation B. Max 750 kcmil single copper conductor power cable with XLPE jacket and insulation. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation. D. Max 3/C No. 2/0 AWG metal clad or armored cable with steel or aluminum jacket. F. Max 3/C No. 8 AWG NM cable (Romex) with PVC insulation and jacket. F. Max four pair No. 22 AWG (or smaller) copper conductor data cable with PVC or plenum rated jacketing and insulation. G. Max four pair No. 22 AWG (or smaller) Cat 5, Cat 5E, Cat 6 or Cat 6A cable with PVC or plenum rated jacketing and H. Coaxial cable with fluorinated ethylene or PVC insulation and jacketing having a max diam of 5/8 in. (16 mm). I. Optical fiber cable with PVC or polyethylene (PE) jacket and insulation and having a max diam of 5/8 in. (16 mm). Max RG6/U coaxial cable with fluorinated ethylene, polyethylene (PE), PVC or plenum rated jacketing and insulation. A. Firestop Device - A firestop device consisting of a rectangular galy steel housing with intumescent curtain sized to the specific diam of the sleeve or opening. Firestop device installed in accordance with the accompanying installation instructions on each side of the wall. Firestop device secured to end of sleeve when sleeve extends from wall surface. When sleeve extends continuously beyond one wall surface, firestop device shall be installed only on the side of the wall with a sleeve termination. When sleeve is flush with wall surface or when sleeve is not used, firestop device secured to assembly using provided anchor tabs by means of 1/8 in. (3.2 mm) diam by 1-3/4 in. (44 mm) long steel molly bolts or toggle bolts in conjunction with min 1-1/4 in. (32 mm) diam steel fender washers. SPECIFIED TECHNOLOGIES INC - EZ PATH Retrofit Device EZDR200 or EZDR400 A1. Firestop Device\* - (Not Shown) - When nom 1-1/2 in. (38 mm) or nom 3 in. (76 mm) diam steel sleeve is used, an appropriately sized steel plate adaptor kit shall be used in conjunction with Item 4A. The steel plate shall be installed in accordance with the accompanying installation instructions SPECIFIED TECHNOLOGIES INC - EZ PATH Retrofit Device Plate Kit EZPR150 or EZPR300 Fill, Void or Cavity Material\* - Sealant or Putty - (Optional, Not Shown) Any existing XHHW sealant or putty either partially or fully installed into one or both ends of the steel sleeve. When annular space is present between the sleeve and the periphery of the opening, a min 5/8 in. (16 mm) thickness of any existing XHHW sealant or putty shall be applied within the annulus, flush with both surfaces of wall. Fill, Void or Cavity Material\* - Sealant or Putty - (Optional, Not Shown) - Min 1/2 in. (13 mm) thickness of sealant or putty applied within annulus, flush with both ends of sleeve. When annular space is present between the sleeve and the periphery of the opening, a min 1/2 in. (13 mm) thickness of sealant or putty shall be applied within the annulus, flush with both surfaces of the wall. Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876 Reproduced courtesy of Underwriters Laboratories. In Created or Revised: February 02, 2018

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EZDR200 | 51% - 75% | Yes | 1.5 | 1.5

EZDR200 | 76% - 100% | Yes | 1.8 | 1.8

EZDR400 50% Yes 1.3 1.3

EZDR400 | 51% - 75% | Yes | 3.7 | 3.7

EZDR400 | 76% - 100% | Yes | 5.2 | 5.2

SpecSeal SIL300 Sealant or SpecSeal Putty

Certification (such as Canada), respectively.

SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LC150 Sealant, SpecSeal LCI Sealant,

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL

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EZDR400 | 51% - 75% | No | 8

2 (51)

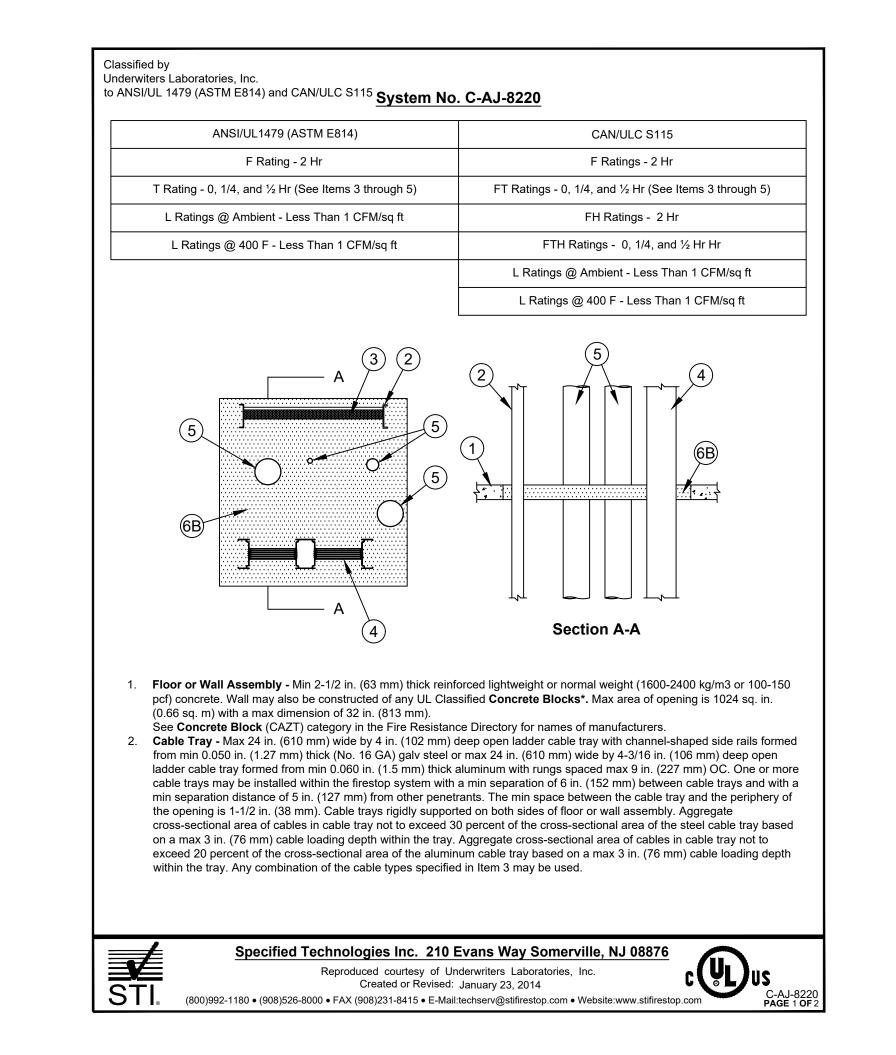
2 (51)

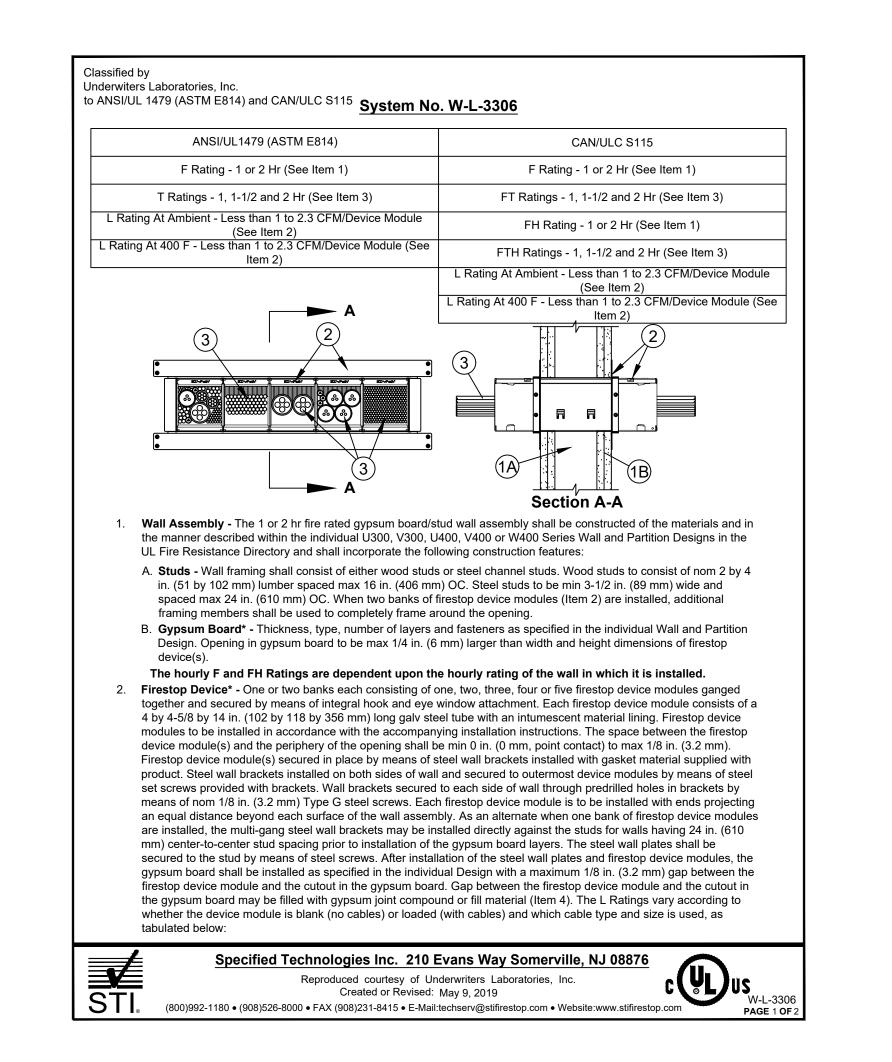
4 (102)

4 (102)

4 (102)

4 (102)





#### **GENERAL NOTES:**

- 1. Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
- UL Fire Resistance Directory;
   Current Edition
- NFPA 101 Life Safety Code
- All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

DIVISION 22: Plumbing

**DIVISION 23: HVAC** 

DIVISION 26: Electrical

DIVICION 27. Communication

DIVISION 27: Communications

#### PROJECT NAME:

PROJECT\_NAME:

PROJECT LOCATION:

PROJECT\_LOCATION:

### ARCHITECT/CONSULTANT:

ARCHITECT/CONSULTANT:

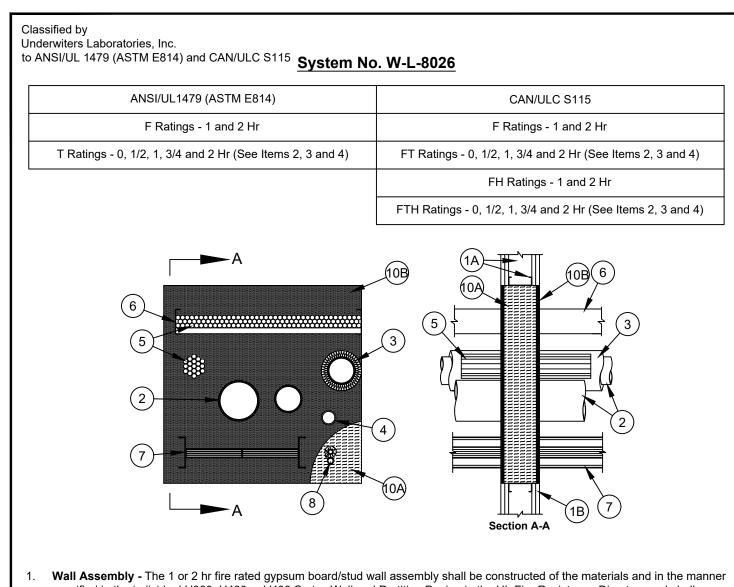
### TITLE:

STI FIRESTOP SYSTEMS

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876





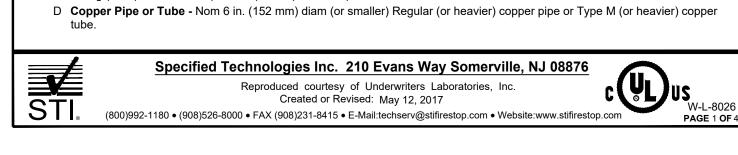


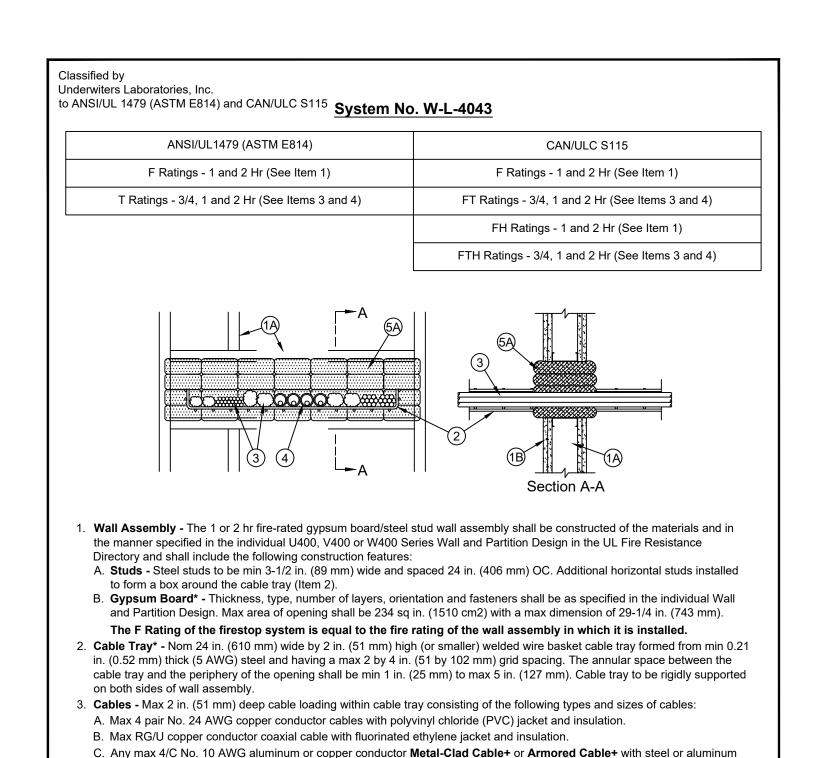
- Wall Assembly The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   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 and spaced max 24 in. (610 mm) OC. Additional studs to be installed horizontally to form a rectangular box around the opening.
  B. Gypsum Board\* Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. When wood studs are used, interior of through opening to be lined with sheets of gypsum board around entire periphery to a total thickness of 5/8 in. (16 mm) or 1-1/4 in. (32 mm) for 1 or 2 hr wall assemblies, respectively. Max area of opening is 7 ft2

(0.66 m<sup>2</sup>)with a max height 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.

  Metallic Penetrants One or more metallic pipes, conduits or tubes to be installed within the opening. Annulus between penetrants is min 0 in. (point contact) to max 24 in. (609 mm). Annulus between penetrants and periphery of opening is 0 in. (point contact) to max 24 in. (609 mm). Penetrants 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 12 in. (305 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
  B. Iron Pipe Nom 12 in. (305 mm) diam (or smaller) cast or ductile iron pipe.
  C. Conduit Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit, nom 4 in. (102 mm) diam (or smaller) electrical metallic
- C. Conduit Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit, nom 4 in. (102 mm) diam (or smaller) electrical metallic tubing (EMT), or nom 4 in. (102 mm) diam (or smaller) steel Flexible Metal Conduit#.
   D Copper Pipe or Tube Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe or Type M (or heavier) copper





See Through-Penetrating Products (XHLY) category in the Fire Resistance Directory for names of manufacturers.

. Optical Fiber Raceway+ - One or more max 2 in. (51 mm) diam (or smaller) optical fiber raceways (innerduct) formed from

polyvinyl chloride (PVC) or polyvinylidene fluoride (PVDF) with fiber optic cable fill. Raceways installed in accordance with the

See Optical Fiber Raceway (QAZM) category in the Electrical Construction Equipment Directory for names of manufacturers.

When only Item 4 is used, the T Rating is equal to the hourly fire rating of the wall assembly in which it is installed.

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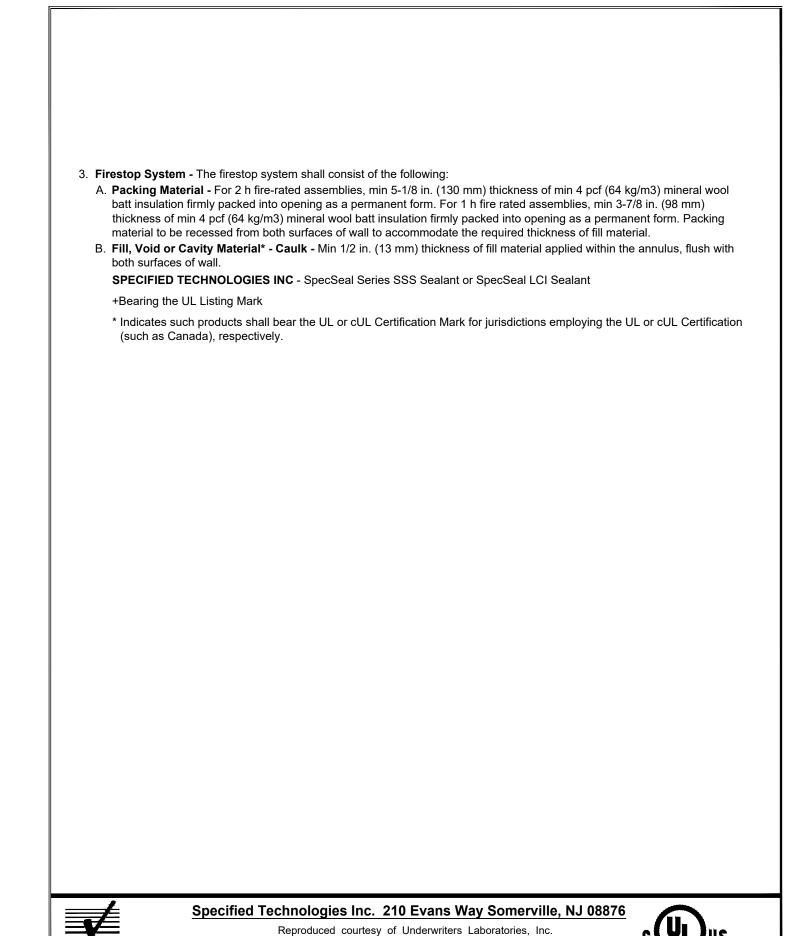
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When Item 3A is used, the T Rating is 1 hr. When Item 3B or 3C is used, the T Rating is 3/4 hr.

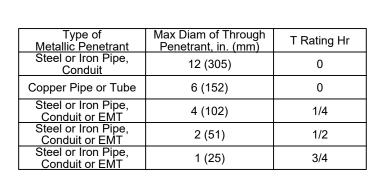
National Electrical Code (NFPA No. 70). Raceways may be used in addition to the cable types listed in Item 3.

jacket currently Classified under the **Through Penetrating Products** category.



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- 3. **Pipe Insulation -** (Optional) One or more max 4 in. (102 mm) metallic pipes or tubes may be insulated. Annulus between penetrants is min 0 in. (point contact) to max 26 in. (660 mm). Annulus between penetrants and periphery of opening is 0 in. (point contact) to max 24 in. (609 mm). The annular space between metallic pipes, conduit and tubes and insulated pipes and tubes shall be a min 1/2 in. (13 mm) to max 24 in. (609 mm). Penetrants rigidly supported on both sides of floor or wall assembly. The following types of pipe insulation may be used
- following types of pipe insulation may be used

  A. Pipe and Equipment Covering Materials\* Nom 1 in. (25 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 56 kg/m3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product.

  When Item 3A is used, T Rating is 3/4 Hr.

  See Pipe and Equipment Covering Materials (BRGU) category in the Building Materials Directory for names of
- manufacturers. Any pipe covering meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

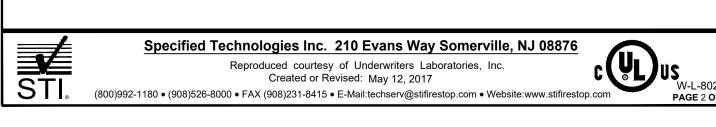
  B. **Pipe Covering Materials\*** Nom 2 in. (51 mm) thick unfaced mineral fiber pipe insulation having a nom density of 3.5 pcf (56 kg/m3) (or heavier) and sized to the outside diam of the pipe or tube. Pipe insulation secured with min 8 AWG steel wire spaced max 12 in. (305 mm) OC. **When Item 3B is used, T Rating is 2 Hr.**
- max 12 in. (305 mm) OC. When Item 3B is used, T Rating is 2 Hr.
   INDUSTRIAL INSULATION GROUP L L C High Temperature Pipe Insulation 1200, High Temperature Pipe Insulation BWT and High Temperature Pipe Insulation Thermaloc
   C. Sheathing Material\* Use in conjunction with Item 3B. Foil-scrim-kraft or all service jacket material shall be wrapped around the outer circumference of the pipe insulation (Item 3B) with the kraft side exposed. Longitudinal and transverse joints sealed
- See **Sheathing Materials** (BVDV) category in the Building Materials Directory for names of manufacturers. Any sheathing 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.

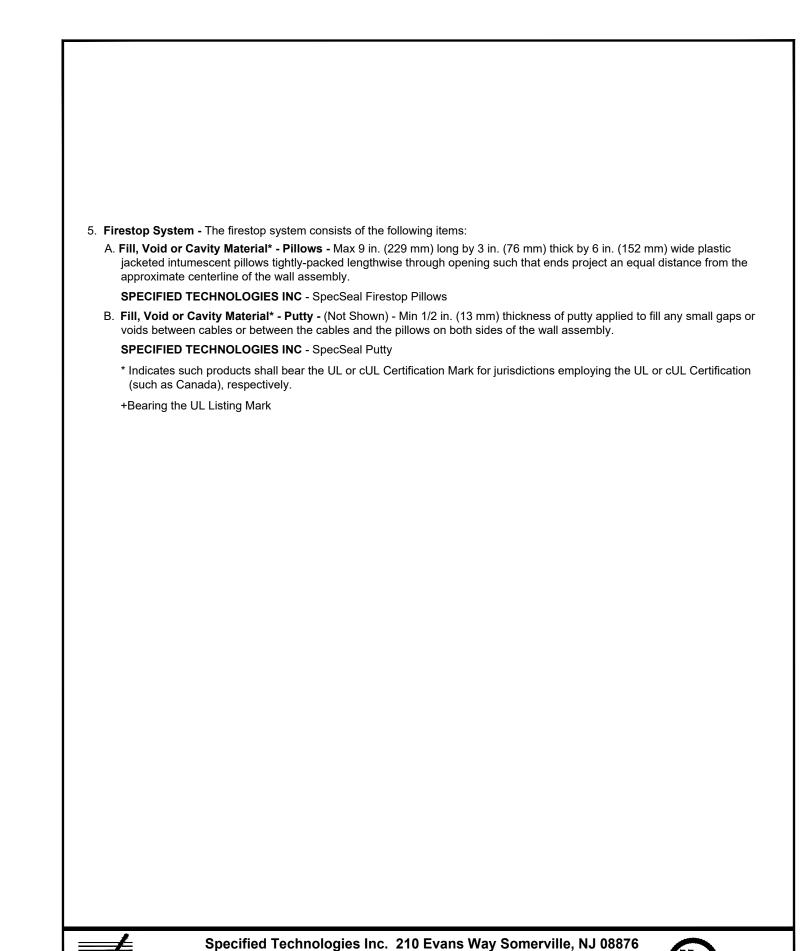
  D **Tube Insulation Plastics# -** Nom 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam
- furnished in the form of tubing. When Item 3D is used, T Rating is 1/2 Hr.

  See Plastics (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.
- E Pipe Covering Materials\* Cellular Glass Insulation Nom 2 to 3 in. (51 to 76 mm) thick cellular glass units sized to the outside diam of the pipe or tube and supplied in nom 24 in. (610 mm) long half sections or nom 18 in.(457 mm) long segments Pipe insulation installed on pipe in accordance with the manufacturer's instructions. When Item 3E is used, T Rating is 2 Hr. PITTSBURGH CORNING CORP FOAMGLAS

  F Metal Jacket Used in conjunction with Item 3E. Min 12 in. (305 mm) long jacket formed from min 0.010 in. (0.25 mm) thick
- aluminum sheet cut to wrap tightly around the pipe insulation with a min 2 in. (51 mm) lap and secured using bands and seals of a similar material or min No. 18 AWG steel tie wire. Bands or steel tie wire to be located within 2 in. (51 mm) of each end of the jacket and spaced max 10 in. (254 mm) OC. Jacket installed with edge abutting surface of fill material (Item 9A) on both surfaces of wall. Metal jacket to be used in addition to any other jacketing material which may be required on the pipe covering.
- surfaces of wall. Metal jacket to be used in addition to any other jacketing material which may be required on the pipe covering.

  G. Pipe and Equipment Covering Materials\* Nom 2 to 3 in. (51 to 76 mm) thick hollow cylindrical calcium silicate (min 14 pcf or 224 kg/m3) units sized to the outside diam of the pipe or tube. Pipe insulation secured with stainless steel bands or min 8 AWG stainless steel wire spaced max 12 in. (305 mm) OC. When Item 3G is used, T Rating is 2 Hr.

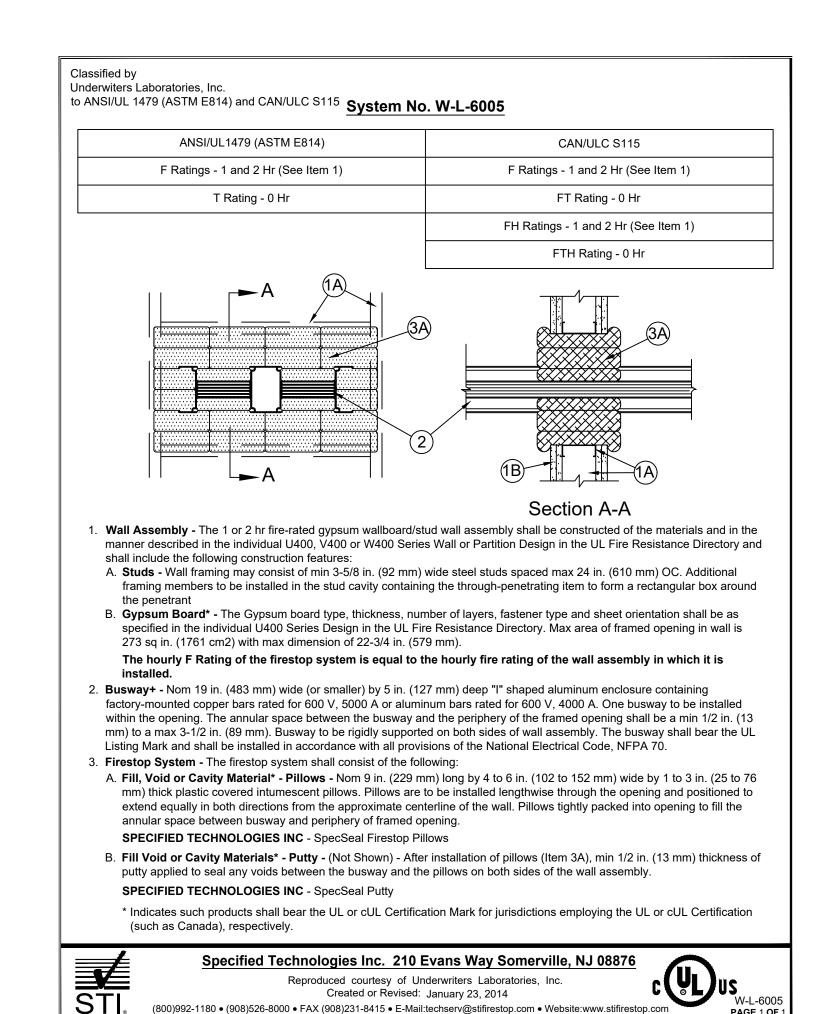




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Nonmetallic Penetrants - One or more nonmetallic pipes, conduits or tubes to be installed within the opening. Annulus between penetrants and periphery of opening is min 1 in. (25 mm) to max 24 in. (609 mm). Separation between metallic and nonmetallic penetrants is min 6 in. (152 mm). Penetrants rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes, conduits or tubing may be used:

A. Polyvinyl Chloride (PVC) Pipe - Nom 2 in. (51 mm) diam (or smaller) solid or cellular core Schedule 40 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 the National Electrical Code (NFPA 70).

D. Electrical Nonmetallic Tubing (ENT)+ - Nom 2 in. (51 mm) diam (or smaller) corrugated wall ENT formed of polyvinyl chloride (PVC) installed in accordance with the National Electrical Code (NFPA 70).
E. Optical Fiber Raceway+ - Nom 2 in. (51 mm) diam (or smaller) optical fiber raceway (innerduct). Optical fiber raceway installed in accordance with the National Electrical Code (NFPA 70).
When Item 4 is used, the T Rating of the firestop system is 2 hr.

5. Cables - Nom 4 in. (102 mm) diam (or smaller) tight bundle of cables. Annulus between cable bundle and periphery of opening is min 0 in. (point contact) to max 24 in. (609 mm). Separation between cable bundle and metallic or nonmetallic penetrants shall be min 6 in. (152 mm). Cable bundle rigidly supported on both sides of wall assembly. The following types and sizes of cables may be used:
A. Max 1/C - 1000 kcmil cable with plenum rated, polyvinyl chloride (PVC) or cross-linked polyethylene (XLPE) insulation and

B. Max 7/C - No. 12 AWG cable with PVC-nylon insulation and PVC jacket.

C. Max 400 pair - No. 24 AWG copper conductor telephone cable with plenum rated or PVC insulation and jacket.

C. Max 400 pair - No. 24 AWG copper conductor telephone cable with plenum rated or PVC insulation and jacket.D. Max RG/U coaxial cables with plenum rated or fluorinated ethylene jacket and insulation.

E. Multiple fiber optic cables with plenum rated or PVC insulation.

sides of the wall assembly.

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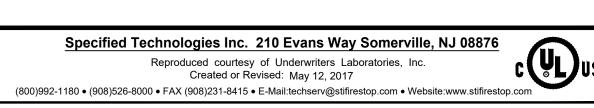
to ASTM/UL1479 (ASTM E814)

F. 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 manufacturer.

6. **Cable Tray -** Max 30 in. (762 mm) wide by max 6 in. (152 mm) deep open ladder cable tray with channel-shaped side rails formed from min 0.060 in. (1.5 mm) thick (No. 16 MSG) galv steel or min 0.060 in. (1.5 mm) thick aluminum with rungs spaced max 9 in. (229 mm) OC. A max of two cable trays may be installed within the opening with a min vertical separation of 4 in. (102 mm) and a min horizontal separation of 1/4 in. (6 mm) between trays. Max vertical or horizontal separation is 24 in. (609 mm). Annulus between the cable tray and the periphery of the opening is min 0 in. (point contact) to max 24 in. (609 mm). Separation between cable tray and metallic or nonmetallic penetrants is min 6 in. (152 mm). Cable trays to be rigidly supported on both sides of the wall assembly. Aggregate cross-sectional area of cables in cable tray not to exceed 40 percent of the cross-sectional area of the cable tray based on a max 3 in. (76 mm) cable loading depth within tray. Any combination of the cable types specified in Item 5 may be used. **When cable tray is used, T Rating is 1/2 hr.** 

**Busway+** - Nom 19 in. (483 mm) wide (or smaller) by 6 in. (152 mm) deep "I" shaped aluminum enclosure containing factory-mounted copper bars rated for 600 V, 5000 A or max 26 in. (660 mm) wide by max 6 in. (152 mm) deep "I" shaped aluminum enclosure containing factory-mounted aluminum bars rated for 600 V, 4000 A. . A max of two busways may be installed within the opening with a min separation of 1 in. (25 mm) to max 24 in. (609 mm). The annular space between the busway and the periphery of the opening shall be a min 0 in. (point contact) to a max 24 in. (609 mm). Busways spaced min 6 in. (152 mm) from all other penetrants. Busway to be rigidly supported on both sides of wall assembly. The busway shall bear the UL Listing Mark and shall be installed in accordance with all provisions of the National Electrical Code, NFPA 70. **When busway is used, the T Rating** in 144 br

Air Conditioning (AC) Line Set - One or more AC line sets installed within opening. Each AC line set consists of two pipes or tubes (Item 8A), tubing insulation (Item 8B) and a thermostat cable (Item 8C). The space between the AC line sets shall be min 2 in. (51 mm). The space between the AC line sets and the periphery of the opening shall be min 0 in. (point contact) to max 24 in. (609 mm). The AC line sets shall be spaced min 6 in. from uninsulated metallic penetrants and shall be rigidly supported on both



L Rating At Ambient - Less Than 1 CFM/sq ft L Rating At 400 F - Less Than 1 CFM/sq ft

. Floor or Wall Assembly - Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400

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

SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

(102 mm) greater than length and width dimensions of busway (Item 2).

when min 4 in. (102 mm) thickness of packing material (Item 3A) is used.

Firestop System - The firestop system shall consist of the following:

required to accommodate the required thickness of fill material

top surface of floor and both surfaces of wall.

\*Bearing the UL Classification Marking

+Bearing the UL Listing Mark

kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks\*. Opening shall be 2 in. (51 mm) to 4 in.

Busway+ - Max 19 in. (483 mm) wide by max 6 in. (152 mm) deep "I" shaped aluminum enclosure containing factory mounted

annular space between the busway and the periphery of the opening shall be min 1 in. (25 mm) to max 2 in. (51 mm). Busway

containing factory-mounted aluminum bars rated for 600 V. 4000 A. One busway to be installed within the opening. The

to be rigidly supported on both sides of floor and wall assembly. The busway shall bear the UL Listing Mark and shall be

installed in accordance with all provisions of the National Electrical Code, NFPA 70. After installation of the firestop system

(Item 3), a min 3/32 in. (2.4 mm) thick steel cover plate provided by busway manufacturer shall be installed on top surface of

floor and both surfaces of wall assembly. Steel cover plate secured in place by means of 1/4 in. (6 mm) diam by 1-3/4 in. (44

A. Packing Material - Min 1-1/2 in. (38 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into

B. Fill, Void or Cavity Material\* - Caulk - Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with

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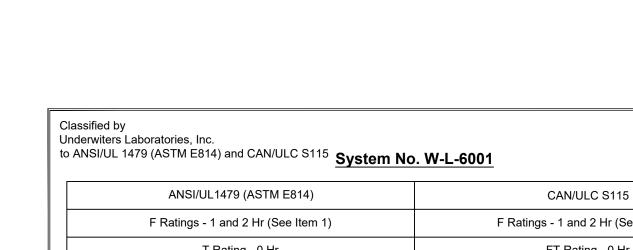
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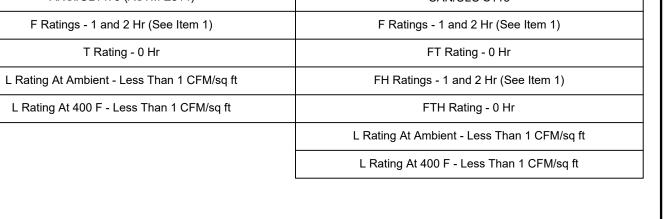
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opening as a permanent form. Packing material to be recessed from top surface of floor and from both surfaces of wall as

mm) long concrete anchors in accordance with busway manufacturer's installation instructions. Steel cover plate is optional

copper bars rated for 600 V, 5000 A or max 26 in. (660 mm) wide by max 6 in. (152 mm) deep "I" shaped aluminum enclosure





8A. **Through Penetrant -** A max of two pipes or tubes to be installed in each AC line set. Of the two pipes or tubes, only one may have

8B. Tube Insulation - Plastics# - Nom 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished

space between the insulated and non-insulated pipes or tubes within each AC line set shall be 0 in. (point contact).

in the form of tubing. The tube insulation may be installed on one max 3/4 in. (19 mm) diam pipe or tube in each AC line set. The

See Plastics (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized

Component tube insulation meeting the above specifications and having a UL 94 Flammability Classification of 945VA may be

8C. Cable - One 4 pair No. 18 AWG (or smaller) thermostat cable with polyvinyl chloride (PVC) insulation and jacket materials may be

Steel Duct - (Not Shown) - Nom 12 in. (305 mm) diameter (or smaller) No. 30 GA (or heavier) steel duct installed within opening

the steel duct and the periphery of the opening shall be min 0 in. (point contact) to max 24 in. (0 to 609 mm). Steel ducts to be

B. Fill. Void or Cavity Materials\*-Sealant - Min 1/2 in. (13 mm) depth of fill material applied within the annulus. flush with both

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL

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trays. At point contact location between through penetrant and gypsum wallboard, a min 3/8 in. (10 mm) diam bead of fill

surfaces of the wall assembly. Additional fill material forced into interstices of grouped cables and grouped cables within cable

A. Packing Material - Min 4 pcf (64 kg/m3) mineral wool batt insulation tightly packed into opening to full depth of the wall.

Packing material recessed from both surfaces of wall to accommodate the required thickness of fill material.

material shall be applied at through penetrant/gypsum board interface on both surfaces of the wall.

SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

when opening contains no cables or cable tray. A max of two steel ducts may be installed within the through-opening. Ducts to be

spaced min 4 in. (102 mm) apart and min 8 in. (203 mm) from insulated penetrants and nonmetallic penetrants. Annulus between

a nom diam greater than 1/2 in. (13 mm). The following types and sizes of through penetrants may be used:

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

C. Copper Pipe - Nom 1 in. (25 mm) diam (or smaller) Regular (or heavier) copper pipe.

D. Copper Tube - Nom 1 in. (25 mm) diam (or smaller) Type L (or heavier) copper tube.

rigidly supported on both sides of wall assembly. When steel duct is used, the T Rating is 0 hr.

B. Iron Pipe - Nom 1 in. (25 mm) diam (or smaller) cast or ductile iron pipe.

When Item 8 is used, the T Rating of the firestop system is 1/4 hr.

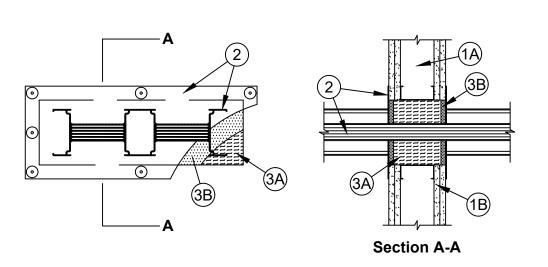
D. Firestop System - The firestop system shall consist of the following items:

Certification (such as Canada), respectively

#Bearing the UL Recognized Components Mark

+Bearing the UL Listing Mark

installed with each AC line set.



Wall Assembly - The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V 400 or W400 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 steel channel studs, min 3-5/8 in. (92 mm) wide and spaced max 24 in. (610 mm) OC. Additional framing shall be installed horizontally so as to form a 22-5/8 in. (576 mm) by 7 in. (178 mm) high opening.

B. **Gypsum Board\*** - 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U400 Series Design in the UL Fire Resistance Directory. Max area of opening is 158-3/8 sq in. (1021 cm2) with max dimensions of 22-5/8 in. (576 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. **Busway+** - Nom 19 in. (483 mm) wide (or smaller) by 5 in. (127 mm) deep "I" shaped aluminum enclosure containing factory

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. **Busway+ -** Nom 19 in. (483 mm) wide (or smaller) by 5 in. (127 mm) deep "I" shaped aluminum enclosure containing factory mounted copper bars rated for 600 V, 5000 A or aluminum bars rated for 600 V, 4000 A. One busway to be installed within the opening. Busway to be rigidly supported on both sides of wall assembly. The annular space between the busway the periphery of the opening shall be a min 1 in. (25 mm) to a max 2 in. (51 mm). The busway shall bear the UL Listing Mark and shall be installed in accordance with all provisions of the National Electrical Code, NFPA 70. After installation of the firestop system (Item 3), a min 3/32 in. (2.4 mm) thick steel cover plate provided by busway manufacturer shall be installed on both surfaces of wall assembly. Steel cover plate secured in place by means of 2 in. (51 mm) long Type S self-drilling, self-tapping bugle-head steel screws and 1/4 by 1-1/4 in. (6 by 32 mm) diam fender washers in accordance with busway manufacturers' installation

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#### **GENERAL NOTES:**

- 1. Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
- UL Fire Resistance Directory;
   Current Edition
- NFPA 101 Life Safety Code
- All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing** 

DIVISION 23: HVAC

**DIVISION 26: Electrical** 

DIVISION 27: Communications

### PROJECT NAME:

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### ARCHITECT/CONSULTANT:

ARCHITECT/CONSULTANT:

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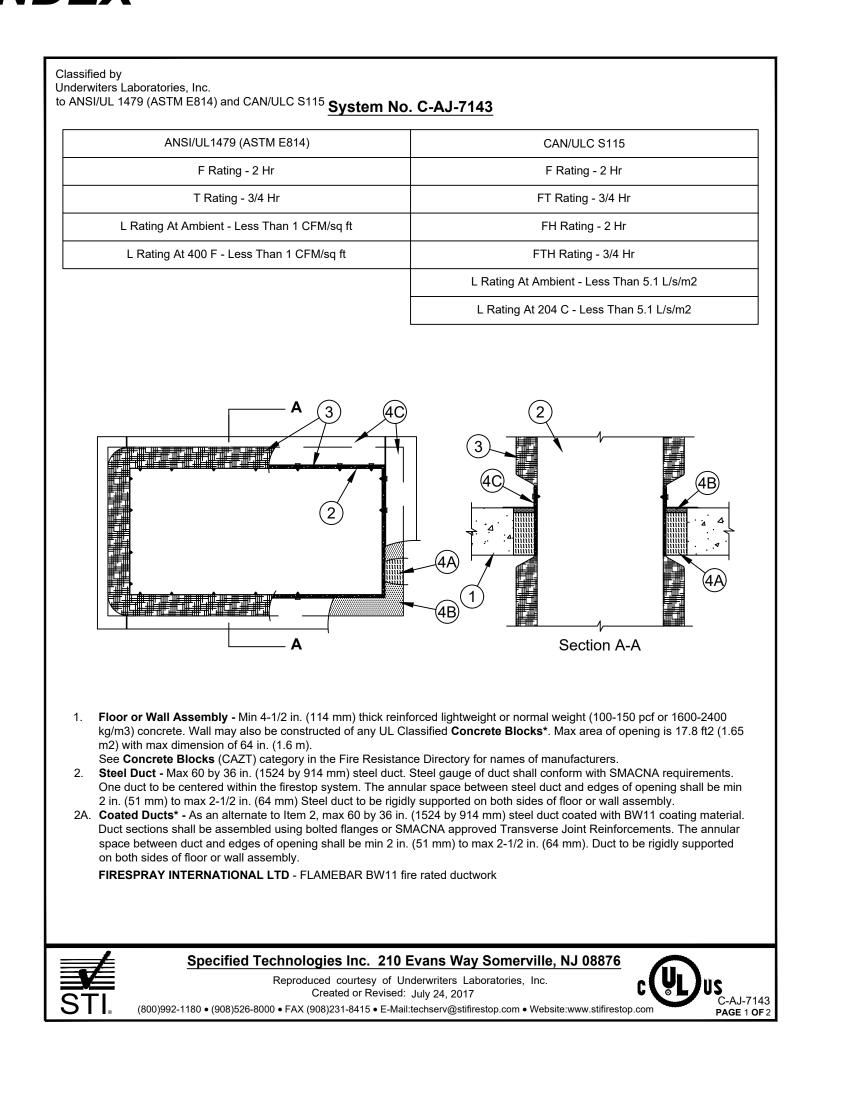
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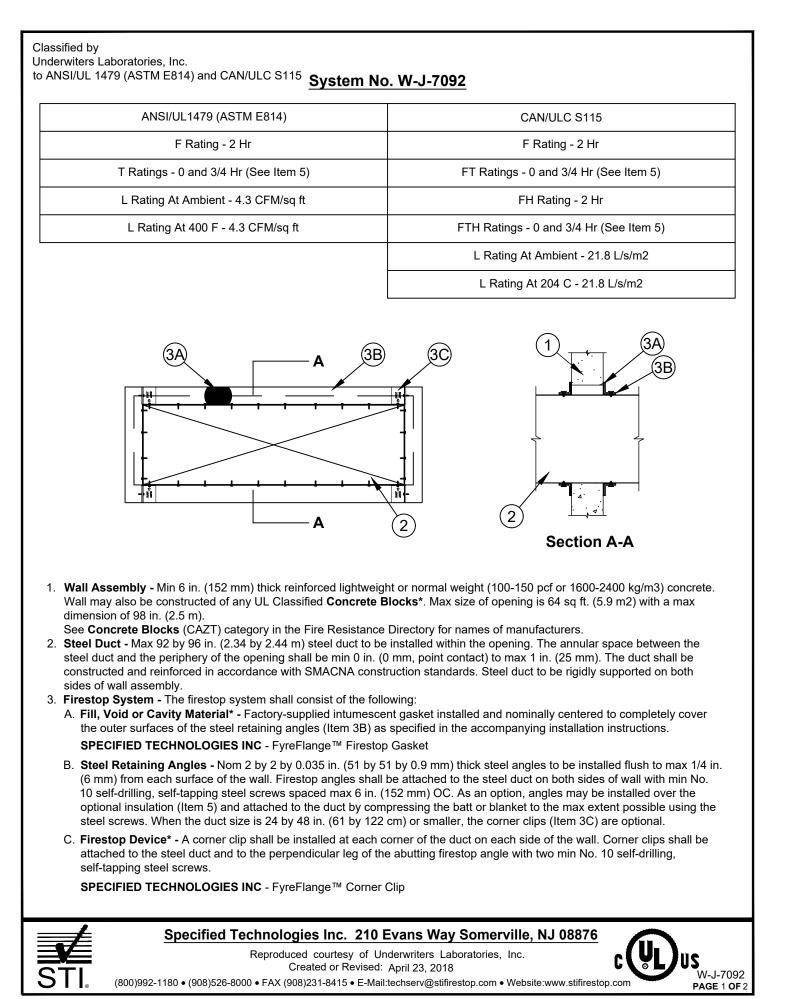
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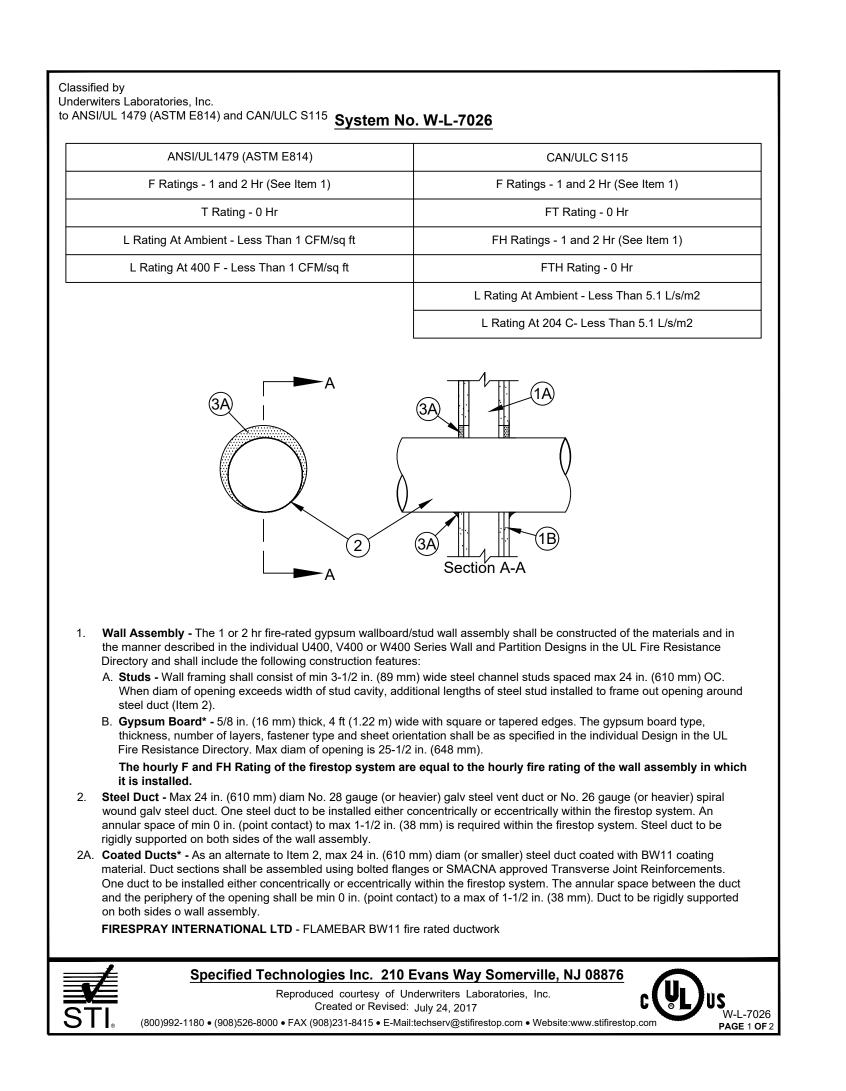
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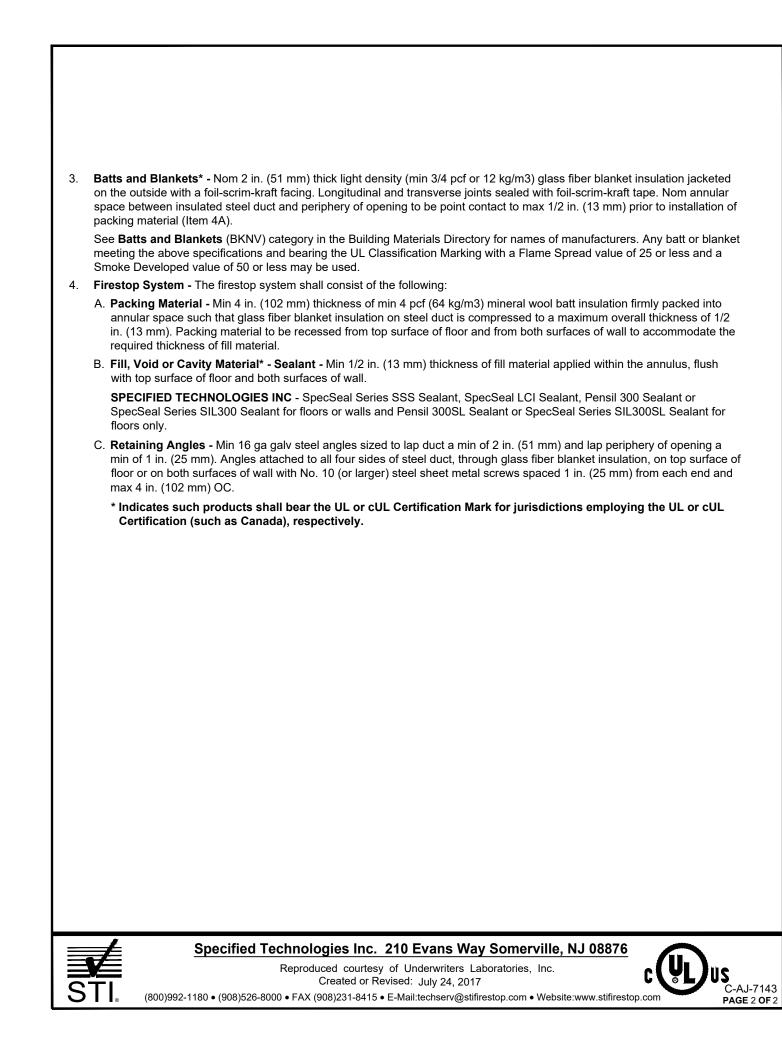


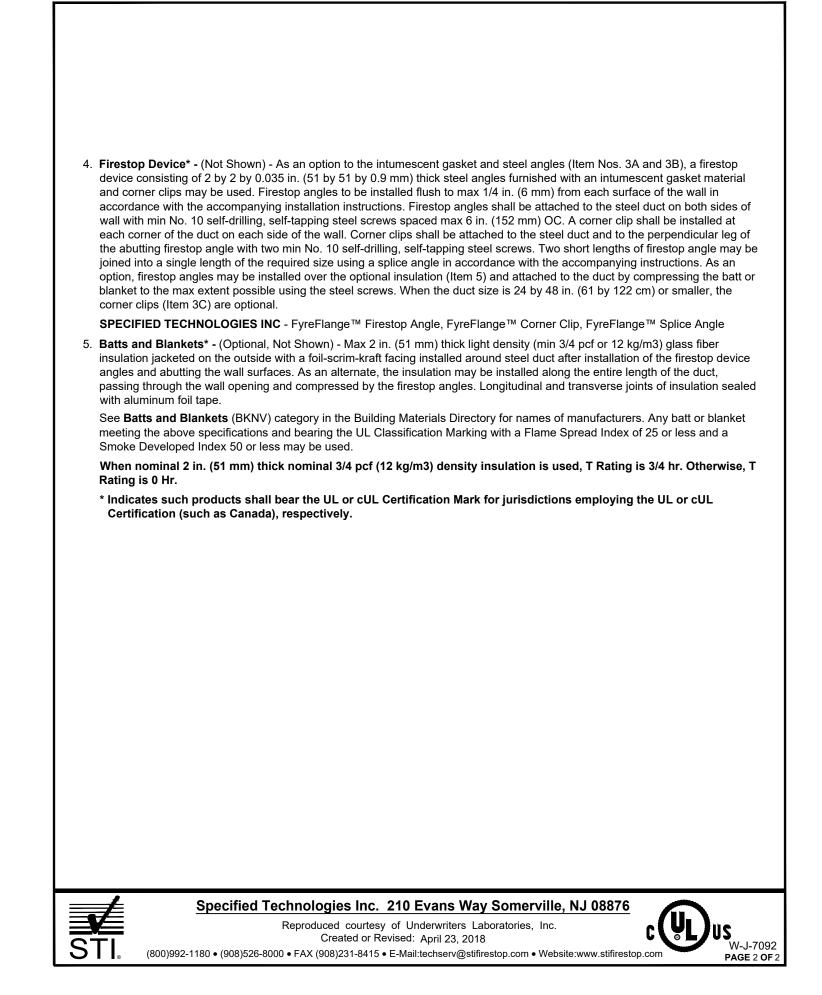
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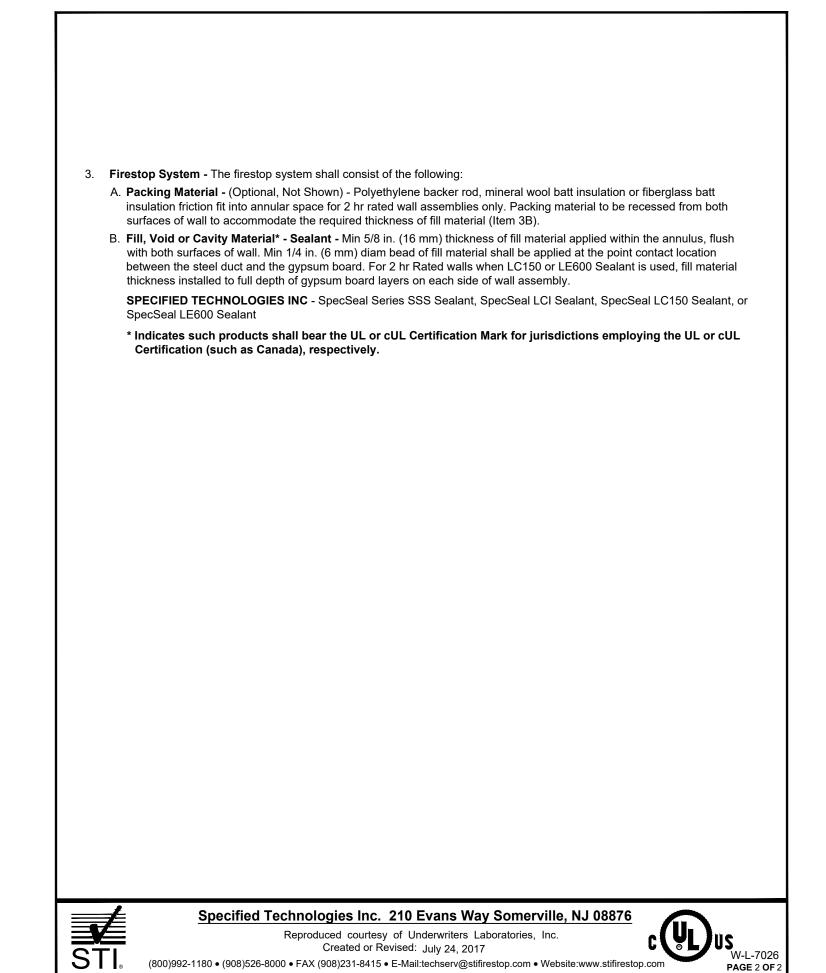


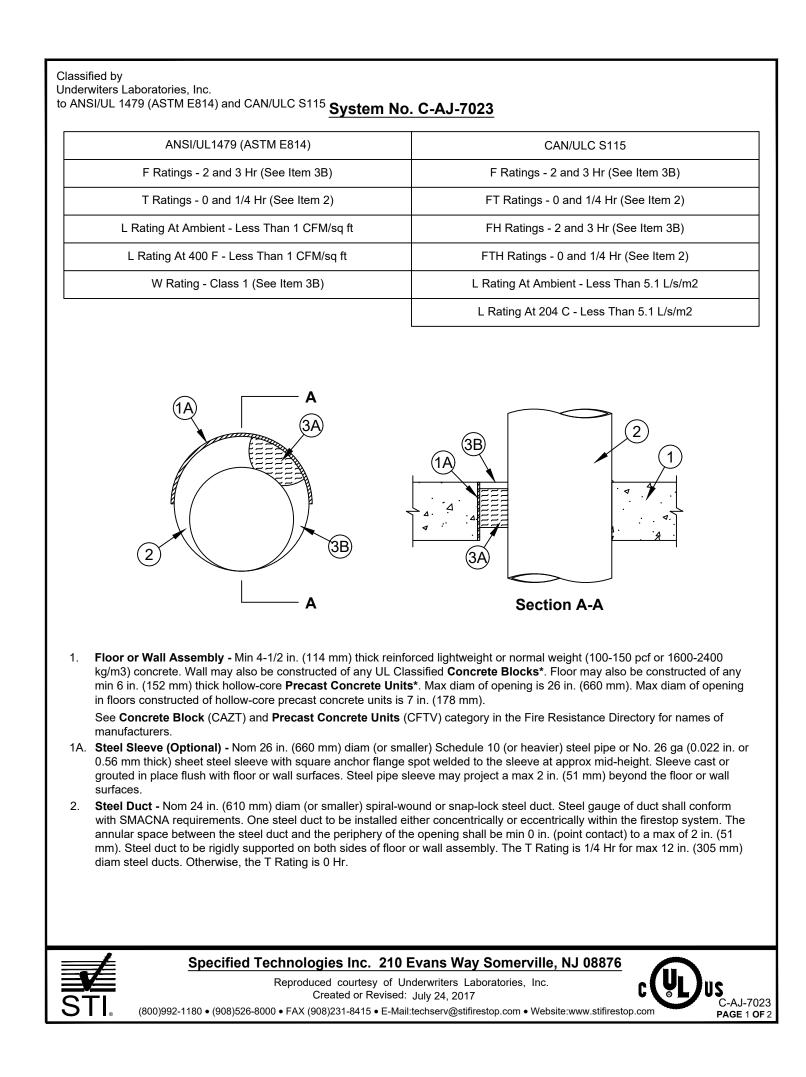


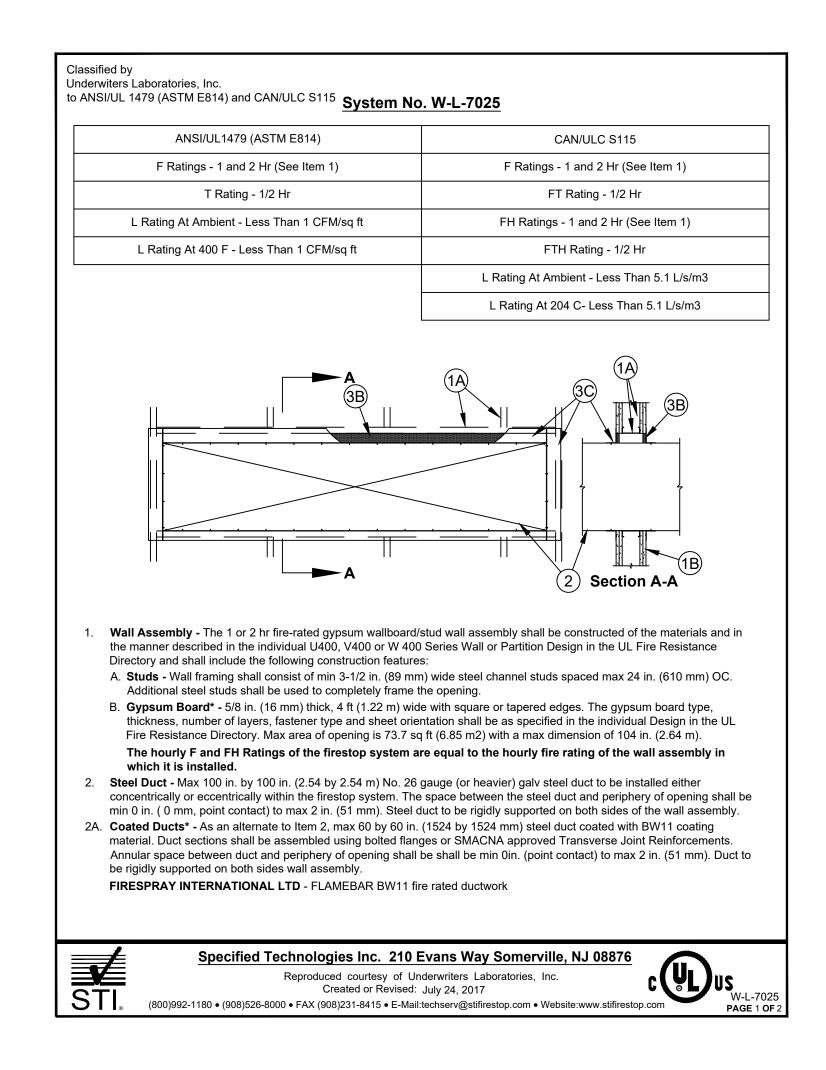


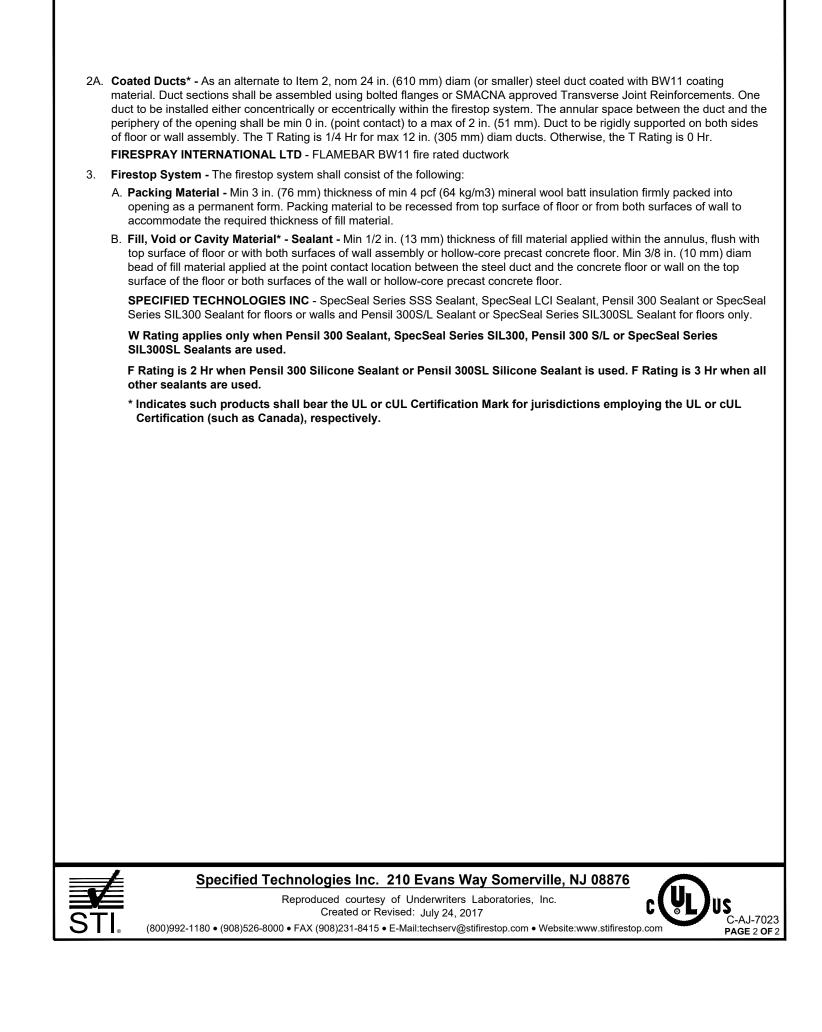


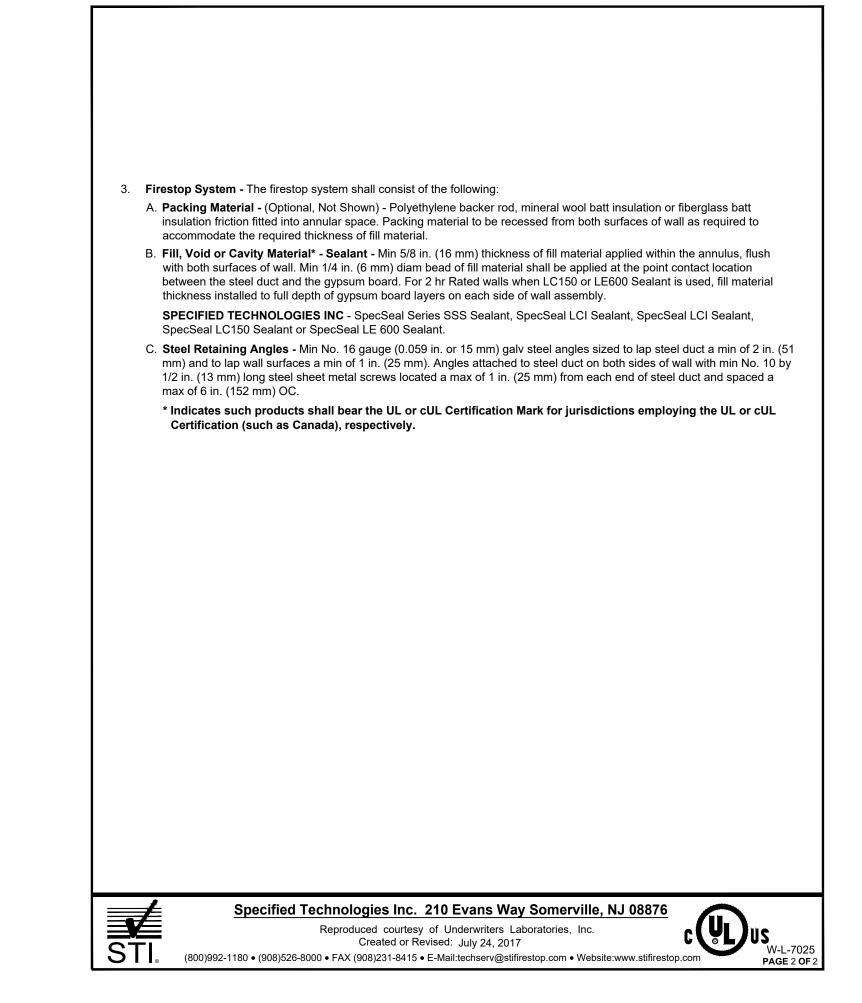












#### **GENERAL NOTES:**

- 1. Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
  - UL Fire Resistance Directory;
     Current Edition
  - NFPA 101 Life Safety Code
  - All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

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Protection

**DIVISION** 9: Finishes

DIVISION 3. I mishes
DIVISION 22: Plumbing

DIVISION 23: HVAC

**DIVISION 26: Electrical** 

**DIVISION 27: Communications** 

#### PROJECT NAME:

PROJECT\_NAME:

PROJECT LOCATION:

PROJECT\_LOCATION:

## ARCHITECT/CONSULTANT:

ARCHITECT/CONSULTANT:

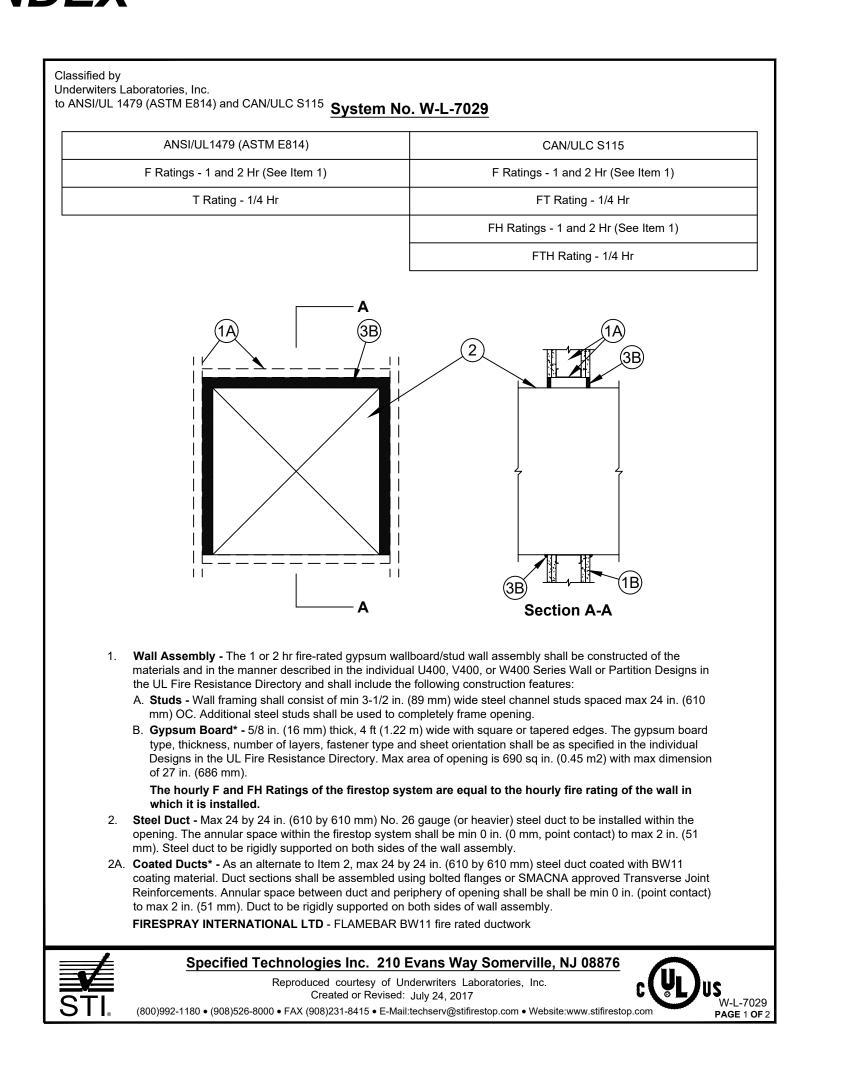
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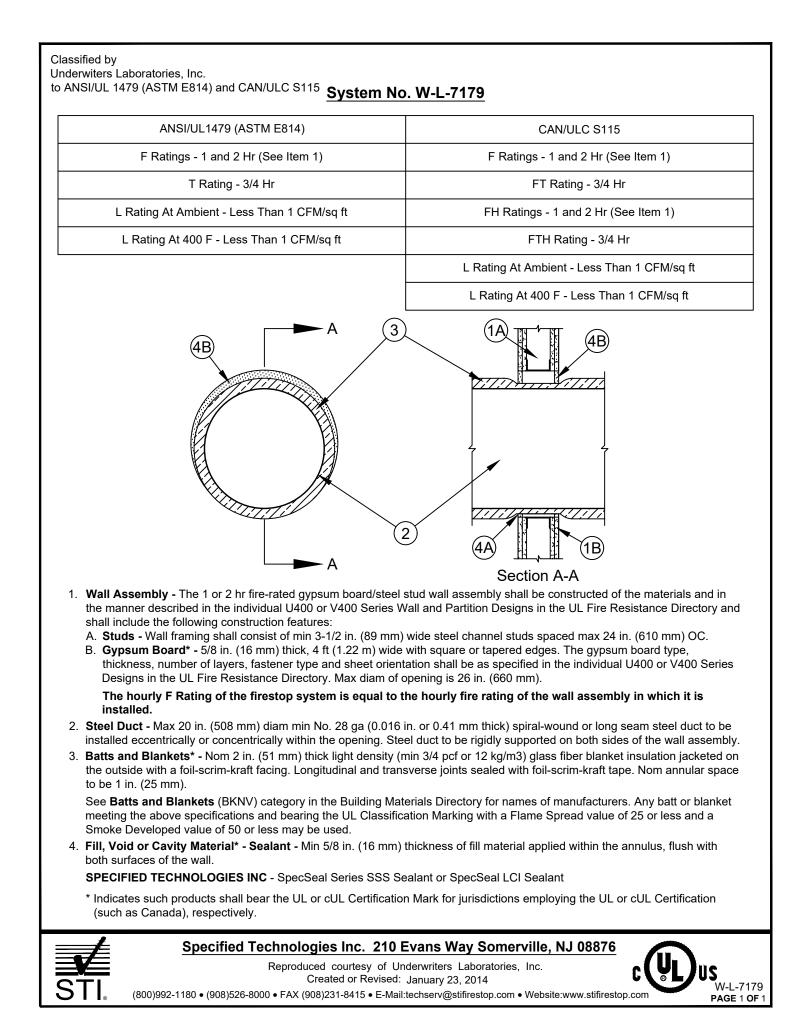
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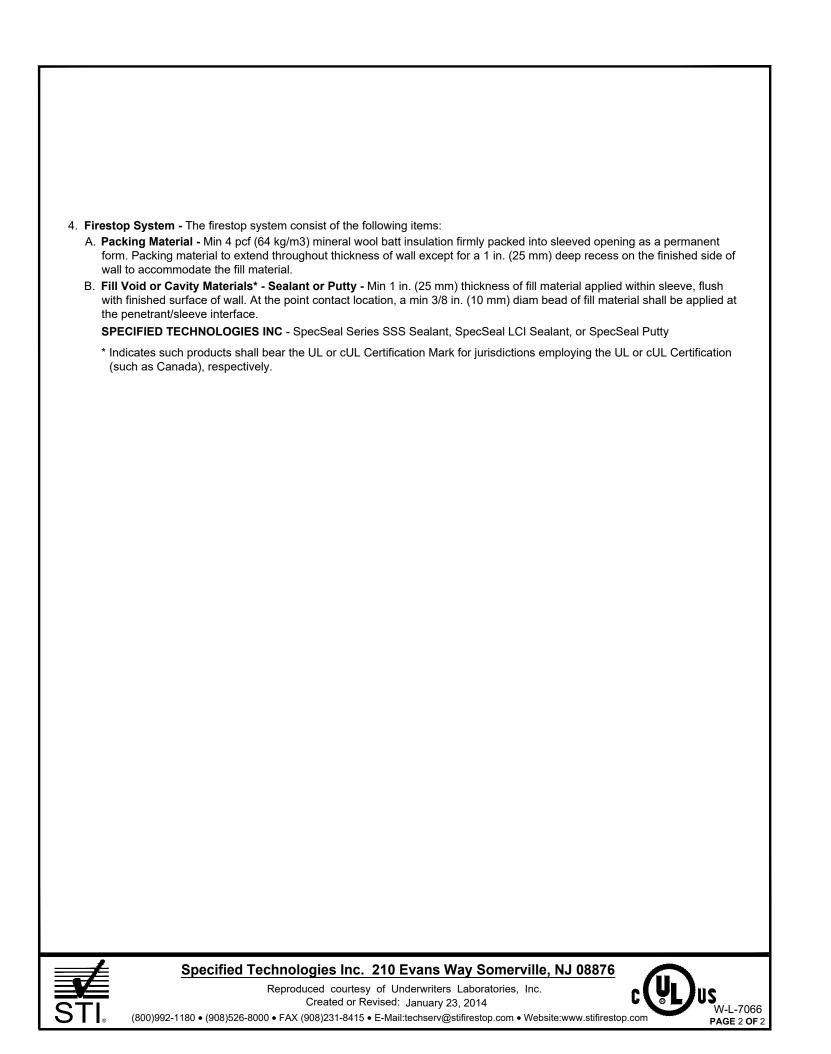
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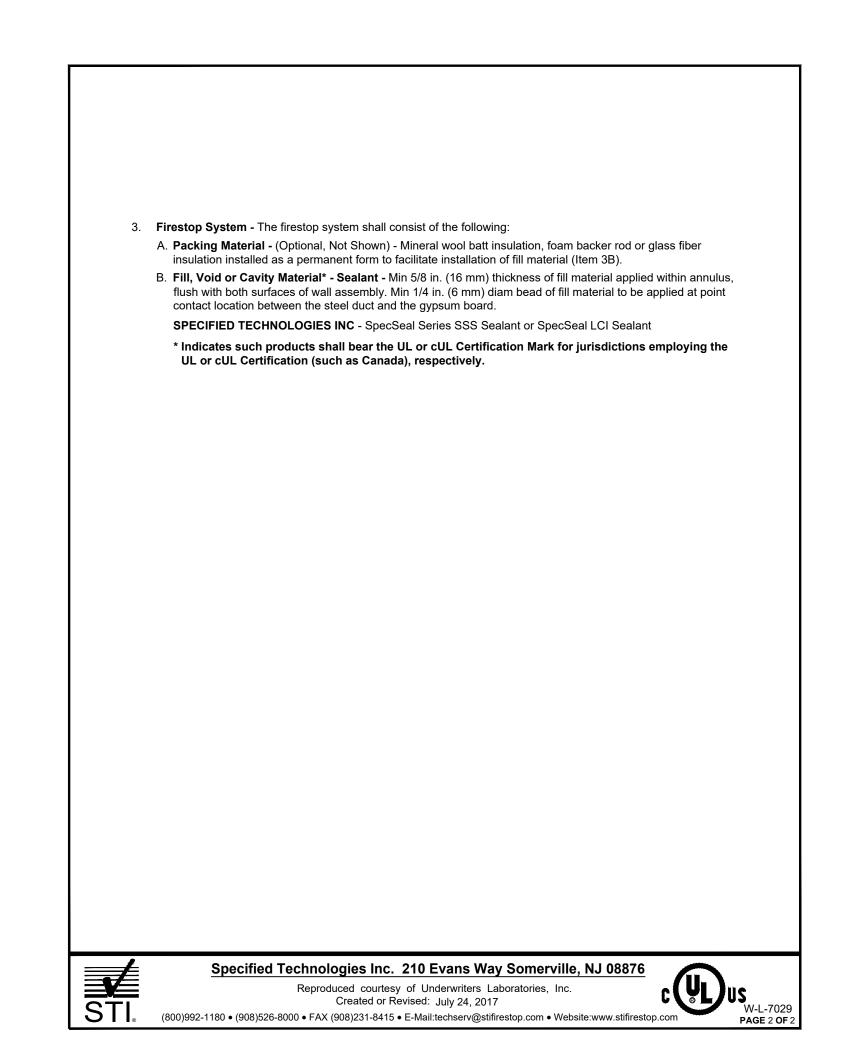


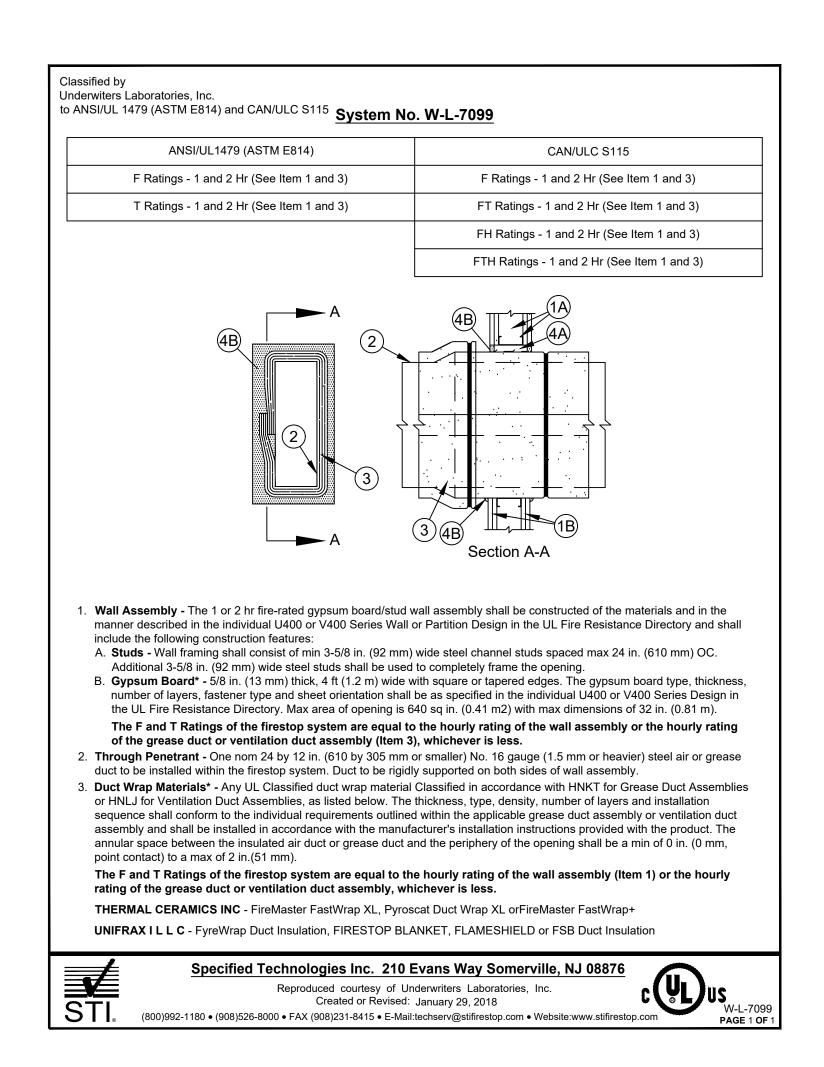
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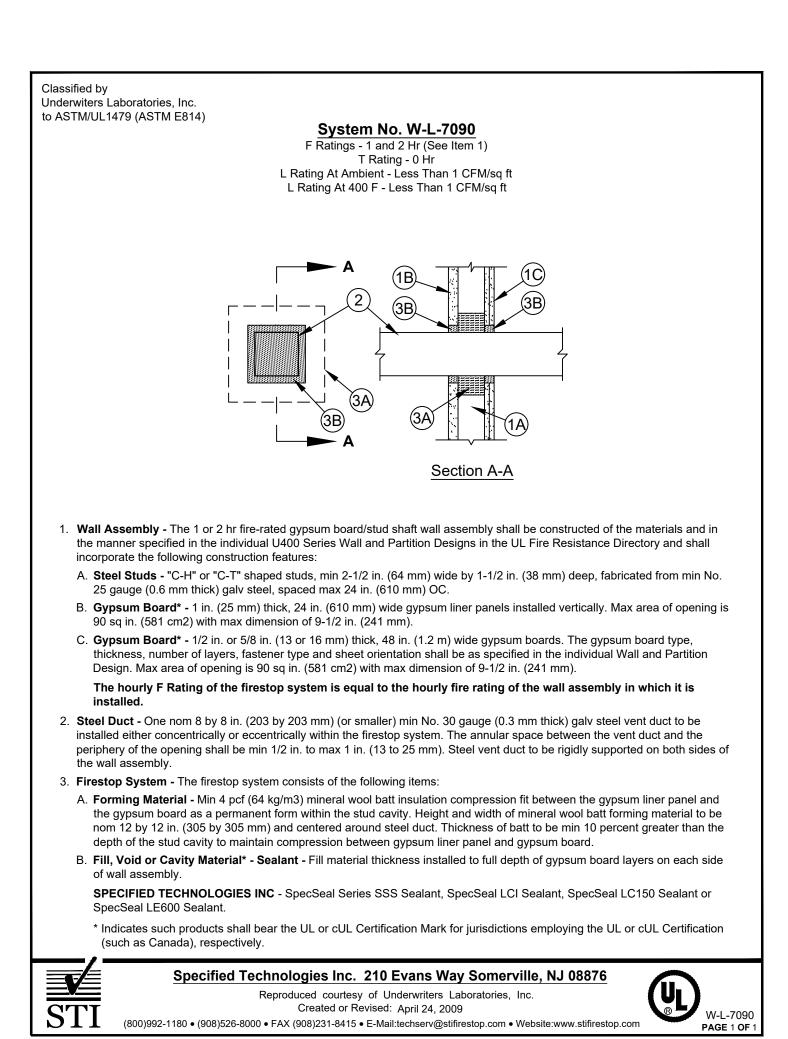


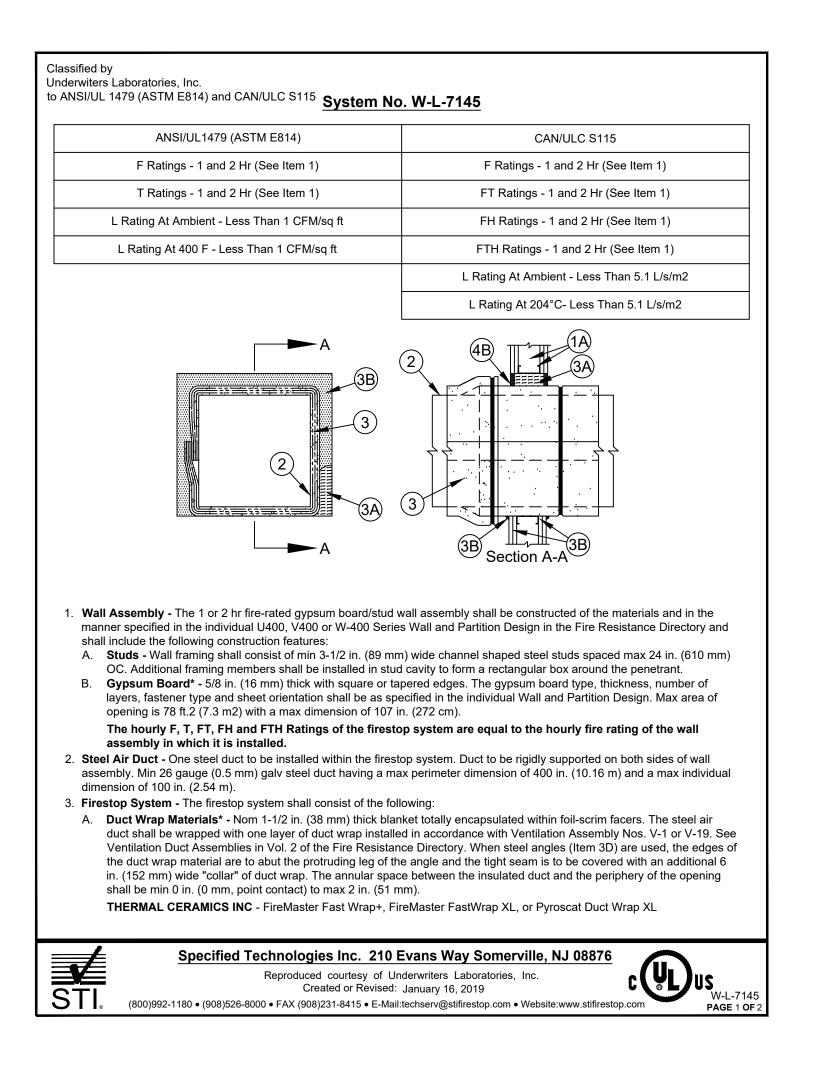


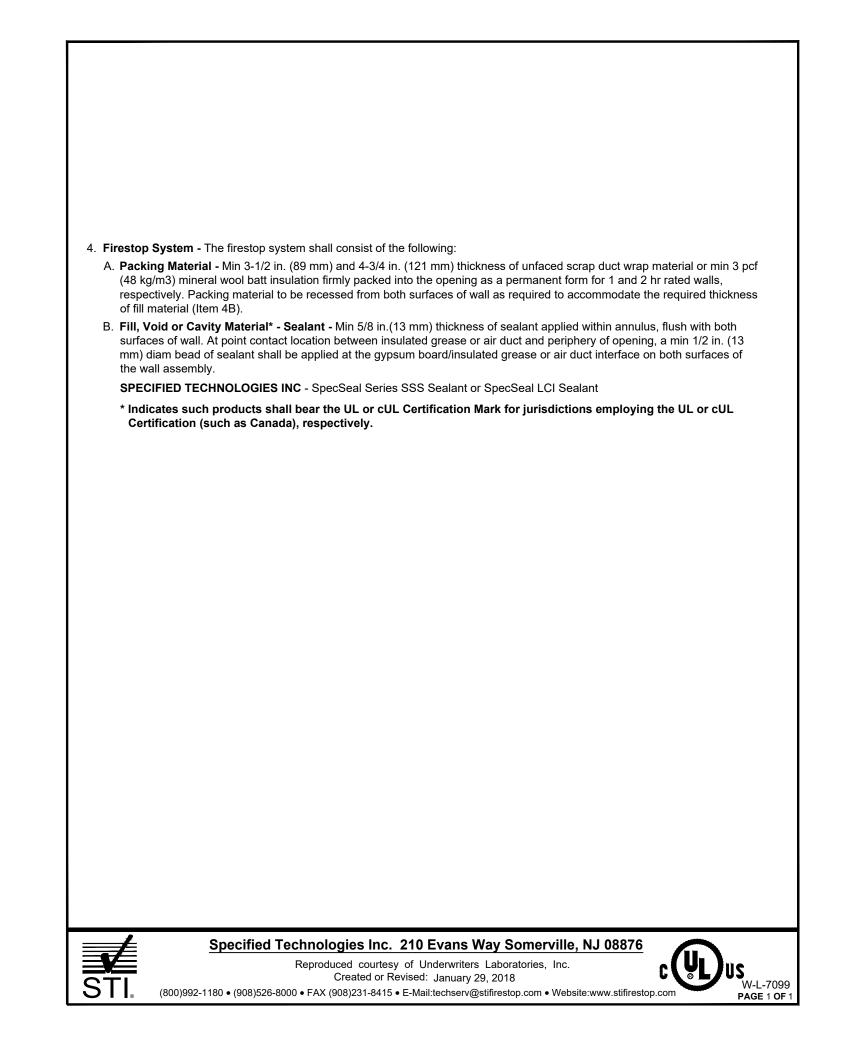


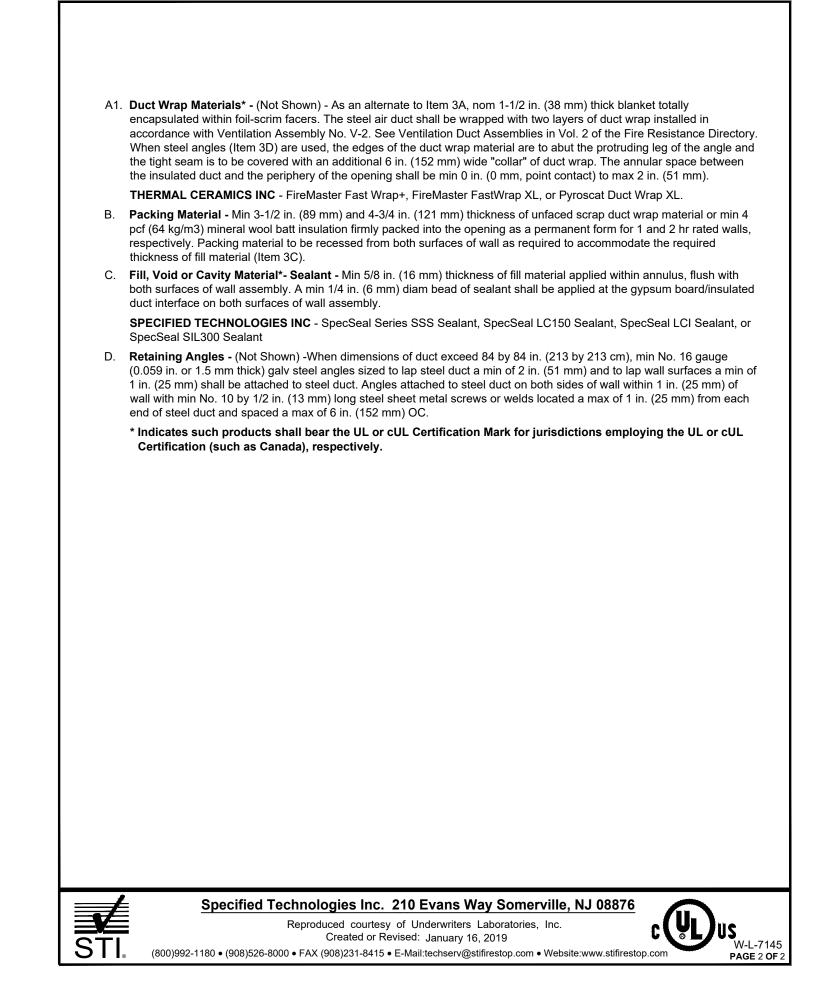


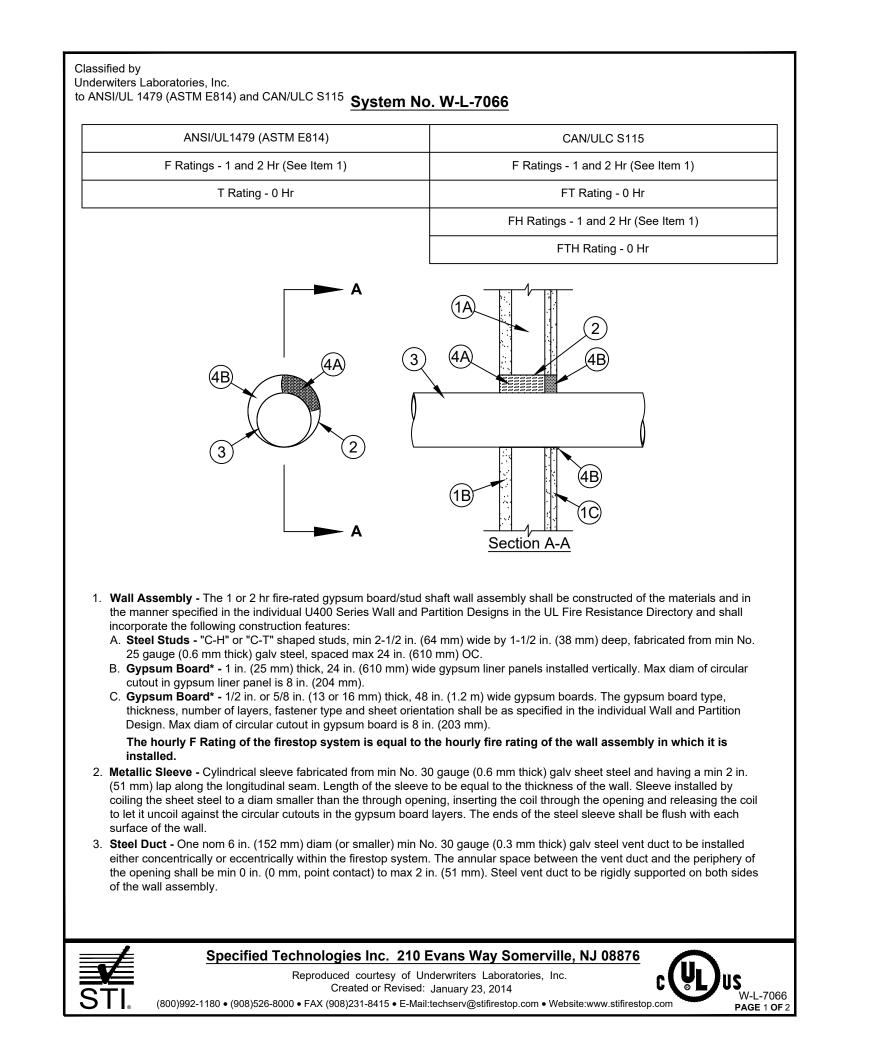












#### **GENERAL NOTES:**

- Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
  - UL Fire Resistance Directory;
     Current Edition
  - NFPA 101 Life Safety Code
  - All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

DIVISION 3. Fillishes
DIVISION 22: Plumbing

DIVISION 23: HVAC

**DIVISION 26: Electrical** 

**DIVISION 27: Communications** 

### PROJECT NAME:

PROJECT\_NAME:

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PROJECT LOCATION:

PROJECT\_LOCATION:

# ARCHITECT/CONSULTANT:

ARCHITECT/CONSULTANT:

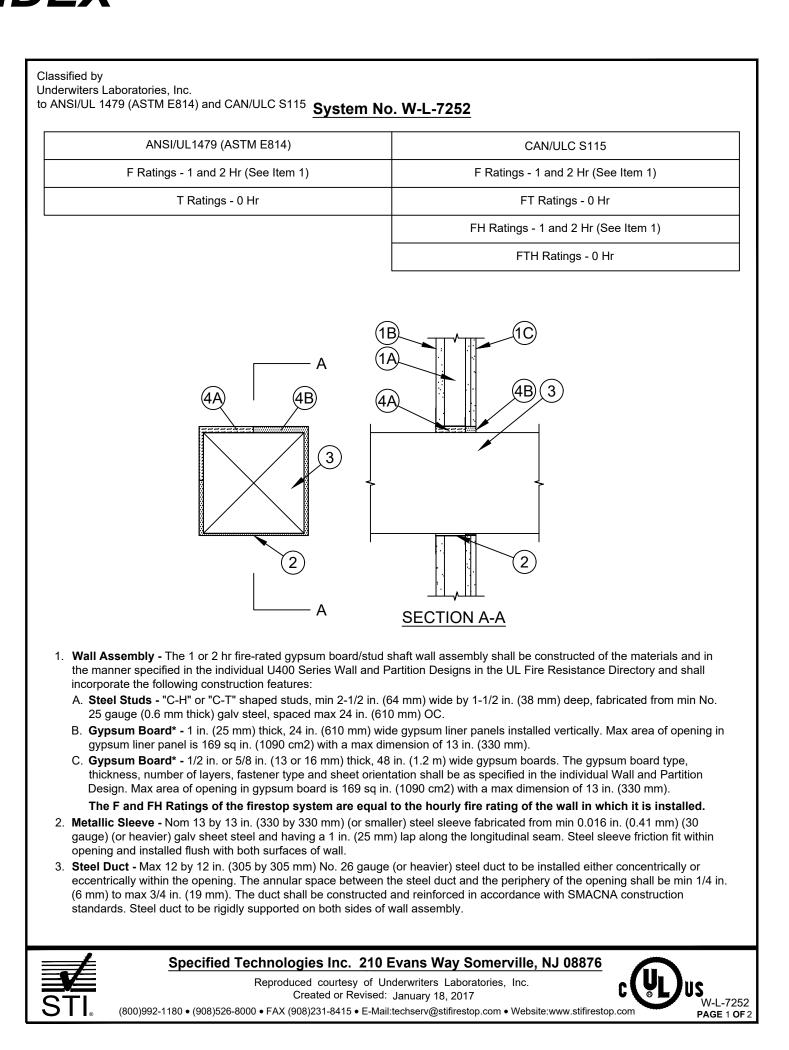
### TITLE:

STI FIRESTOP SYSTEMS

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876



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Phone: (908)526-8000
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Separation between cable tray and metallic or nonmetallic penetrants is min 6 in. (152 mm). Cable trays to be rigidly

percent of the cross-sectional area of the cable tray based on a max 3 in. (76 mm) cable loading depth within tray. Any combination of the cable types specified in Item 5 may be used. When cable tray is used, T Rating is 1/2 hr. Busway+ - Nom 19 in. (483 mm) wide (or smaller) by 6 in. (152 mm) deep "I" shaped aluminum enclosure containing

supported on both sides of the floor or wall assembly. Aggregate cross-sectional area of cables in cable tray not to exceed 40

factory-mounted copper bars rated for 600 V, 5000 A or max 26 in. (660 mm) wide by max 6 in. (152 mm) deep "I" shaped aluminum enclosure containing factory-mounted aluminum bars rated for 600 V, 4000 A, A max of two busways may be installed within the opening with a min separation of 1 in. (25 mm) to max 24 in. (609 mm). The annular space between the busway and the periphery of the opening shall be a min 0 in. (point contact) to a max 24 in. (609 mm). Busways spaced min 6 in. (152 mm) from all other penetrants. Busway to be rigidly supported on both sides of floor or wall assembly. The busway

shall bear the UL Listing Mark and shall be installed in accordance with all provisions of the National Electrical Code, NFPA

8. Air Conditioning (AC) Line Set - One or more AC line sets installed within opening. Each AC line set consists of two pipes

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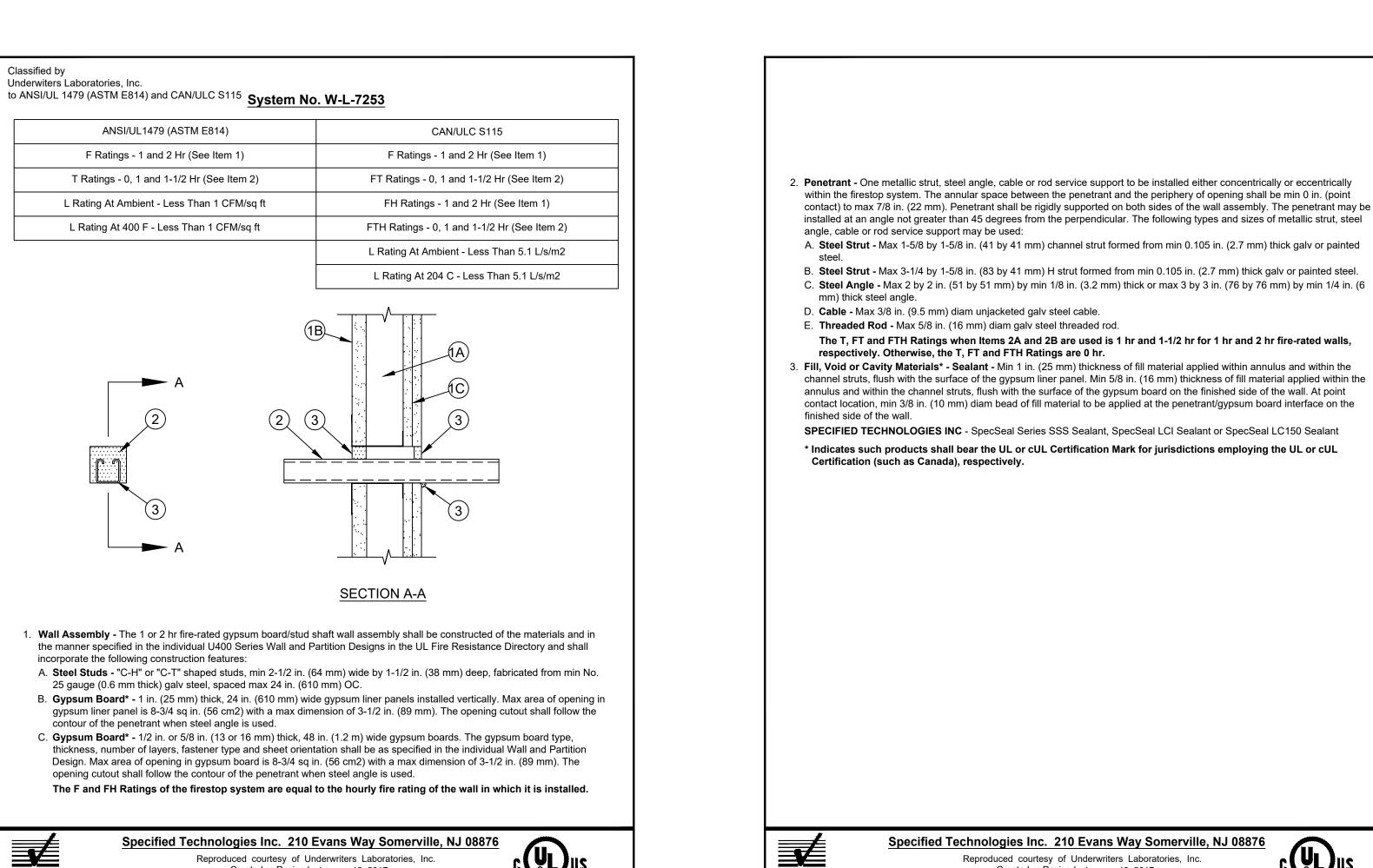
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or tubes (Item 8A), tubing insulation (Item 8B) and a thermostat cable (Item 8C). The space between the AC line sets shall be min 2 in. (51 mm). The space between the AC line sets and the periphery of the opening shall be min 0 in. (point contact) to max 24 in. (609 mm). The AC line sets shall be spaced min 6 in. from uninsulated metallic penetrants and shall be rigidly

70. When busway is used, the T Rating is 1/4 hr.

supported on both sides of the floor or wall assembly.



4. Firestop System - The firestop system shall consist of the following items

side of wall to accommodate fill materia

Certification (such as Canada), respectively.

A. Packing Material - Min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into sleeved opening as a permanent form. Packing material to extend throughout thickness of wall except for a 1-1/4 in. (32 mm) deep recess on the finished

B. Fill, Void or Cavity Material\* - Min 1-1/4 (32 mm) thickness of fill material applied within sleeve, flush with finished surface

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL

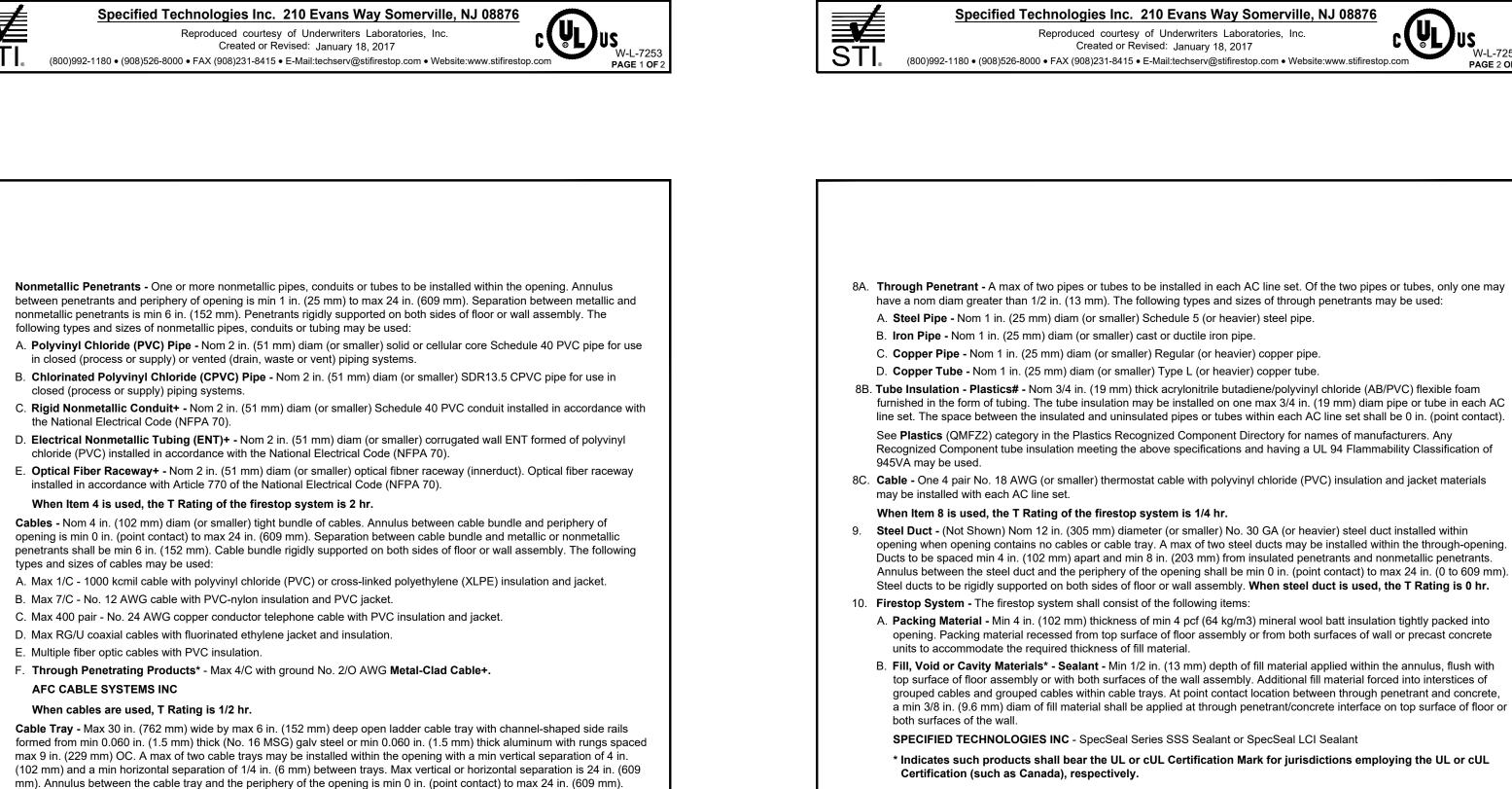
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SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant



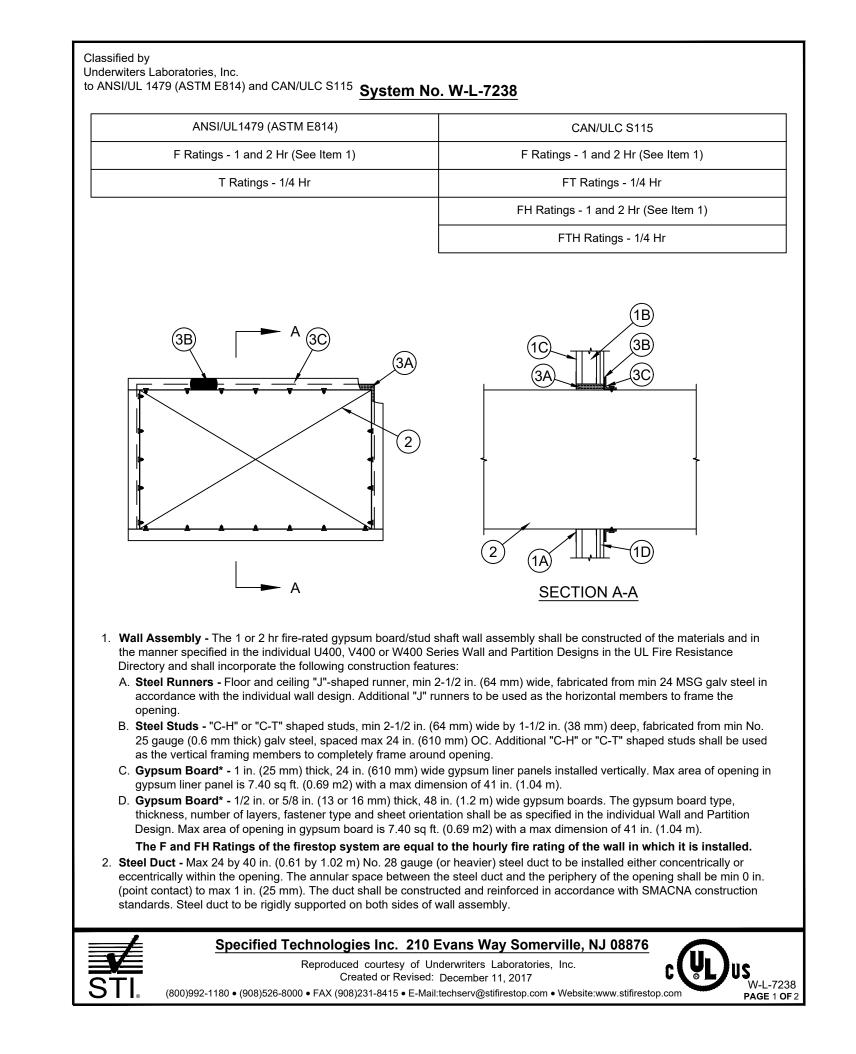
#Bearing the UL Recognized Components Mark

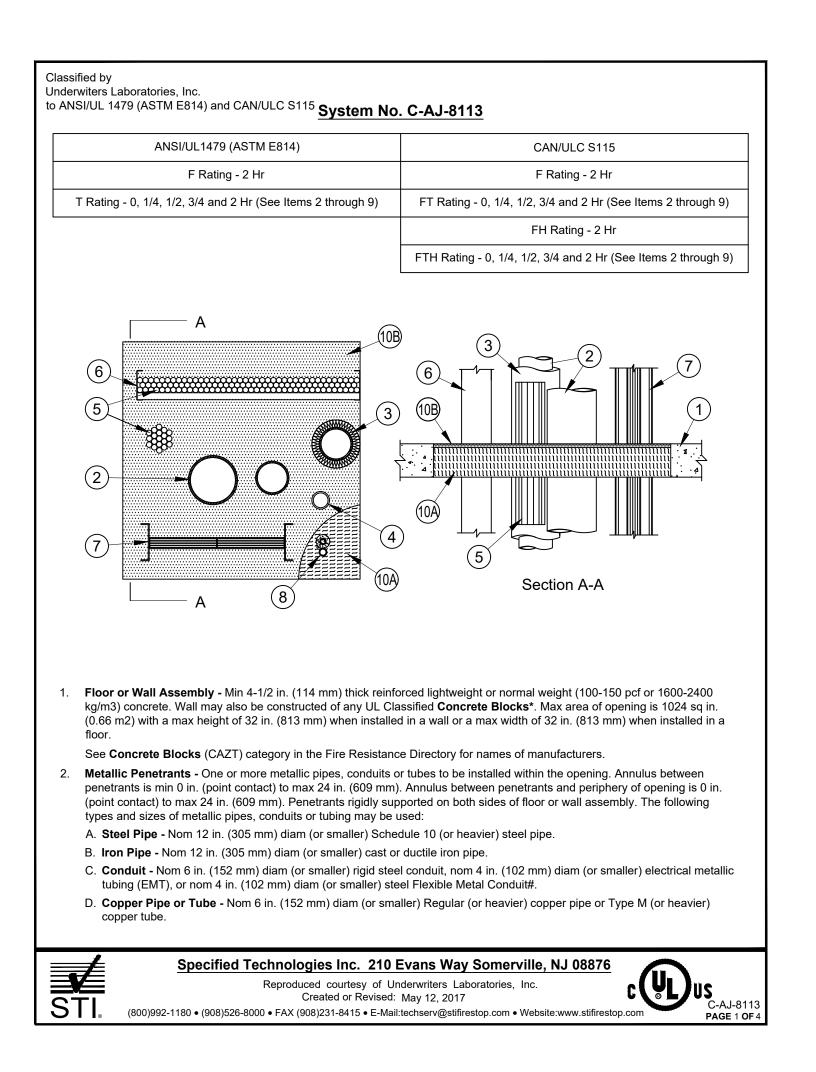
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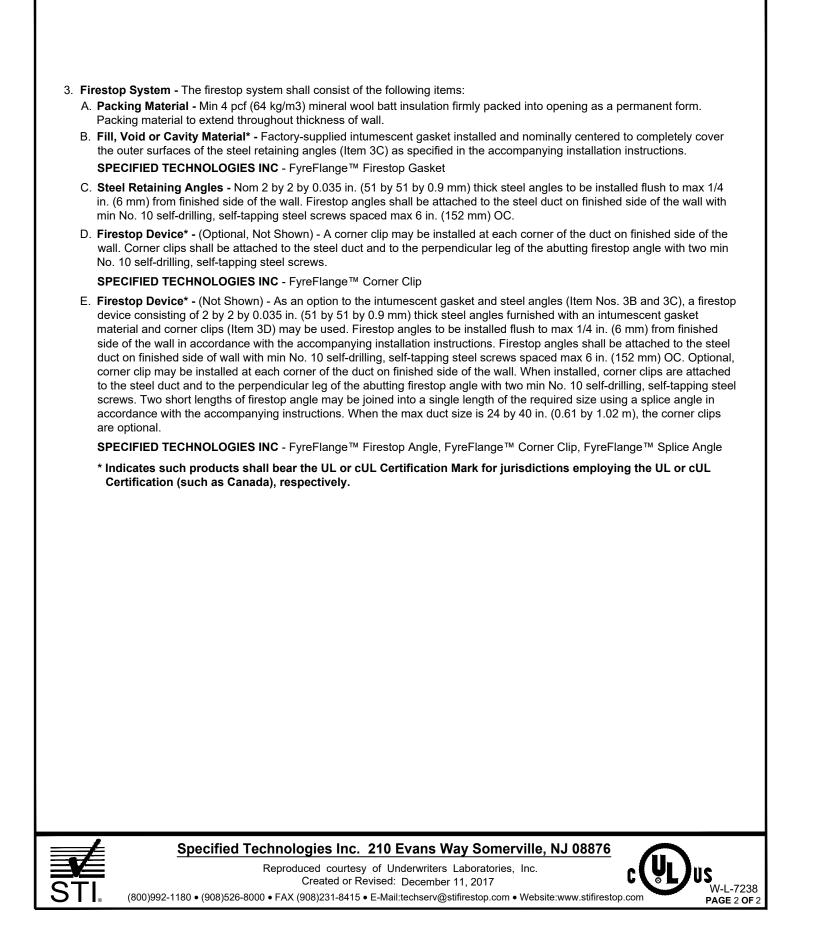
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+Bearing the UL Listing Mark







	Type of Metallic Penetrant	Max Dim of Throught Penetrants, In.(mm)	T Rating, Hr	
	Steel or Iron Pipe, Conduit	12 (305)	0	
	Copper Pipe or Tube	6 (152)	0	
;	Steel or Iron Pipe, Conduit or EMT	4 (102)	1/4	
;	Steel or Iron Pipe, Conduit or EMT	2 (51)	1/2	
	Steel or Iron Pipe, Conduit or EMT	1(25)	3/4	
to max 24 in. (609 mm) a min 1/2 in. (13 mm) to following types of pipe i A. <b>Pipe and Equipmer</b> kg/m3) glass fiber un factory-applied self-s	to max 24 in. (609 mm). Annulus I. The annular space between meta max 24 in. (609 mm). Penetrants insulation may be used:  at Covering Materials* - Nom 1 in inits jacketed on the outside with ar sealing lap tape. Transverse joints  3A is used, T Rating is 3/4 Hr.	allic pipes, conduit and the rigidly supported on both in the conduction (25 mm) thick hollow on all service jacket. Long	ubes and insulated th sides of floor or cylindrical heavy de gitudinal joints seal	d pipes and tubes shall be wall assembly. The ensity (min 3.5 pcf or 56 led with metal fasteners or
See Pipe and Equip manufacturers. Any Flame Spread Index	oment Covering Materials (BRGL pipe covering meeting the above s of 25 or less and a Smoke Develo erials* - Nom 2 in. (51 mm) thick u	specifications and bearing ped Index of 50 or less	ng the UL Classific may be used.	ation Marking with a
(56 kg/m3) (or heavi wire spaced max 12	er) and sized to the outside diam of in. (305 mm) OC. When <b>Item 3B</b> in	of the pipe or tube. Pipe is used, T Rating is 2	insulation secured Hr.	with min 8 AWG steel
	<b>LATION GROUP L L C</b> - High Temperature Pipe Insulation Thermalog		n 1200, High Tem	perature Pipe Insulation
around the outer circ	<ul> <li>Use in conjunction with Item 3B cumference of the pipe insulation (letal fasteners or butt tape.</li> </ul>			
material meeting the	erials (BVDV) category in the Build above specifications and bearing eveloped Index of 50 or less may be	the UL Classification M		
	astics## - Nom 3/4 in. (19 mm) thing of tubing. When Item 3D is used		e/polyvinyl chloride	e (AB/PVC) flexible foam
	<li>72) category in the Plastics Recognent tube insulation meeting the absect.</li>			
outside diam of the	erials* - Cellular Glass Insulation pipe or tube and supplied in nom 2 lation installed on pipe in accordar	4 in. (610 mm) long hal	f sections or nom 1	18 in.(457 mm) long
thick aluminum shee and seals of a simila of each end of the ja	I in conjunction with Item 3E. Min 1 tet cut to wrap tightly around the pipur material or min No. 18 AWG steel teket and spaced max 10 in. (254 rese of floor or both surfaces of was	e insulation with a min el tie wire. Bands or ste mm) OC. Jacket installe	2 in. (51 mm) lap a el tie wire to be loc d with edge abuttir	and secured using bands ated within 2 in. (51 mm)
	red on the pipe covering.	•		

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#### **GENERAL NOTES:**

- . Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
- Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
- UL Fire Resistance Directory; Current Edition
- NFPA 101 Life Safety Code
- All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

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**DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

#### PROJECT NAME:

PROJECT\_NAME:

PROJECT LOCATION:

PROJECT\_LOCATION:

ARCHITECT/CONSULTANT:

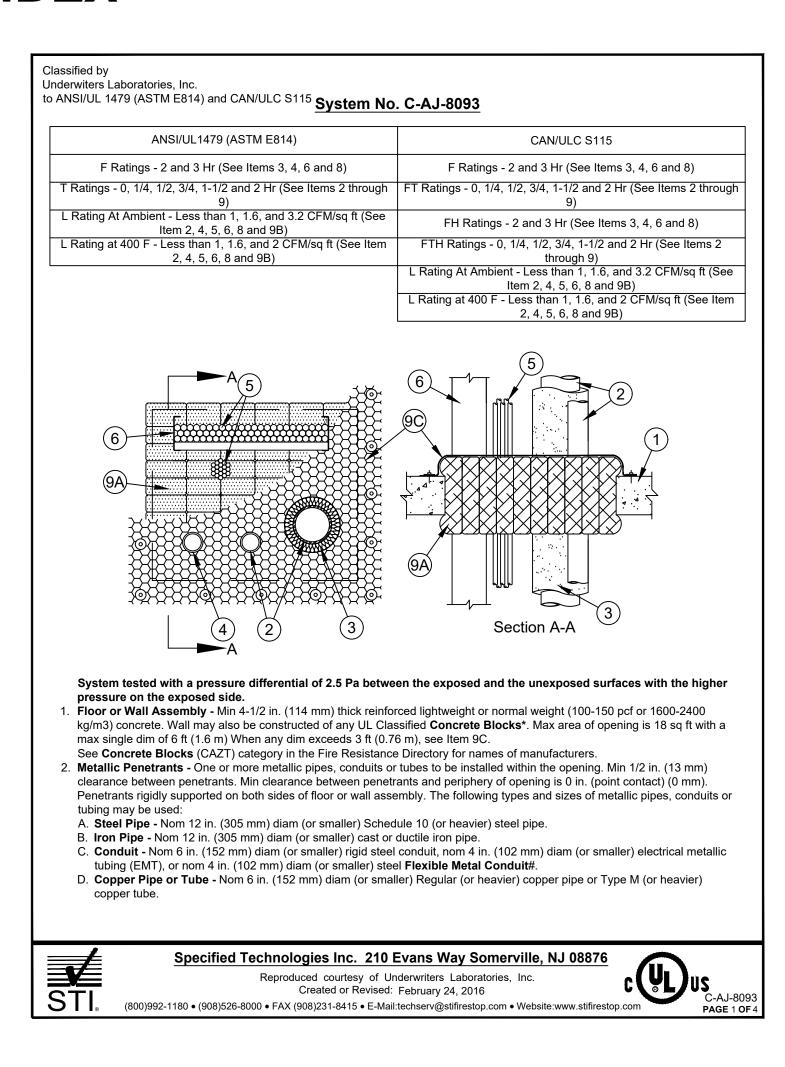
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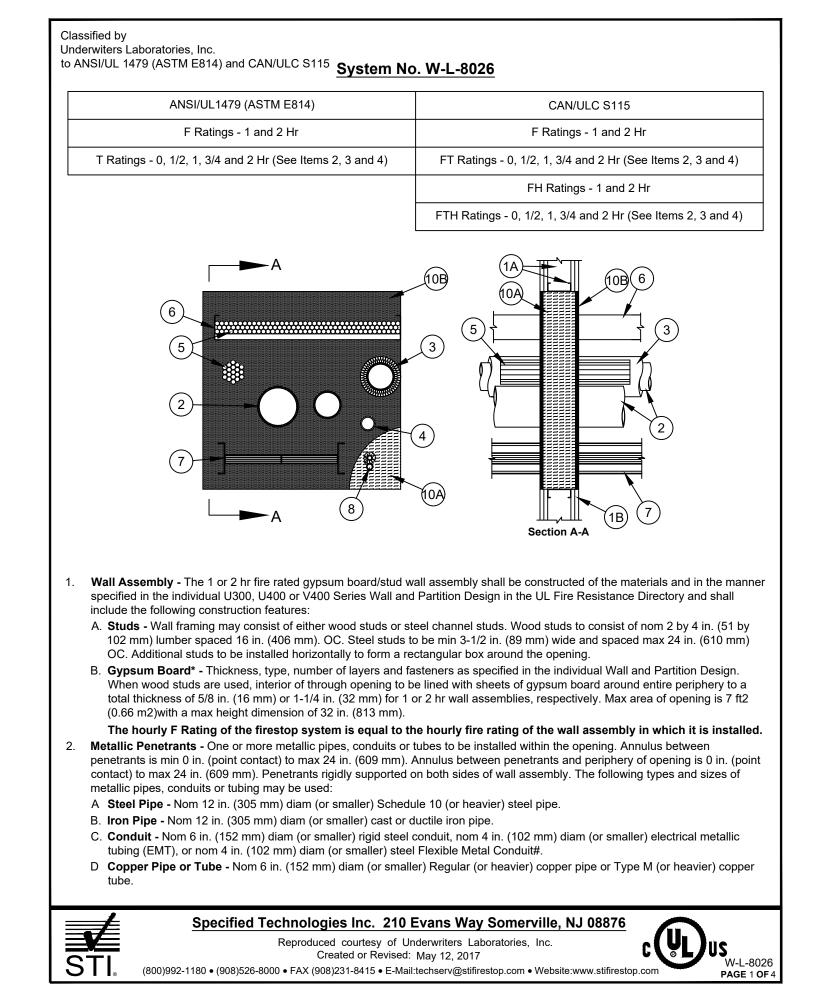
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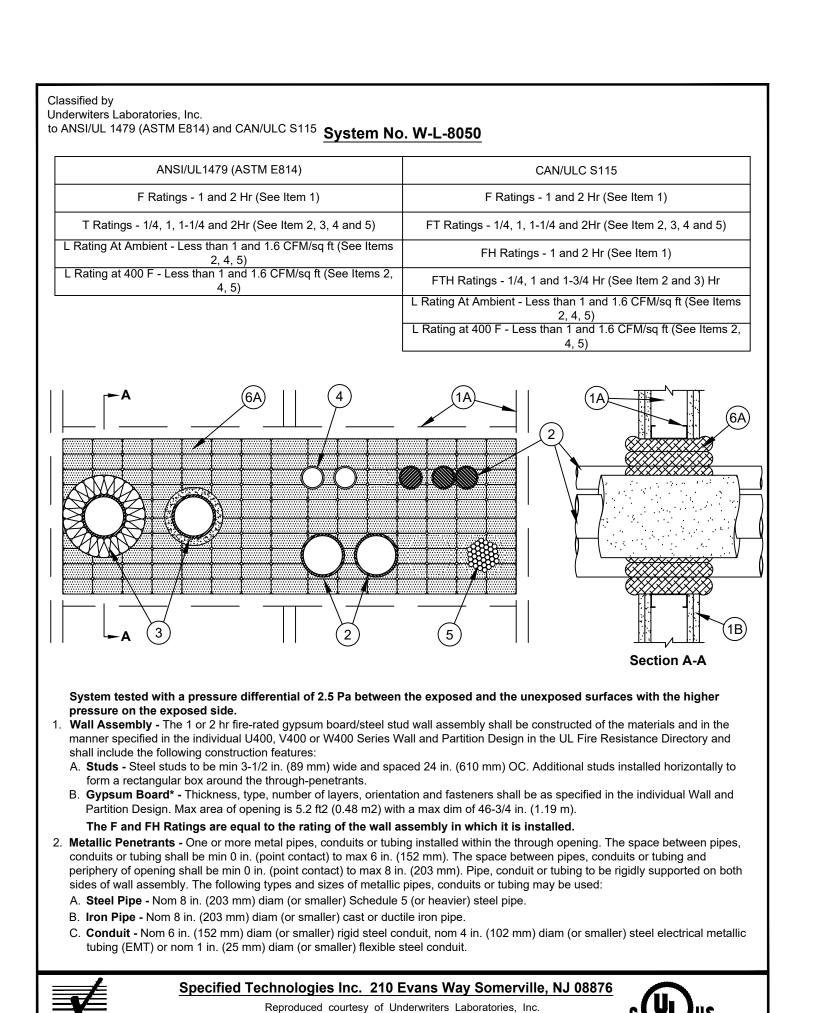
STI FIRESTOP SYSTEMS

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876









Created or Revised: March 24, 2016

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	Type of Metallic Penetrant	Max Diam of Throught Penetrant, in. (mm)	T Rating, Hr	
	Steel or Iron Pipe, Conduit or Copper Pipe or Tube	12 (305)	1/4	
	Steel or Iron Pipe, Conduit or EMT	4 (102)	3/4	
	Steel or Iron Pipe, Conduit or EMT	2 (51)	2	
tubing:  A. <b>Pipe and Equi</b> kg/m3) glass fil factory-applied product.	(Optional) - The following types of pipe in pment Covering Materials* - Max 2 in. ber units jacketed on the outside with an self-sealing lap tape. Transverse joints:	(51 mm) thick hollow cylindrical all service jacket. Longitudinal journed with metal fasteners or	heavy density (mi pints sealed with r with butt tape sup	in 3.5 pcf or 57 metal fasteners or plied with the
manufacturers.	Equipment Covering Materials (BRGU Any pipe covering meeting the above sp of 25 or less and a Smoke Developed Inc	pecifications and bearing the UL		
(57 kg/m3) (or	Materials* - Max 2 in. (51 mm) thick un heavier) and sized to the outside diam o 2 in. (305 mm) OC.	• •	•	•

sity of 3.5 pcf AWG steel wire INDUSTRIAL INSULATION GROUP L L C - High Temperature Pipe Insulation 1200, High Temperature Pipe Insulation BWT and High Temperature Pipe Insulation Thermaloc

C. Sheathing Material\* - Use in conjunction with Item 3B. Foil-scrim-kraft or all service jacket material shall be wrapped around the outer circumference of the pipe insulation (Item 3B) with the kraft side exposed. Longitudinal and transverse ioints sealed with metal fasteners or butt tape. See Sheathing Materials (BVDV) category in the Building Materials Directory for names of manufacturers. Any sheathing

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 D. Tube Insulation - Plastics## - Max 1 in. (25 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. When tube insulation is used, nom diam of copper pipe or tube shall not exceed 4 in. (102

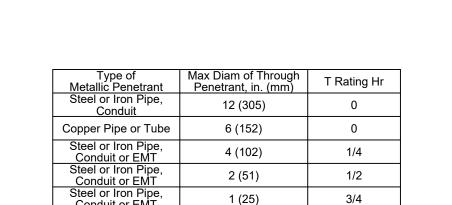
See Plastics (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation meeting the above specifications and having a UL 94 Flammability Classification of E. Pipe Covering Materials\*- Cellular Glass Insulation - Max 3 in. (76 mm) thick cellular glass units sized to the outside

diam of the pipe or tube and supplied in nom 24 in. (610 mm) long half sections or nom 18 in. (457 mm) long segments. Pipe insulation installed on pipe in accordance with the manufacturer's instructions. PITTSBURGH CORNING CORP - FOAMGLAS F. Metal Jacket - Used in conjunction with Item 3E. Min 12 in. long jacket formed from min 0.010 in. (0.254 mm) thick aluminum sheet cut to wrap tightly around the pipe insulation with a min 2 in. (51 mm) lap and secured using bands and seals of a similar material or min No. 18 AWG steel tie wire. Bands or steel tie wire to be located within 2 in. (51 mm) of

each end of the jacket and spaced max 10 in. (254 mm) OC. Jacket installed with edge abutting surface of fill material (Item 9A) on top surface of floor or both surfaces of wall. Metal jacket to be used in addition to any other jacketing material which G. Pipe and Equipment Covering Materials\* - Max 3 in. (76 mm) thick hollow cylindrical calcium silicate (min 10.0 pcf or 160 kg/m3) sized to the outside diam of the pipe or tube. Pipe insulation secured with min 8 AWG steel wire spaced max 12 in.

(305 mm) OC. See Pipe and Equipment Covering Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used. When Items 3A or 3D are used, the F and FH Ratings are 2 hr. When other pipe covering materials are used, F and

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Pipe Insulation - (Optional) - One or more max 4 in. (102 mm) metallic pipes or tubes may be insulated. Annulus between penetrants is min 0 in. (point contact) to max 26 in. (660 mm). Annulus between penetrants and periphery of opening is 0 in. (point contact) to max 24 in. (609 mm). The annular space between metallic pipes, conduit and tubes and insulated pipes and tubes shall be a min 1/2 in. (13 mm) to max 24 in. (609 mm). Penetrants rigidly supported on both sides of floor or wall assembly. The following types of pipe insulation mav be used A. Pipe and Equipment Covering Materials\* - Nom 1 in. (25 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 56 kg/m3

glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. When Item 3A is used, T Rating is 3/4 Hr See Pipe and Equipment Covering Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering meeting the above specifications and bearing the UL Classification Marking with a Flame

Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used. B. Pipe Covering Materials\* - Nom 2 in. (51 mm) thick unfaced mineral fiber pipe insulation having a nom density of 3.5 pcf (56 kg/m3) (or heavier) and sized to the outside diam of the pipe or tube. Pipe insulation secured with min 8 AWG steel wire spaced max 12 in. (305 mm) OC. When Item 3B is used, T Rating is 2 Hr. INDUSTRIAL INSULATION GROUP L L C - High Temperature Pipe Insulation 1200, High Temperature Pipe Insulation BWT and High Temperature Pipe Insulation Thermaloc

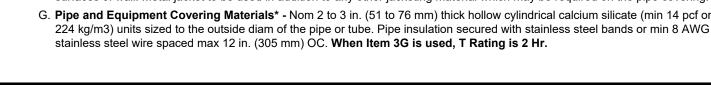
. Sheathing Material\* - Use in conjunction with Item 3B. Foil-scrim-kraft or all service jacket material shall be wrapped around the outer circumference of the pipe insulation (Item 3B) with the kraft side exposed. Longitudinal and transverse joints sealed with metal fasteners or butt tape. See Sheathing Materials (BVDV) category in the Building Materials Directory for names of manufacturers. Any sheathing

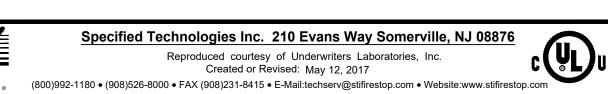
material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used. Tube Insulation - Plastics# - Nom 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. When Item 3D is used, T Rating is 1/2 Hr.

See Plastics (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be E Pipe Covering Materials\* - Cellular Glass Insulation - Nom 2 to 3 in. (51 to 76 mm) thick cellular glass units sized to the outside diam of the pipe or tube and supplied in nom 24 in. (610 mm) long half sections or nom 18 in. (457 mm) long segments.

PITTSBURGH CORNING CORP - FOAMGLAS Metal Jacket - Used in conjunction with Item 3E. Min 12 in. (305 mm) long jacket formed from min 0.010 in. (0.25 mm) thick aluminum sheet cut to wrap tightly around the pipe insulation with a min 2 in. (51 mm) lap and secured using bands and seals of a similar material or min No. 18 AWG steel tie wire. Bands or steel tie wire to be located within 2 in. (51 mm) of each end of the jacket and spaced max 10 in. (254 mm) OC. Jacket installed with edge abutting surface of fill material (Item 9A) on both surfaces of wall. Metal jacket to be used in addition to any other jacketing material which may be required on the pipe covering.

Pipe insulation installed on pipe in accordance with the manufacturer's instructions. When Item 3E is used, T Rating is 2 Hr.







D. Copper Pipe or Tube - Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe or Type L (or heavier) copper The hourly T, FT and FTH Ratings are 1/4 hr when bare (non-insulated) metallic penetrant is used. The L Rating is Less

used, min space between insulated metallic pipes and tubes and bare metallic pipes, conduits and tubing shall be min 2 in. (51 mm). The following types of pipe insulations may be used: A. Pipe and Equipment Covering Materials\* - Nom 2 in. (51 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 56 kg/m3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product When Item 3A is used, T, FT and FTH Ratings are 1 hr and 1-1/4 hr for 1 hr and 2 hr fire rated walls, respectively. See Pipe and Equipment Covering Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

Pipe Insulation - (Optional) - Pipe insulation may be installed on one or more of the metallic pipes or tubes. When pipe insulation is

than 1 CFM/sq ft at ambient and 400 F.

kg/m3) and sized to the outside diam of the pipe or tube. Pipe insulation secured with min 18 SWG steel wire spaced max 12 in. (305 mm) OC. When Item 3B is used, T, FT and FTH Ratings are 1 hr and 2 hr for 1 hr and 2 hr fire rated walls, INDUSTRIAL INSULATION GROUP L L C - High Temperature Pipe Insulation 1200, High Temperature Pipe Insulation BWT and High Temperature Pipe Insulation Thermaloc . Sheathing Material\* - Use in conjunction with Item 3B. Foil-scrim-kraft or all service jacket material shall be wrapped around the

3. Pipe Covering Materials\* - Nom 2 in. (51 mm) thick unfaced mineral fiber pipe insulation having a min density of 3.5 pcf (56

outer circumference of the pipe insulation (Item 3B) with the kraft side exposed. Longitudinal and transverse joints sealed with metal fasteners or butt tape. See **Sheathing Materials** (BVDV) category in the Building Materials Directory for names of manufacturers. Any sheathing 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.

D. **Tube Insulation - Plastics## -** Nom 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam

furnished in the form of tubing. The max diam of the pipe shall be 4 in. (102 mm) when Item 3D is used. When Item 3D is used, T, FT and FTH Ratings are 3/4 Hr. See Plastics (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be

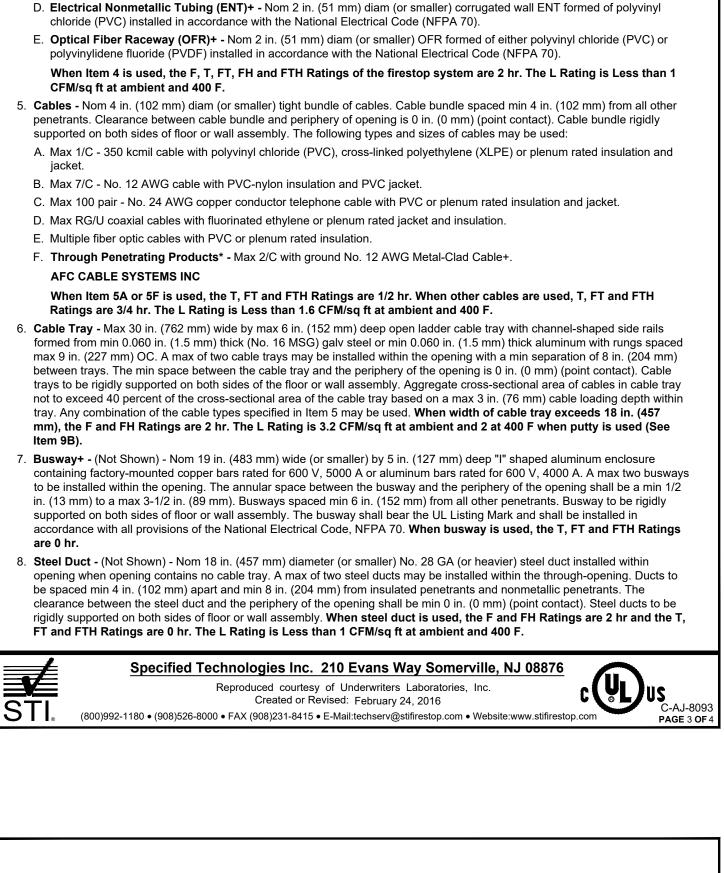
E. Pipe Covering Materials\* - Cellular Glass Insulation - Nom 2 to 3 in. (51 to 76 mm) thick cellular glass units sized to the outside diam of the pipe or tube and supplied in nom 24 in. (610 mm) long half sections or nom 18 in. (457 mm) long segments. Pipe insulation installed on pipe in accordance with the manufacturer's instructions. When Item 3E is used, T, FT and FTH Ratings are 1 hr and 2 hr for 1 hr and 2 hr fire rated walls, respectively.

F. Metal Jacket - Used in conjunction with Item 3E. Min 12 in. (305 mm) long jacket formed from min 0.010 in. (0.25 mm) thick

aluminum sheet cut to wrap tightly around the pipe insulation with a min 2 in. (51 mm) lap and secured using bands and seals of a similar material or min No. 18 SWG steel tie wire. Bands or steel tie wire to be located within 2 in. (51 mm) of each end of the jacket and spaced max 10 in. (254 mm) OC. Jacket installed on each side of wall with edge flush with wall surface. Metal jacket to be used in addition to any other jacketing material which may be required on the pipe covering. b. Pipe and Equipment Covering Materials\* - Nom 2 to 3 in. (51 to 76 mm) thick hollow cylindrical calcium silicate (min 14 pcf or 224 kg/m3) units sized to the outside diam of the pipe or tube. Pipe insulation secured with stainless steel bands or with min No. 18 SWG stainless steel wire spaced max 12 in. (305 mm) OC. When Item 3G is used, T, FT and FTH Ratings are 1 hr and 2

hr for 1 hr and 2 hr fire rated walls, respectively. Nonmetallic Penetrants - One or more nonmetallic pipes, conduits or tubes to be installed within the opening. Min clearance between nonmetallic penetrants to be 2 in. (51 mm). Min clearance between nonmetallic penetrants and cables or metallic penetrants to be 4 in. (102 mm). Min clearance between penetrants and periphery of opening is 2 in. (51 mm). Penetrants rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes, conduits or tubing may be used:

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. Nonmetallic Penetrants - One or more nonmetallic pipes, conduits or tubes to be installed within the opening. Min clearance

between nonmetallic penetrants to be 1 in. (25 mm). Min clearance between nonmetallic and metallic penetrants to be 4 in.

supported on both sides of floor or wall assembly. The following types and sizes of nonmetallic pipes, conduits or tubing may

A. Polyvinyl Chloride (PVC) Pipe - Nom 2 in. (51 mm) diam (or smaller) solid or cellular core Schedule 40 PVC pipe for use

B. Chlorinated Polyvinyl Chloride (CPVC) Pipe - Nom 2 in. (51 mm) diam (or smaller) SDR17 CPVC pipe for use in closed

C. Rigid Nonmetallic Conduit+ - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with

(102 mm) Min clearance between penetrants and periphery of opening is 0 in. (0 mm) (point contact). Penetrants rigidly

in closed (process or supply) or vented (drain, waste or vent) piping systems.

(process or supply) or vented (drain, waste or vent) piping systems.

the National Electrical Code (NFPA 70)

Nonmetallic Penetrants - One or more nonmetallic pipes, conduits or tubes to be installed within the opening. Annulus between penetrants and periphery of opening is min 1 in. (25 mm) to max 24 in. (609 mm). Separation between metallic and nonmetallic penetrants is min 6 in. (152 mm). Penetrants rigidly supported on both sides of wall assembly. The following types and sizes of A. Polyvinyl Chloride (PVC) Pipe - Nom 2 in. (51 mm) diam (or smaller) solid or cellular core Schedule 40 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 the

National Electrical Code (NFPA 70) D. Electrical Nonmetallic Tubing (ENT)+ - Nom 2 in. (51 mm) diam (or smaller) corrugated wall ENT formed of polyvinyl chloride (PVC) installed in accordance with the National Electrical Code (NFPA 70). E. Optical Fiber Raceway+ - Nom 2 in. (51 mm) diam (or smaller) optical fiber raceway (innerduct). Optical fiber raceway installed in accordance with the National Electrical Code (NFPA 70).

When Item 4 is used, the T Rating of the firestop system is 2 hr. Cables - Nom 4 in. (102 mm) diam (or smaller) tight bundle of cables. Annulus between cable bundle and periphery of opening is min 0 in. (point contact) to max 24 in. (609 mm). Separation between cable bundle and metallic or nonmetallic penetrants shall be min 6 in. (152 mm). Cable bundle rigidly supported on both sides of wall assembly. The following types and sizes of cables may be

A. Max 1/C - 1000 kcmil cable with plenum rated, polyvinyl chloride (PVC) or cross-linked polyethylene (XLPE) insulation and B. Max 7/C - No. 12 AWG cable with PVC-nylon insulation and PVC jacket.

C. Max 400 pair - No. 24 AWG copper conductor telephone cable with plenum rated or PVC insulation and jacket. D. Max RG/U coaxial cables with plenum rated or fluorinated ethylene jacket and insulation.

When cables are used, T Rating is 1/2 hr.

E. Multiple fiber optic cables with plenum rated or PVC insulation. F. 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 manufacturer.

Cable Tray - Max 30 in. (762 mm) wide by max 6 in. (152 mm) deep open ladder cable tray with channel-shaped side rails formed from min 0.060 in. (1.5 mm) thick (No. 16 MSG) galv steel or min 0.060 in. (1.5 mm) thick aluminum with rungs spaced max 9 in. (229 mm) OC. A max of two cable trays may be installed within the opening with a min vertical separation of 4 in. (102 mm) and a min horizontal separation of 1/4 in. (6 mm) between trays. Max vertical or horizontal separation is 24 in. (609 mm). Annulus between the cable tray and the periphery of the opening is min 0 in. (point contact) to max 24 in. (609 mm). Separation between cable tray and metallic or nonmetallic penetrants is min 6 in. (152 mm). Cable trays to be rigidly supported on both sides of the wall assembly. Aggregate cross-sectional area of cables in cable tray not to exceed 40 percent of the cross-sectional area of the cable tray based on a max 3 in. (76 mm) cable loading depth within tray. Any combination of the cable types specified in Item 5 may be used. When cable tray is used, T Rating is 1/2 hr.

Busway+ - Nom 19 in. (483 mm) wide (or smaller) by 6 in. (152 mm) deep "I" shaped aluminum enclosure containing factory-mounted copper bars rated for 600 V 5000 A or max 26 in (660 mm) wide by max 6 in (152 mm) deep "I" shaped aluminum enclosure containing factory-mounted aluminum bars rated for 600 V, 4000 A. . A max of two busways may be installed within the opening with a min separation of 1 in. (25 mm) to max 24 in. (609 mm). The annular space between the busway and the periphery of the opening shall be a min 0 in. (point contact) to a max 24 in. (609 mm). Busways spaced min 6 in. (152 mm) from all other penetrants. Busway to be rigidly supported on both sides of wall assembly. The busway shall bear the UL Listing Mark and shall be installed in accordance with all provisions of the National Electrical Code, NFPA 70. When busway is used, the T Rating

Air Conditioning (AC) Line Set - One or more AC line sets installed within opening. Each AC line set consists of two pipes or tubes (Item 8A), tubing insulation (Item 8B) and a thermostat cable (Item 8C). The space between the AC line sets shall be min 2 in. (51 mm). The space between the AC line sets and the periphery of the opening shall be min 0 in. (point contact) to max 24 in. (609 mm). The AC line sets shall be spaced min 6 in. from uninsulated metallic penetrants and shall be rigidly supported on both



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A. Polyvinyl Chloride (PVC) Pipe - Nom 2 in. (51 mm) diam (or smaller) solid or cellular core Schedule 40 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) SDR17 CPVC pipe for use in closed

2. Rigid Nonmetallic Conduit+ - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA 70). D. Electrical Nonmetallic Tubing (ENT)+ - Nom 2 in. (51 mm) diam (or smaller) corrugated wall ENT formed of polyvinyl chloride (PVC) installed in accordance with the National Electrical Code (NFPA 70).

(process or supply) or vented (drain, waste or vent) piping systems.

. Optical Fiber Raceway (OFR)+ - Nom 2 in. (51 mm) diam (or smaller) OFR formed of either polyvinyl chloride (PVC) or polyvinylidene fluoride (PVDF) installed in accordance with the National Electrical Code (NFPA 70). When Item 4 is used. the T, FT and FTH Ratings are equal to the 1 or 2 hr fire rating of the wall assembly. The L Rating is . Cables - One or more individual or max 4 in. (102 mm) diam tight bundles of cables to be installed within opening. Cables shall be

spaced min 4 in. (102 mm) from all other penetrants. Min clearance between cable and periphery of opening is 2 in. (51 mm). Cables rigidly supported on both sides of wall assembly. The following types and sizes of cables may be used: A. Max 1/C - 350 kcmil cable with polyvinyl chloride (PVC), cross-linked polyethylene (XLPE) or plenum rated insulation and jacket. B. Max 7/C - No. 12 AWG cable with PVC-nylon insulation and PVC or plenum rated jacket. C. Max 200 pair - No. 24 AWG copper conductor telephone cable with plenum rated or PVC insulation and jacket.

D. Max RG/U coaxial cables with plenum rated or fluorinated ethylene jacket and insulation. E. Multiple fiber optic cables with plenum rated or PVC insulation. F. Max four pair No. 22 AWG (or smaller) copper conductor data cable with PVC or plenum rated jacketing and insulation. G. 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 When Item 5A or 5F is used, the T, FT and FTH Ratings are 1/2 hr. When other cables are used, T, FT and FTH Ratings are 3/4 hr. The L Rating is 1.6 CFM/sq ft at ambient and at 400 F **Firestop System -** The firestop system consists of the following items: A. Fill, Void or Cavity Material\* - Pillows - Max 3 in. (76 mm) thick by 6 in. (152 mm) wide by 9 in. (229 mm) long intumescent

pillows covered with a plastic jacket installed lengthwise through opening such that ends project an equal distance from the approximate centerline of the wall assembly. Pillows tightly-packed into opening between pipes and between pipes and periphery SPECIFIED TECHNOLOGIES INC - SpecSeal Firestop Pillows

B. Fill, Void or Cavity Material\* - Sealant or Putty (Not Shown) - At locations of point contact, apply min 1/2 in. (13 mm) diam bead of sealant or putty at penetrant/gypsum board interface on both surfaces of wall. SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant, SpecSeal Series SSS Sealant, SpecSeal Putty \* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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9. Firestop System - The firestop system shall consist of the following items

A. Fill, Void or Cavity Materials\* - Pillows - Nom 9 in. (227 mm) long by 4 to 6 in. (102 to 152 mm) wide by 1 to 3 in. (25 to 76 mm) thick plastic covered intumescent pillows. In floors, pillows to be installed lengthwise through opening and positioned to extend a maximum of 2-1/2 in. (64 mm) below the bottom plane of the floor. In walls, pillows to be installed lengthwise through opening and positioned to extend an equal distance from the approximate center line of the wall. Pillows tightly packed into the opening to fill the annular space between the annular space and the penetrating items.

SPECIFIED TECHNOLOGIES INC - SpecSeal Firestop Pillows B. Fill, Void or Cavity Materials\* - Sealant or Putty - Min 1/2 in. (13 mm) depth of fill material applied at point contact locations between penetrating items and periphery of opening. Additional fill material forced into interstices of grouped cables and grouped cables within cable trays. For L Ratings, apply nom 3/16 in. (4.8 mm) thick by 4-3/4 in. (121 mm) wide band of putty to top of cables in the cable tray.

SPECIFIED TECHNOLOGIES INC - SpecSeal Series 100, 101, 102, 120, 129 or 105 Sealant, SpecSeal LCI Sealant,

SpecSeal SIL300 Silicone Firestop Sealant, or SpecSeal Putty C. Wire Mesh - Nom 1 in. (25 mm) hexagonal wire mesh fabricated from min 20 ga galv steel wire cut to fit the contours of the penetrating items and the opening with a min 2 in. (51 mm) lap beyond the periphery of the opening. Wire mesh secured to both sides of floor or wall by means of 1/4 in. (6 mm) diam by 1-1/2 in. (38 mm) long steel concrete screws in conjunction with 1-1/4 in. (31 mm) diam steel fender washers spaced max 6 in. (152 mm) OC. Any joints within wire mesh shall overlap 2 in. (51 mm) and be secured together by means of No. 20 AWG steel wire spaced 6 in. (152 mm) OC. When both the length and width dimensions of the through opening are less than 36 in. (914 mm) and when the max space between penetrants or between the penetrant and the perimeter of the opening is less than 10 in. (254 mm), the wire mesh is optional. When the area of the opening exceeds 1296 sq in. (0.84 m2), the gauge of the steel wire mesh shall be increased

D. Steel Straps - (Not shown) - As an alternate to the wire mesh (Item 9C) in wall assemblies, min 1 in. (25 mm) wide by 0.015 in. (0.38 mm) thick steel banding straps sized to lap 2 in. (51 mm) beyond the periphery of the opening may be installed either horizontally or vertically between rows of penetrants with a max on center spacing of 4 in. (102 mm). Steel banding straps secured to concrete with 1/4 in. (6 mm) diam by 1-1/2 in. (38 mm) long steel concrete screws in conjunction with 1-1/4 in. (31 mm) diam steel fender washers.

E. Steel Plate - (Not Shown) - As an alternate to Item 9C or 9D, min 28 GA (or heavier) steel plate sized to lap 2 in. (51 mm) beyond periphery of opening may be installed on minimum one side of floor or wall assembly on either side of assembly. Steel plate secured to concrete with 1/4 in. (6 mm) diam by 1-1/2 in. (38 mm) long steel concrete screws in conjunction with 1-1/4 in. (31 mm) diam steel fender washers. Fasteners spaced 1 in. (25 mm) from each corner and 8 in. (204 mm) center-to-center. When steel plate is used, the T, FT and FTH Ratings are 0 hr. \* Bearing the UL Classification Marking

#Bearing the UL Recognized Components Mark +Bearing the UL Listing Mark

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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8A. Through Penetrant - A max of two pipes or tubes to be installed in each AC line set. Of the two pipes or tubes, only one may have a nom diam greater than 1/2 in. (13 mm). The following types and sizes of through penetrants may be used: A. **Steel Pipe -** Nom 1 in. (25 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.

B. Iron Pipe - Nom 1 in. (25 mm) diam (or smaller) cast or ductile iron pipe. C. Copper Pipe - Nom 1 in. (25 mm) diam (or smaller) Regular (or heavier) copper pipe.

D. Copper Tube - Nom 1 in. (25 mm) diam (or smaller) Type L (or heavier) copper tube. 8B. Tube Insulation - Plastics# - Nom 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. The tube insulation may be installed on one max 3/4 in. (19 mm) diam pipe or tube in each AC line set. The space between the insulated and non-insulated pipes or tubes within each AC line set shall be 0 in. (point contact). See Plastics (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation meeting the above specifications and having a UL 94 Flammability Classification of 945VA may be

8C. Cable - One 4 pair No. 18 AWG (or smaller) thermostat cable with polyvinyl chloride (PVC) insulation and jacket materials may be installed with each AC line set.

When Item 8 is used, the T Rating of the firestop system is 1/4 hr. Steel Duct - (Not Shown) - Nom 12 in. (305 mm) diameter (or smaller) No. 30 GA (or heavier) steel duct installed within opening when opening contains no cables or cable tray. A max of two steel ducts may be installed within the through-opening. Ducts to be spaced min 4 in. (102 mm) apart and min 8 in. (203 mm) from insulated penetrants and nonmetallic penetrants. Annulus between the steel duct and the periphery of the opening shall be min 0 in. (point contact) to max 24 in. (0 to 609 mm). Steel ducts to be rigidly supported on both sides of wall assembly. When steel duct is used, the T Rating is 0 hr.

D. Firestop System - The firestop system shall consist of the following items: A. Packing Material - Min 4 pcf (64 kg/m3) mineral wool batt insulation tightly packed into opening to full depth of the wall. Packing material recessed from both surfaces of wall to accommodate the required thickness of fill material. B. Fill, Void or Cavity Materials\*-Sealant - Min 1/2 in. (13 mm) depth of fill material applied within the annulus, flush with both surfaces of the wall assembly. Additional fill material forced into interstices of grouped cables and grouped cables within cable trays. At point contact location between through penetrant and gypsum wallboard, a min 3/8 in. (10 mm) diam bead of fill

material shall be applied at through penetrant/gypsum board interface on both surfaces of the wall. SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively. #Bearing the UL Recognized Components Mark +Bearing the UL Listing Mark

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#### **GENERAL NOTES:**

1. Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.

2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:

 Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.

3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

 UL Fire Resistance Directory; Current Edition

NFPA 101 Life Safety Code

 All governing local and regional building codes

5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection DIVISION 9: Finishes

**DIVISION 22: Plumbing DIVISION 23: HVAC** 

DIVISION 26: Electrical

**DIVISION 27: Communications** 

## PROJECT NAME:

PROJECT\_NAME:

PROJECT LOCATION:

PROJECT\_LOCATION:

### ARCHITECT/CONSULTANT:

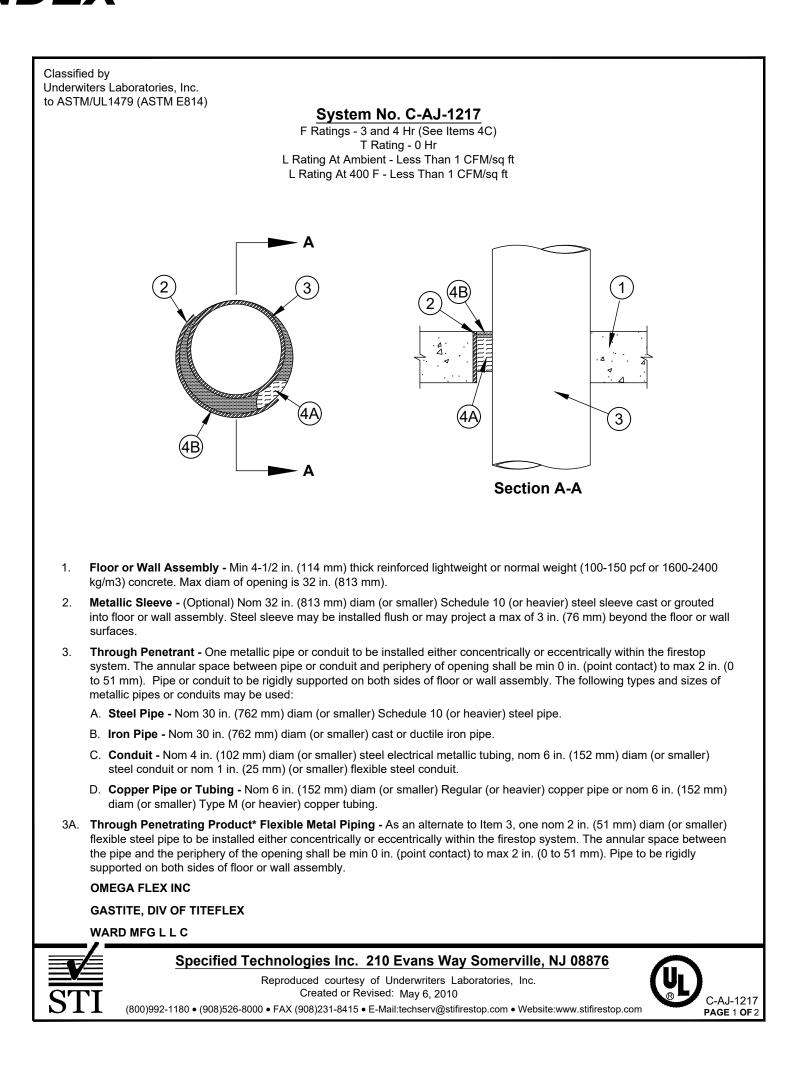
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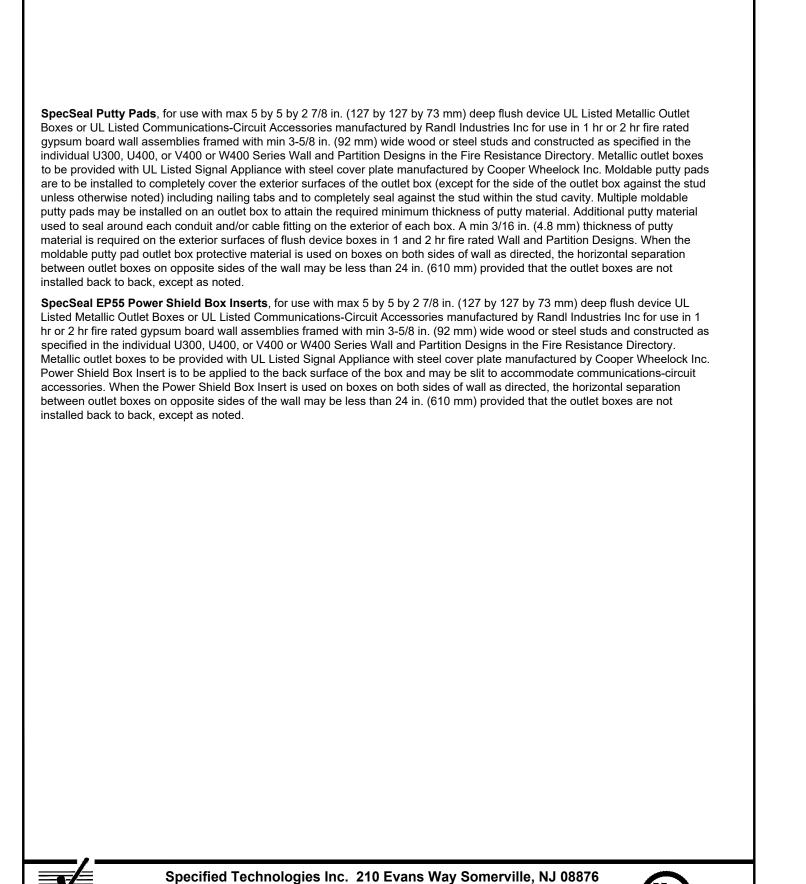
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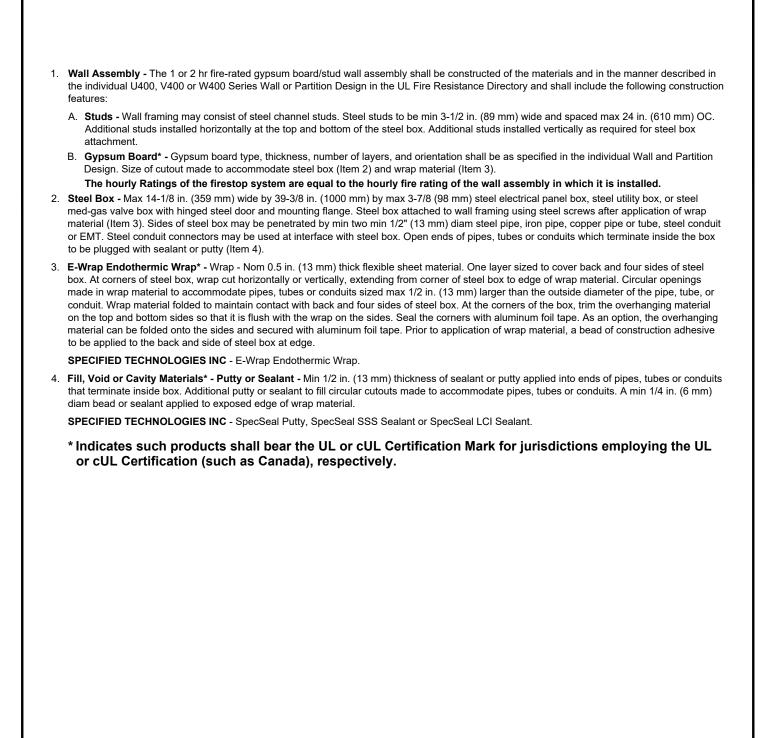




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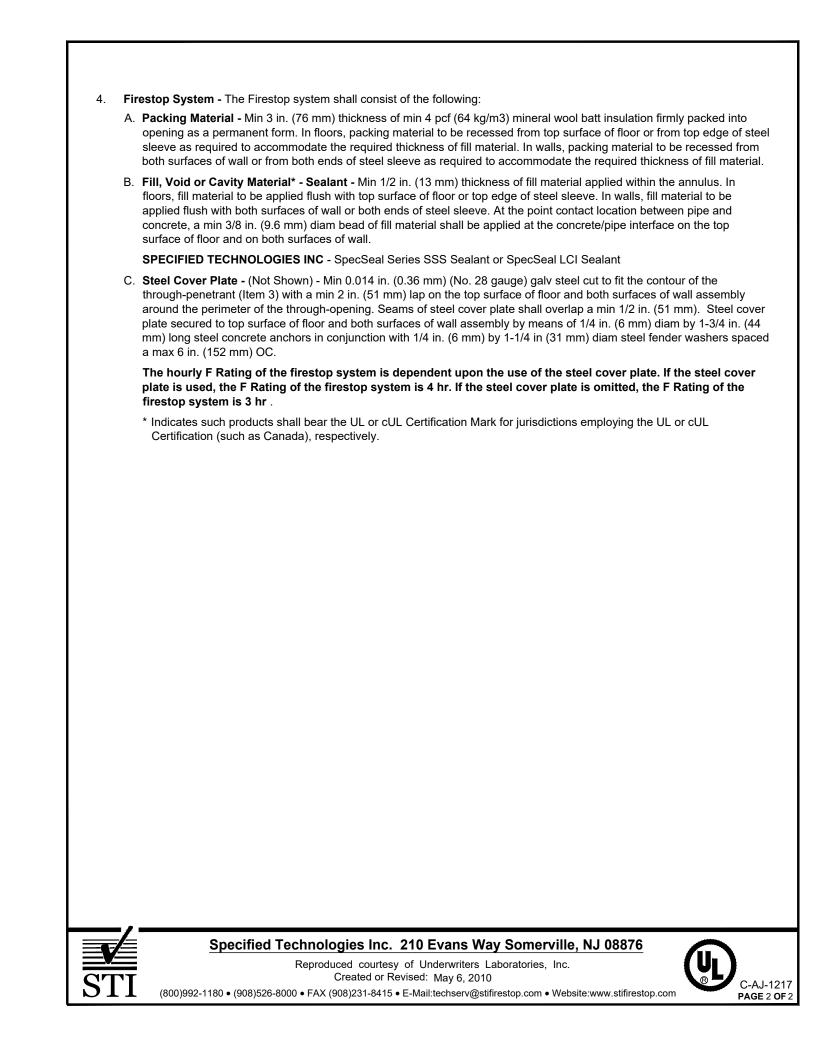
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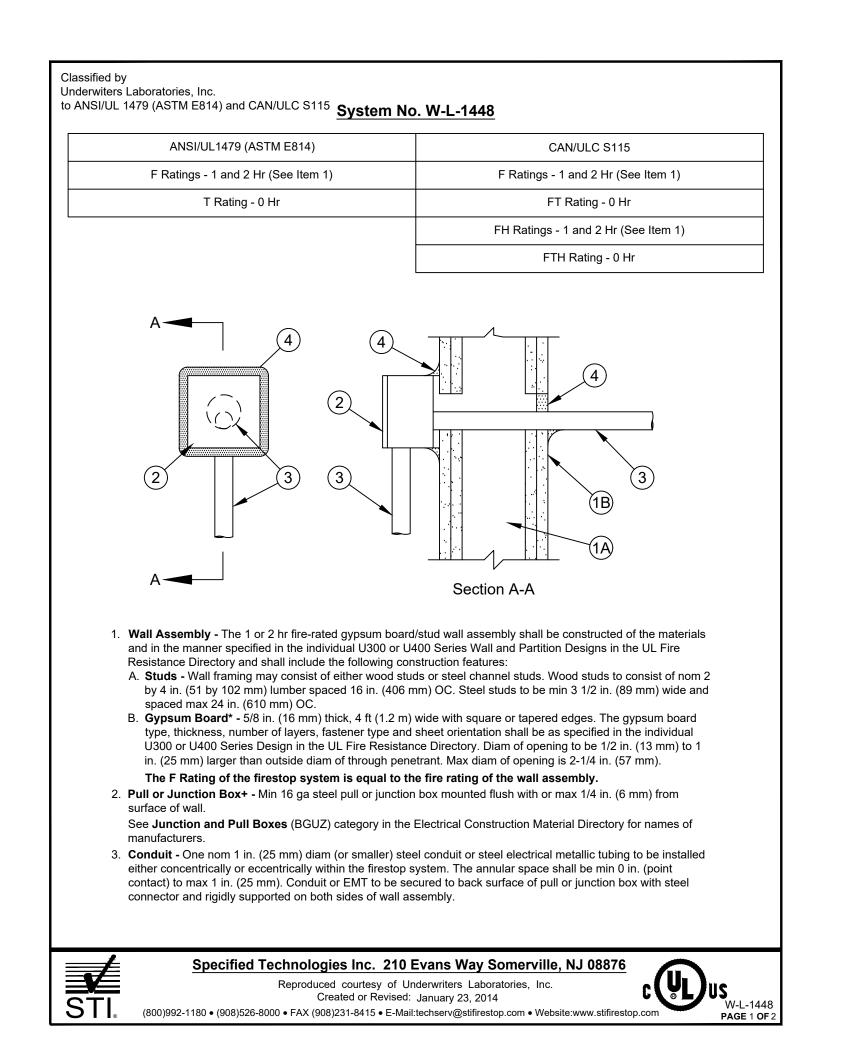


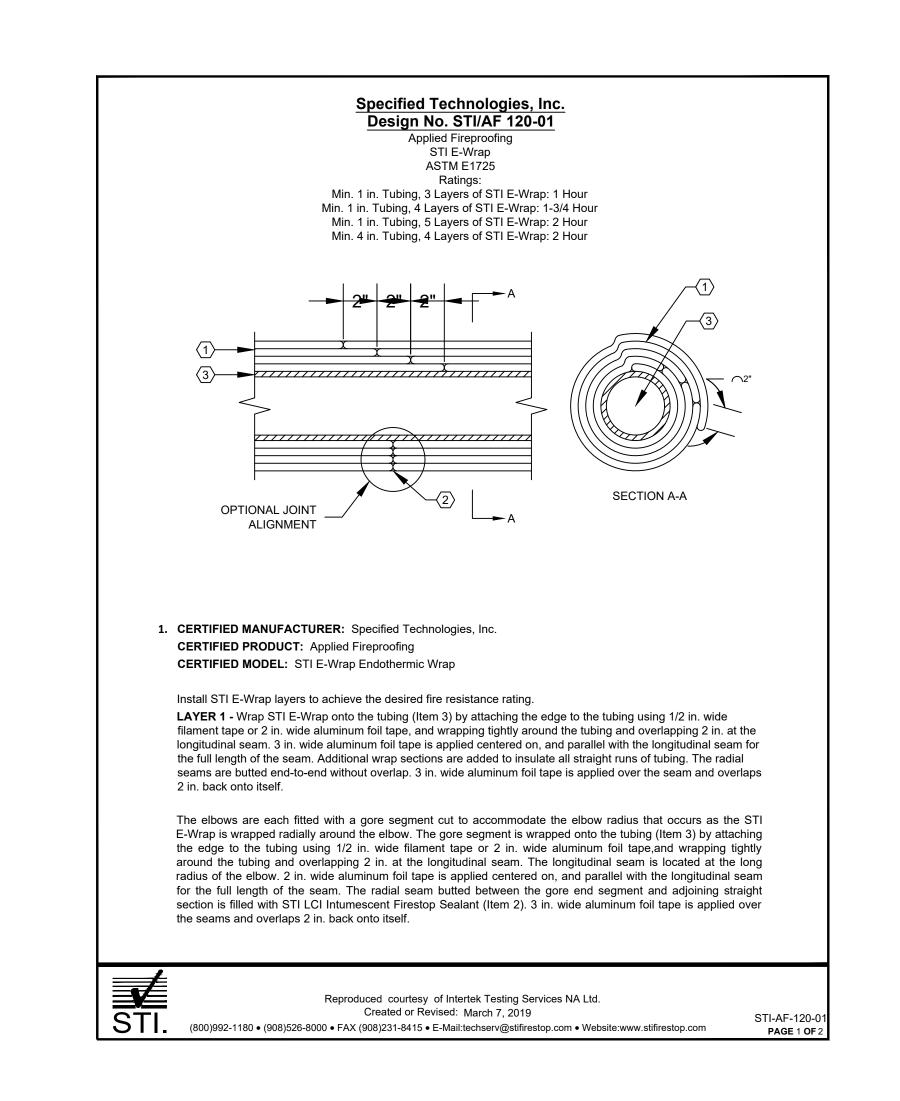
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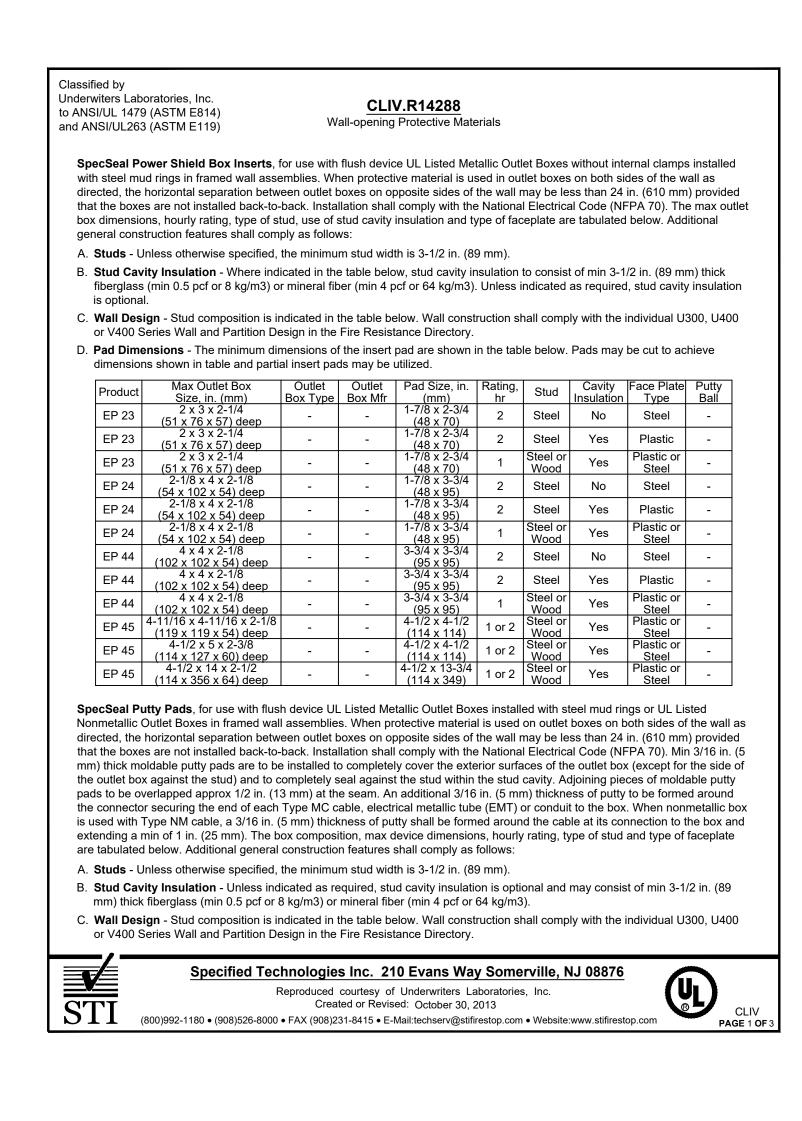
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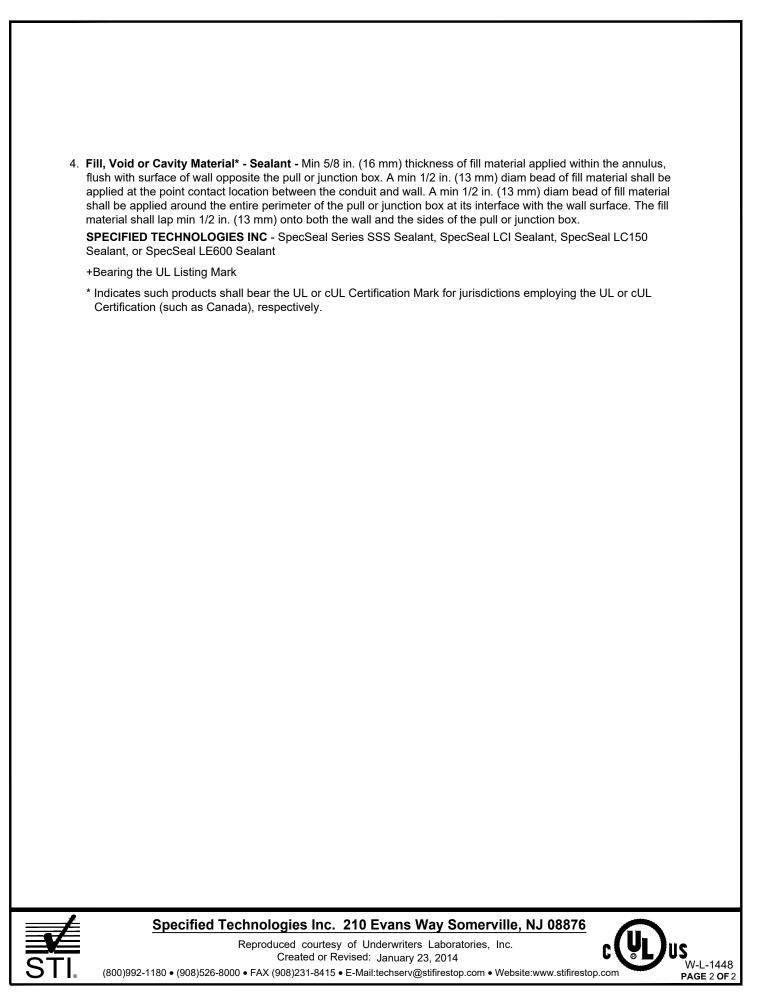
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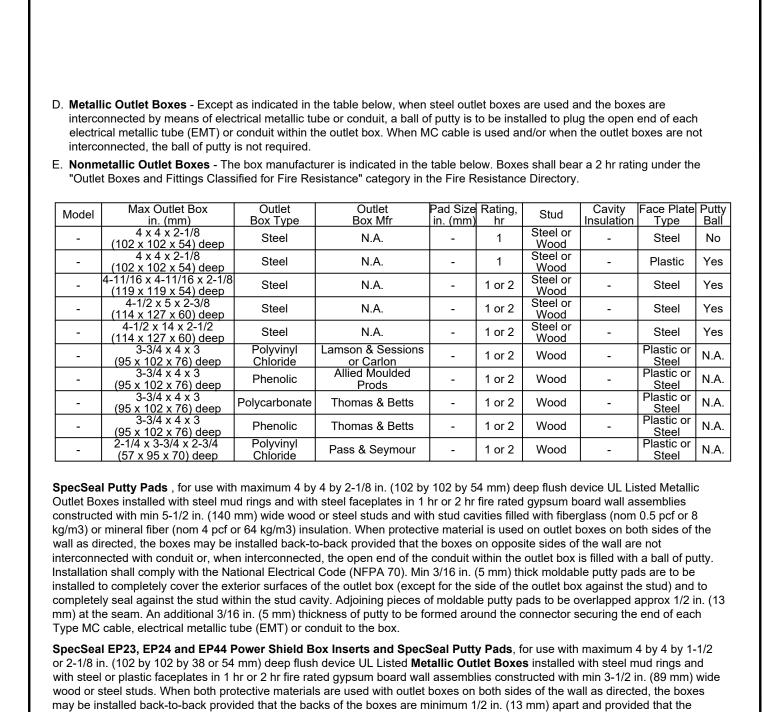






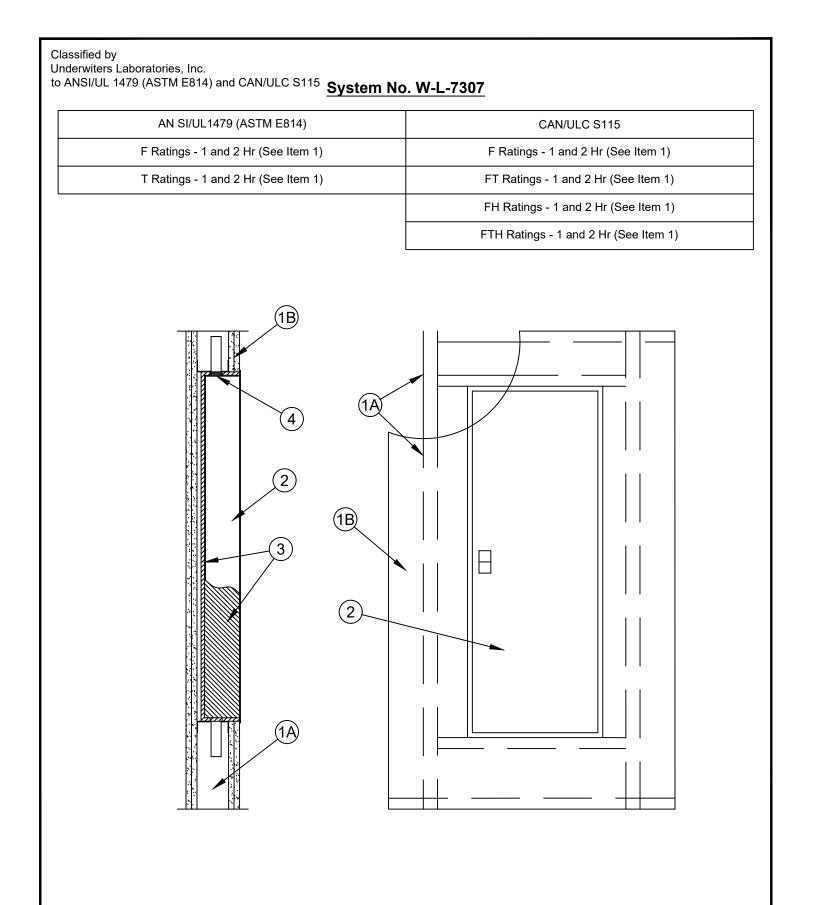






boxes are not interconnected. Installation shall comply with the National Electrical Code (NEPA 70). Min 3/16 in. (5 mm) thick moldable putty pads are to be installed to completely cover the exterior surfaces of the outlet box (except for the side of the outlet box against the stud) and to completely seal against the stud within the stud cavity. Adjoining pieces of moldable putty pads to be overlapped approx 1/2 in. (13 mm) at the seam. An additional 3/16 in. (5 mm) thickness of putty to be formed around the connector securing the end of each Type MC cable, electrical metallic tube (EMT) or conduit to the box. An insert pad shall be installed to completely cover the back inside surface of each outlet box.

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#### GENERAL NOTES:

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- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- 4. References:
  - UL Fire Resistance Directory; Current Edition
  - NFPA 101 Life Safety Code
  - All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry

DIVISION 7: Thermal & Moisture

Protection

DIVISION 9: Finishes

**DIVISION 22: Plumbing** 

**DIVISION 23: HVAC** 

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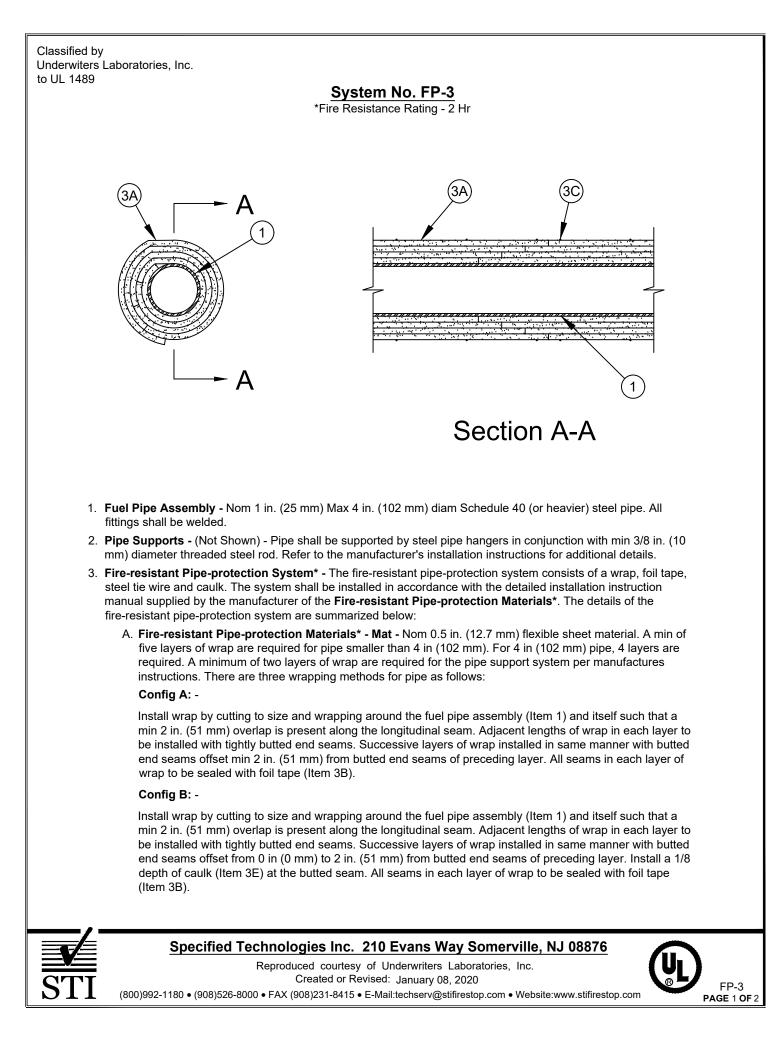
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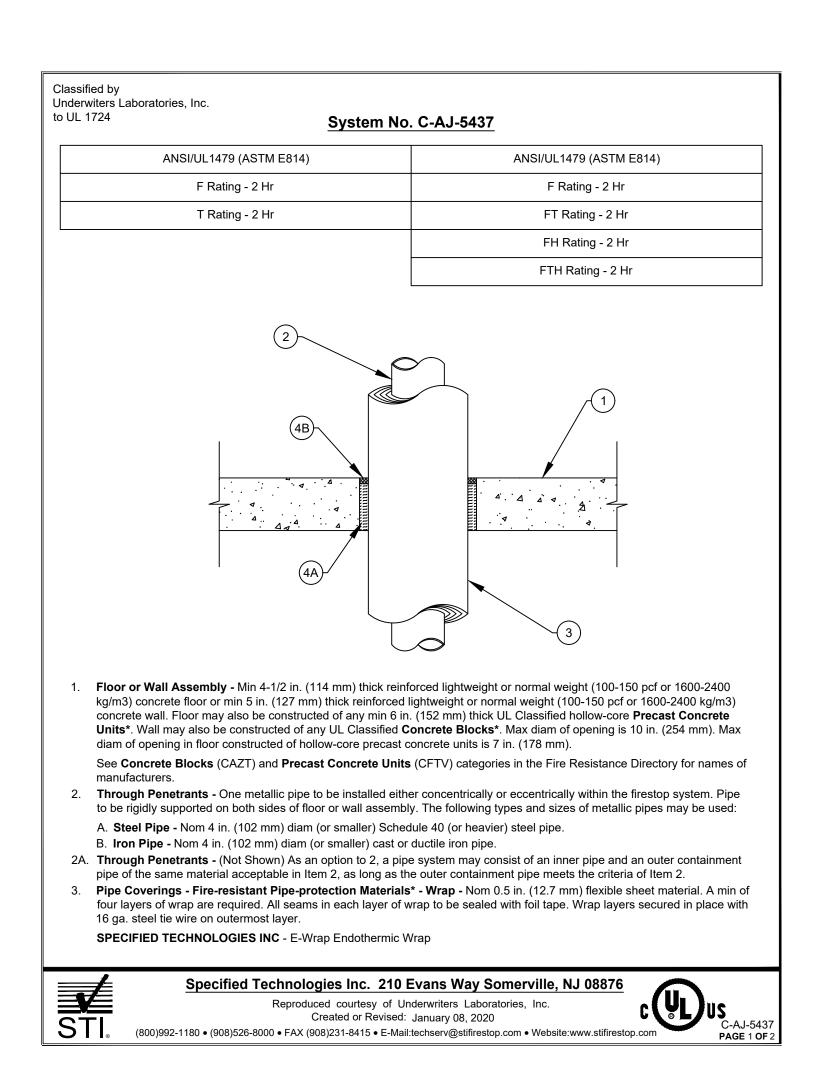
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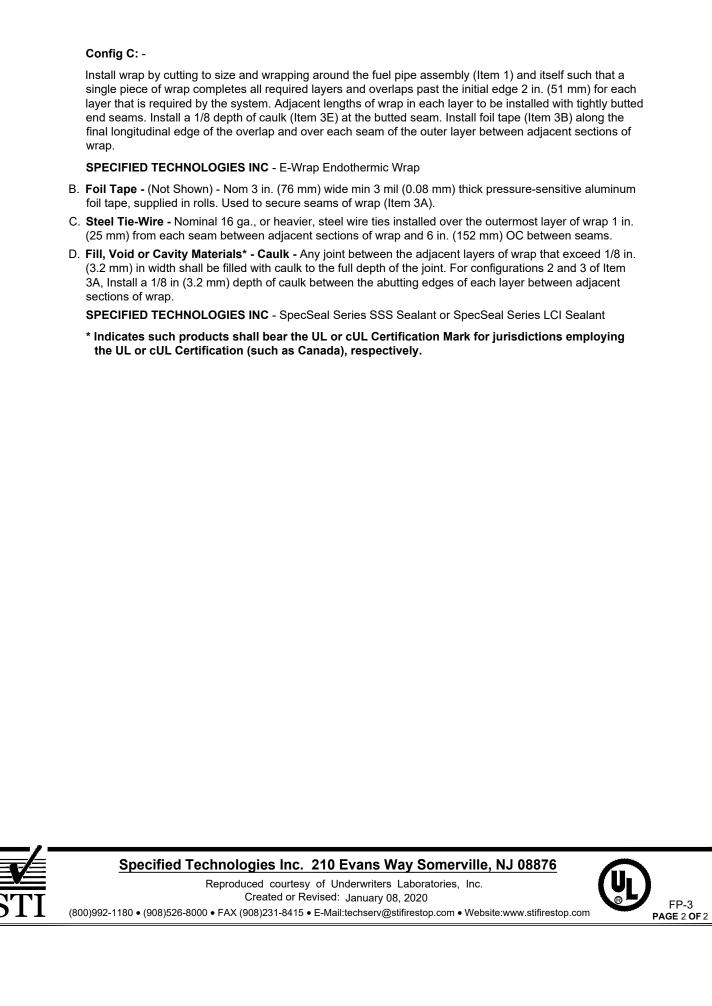
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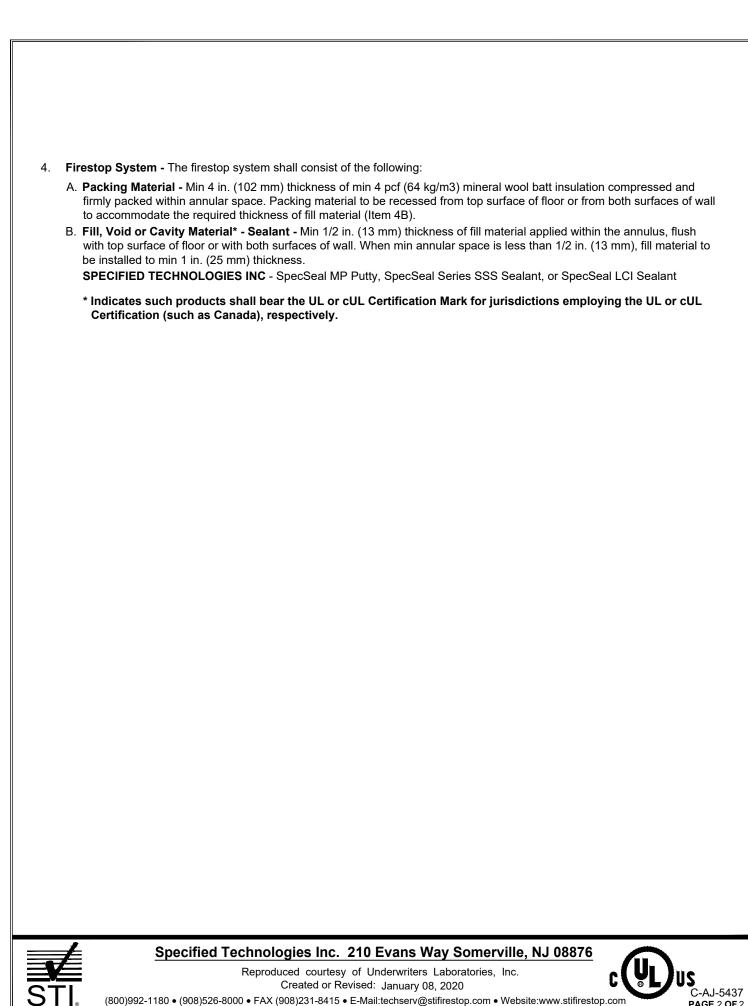


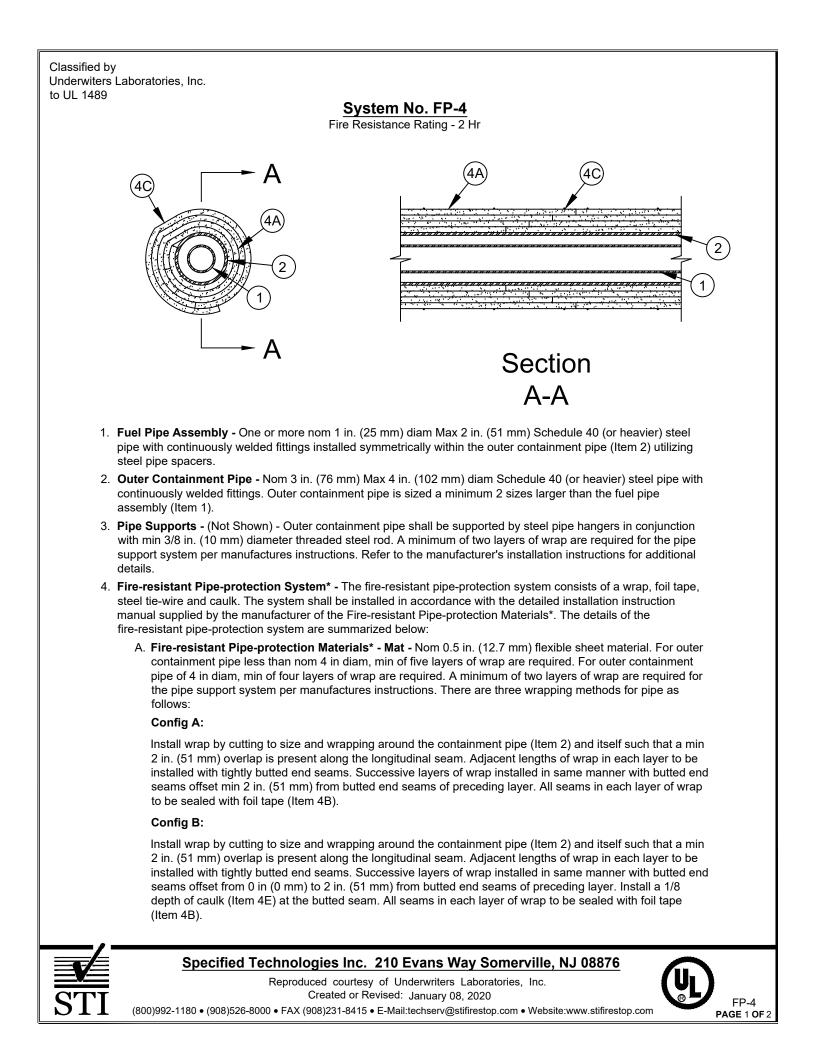


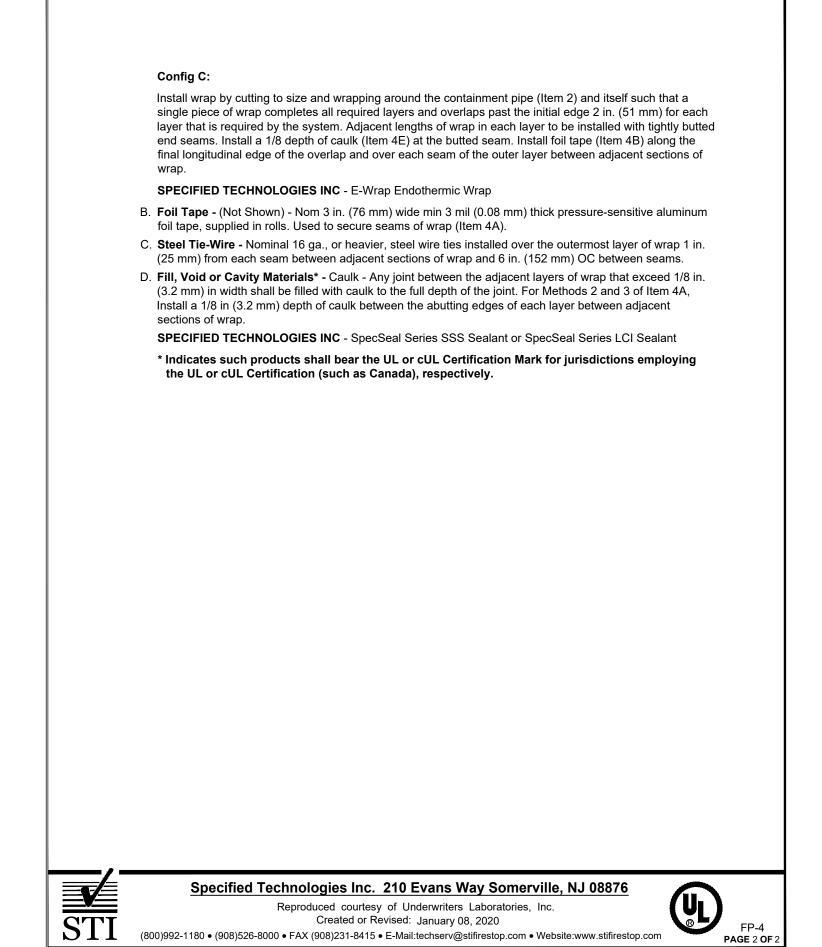












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STI FIRESTOP SYSTEMS

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