System Number	Rating	Description	Sheet Number
HEAD-OF-WALL JOINTS			
HW-D-0043	1, 2, 3 & 4 HR	GYPSUM WALL PERPENDICULAR TO DECK	***SHEET 1***
HW-D-0747	1 & 2 HR	GYPSUM WALL PARALLEL TO DECK, STEEL PLATE BRIDGING FLUTES	***SHEET 1***
HW-D-0210	1 & 2 HR	GYPSUM WALL PARALLEL TO DECK, DIRECTLY UNDER BOTTOM FLUTE	***SHEET 1***
HW-D-0365	1 & 2 HR	GYPSUM WALL PARALLEL TO DECK, PARTIALLY UNDER BOTTOM FLUTE	***SHEET 1***
HW-D-0252	1 & 2 HR	GYPSUM WALL UNDER STEEL BEAM	***SHEET 2***
HW-D-0617	1 & 2 HR	GYPSUM WALL OFFSET FROM STEEL BEAM	***SHEET 2***
HW-D-0548	1 & 2 HR	GYPSUM SHAFT WALL PERPENDICULAR TO DECK	***SHEET 3***
HW-D-0644	1 & 2 HR	GYPSUM SHAFT WALL PARALLEL TO DECK	***SHEET 3***
HW-D-0642	1 & 2 HR	GYPSUM SHAFT WALL UNDER STEEL BEAM	***SHEET 4***
HW-D-0645	1 & 2 HR	GYPSUM SHAFT WALL OFFSET FROM STEEL BEAM	***SHEET 4***
HW-D-0646	1 & 2 HR	GYPSUM SHAFT WALL AT EDGE OF SLAB (e.g. STAIRWELL)	***SHEET 4***
HW-D-0140	3 HR	CONCRETE/BLOCK WALL PARALLEL TO DECK	***SHEET 5***
HW-D-0086	1, 2, 3 & 4 HR	CONCRETE/BLOCK WALL PERPENDICULAR TO DECK	***SHEET 5***
BOTTOM-OF-WALL JOINTS			
BW-S-0003	1 & 2 HR	GYPSUM WALL - ES SEALANT	***SHEET 5***
BW-S-0017	1 & 2 HR	GYPSUM WALL - TRACK TOP GASKET	***SHEET 5***
BW-S-0020	1 & 2 HR	GYPSUM SHAFT WALL - ES SEALANT	***SHEET 5***
BW-S-0038	1 & 2 HR	GYPSUM SHAFT WALL - TRACK TOP GASKET	***SHEET 5***
FLOOR-TO-WALL JOINTS			
FW-D-1006	2 HR	CONCRETE FLOOR TO CONCRETE/BLOCK WALL - SPRAY	***SHEET 5***
FW-D-1007	3 HR	CONCRETE FLOOR TO CONCRETE/BLOCK WALL - SEALANT	***SHEET 5***
WALL-TO-WALL JOINTS			
WW-S-0052	1, 2, 3 & 4 HR	GYPSUM WALL TO CONCRETE/BLOCK WALL - SEALANT	***SHEET 6***
WW-S-0063	1 & 2 HR	GYPSUM WALL TO CONCRETE/BLOCK WALL - INTUMESCENT GASKET	***SHEET 6***
WW-S-0064	1 & 2 HR	SHAFT WALL TO CONCRETE/BLOCK WALL - INTUMESCENT GASKET	***SHEET 6***
WW-D-0004	3 HR	CONCRETE/BLOCK WALLS - MAX 1" JOINT - SEALANT	***SHEET 6***
WW-D-1006	2 HR	CONCRETE/BLOCK WALLS - MAX 4" JOINT - SPRAY	***SHEET 6***
WALL-TO-FIREPROOFED COLUMN			
STI-JF-120-01	2 HR	GYPSUM WALL TO COLUMN WEB - SPRAY & BACKING	***SHEET 6***
STI-JF-120-02	2 HR	GYPSUM WALL TO COLUMN FLANGE - SEALANT & BACKING	***SHEET 6***
PERIMETER FIRE BARRIER SYSTEMS			
CW-D-1041	2 HR	CURTAIN WALL - MIN 6' SILL HEIGHT - QUICK CLIP SYSTEM	***SHEET 7***
CW-D-1044	2 HR	CURTAIN WALL - STEEL BACKPAN, FLUSH SILL - FIRESTOP SPRAY	***SHEET 7***
CW-D-1051	2 HR	CURTAIN WALL - CONTINUOUS GLAZING (KISS MULLION), OPTIONAL RAISED FLOOR - QUICK CLIP SYSTEM	***SHEET 7***
STI/BPF-120-03	2 HR	CURTAIN WALL - ALL VISION GLASS, FLUSH SILL, SHADOW BOX - FIRESTOP SPRAY	***SHEET 7***
STI/BPF-120-04	2 HR	HYBRID WINDOW WALL - MULTIPLE CLOSURE PANEL OPTIONS - WINDOW WALL GASKET	***SHEET 8***
CW-S-1007	2 HR	STEEL STUD WALL - PLATFORM FRAMED, MULTIPLE FINISH OPTIONS - TRACK TOP GASKET	***SHEET 8***
CW-S-2076	2 HR	STEEL STUD WALL - BALLOON FRAMED, MULTIPLE FINISH OPTIONS - FIRESTOP SPRAY	***SHEET 8***
METAL PIPE/CONDUIT PENETRATIONS			
C-AJ-1353	2 & 3 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - SINGLE METAL PIPE/CONDUIT - SEALANT (2 HR) & BACKING (3 HR)	***SHEET 8***
C-AJ-1361	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MULTIPLE METAL PIPE/CONDUITS, MAX 49 SQ. IN. OPENING	***SHEET 8***
C-AJ-1354	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MULTIPLE METAL CONDUIT, MAX 6" DIA. OPENING	***SHEET 9***
F-A-1110	3 HR	MIN 2-1/2" CONCRETE FLOOR - 6" METAL PIPE/CONDUIT - CAST-IN DEVICE & DECK ADAPTER	***SHEET 9***
F-A-1093	2 HR F & T	EQUAL F & T RATINGS FOR EXPOSED METAL PIPE/CONDUIT PENETRATIONS	***SHEET 9***
F-A-1138	2 HR F &T	FLOOR SINK - SEALANT & DUCT WRAP	***SHEET 9***
F-A-1129	2 HR	CONCRETE FLOOR - TOILET DRAIN - CLOSET FLANGE GASKET	***SHEET 9***
W-L-1049	1 & 2 HR	GYPSUM WALL - SINGLE METAL PIPE/CONDUIT	***SHEET 10***
W-L-1168	1 & 2 HR	GYPSUM WALL - MULTIPLE METAL PIPE/CONDUIT IN RECTANGULAR OPENING	***SHEET 10***
INSULATED METAL PIPE PENETRATIONS			
C-AJ-5087	2 HR	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***
F-A-5041	3 HR	CONCRETE FLOOR - MAX 4" METAL PIPE WITH MAX 1" GLASS FIBER INSULATION - CAST-IN DEVICE & DECK ADAPTER	***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	1 & 2 HR	GYPSUM WALL - MAX 4" METAL PIPE WITH 3/4-1" AB/PVC (FOAM RUBBER) INSULATION	***SHEET 11***
W-L-5262	1 & 2 HR	GYPSUM SHAFT WALL - MAX 2" METAL PIPE WITH 1" GLASS FIBER INSULATION	***SHEET 11***
PLASTIC PIPE/CONDUIT PENETRATIONS			
C-AJ-2578	3 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 2" PLASTIC PIPE - SEALANT & BACKING	***SHEET 11***
C-AJ-2282	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 4" PLASTIC PIPE - WRAP STRIP TUCK-IN	***SHEET 11***
C-AJ-2297	2 & 3 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 6" PLASTIC PIPE - FIRESTOP COLLAR	***SHEET 11***
F-A-2246	2 HR	MIN 2-1/2" CONCRETE FLOOR - MAX 4" PLASTIC PIPE - CAST-IN DEVICE	***SHEET 12***
F-A-2073	3 HR	MIN 2-1/2" CONCRETE FLOOR - MAX 4" PLASTIC PIPE - DROP IN COLLAR	***SHEET 12***
F-A-2077	2 HR2 HR	MIN 2-1/2" CONCRETE FLOOR - MAX 4" PLASTIC PIPE - WRAP STRIP TUCK-IN	***SHEET 12***
F-A-2186	2 HR	MIN 2-1/2" CONCRETE FLOOR - MAX 2" PLASTIC PIPE - SEALANT & BACKING	***SHEET 12***
F-A-2210	2 HR	MIN 2-1/2" CONCRETE FLOOR/METAL DECK - MAX 12" PLASTIC PIPE - FIRESTOP COLLAR	***SHEET 12***
F-A-2216	2 HR	MIN 2-1/2" CONCRETE FLOOR - TOILET DRAIN - CLOSET FLANGE GASKET	***SHEET 13***
W-L-2241	1 & 2 HR	GYPSUM WALL - MAX 2" PLASTIC PIPE - SEALANT ONLY	***SHEET 13***
W-L-2248	1 & 2 HR	GYPSUM WALL - MAX 3" PLASTIC PIPE - WRAP STRIP TUCK-IN	***SHEET 13***
W-L-2237	1 & 2 HR	GYPSUM WALL - MAX 4" PLASTIC PIPE - FIRESTOP COLLARS	***SHEET 13***
W-L-2257	2 HR	GYPSUM SHAFT WALL - MAX 4" PLASTIC PIPE - FIRESTOP COLLARS	***SHEET 13***
CABLE PENETRATIONS (NOT IN CONDUIT)			
C-AJ-3260	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - SINGLE EZ-PATH 44+	***SHEET 13***
C-AJ-3317	3 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - EZ-PATH 44+ GRID UP TO 16 UNITS GANGED	***SHEET 13***
F-A-3054	2, 3 & 4 HR	CONCRETE FLOOR - SINGLE EZ PATH 44+	***SHEET 13***
W-J-3158	2 HR	CONCRETE/BLOCK WALL - EZ-PATH 44+ UP TO 5 UNITS GANGED	***SHEET 14***
W-L-3377	1, 2, 3 & 4 HR	GYPSUM WALL - SINGLE EZ-PATH SERIES 22, 33, 44, 44+	***SHEET 14***
W-L-3306	1 & 2 HR	GYPSUM WALL - EZ-PATH 44+ UP TO 5 UNITS GANGED	***SHEET 14***
W-L-3379	1 & 2 HR	GYPSUM WALL - ONE OR MORE CABLES UP TO 1/2" DIA - CABLE GROMMET RFG2	***SHEET 14***
RETROFIT CABLE PENETRATIONS (FOR RENOVATIONS/ALTERATIONS)			
F-A-3063	2 HR	CONCRETE FLOOR - RETROFIT DEVICE	***SHEET 14***
F-A-3064	2 HR F &T	CONCRETE FLOOR - RETROFIT DEVICE - EQUAL F & T RATINGS FOR EXPOSED PENETRATIONS	***SHEET 15***
W-J-3240	2 HR	CONCRETE/BLOCK WALL - RETROFIT DEVICE	***SHEET 15***
W-L-3435	1 & 2 HR	GYPSUM WALL - RETROFIT DEVICE	***SHEET 15***
ELECTRICAL BUSWAY PENETRATIONS			
C-AJ-6008	3 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - SEALANT & BACKING	***SHEET 15***
C-BK-6001	3HR	CONCRETE FLOOR - 2 HR T RATING - PILLOWS & WRAP	***SHEET 15***
W-L-6001	1 & 2 HR	GYPSUM WALL - SEALANT & BACKING	***SHEET 16***
W-L-6005	1 & 2 HR	GYPSUM WALL - PILLOWS	***SHEET 16***
DUCT PENETRATIONS (WITHOUT DAMPERS)			
C-AJ-7027	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 60" X 36" DUCT - SEALANT & BACKING + RETAINING ANGLES	***SHEET 16***
C-AJ-7143	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 60" X 36" DUCT - INSULATED - SEALANT & BACKING + RETAINING ANGLES	***SHEET 16***
C-AJ-7023	2 & 3 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - MAX 24" DIA. ROUND DUCT - SEALANT & BACKING	***SHEET 16***
W-J-7092	2 HR	CONCRETE/BLOCK WALL - MAX 92" X 96" DUCT - OPTIONAL INSULATION - FYREFLANGE GASKET	***SHEET 16***
W-L-7025	1 & 2 HR	GYPSUM WALL - MAX 100" X 100" DUCT - SEALANT & RETAINING ANGLES	***SHEET 17***
W-L-7026	1 & 2 HR	GYPSUM WALL - MAX 24" DIA. ROUND DUCT - SEALANT ONLY	***SHEET 17***
W-L-7029	1 & 2 HR	GYPSUM WALL - MAX 24" X 24" DUCT - SEALANT ONLY	***SHEET 17***
W-L-7145	1 & 2 HR	GYPSUM WALL - INSULATED RECTANGULAR DUCT - SEALANT & BACKING	***SHEET 17***
W-L-7179	1 & 2 HR	GYPSUM WALL - INSULATED ROUND DUCT - SEALANT ONLY	***SHEET 17***
W-L-7099	1 & 2 HR	GYPSUM WALL - INSULATED GREASE DUCT - SEALANT & BACKING	***SHEET 17***
W-L-7066	1 & 2 HR	GYPSUM SHAFT WALL - MAX 6" DIA. ROUND DUCT THRU SLEEVE - SEALANT & BACKING	***SHEET 18***
W-L-7090	1 & 2 HR	GYPSUM SHAFT WALL - MAX 8" X 8" DUCT, NO SLEEVE - SEALANT & BACKING	***SHEET 18***
W-L-7252	1 & 2 HR	GYPSUM SHAFT WALL - MAX 12" X 12" DUCT THRU SLEEVE - SEALANT & BACKING	***SHEET 18***
W-L-7238	1 & 2 HR	GYPSUM SHAFT WALL - MAX 24" X 40" DUCT, NO SLEEVE - FYREFLANGE GASKET	***SHEET 18***
W-L-7253	1 & 2 HR	GYPSUM SHAFT WALL - STEEL STRUT, CHANNEL, CABLE OR THREADED ROD	***SHEET 18***
LARGE OPENINGS & MIXED PENETRANTS			
C-AJ-8113	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - SEALANT & BACKING	***SHEET 19***
C-AJ-8093	2 & 3 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - PILLOWS	***SHEET 19***
W-L-8026	1 & 2 HR	GYPSUM WALL - SEALANT & BACKING	***SHEET 20***
W-L-8050	1 & 2 HR	GYPSUM WALL - PILLOWS	***SHEET 20***
ELECTRICAL & UTILITY BOXES			
C-AJ-1217	2 HR	CONCRETE FLOOR OR CONCRETE/BLOCK WALL - PULL OR JUNCTION BOX - SEALANT	***SHEET 20***
CLIV.R14288	1 & 2 HR	GYPSUM WALL - ELEC BOX - PUTTY PADS OR ELEC BOX INSERTS	***SHEET 21***
W-L-1448	1 & 2 HR	GYPSUM WALL - PULL OR JUNCTION BOX - SEALANT	***SHEET 21***
W-L-7307	1 & 2 HR	GYPSUM WALL - ELEC, UTILITY OR MED GAS VALVE BOX - E-WRAP	***SHEET 21***
CIRCUIT INTEGRITY			
STI/AF 120-01	1 & 2 HR	MIN 1" STEEL CONDUIT - E-WRAP	***SHEET 21***
FUEL LINE PROTECTION			
FP-3	2 HR	1" - 4" STEEL PIPE - E-WRAP	***SHEET 22***
FP-4	2 HR	3" - 4" OUTER CONTAINMENT PIPE - E-WRAP	***SHEET 22***
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 22***

UL FIRE RESISTANCE DIRECTORY NOMENCLATURE

Through Penetrations

First letter represents what is being penetrated:

F = Floor
W = Wall
C = Floors or Walls (combined)

Second letter(s) provide more information about the floor or wall:

A = Concrete Floors with a min thickness that is 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

Four digit number describes the penetrating item(s):

0000-0999 = Blank Openings
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

Example: C-AJ-1150

C = Floor or Wall Penetration
A = Concrete Floor that is 5" or less
J = Concrete or Masonry Walls that are 8" or less
1150 = Metal Pipe, Conduit, or Tubing

Joint Systems

First letter identifies the type joint:

CJ = Floor
FF = Wall
WW = Floors or Walls (combined)
FW = Floor to Wall
HW = Head to Wall
BW = Bottom of Wall

Second letter(s) provide more information about the floor or wall:

S = No Movement (Static)
D = Allows Movement (Dynamic)

Four digit number describes the joint width:

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"

Example: HW-D-0757

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 - HEALTHCARE FACILITY

Specified Technologies Inc.
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Toll Free: (800)992-1180
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STI.

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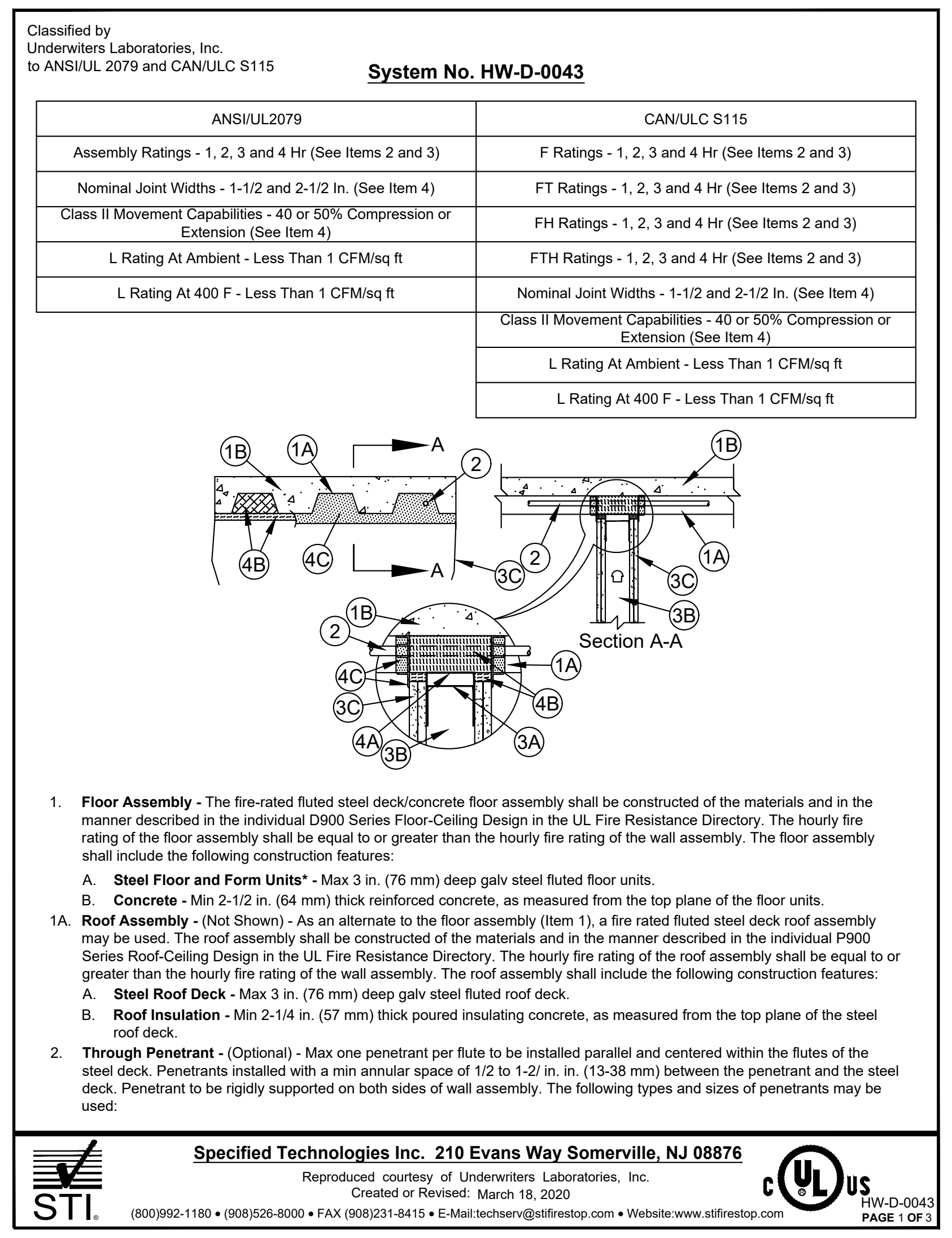
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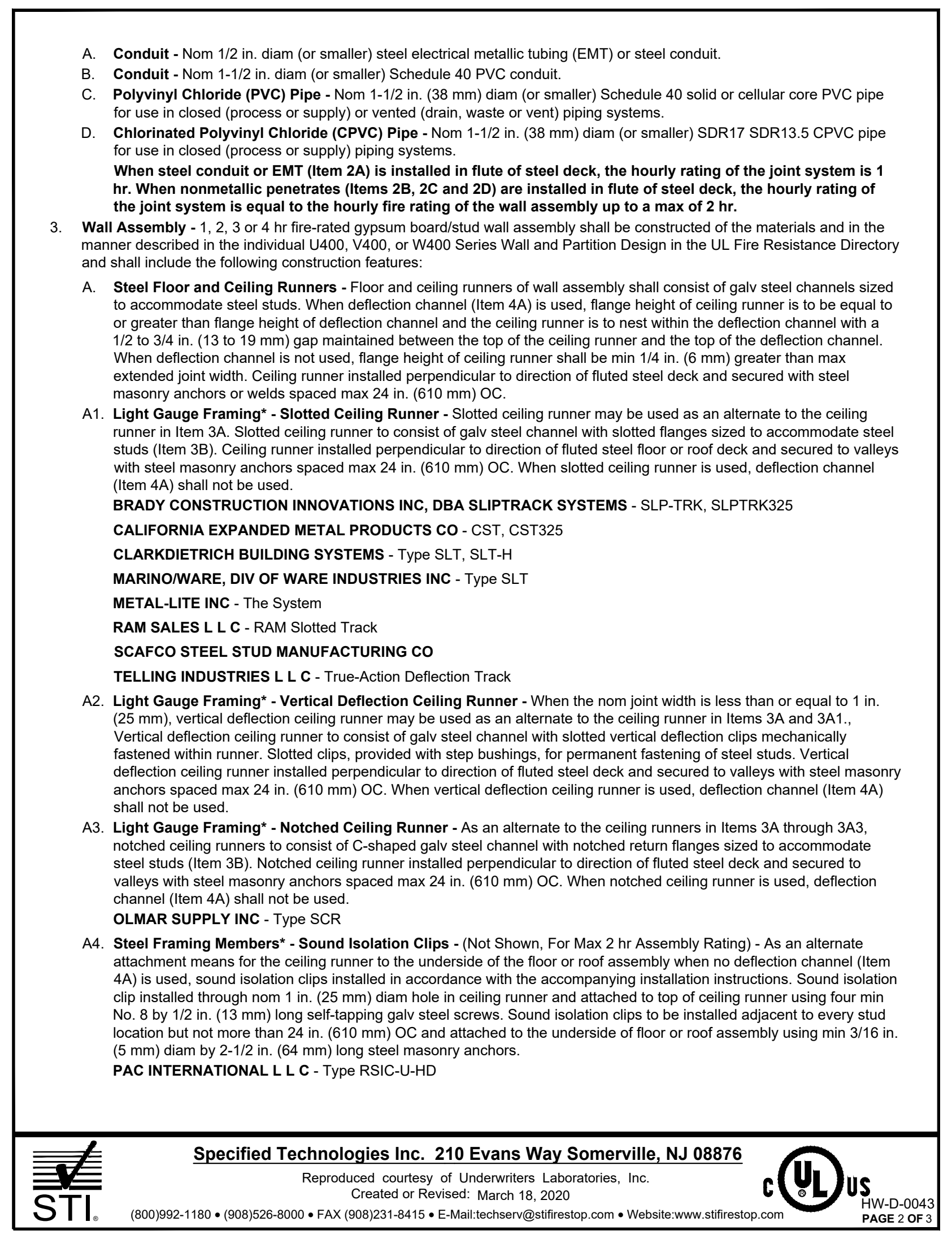

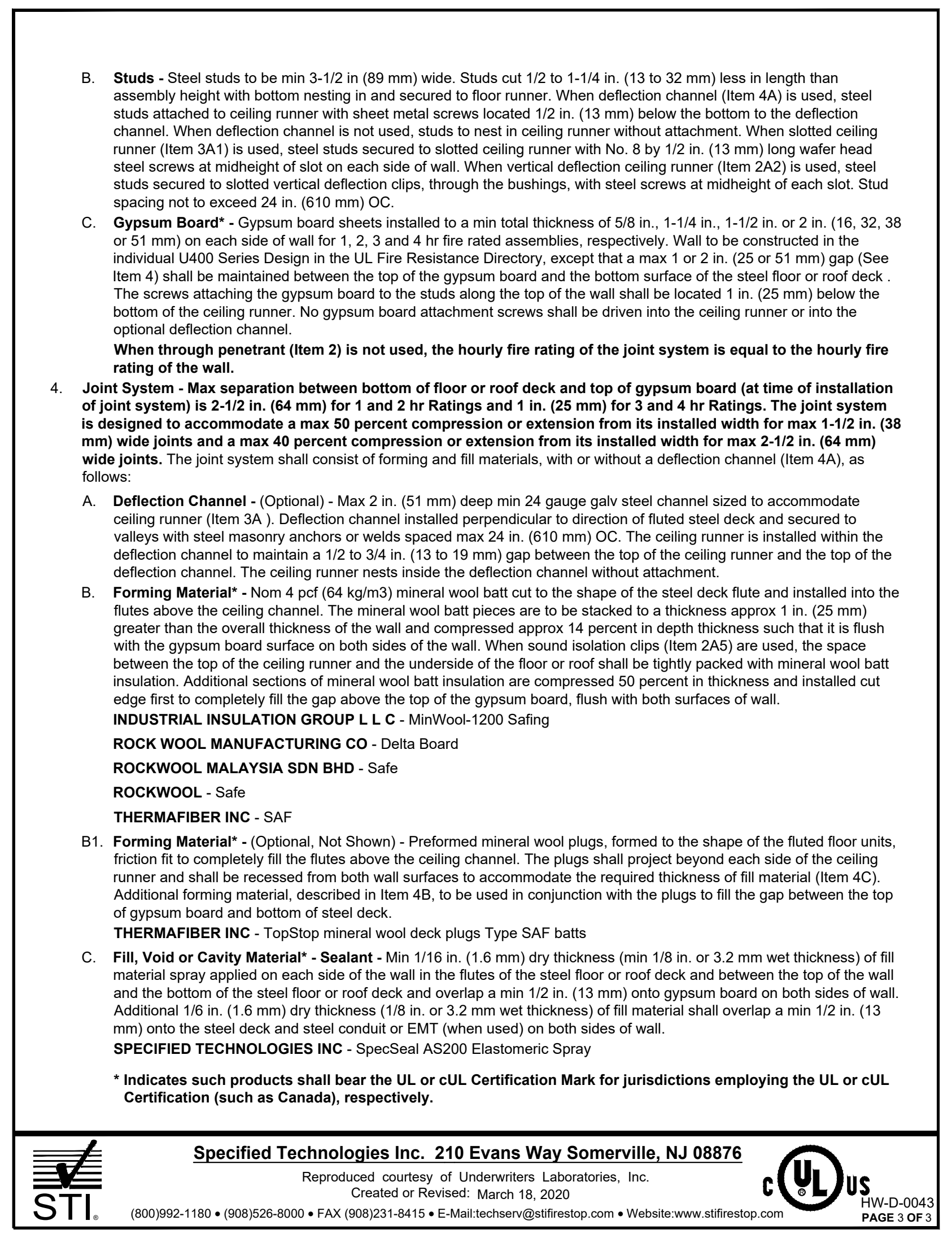

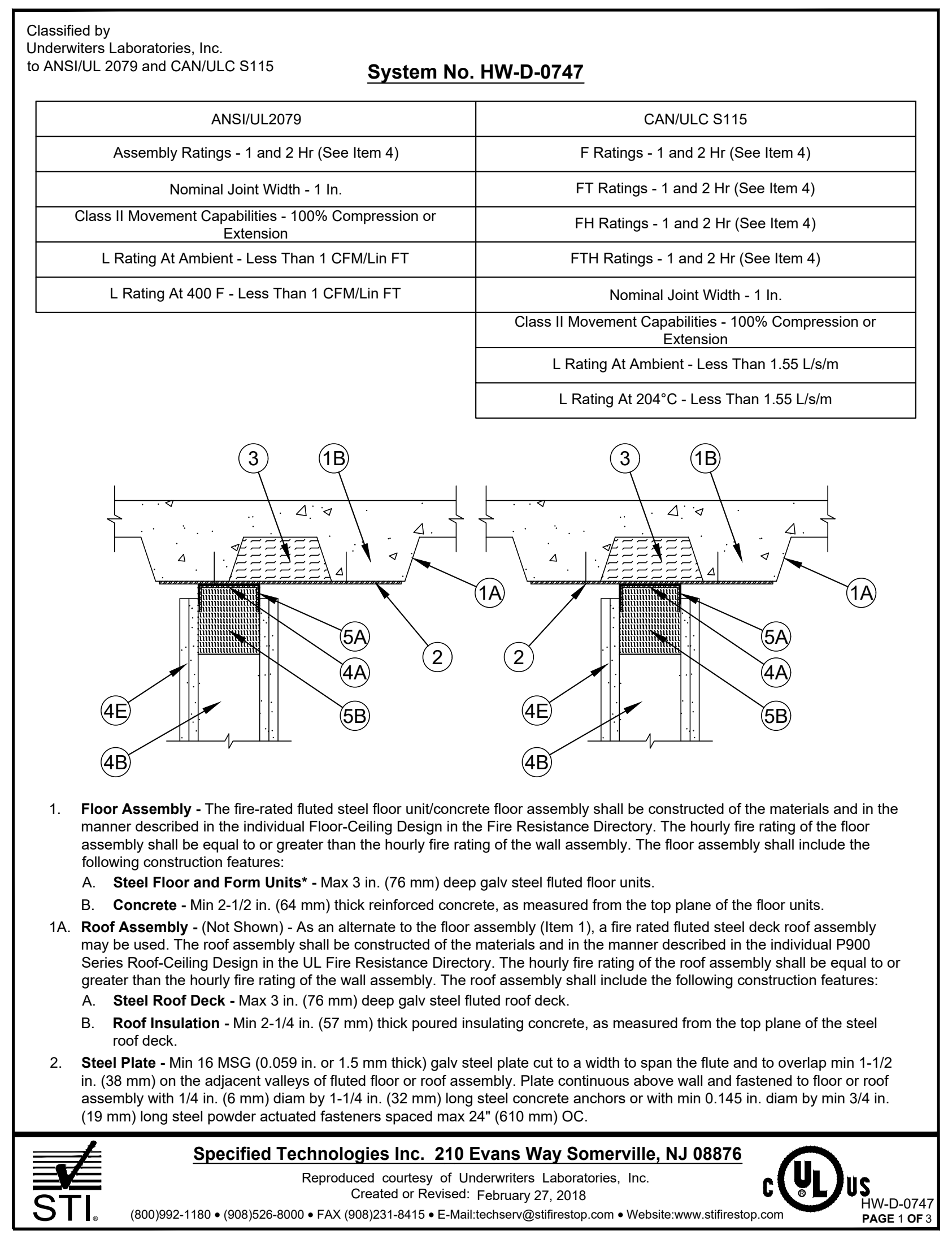
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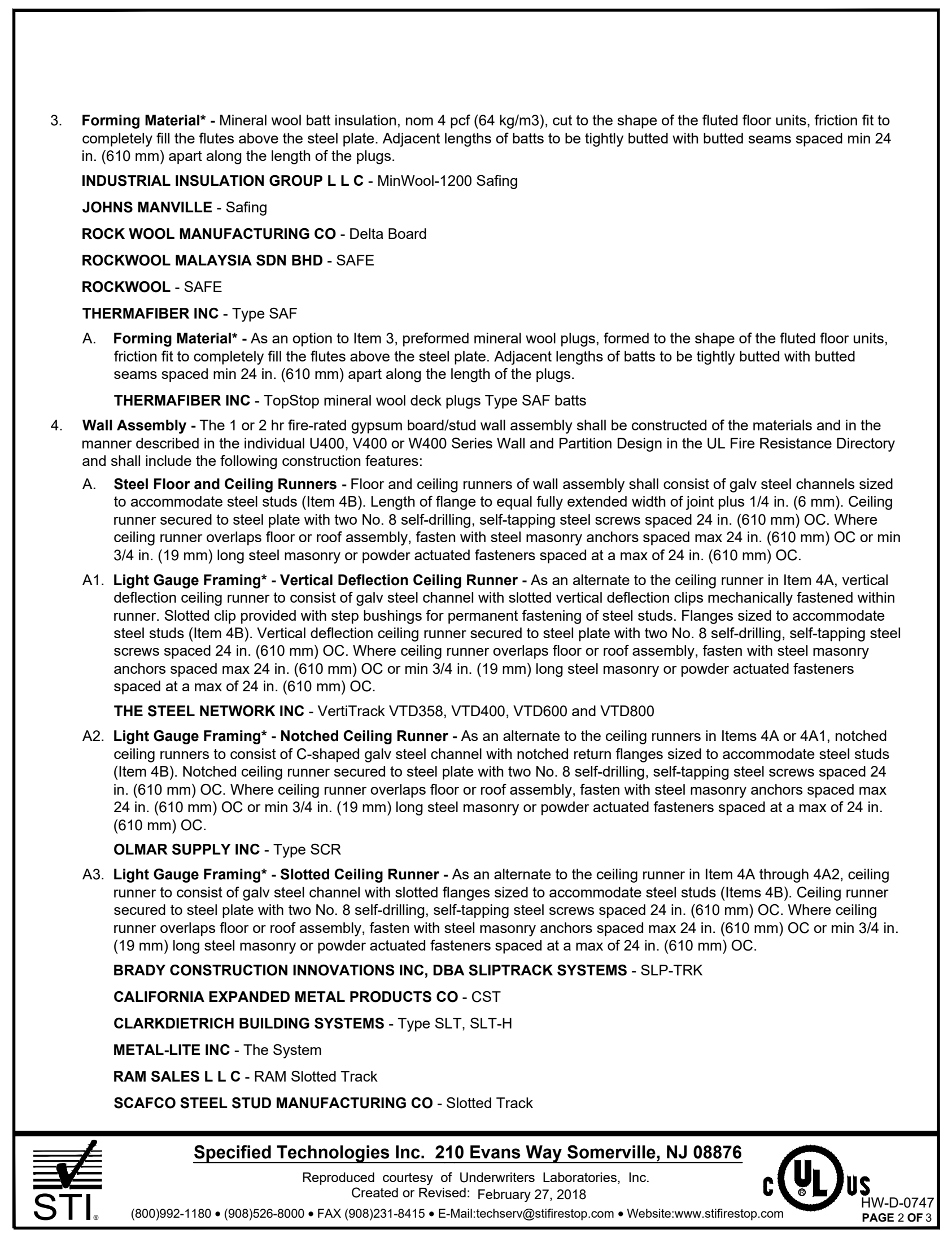

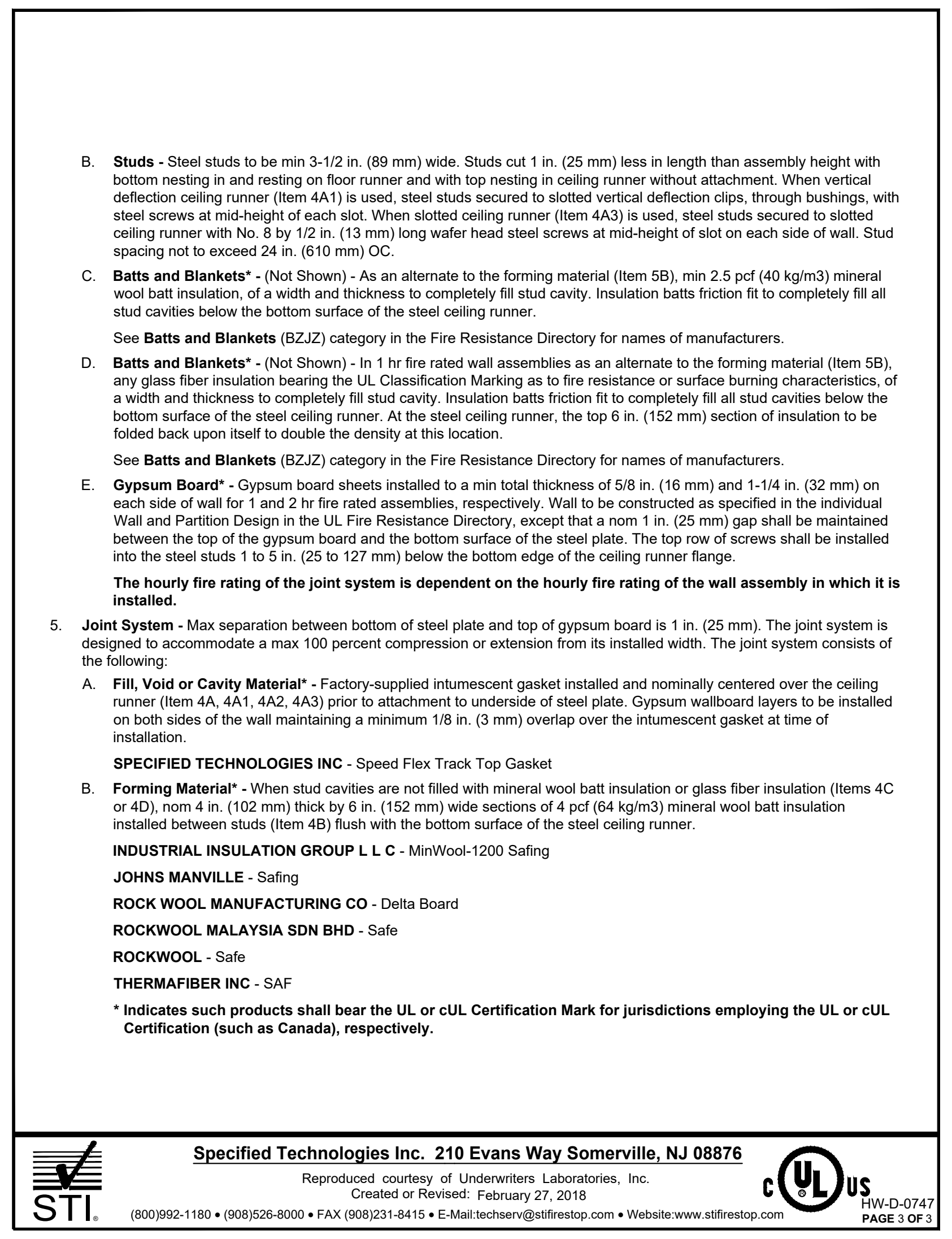

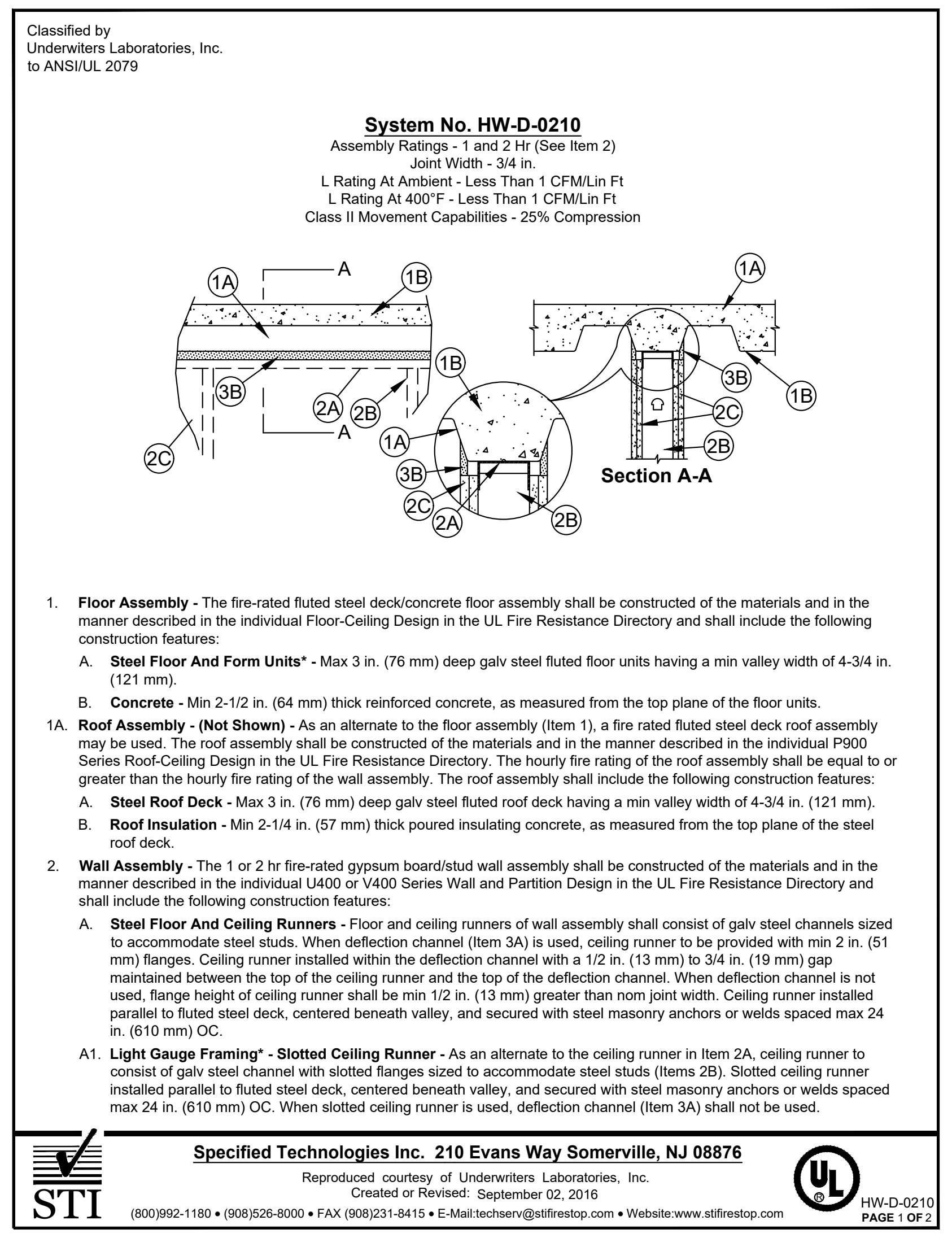
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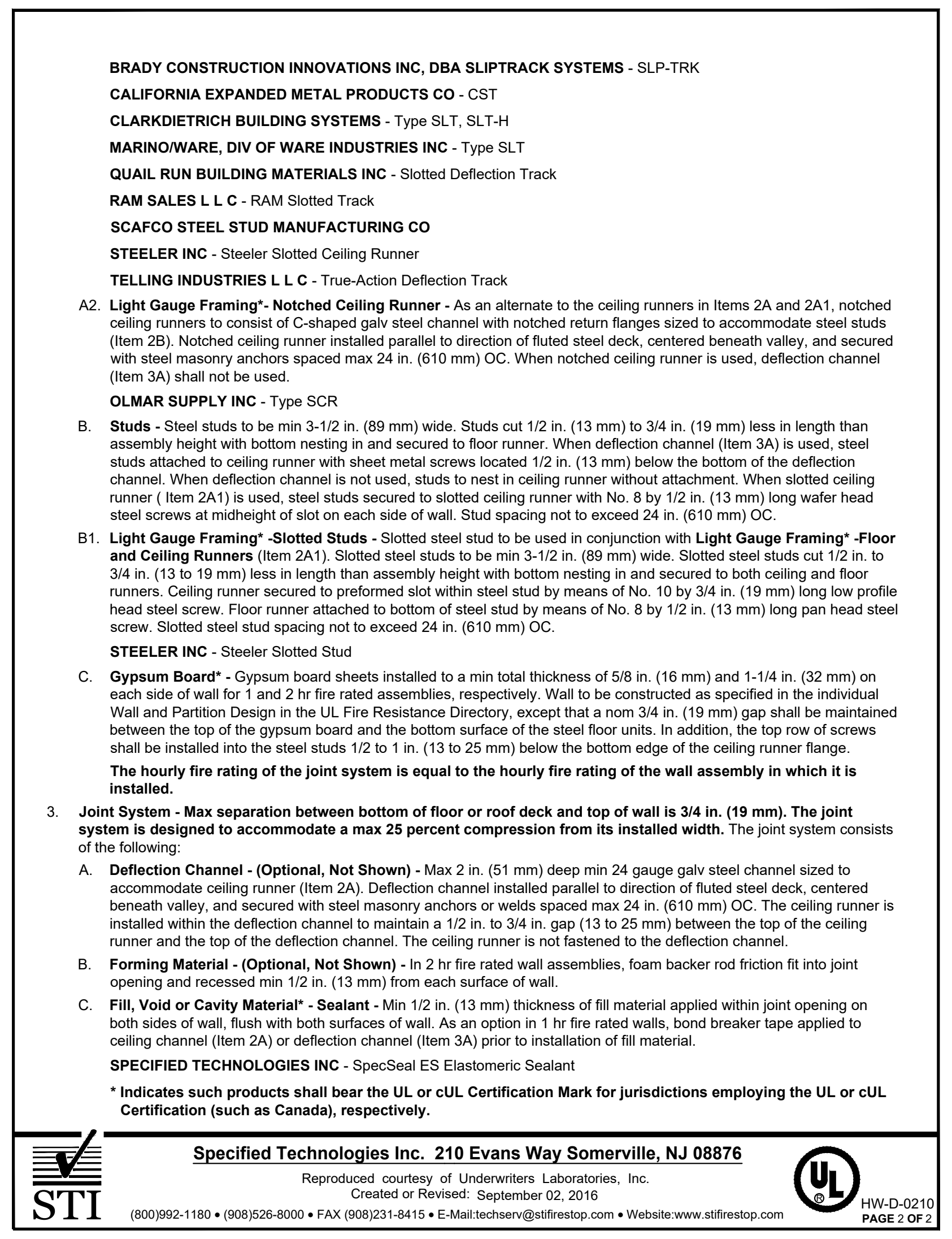

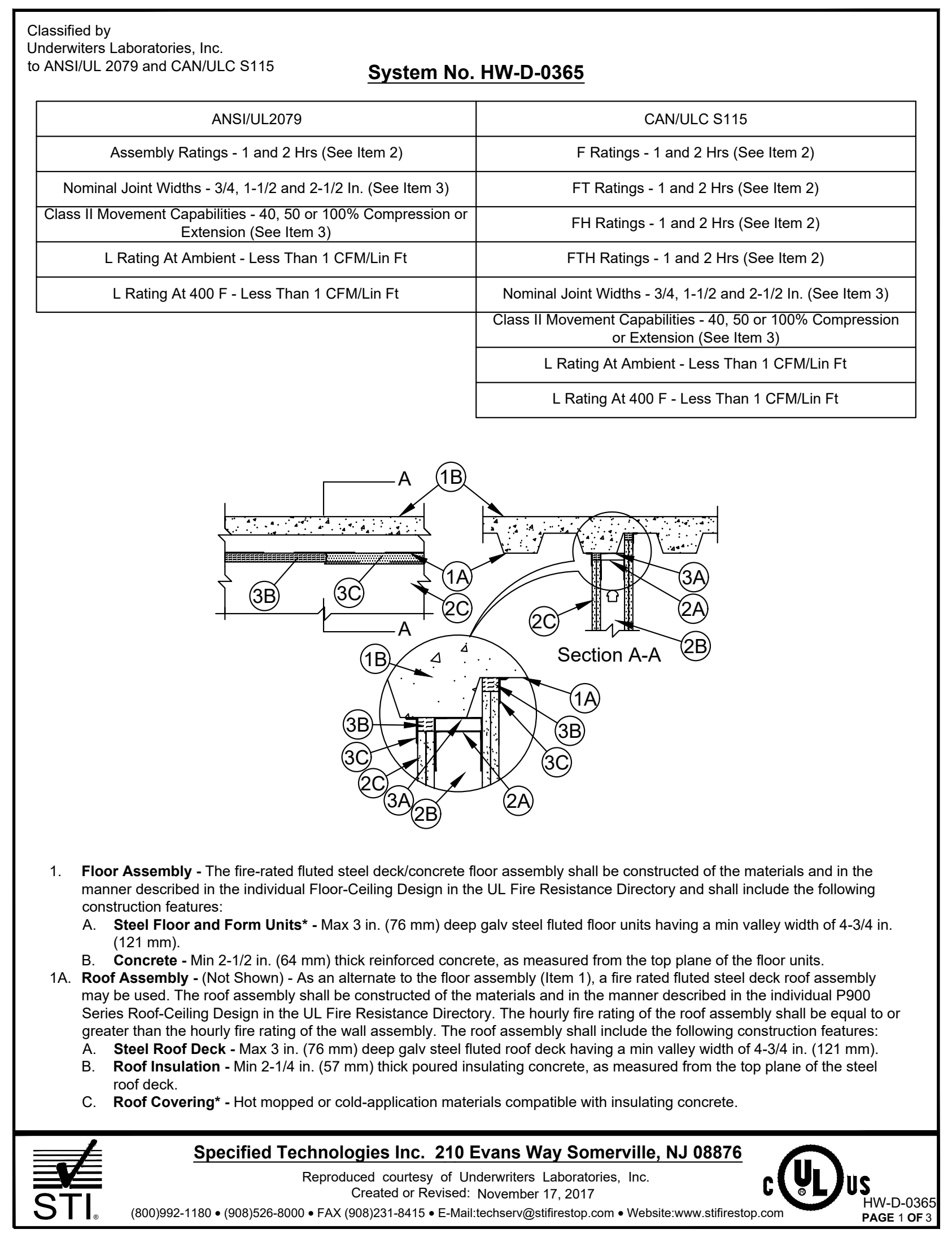
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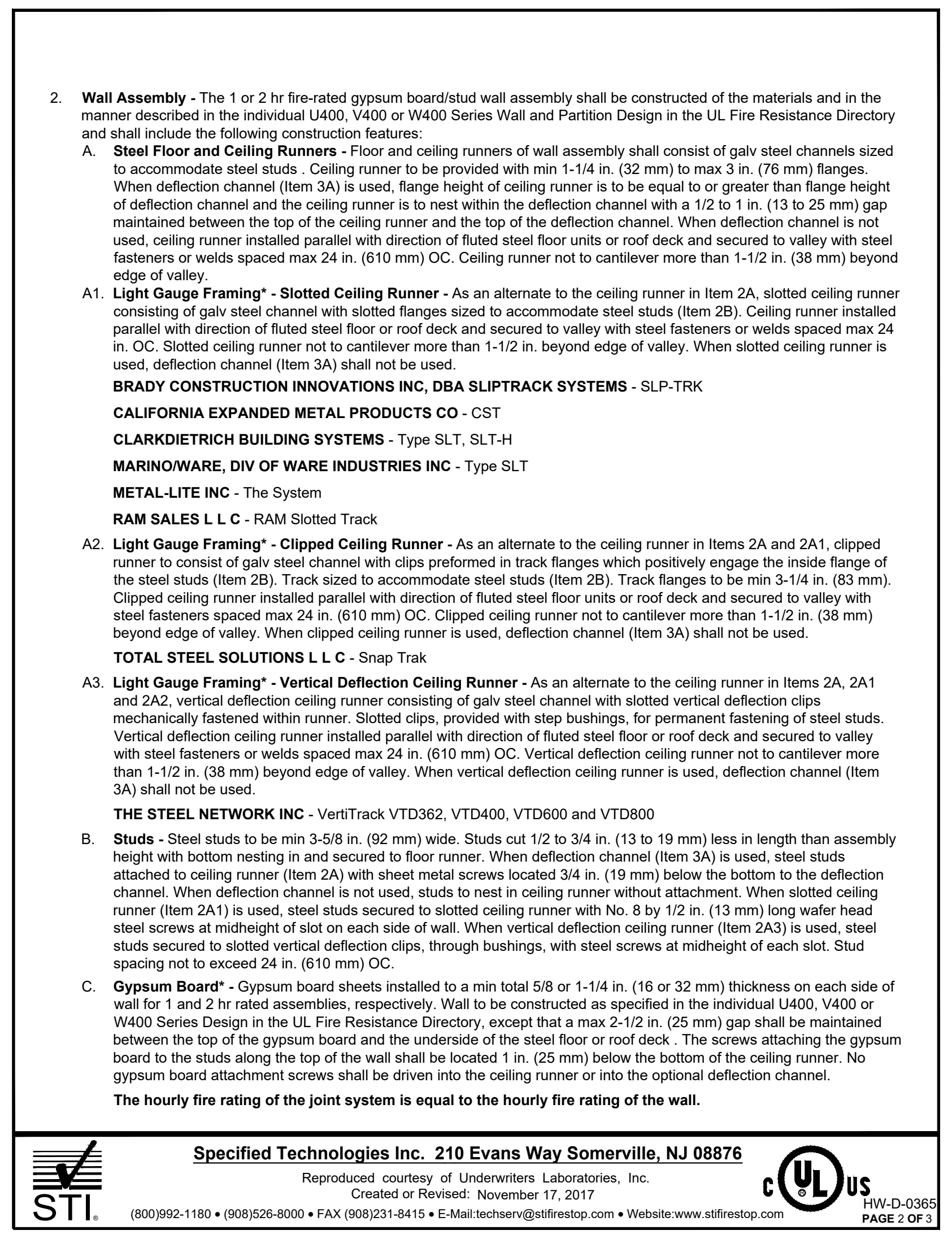

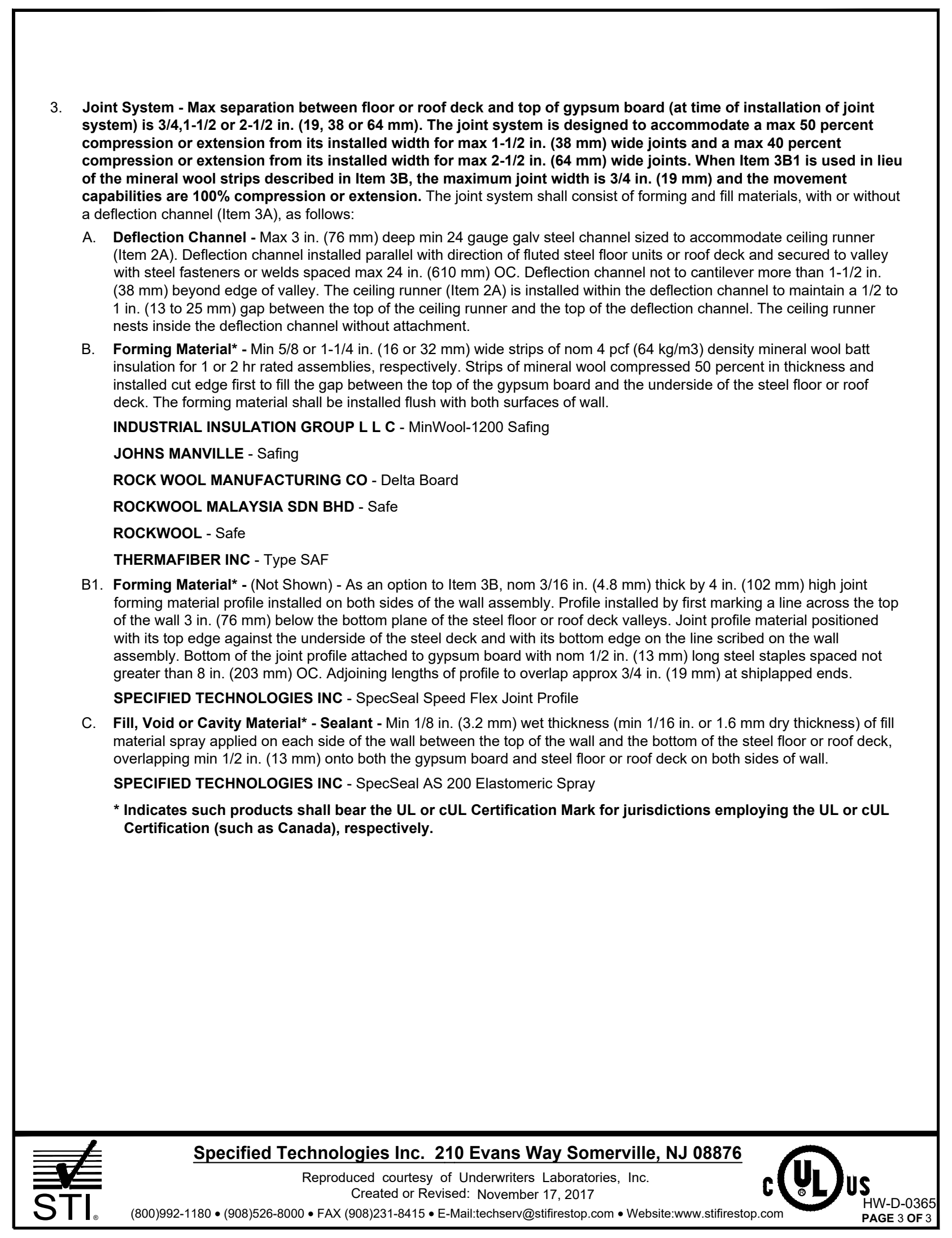

GENERAL NOTES:

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.

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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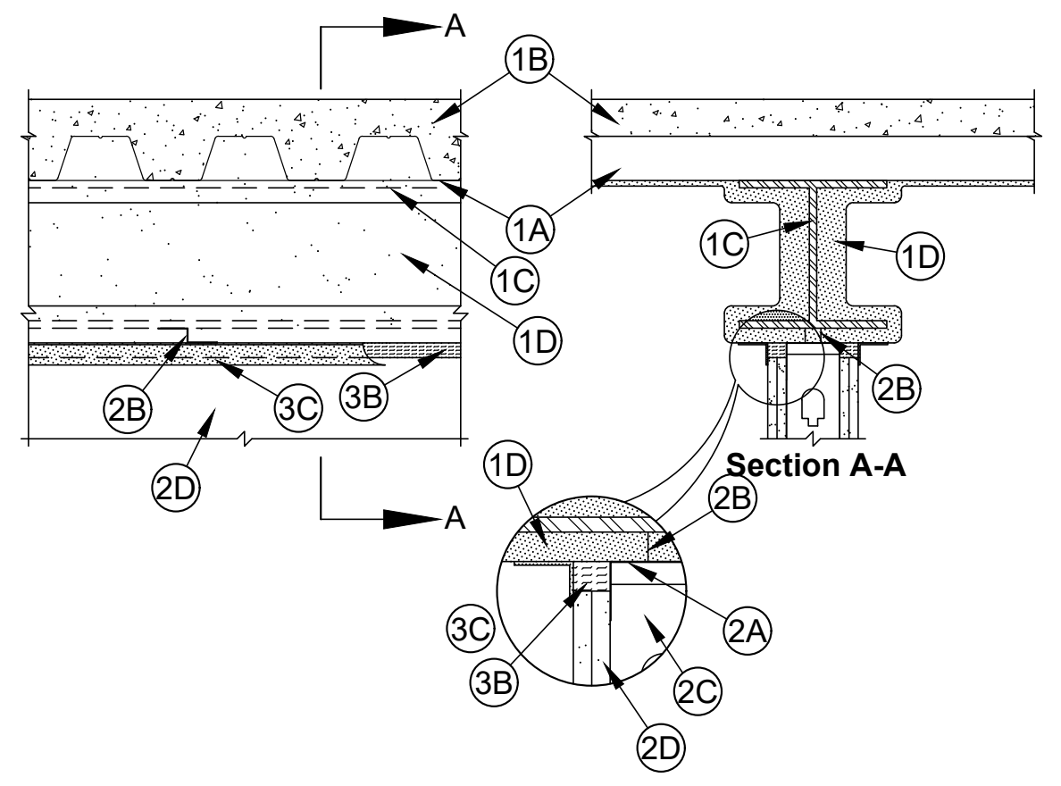
Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 2079 and CAN/ULC S115

System No. HW-D-0252

ANSI/UL2079	CAN/ULC S115
Assembly Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
Nominal Joint Width - 3/4 or 1-1/2 in. (See Item 3).	FT Ratings - 1 and 2 Hr (See Item 1)
Class II Movement Capabilities - 50% or 100 % Compression or Extension (See Item 3)	FH Ratings- 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft	FTH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	Nominal Joint Width - 3/4 or 1-1/2 in. (See Item 3)
	Class II Movement Capabilities - 50% or 100 % Compression or Extension (See Item 3)
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



1. **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 D700, D800, or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   - A. **Steel Floor And Floor 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.
   - C. **Structural Steel Support -** Steel beam, as specified in the individual D700, D800, or D900 Series Floor-Ceiling Design, used to support steel floor units. Steel beam centered over and parallel with wall assembly.

- 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
- D1. **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

2. **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 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 galv 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
   - B. **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.
   - C. **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.

   - D. **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 in accordance with the individual U400 or V400 Series Design in the UL Fire Resistance Directory, except that a max 1 in. (25 mm) high gap shall be maintained between the top of the gypsum board and the bottom plane of the spray applied fire resistive material on the structural steel support member. 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.

3. **Joint System - Max separation between spray applied fire resistive material on bottom of structural support member and top of gypsum board (at time of installation of joint system) is 3/4 or 1-1/2 in. (19 or 38 mm). The joint system is designed to accommodate a max 50 or 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. When Item 3B1 is used in lieu of the strips of mineral wool 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 -** (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 with and centered beneath bottom flange of steel beam (Item 1C) and secured to steel beam with steel clips (Item 2B) spaced max 16 in. (406 mm) OC. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1/2 in. (13 mm) to 3/4 in. (19 mm) gap between the top of the ceiling runner and the top of the deflection channel. 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. The ceiling runner nests inside the deflection channel without attachment.
   - B. **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 gypsum board. 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 both the underside of the spray-applied fire-resistive material 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 or 1/16 in. (1.6 mm) dry thickness of fill material spray applied over the forming material on each side of the wall. Fill material to overlap min 1/2 in. (13 mm) onto gypsum board and min 2 in. onto the spray applied material (Item 1D) on the steel beam on both sides of wall.

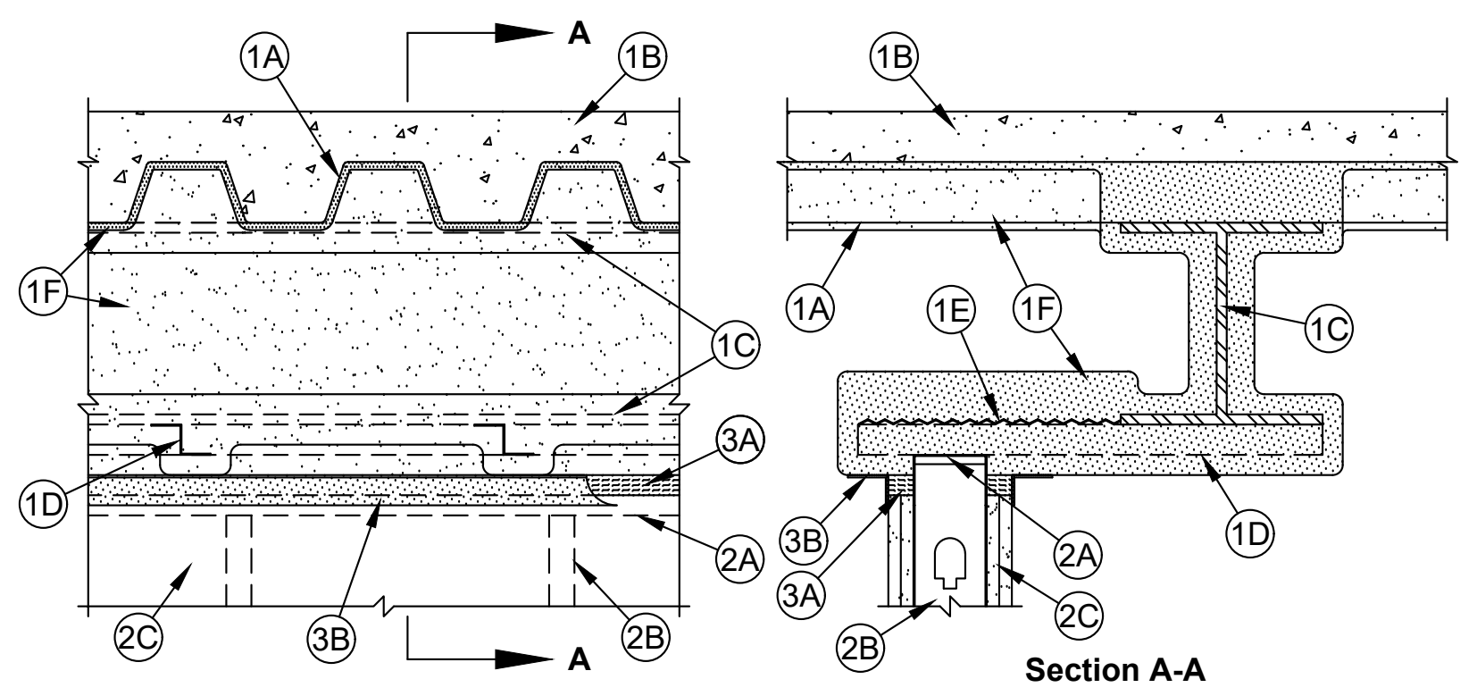
     SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray

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

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 2079 and CAN/ULC S115

System No. HW-D-0617

ANSI/UL2079	CAN/ULC S115
Assembly Ratings - 1 and 2 Hr (See Items 1 and 2)	F Ratings - 1 and 2 Hr (See Items 1 and 2)
Maximum Joint Width - 3/4 or 1-1/2 In. (See Item 3)	FT Ratings - 1 and 2 Hr (See Items 1 and 2)
Class II or III Movement Capabilities - 25%, 50% or 100%Compression or Extension (See Item 3)	FH Ratings - 1 and 2 Hr (See Items 1 and 2)
L Rating At Ambient - Less Than 1 CFM/sq ft	FTH Ratings - 1 and 2 Hr (See Items 1 and 2)
L Rating At 400 F - Less Than 1 CFM/sq ft	Maximum Joint Width - 3/4 or 1-1/2 In. (See Item 3)
	Class II or III Movement Capabilities - 25%, 50% or 100%Compression or Extension (See Item 3)
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



1. **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 D700 or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   - A. **Steel Floor And Floor Units* -** Max 3 in. (76 mm) deep galv steel fluted floor units.
   - B. **Concrete -** Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete, as measured from the top plane of the floor units.
   - C. **Structural Steel Support -** Steel beam, as specified in the individual D700 or D900 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 (Item 1F) 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 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 assembly.

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 features:
   - 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).

   - F. **Spray-Applied Fire Resistive Material* -** After installation of steel attachment clip and steel lath (Items 1AD and 1AE) surfaces of the roof deck to be sprayed with the thickness of material specified in the individual P700 Series Design. For P900 Series Designs structural steel supports, steel attachment clip and steel lath only to be sprayed in accordance with the specifications in the individual P900 Series Design. The flutes of the steel roof deck are to be filled with material across the entire top flange of the steel beam. Each bar or channel attachment clips (Item 1AD) 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.

     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 assembly.

2. **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.
   - C. **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.

3. **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:

   - A. **Forming Material* -** Nom 4 pcf (64 kg/m3) density mineral wool batt insulation. Sections of mineral wool batt cut to a thickness equal to the overall thickness of gypsum board and compressed a min of 50 percent into the gap 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.

     INDUSTRIAL INSULATION GROUP L L C - MinWool-1200 Safing

     JOHNS MANVILLE - Safing

     ROCK WOOL MANUFACTURING CO - Delta Safing Insulation

     ROCKWOOL MALAYSIA SDN BHD - SAF Mineral Wool

     ROCKWOOL - SAF Mineral Wool

     THERMAFIBER INC - Type SAF
   - A1. **Forming Material* -** (Not Shown) - As an option to Item 3A, 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 both the underside of the spray-applied fire-resistive material 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 rabbeted ends.

     SPECIFIED TECHNOLOGIES INC - SpecSeal Speed Flex Joint Profile
   - B. **Fill, Void or Cavity Material* - Sealant -** A min 1/8 in. (3 mm) wet thickness (min 1/16 in. or 1.6 mm dry thickness) of fill material applied on each side of wall to completely cover forming material and to overlap min 1/2 in. (13 mm) onto wall and min 2 in. (51 mm) onto spray-applied fire resistive material.

     SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray
   - C. **Fill, Void or Cavity Material* - Sealant -** (Not Shown) - As an alternate to Items 3A and 3B, min 5/8 in. (16 mm) depth of sealant applied within joint flush with each side of wall.

     SPECIFIED TECHNOLOGIES INC - SpecSeal ES Sealant

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

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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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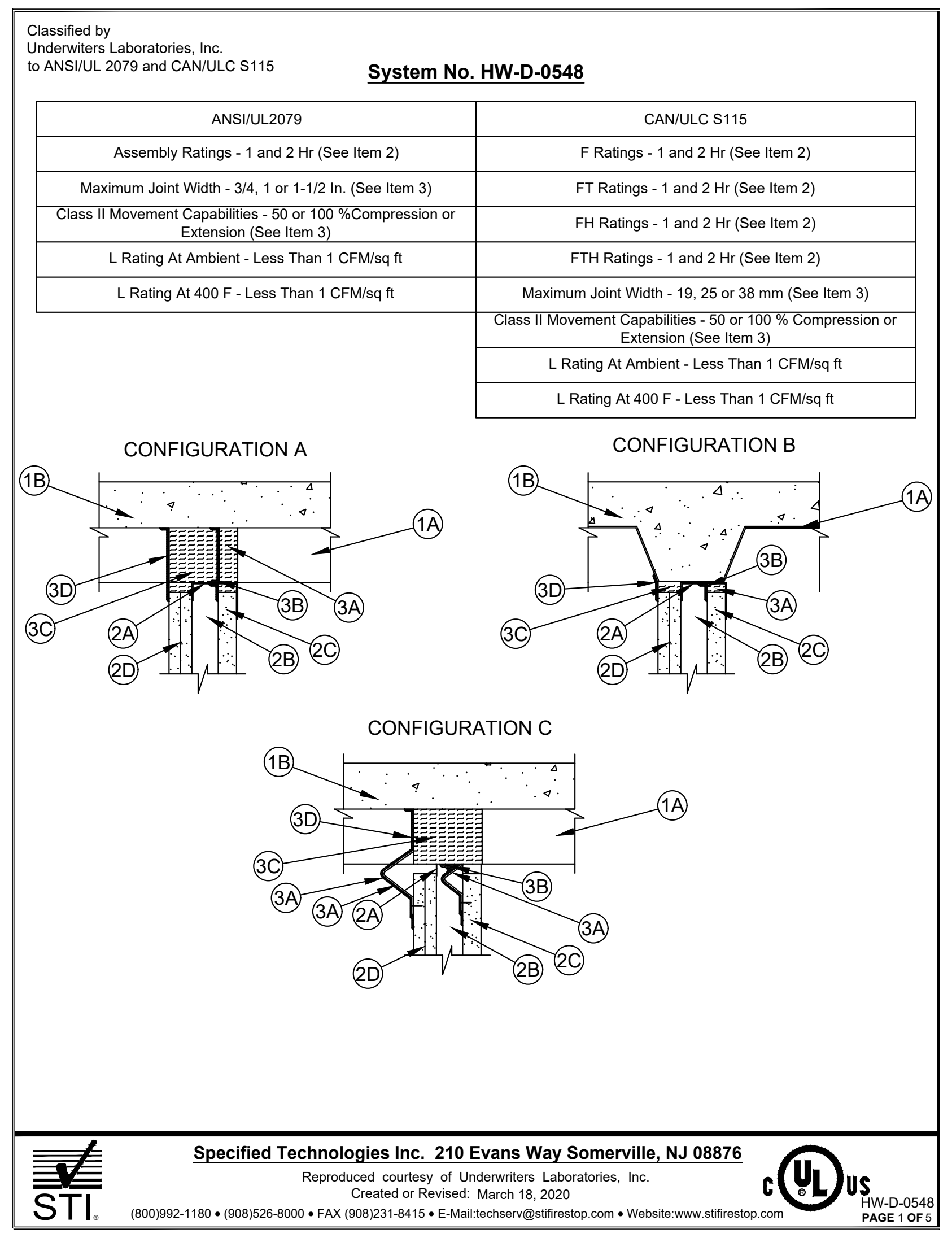

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 2079 and CAN/ULC S115

System No. HW-D-0548

ANSI/UL2079	CAN/ULC S115
Assembly Ratings - 1 and 2 Hr (See Item 2)	F Ratings - 1 and 2 Hr (See Item 2)
Maximum Joint Width - 3/4, 1 or 1-1/2 In. (See Item 3)	FT Ratings - 1 and 2 Hr (See Item 2)
Class II Movement Capabilities - 50 or 100 %Compression or Extension (See Item 3)	FH Ratings - 1 and 2 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/sq ft	FTH Ratings - 1 and 2 Hr (See Item 2)
L Rating At 400 F - Less Than 1 CFM/sq ft	Maximum Joint Width - 19, 25 or 38 mm (See Item 3)
	Class II Movement Capabilities - 50 or 100 % Compression or Extension (See Item 3)
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft

CONFIGURATION A

CONFIGURATION B

CONFIGURATION C

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876
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Created or Revised: March 18, 2020
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HW-D-0548
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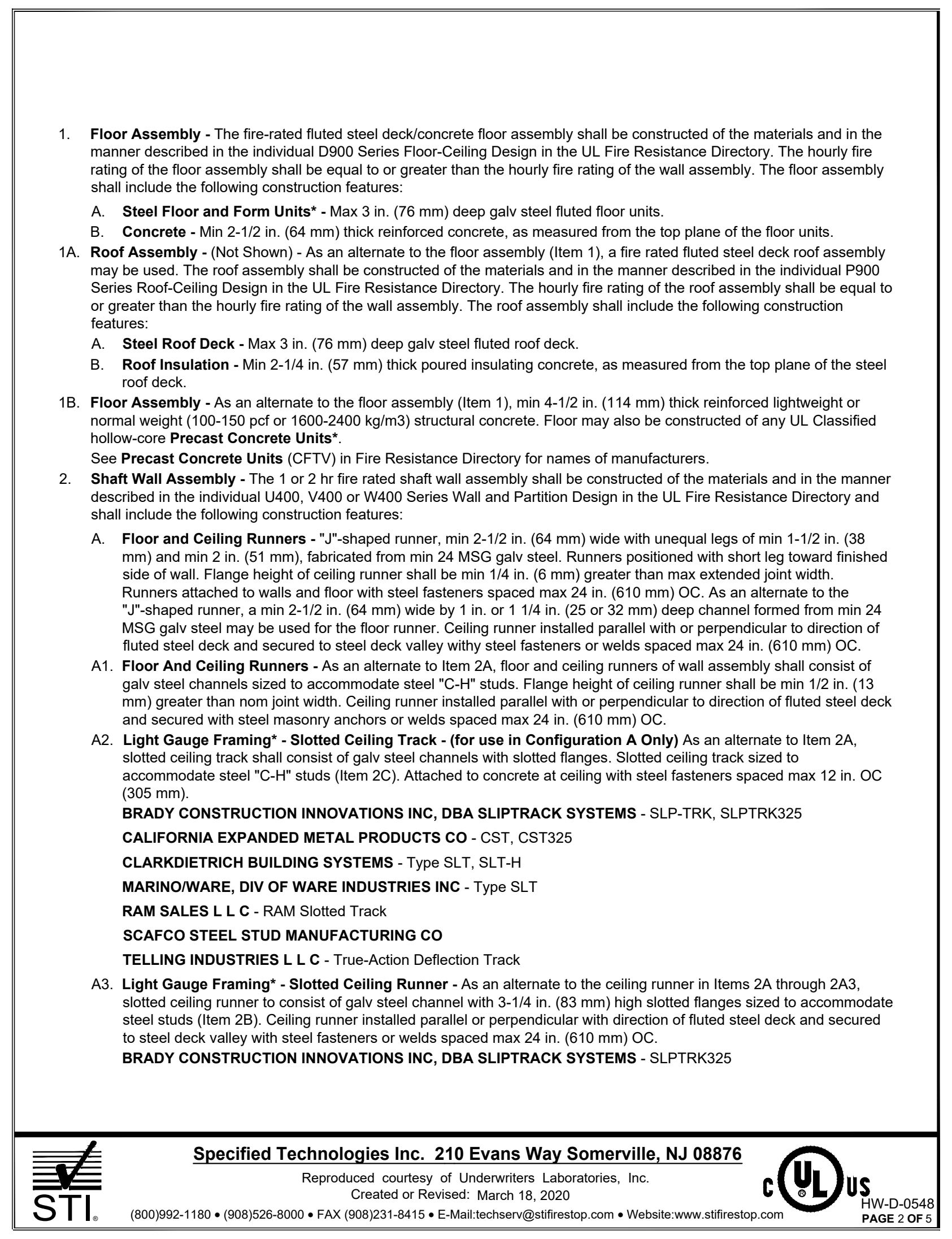

1. **Floor Assembly -** The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the floor assembly shall be equal to or 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 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 roof deck.

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.

2. **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 (305 mm).

      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
      RAM SALES L L C - RAM Slotted Track
      SCAFCO STEEL STUD MANUFACTURING CO
      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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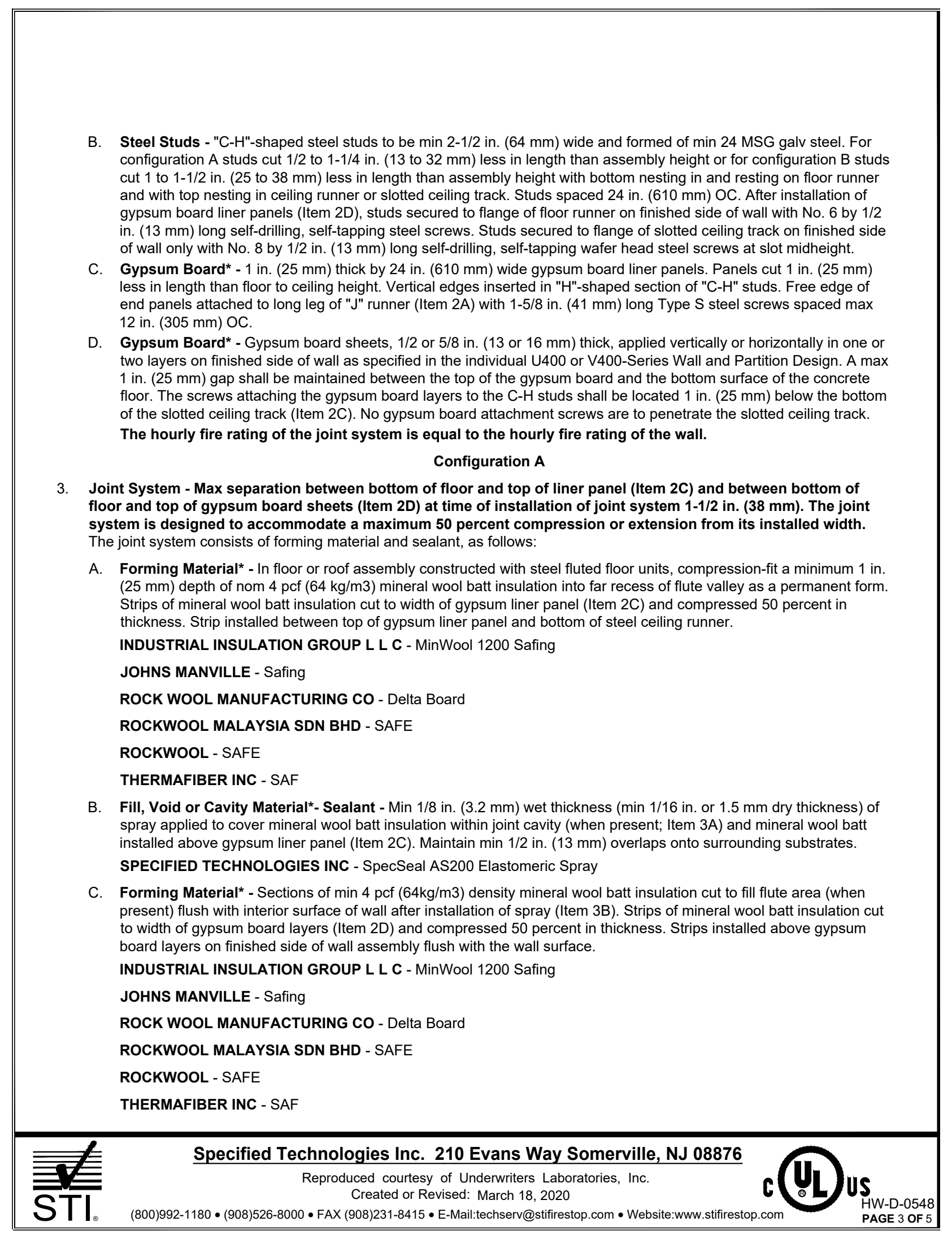

   B. **Steel Studs -** "C-H"-shaped steel studs to be min 2-1/2 in. (64 mm) wide and formed of min 24 MSG galv steel. For configuration A studs cut 1/2 to 1-1/4 in. (13 to 32 mm) less in length than assembly height or for configuration B studs cut 1 to 1-1/2 in. (25 to 38 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner or slotted ceiling track. Studs spaced 24 in. (610 mm) OC. After installation of 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 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. 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 2A) 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 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.

Configuration A

3. **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 - SAF

   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

   C. **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

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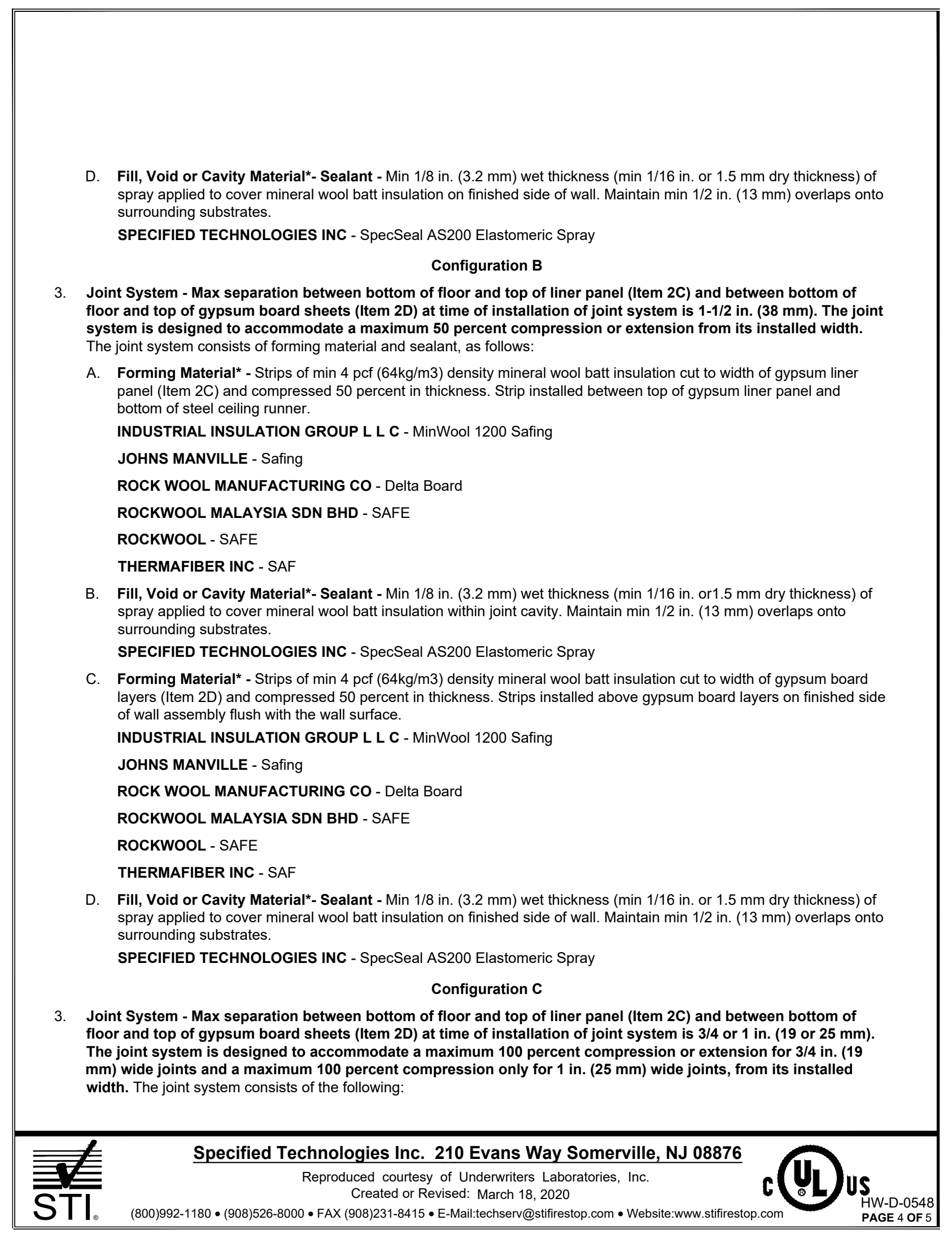

   D. **Fill, Void or Cavity Material*- Sealant -** Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or 1.5 mm dry thickness) of spray applied to cover mineral wool batt insulation on finished side of wall. Maintain min 1/2 in. (13 mm) overlaps onto surrounding substrates.

      SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray

Configuration B

3. **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 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* -** 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 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 - SAF

   B. **Fill, Void or Cavity Material*- Sealant -** Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or1.5 mm dry thickness) of spray applied to cover mineral wool batt insulation within joint cavity. Maintain min 1/2 in. (13 mm) overlaps onto 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 surrounding substrates.

      SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray

Configuration C

3. **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:

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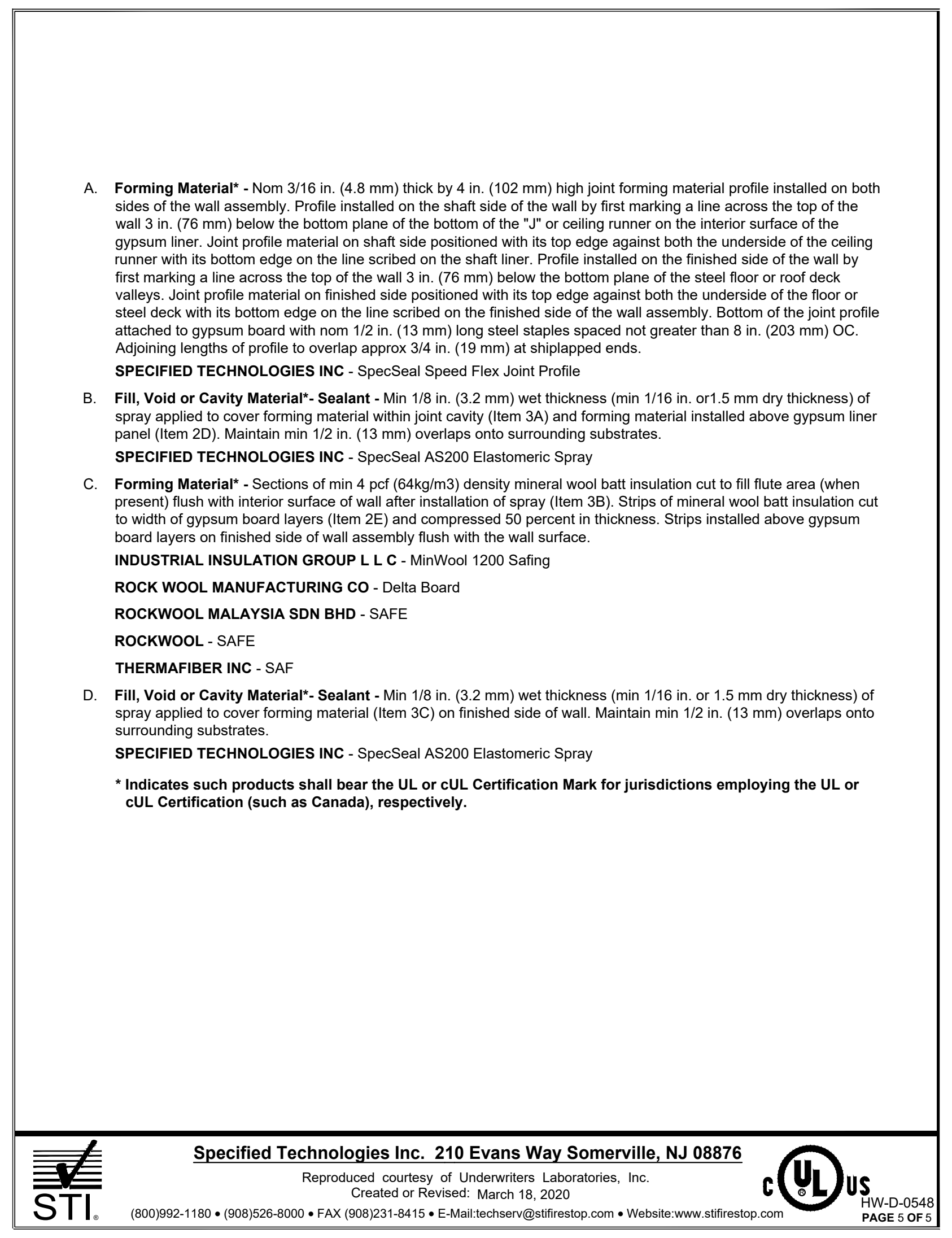

   A. **Forming Material* -** Nom 3/16 in. (4.8 mm) thick by 4 in. (102 mm) high joint forming material profile installed on both sides of the wall assembly. Profile installed on the shaft side of the wall by first marking a line across the top of the wall 3 in. (76 mm) below the bottom plane of the bottom 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 steel floor or roof deck valleys. Joint profile material on finished side positioned with its top edge against both the underside of the floor or steel deck 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 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. or1.5 mm dry thickness) of spray applied to cover forming material within joint cavity (Item 3A) and forming material installed above gypsum liner panel (Item 2D). Maintain min 1/2 in. (13 mm) overlaps onto surrounding substrates.

      SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray

   C. **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 2E) 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
      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 forming material (Item 3C) on finished side of wall. Maintain min 1/2 in. (13 mm) overlaps onto surrounding substrates.

      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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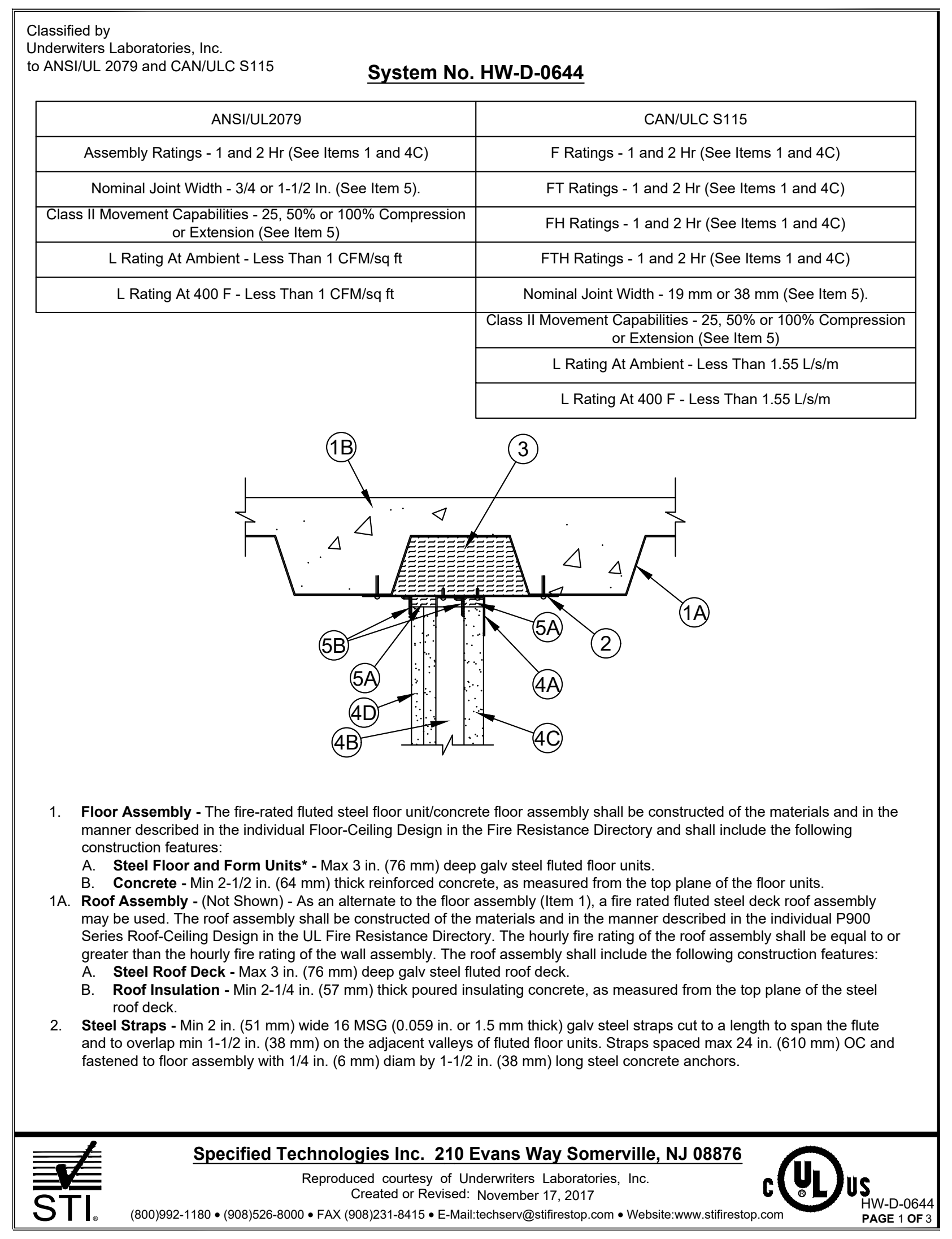

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 2079 and CAN/ULC S115

System No. HW-D-0644

ANSI/UL2079	CAN/ULC S115
Assembly Ratings - 1 and 2 Hr (See Items 1 and 4C)	F Ratings - 1 and 2 Hr (See Items 1 and 4C)
Nominal Joint Width - 3/4 or 1-1/2 In. (See Item 5).	FT Ratings - 1 and 2 Hr (See Items 1 and 4C)
Class II Movement Capabilities - 25, 50% or 100% Compression or Extension (See Item 5)	FH Ratings - 1 and 2 Hr (See Items 1 and 4C)
L Rating At Ambient - Less Than 1 CFM/sq ft	FTH Ratings - 1 and 2 Hr (See Items 1 and 4C)
L Rating At 400 F - Less Than 1 CFM/sq ft	Nominal Joint Width - 19 mm or 38 mm (See Item 5).
	Class II Movement Capabilities - 25, 50% or 100% Compression or Extension (See Item 5)
	L Rating At Ambient - Less Than 1.55 L/s/m
	L Rating At 400 F - Less Than 1.55 L/s/m

1. **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 and 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 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 roof deck.

2. **Steel Straps -** Min 2 in. (51 mm) wide 16 MSG (0.059 in. or 1.5 mm thick) galv steel straps cut to a length to span the flute and to overlap min 1-1/2 in. (38 mm) on the adjacent valleys of fluted floor units. Straps spaced max 24 in. (610 mm) OC and fastened to floor assembly with 1/4 in. (6 mm) diam by 1-1/2 in. (38 mm) long steel concrete anchors.

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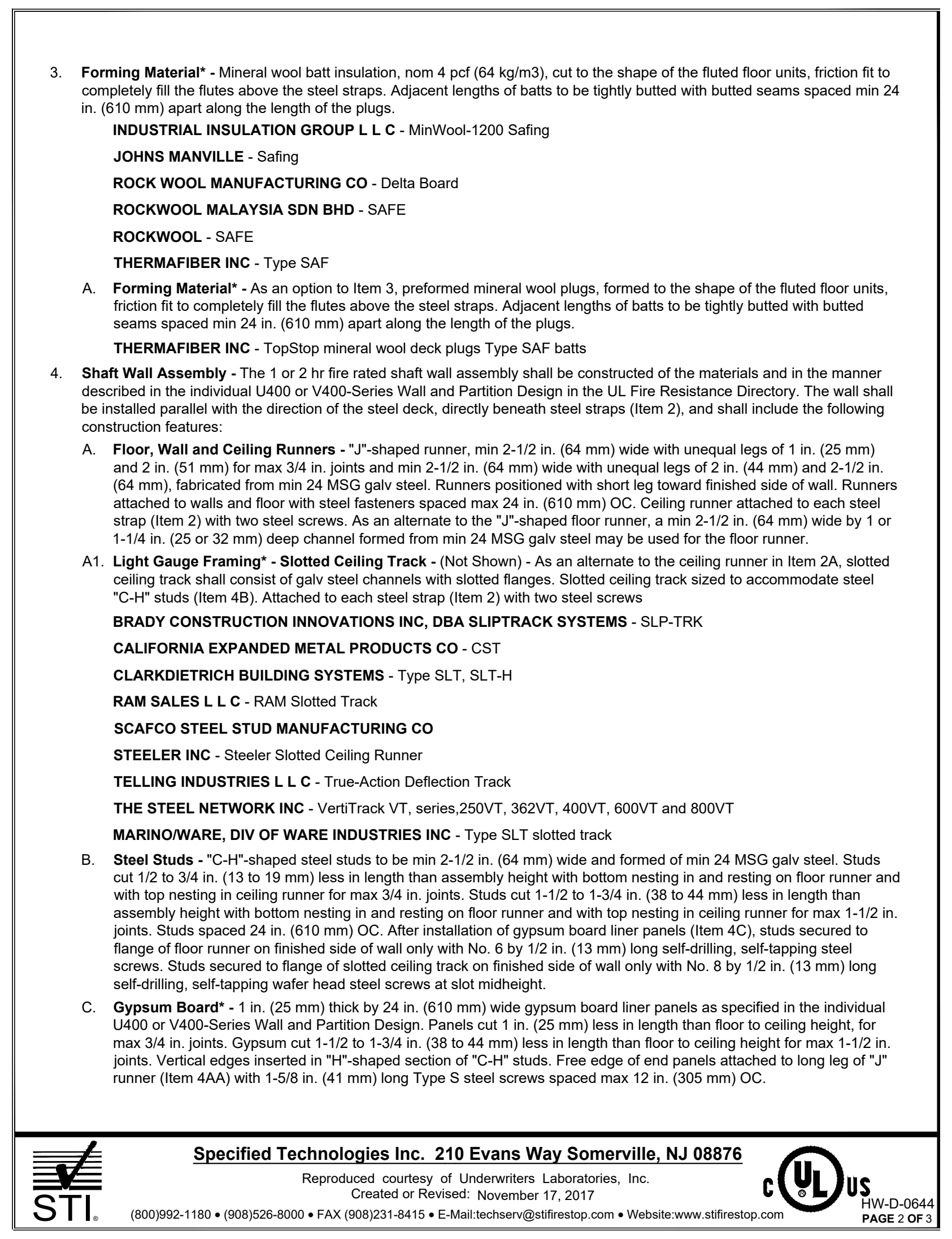

3. **Forming Material* -** Mineral wool batt insulation, nom 4 pcf (64 kg/m3), cut to the shape of the fluted floor units, friction fit to completely fill the flutes above the steel straps. Adjacent lengths of batts to be tightly butted with butted seams spaced min 24 in. (610 mm) apart along the length 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 straps. 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

4. **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 or V400-Series Wall and Partition Design in the UL Fire Resistance Directory. The wall shall be installed parallel with the direction of the steel deck, directly beneath steel straps (Item 2), and 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) for max 3/4 in. joints and min 2-1/2 in. (64 mm) wide with unequal legs of 2 in. (44 mm) and 2-1/2 in. (64 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. Ceiling runner attached to each steel strap (Item 2) with two steel screws. 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 for the floor runner.
   A1. **Light Gauge Framing* - Slotted Ceiling Track -** (Not Shown) - As an alternate to the 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 (Item 4B). Attached to each steel strap (Item 2) with two steel screws

      BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS - SLP-TRK
      CALIFORNIA EXPANDED METAL PRODUCTS CO - CST
      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 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner for max 3/4 in. joints. Studs cut 1-1/2 to 1-3/4 in. (38 to 44 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner for max 1-1/2 in. joints. Studs spaced 24 in. (610 mm) OC. After installation of gypsum board liner panels (Item 4C), 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, for max 3/4 in. joints. Gypsum cut 1-1/2 to 1-3/4 in. (38 to 44 mm) less in length than floor to ceiling height for max 1-1/2 in. joints. Vertical edges inserted in "H"-shaped section of "C-H" studs. Free edge of end panels attached to long leg of "J" runner (Item 4AA) with 1-5/8 in. (41 mm) long Type S steel screws spaced max 12 in. (305 mm) OC.

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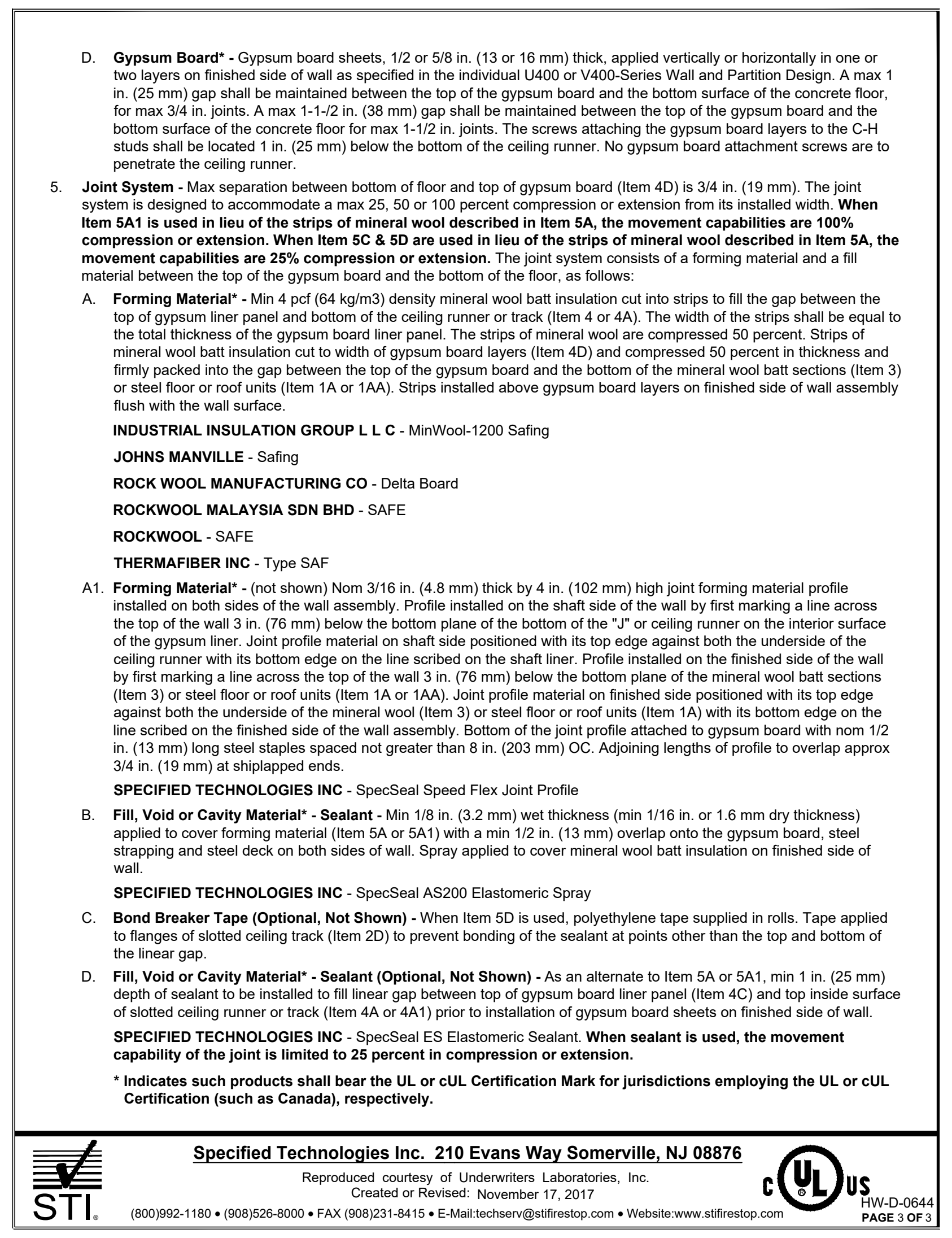

   D. **Gypsum Board* -** Gypsum board sheets, 1/2 or 5/8 in. (13 or 16 mm) thick, applied vertically or horizontally in one or two layers on finished side of wall as specified in the individual U400 or V400-Series Wall and Partition Design. A max 1 in. (25 mm) gap shall be maintained between the top of 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 penetrate the ceiling runner.

5. **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
      JOHNS MANVILLE - Safing
      ROCK WOOL MANUFACTURING CO - Delta Board
      ROCKWOOL MALAYSIA SDN BHD - SAFE
      ROCKWOOL - SAFE
      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 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 1.6 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 wall.

      SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray

   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 the linear gap.
   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 Certification (such as Canada), respectively.**

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876
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Created or Revised: November 17, 2017
(800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techserv@stifirestop.com • Website:www.stifirestop.com
HW-D-0644
PAGE 3 **OF** 3

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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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210 Evans Way Somerville, NJ 08876
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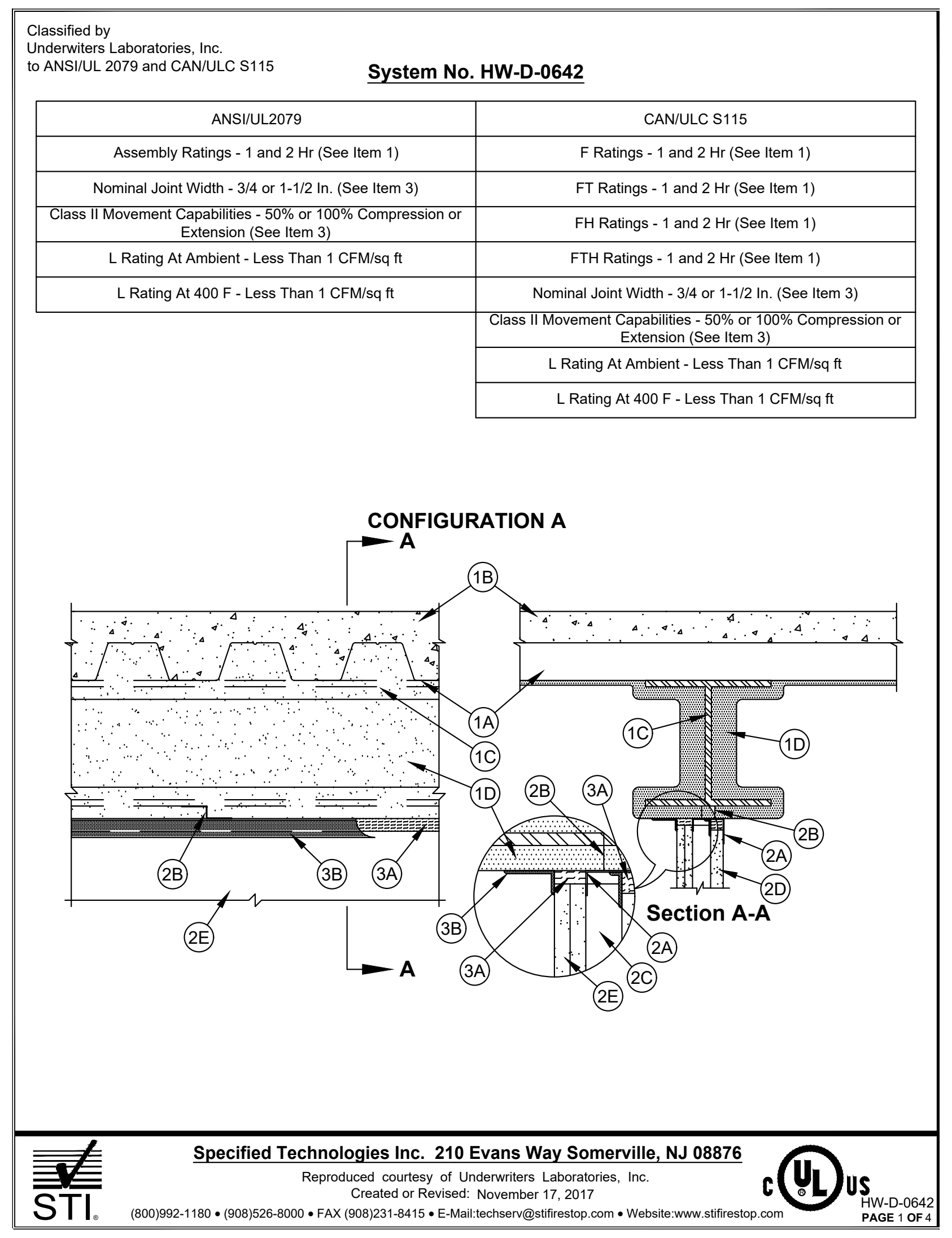

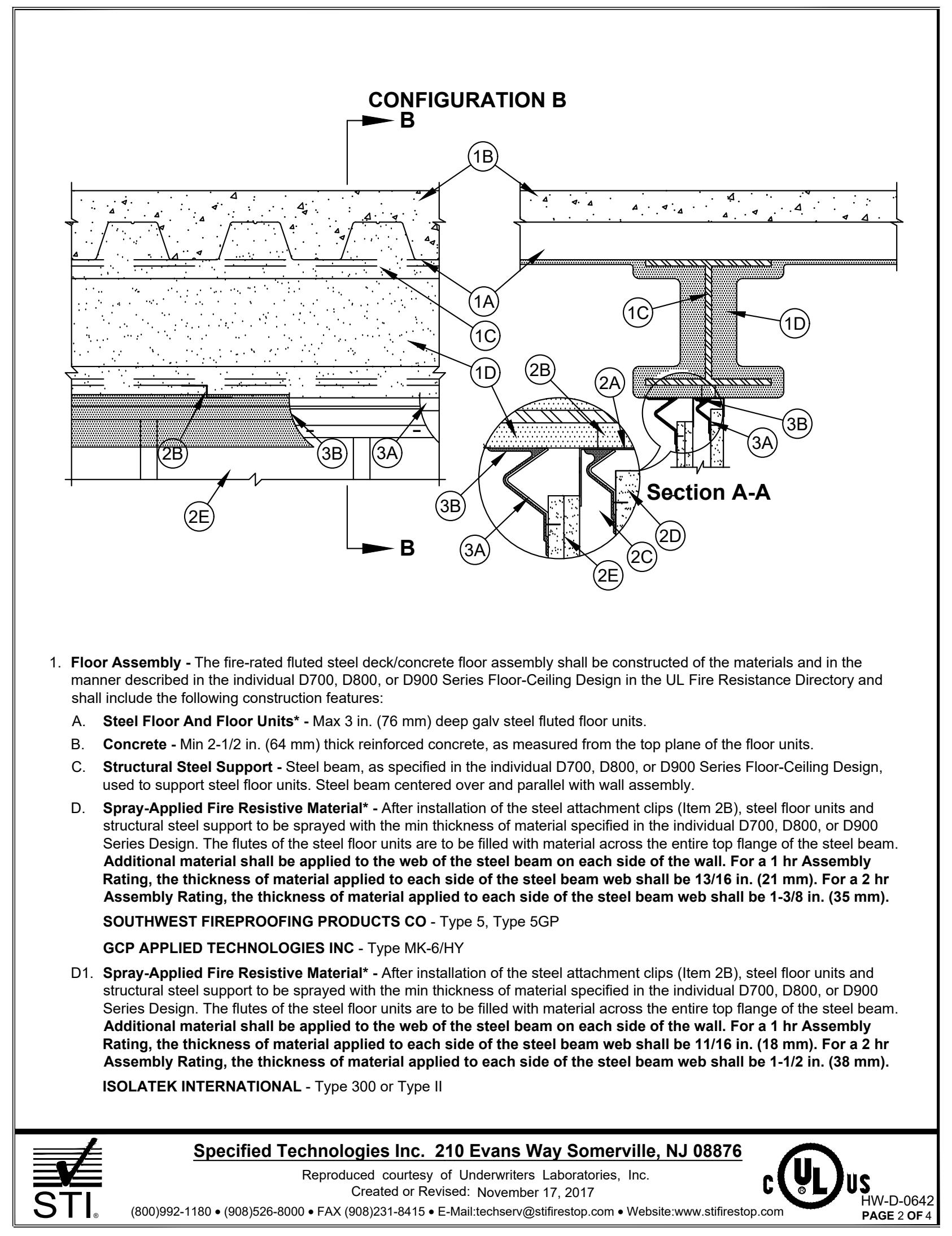

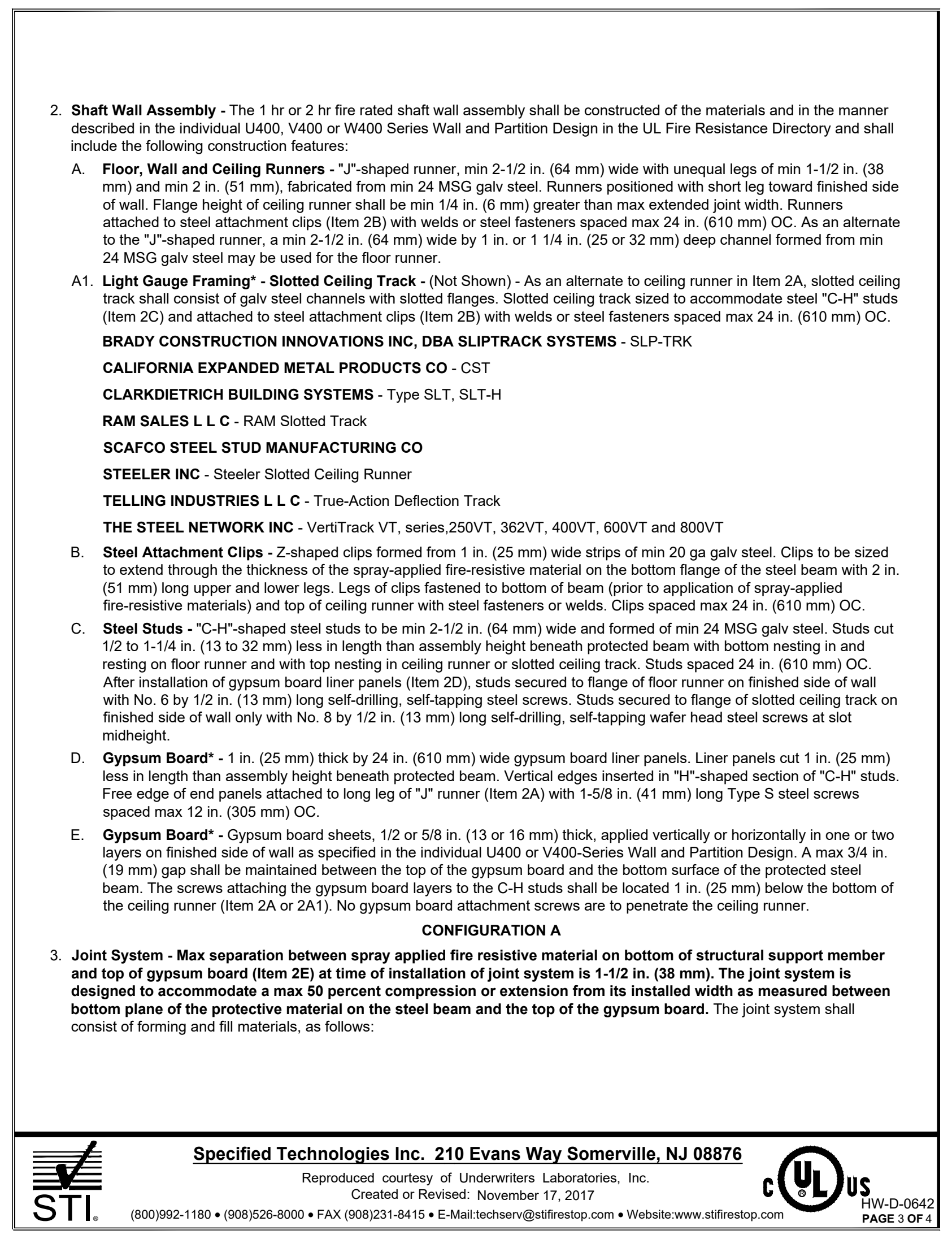

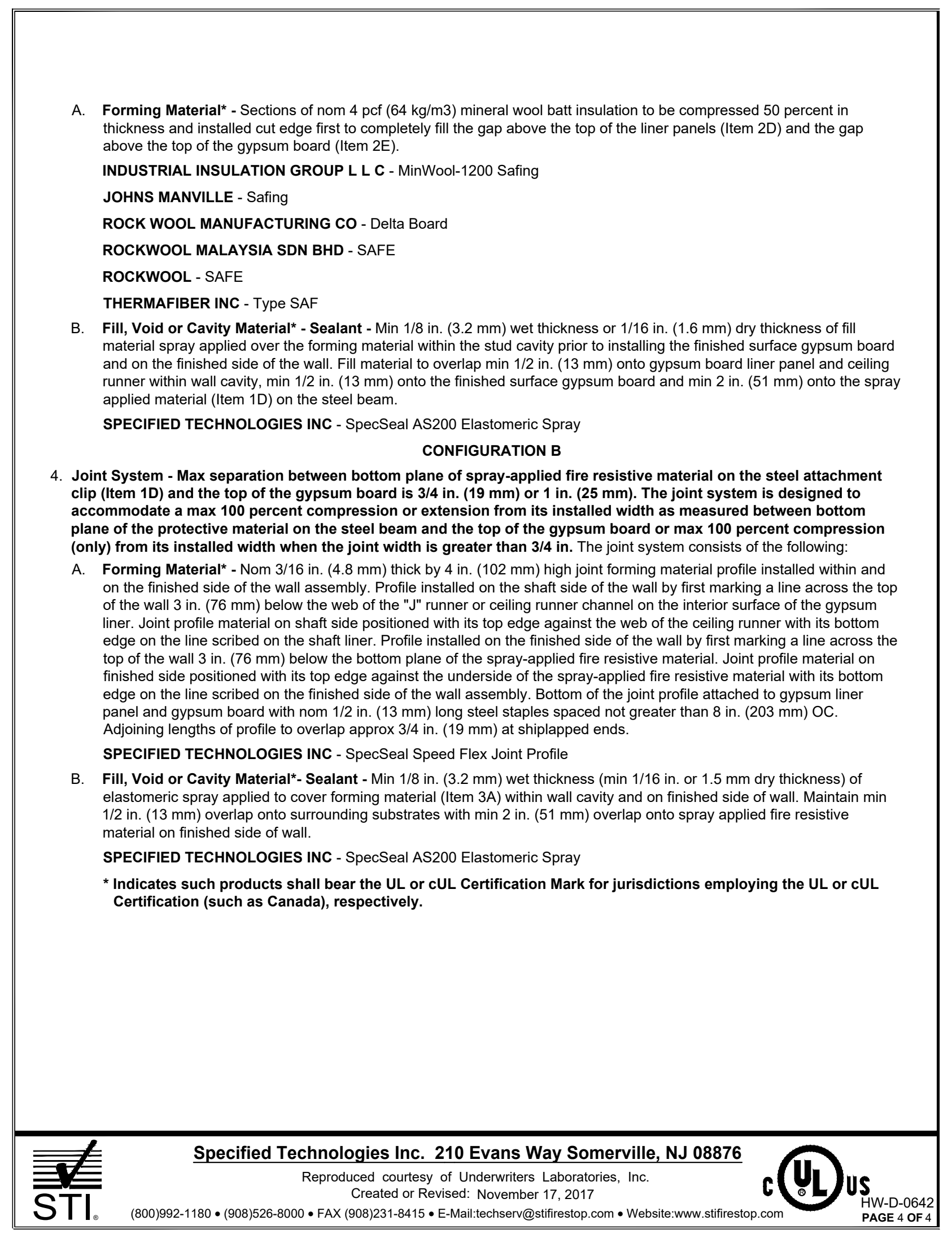

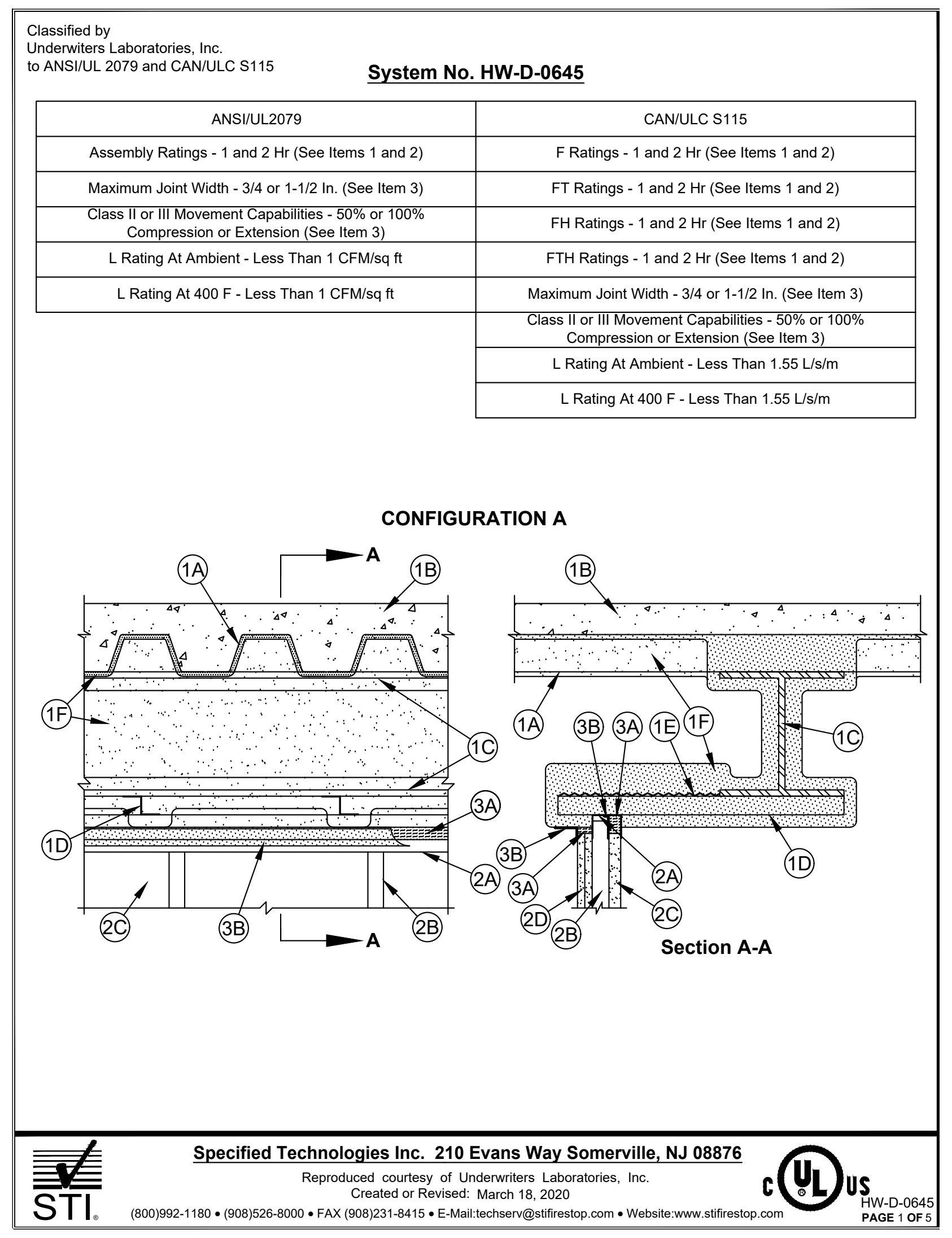

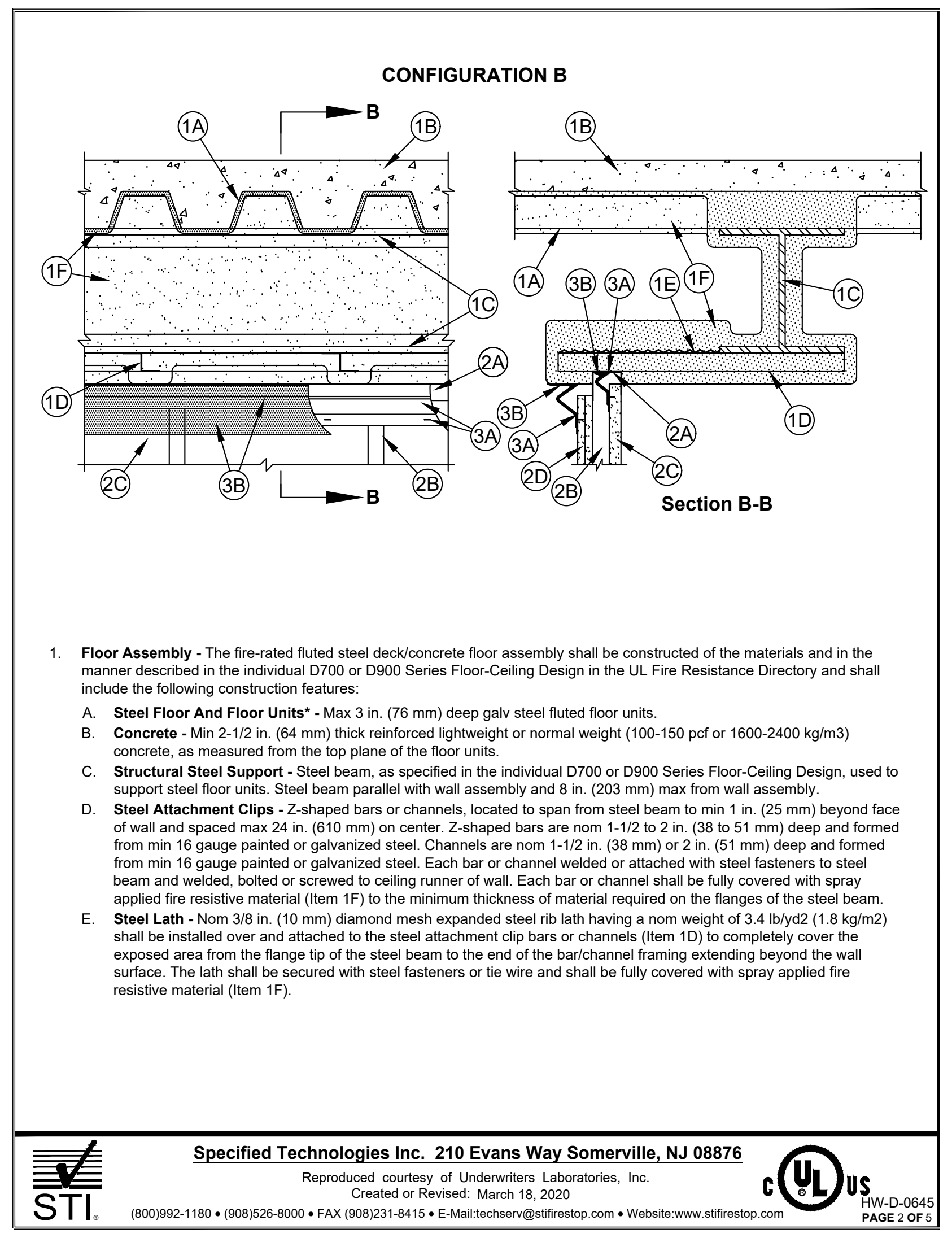

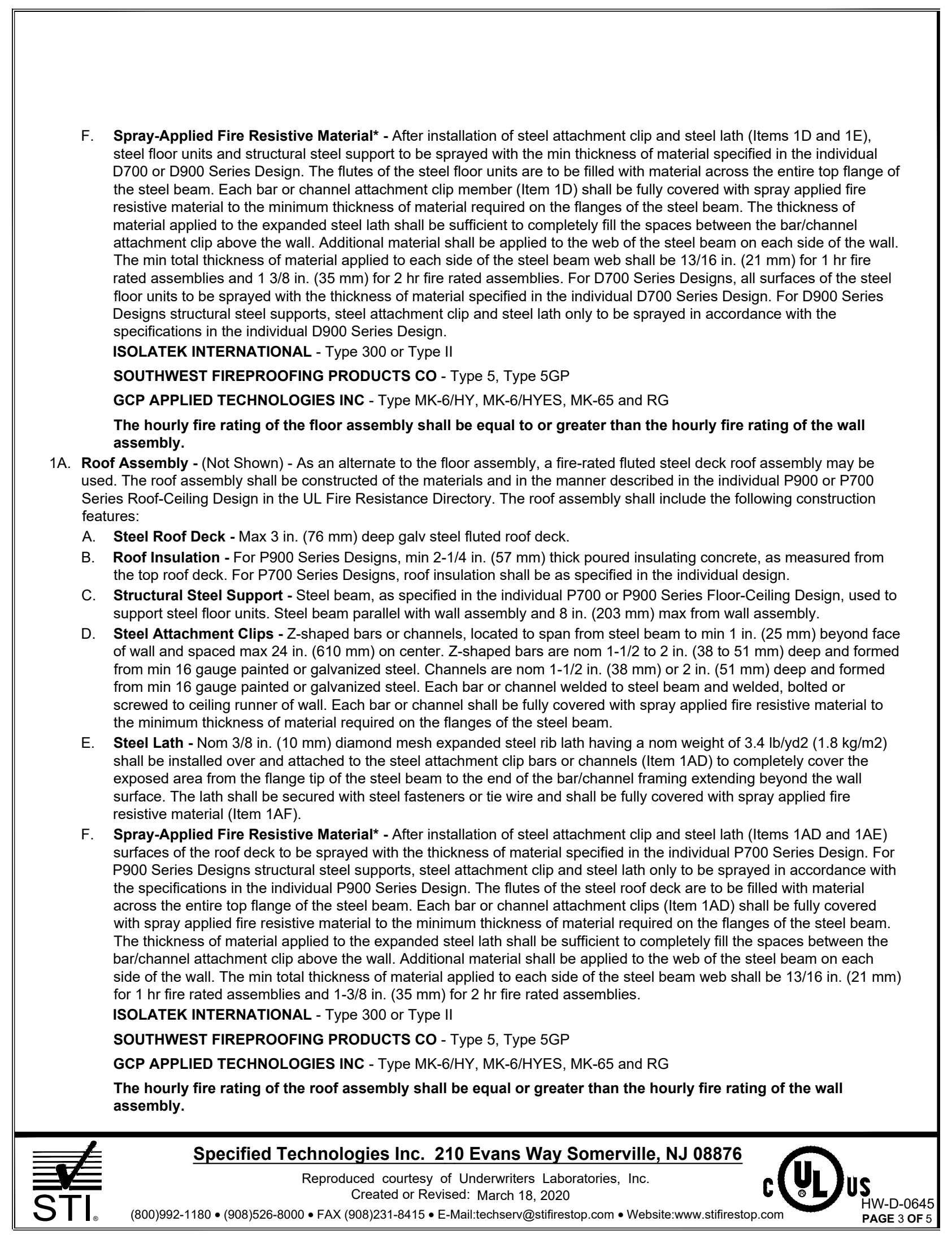

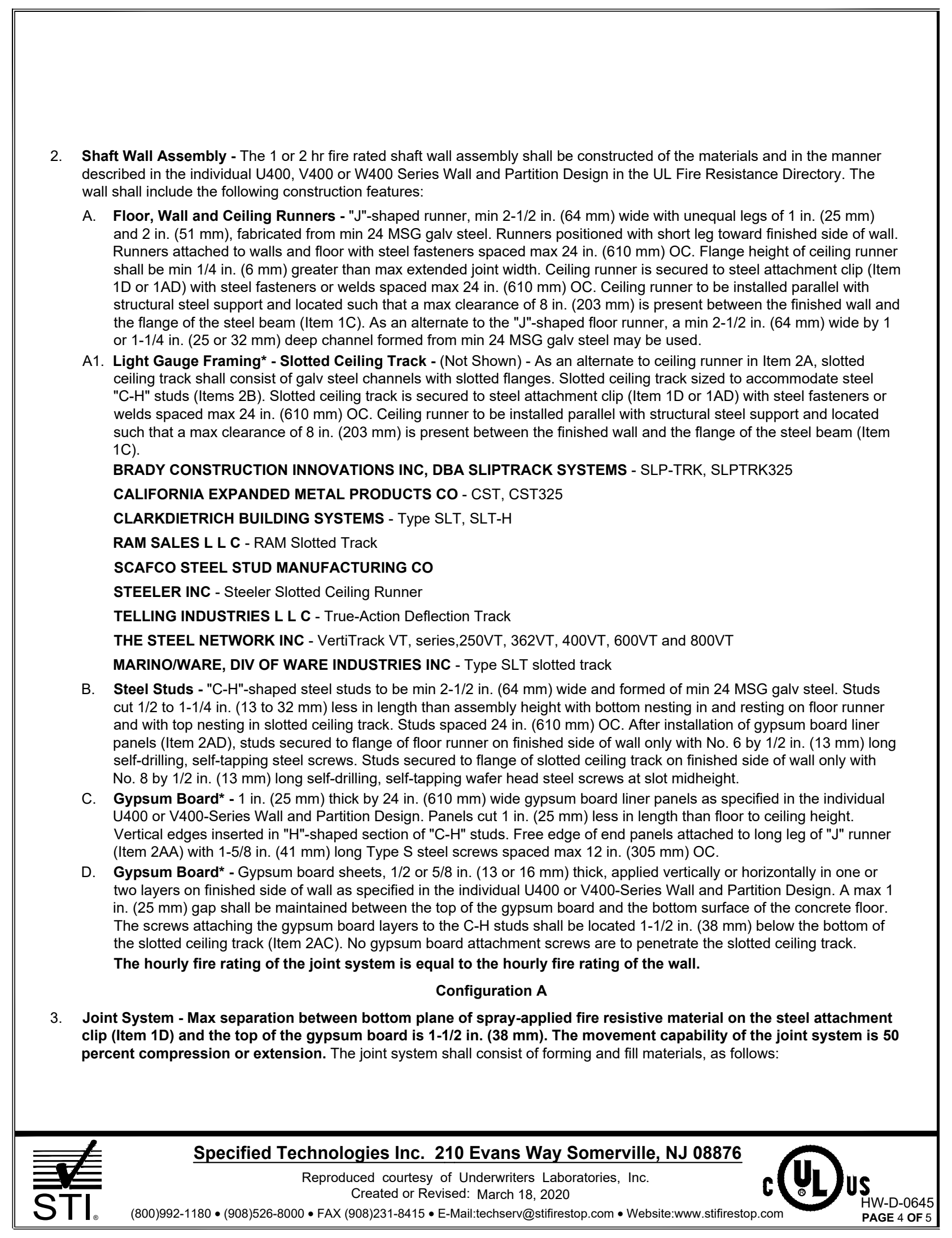

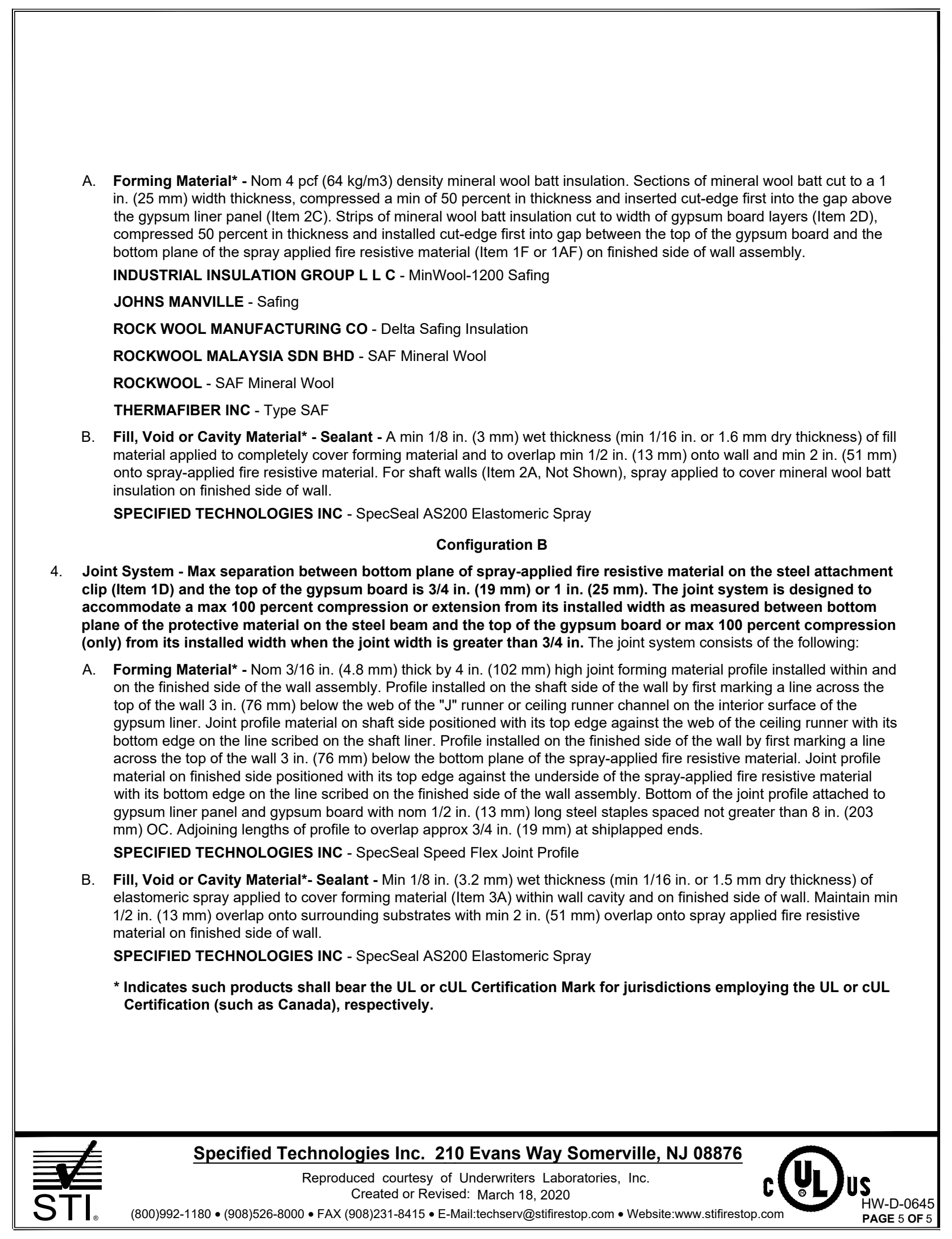

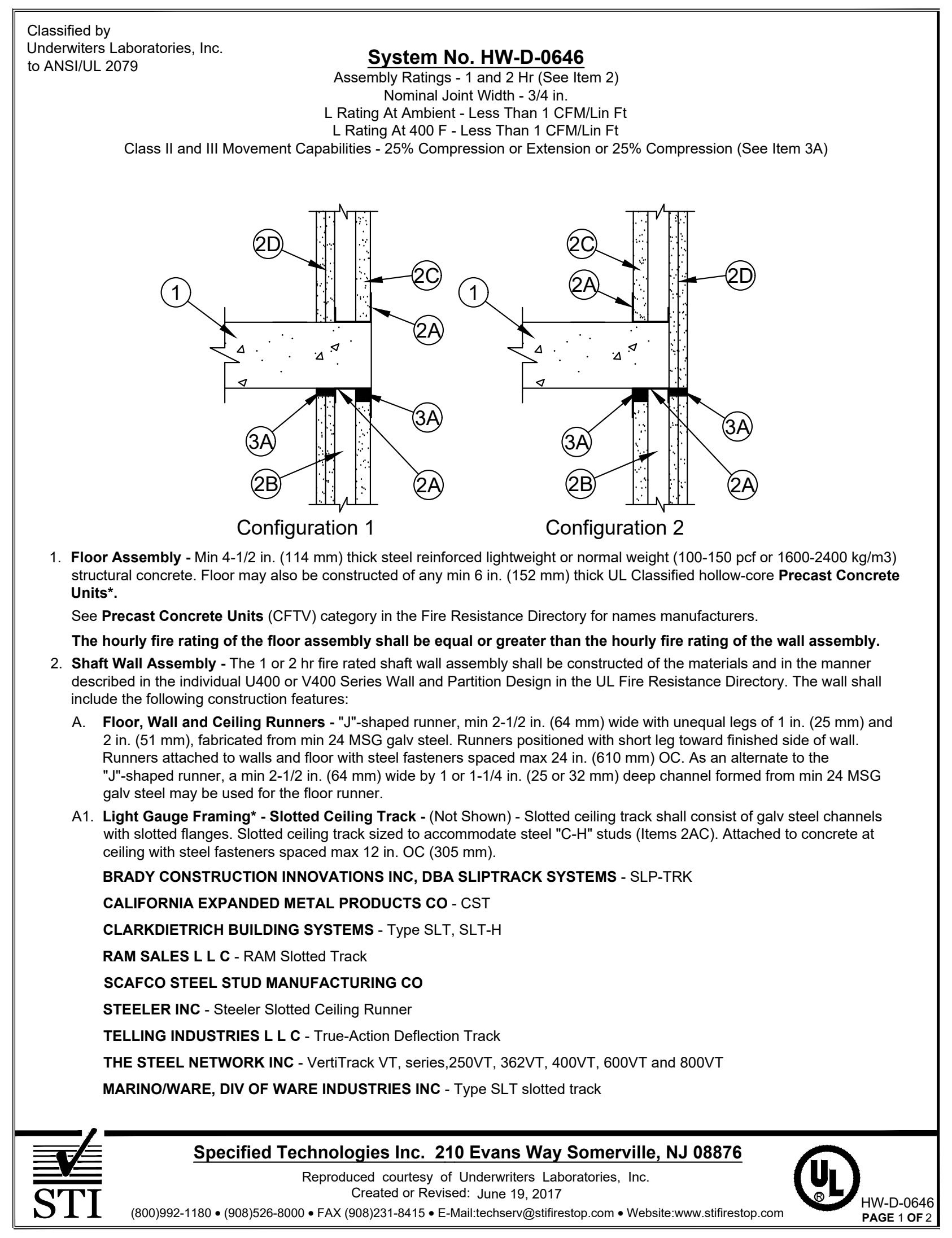

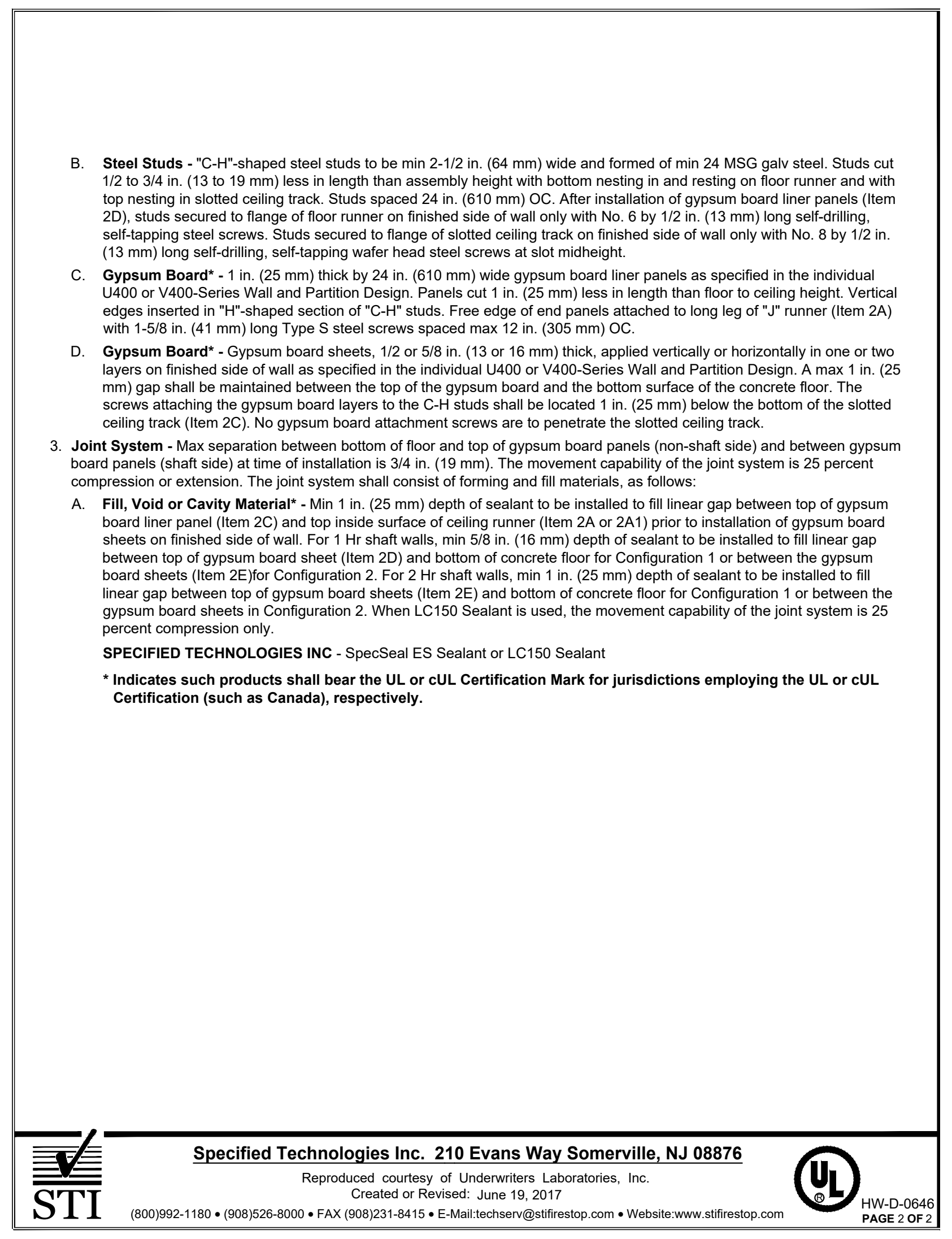

GENERAL NOTES:

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:
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   - 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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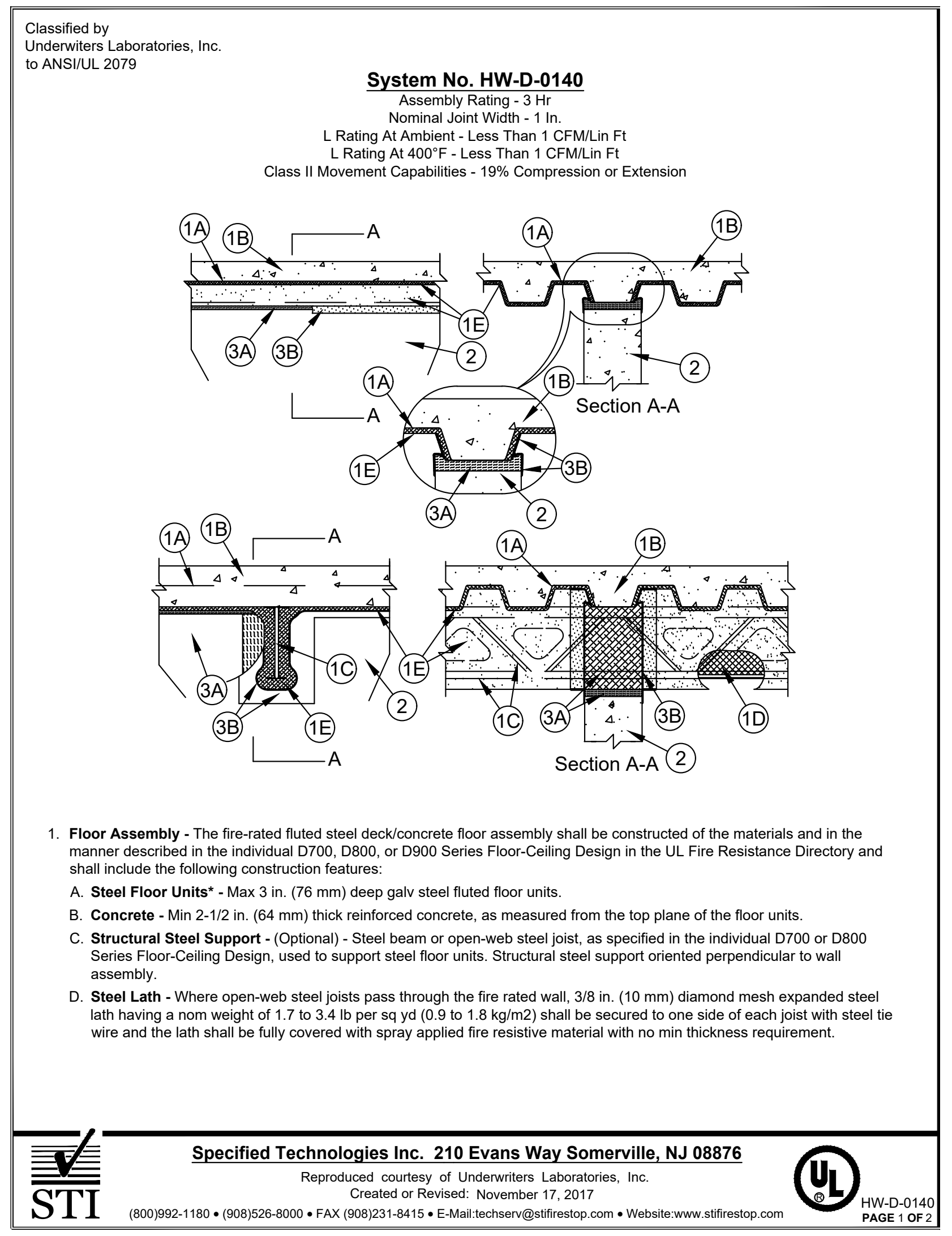
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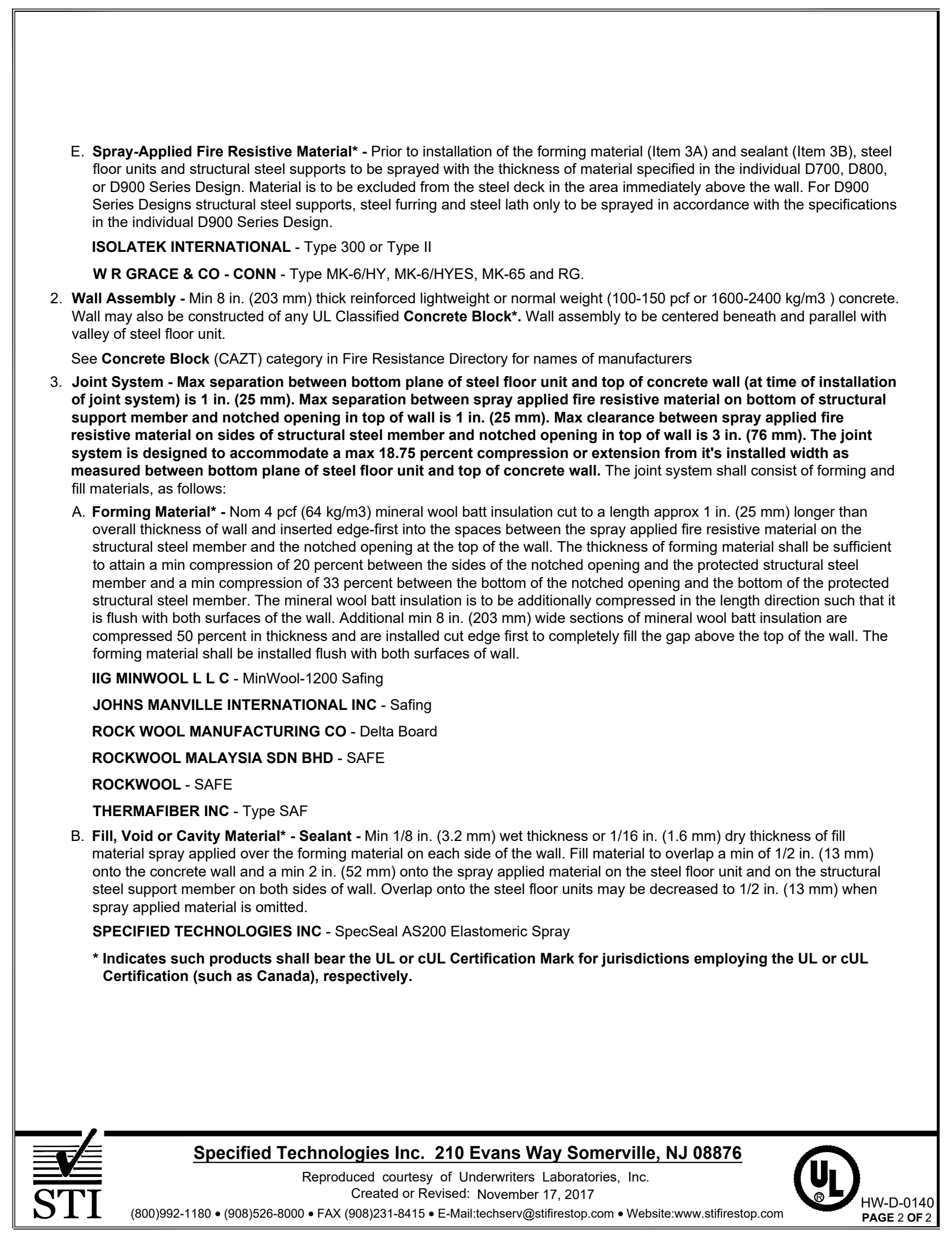
Underwiters Laboratories, Inc.
to ANSI/UL 2079

System No. HW-D-0140

Assembly Rating - 3 Hr
Nominal Joint Width - 1 In.
L Rating At Ambient - Less Than 1 CFM/Lin Ft
L Rating At 400°F - Less Than 1 CFM/Lin Ft
Class II Movement Capabilities - 19% Compression or Extension

1. **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 D700, D800, or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor 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.
   C. **Structural Steel Support -** (Optional) - Steel beam or open-web steel joist, as specified in the individual D700 or D800 Series Floor-Ceiling Design, used to support steel floor units. Structural steel support oriented perpendicular to wall assembly.
   D. **Steel Lath -** Where open-web steel joists pass through the fire rated wall, 3/8 in. (10 mm) diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd (0.9 to 1.8 kg/m2) shall be secured to one side of each joist with steel tie wire and the lath shall be fully covered with spray applied fire resistive material with no min thickness requirement.


   E. **Spray-Applied Fire Resistive Material* -** Prior to installation of the forming material (Item 3A) and sealant (Item 3B), steel floor units and structural steel supports to be sprayed with the thickness of material specified in the individual D700, D800, or D900 Series Design. Material is to be excluded from the steel deck in the area immediately above the wall. For D900 Series Designs structural steel supports, steel furring and steel lath only to be sprayed in accordance with the specifications in the individual D900 Series Design.

   ISOLATEK INTERNATIONAL - Type 300 or Type II

   W R GRACE & CO - CONN - Type MK-6/HY, MK-6/HYES, MK-65 and RG.

2. **Wall Assembly -** Min 8 in. (203 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 Block*.** Wall assembly to be centered beneath and parallel with valley of steel floor unit.

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

3. **Joint System - Max separation between bottom plane of steel floor unit and top of concrete wall (at time of installation of joint system) is 1 in. (25 mm). Max separation between spray applied fire resistive material on bottom of structural support member and notched opening in top of wall is 1 in. (25 mm). Max clearance between spray applied fire resistive material on sides of structural steel member and notched opening in top of wall is 3 in. (76 mm). The joint system is designed to accommodate a max 18.75 percent compression or extension from it's installed width as measured between bottom plane of steel floor unit and top of concrete wall.** The joint system shall consist of forming and fill materials, as follows:
   A. **Forming Material* -** Nom 4 pcf (64 kg/m3) mineral wool batt insulation cut to a length approx 1 in. (25 mm) longer than overall thickness of wall and inserted edge-first into the spaces between the spray applied fire resistive material on the structural steel member and the notched opening at the top of the wall. The thickness of forming material shall be sufficient to attain a min compression of 20 percent between the sides of the notched opening and the protected structural steel member and a min compression of 33 percent between the bottom of the notched opening and the bottom of the protected structural steel member. The mineral wool batt insulation is to be additionally compressed in the length direction such that it is flush with both surfaces of the wall. Additional min 8 in. (203 mm) wide sections of mineral wool batt insulation are compressed 50 percent in thickness and are installed cut edge first to completely fill the gap above the top of the wall. The forming material shall be installed flush with both surfaces of wall.

   IIG MINWOOL L L C - MinWool-1200 Safing

   JOHNS MANVILLE INTERNATIONAL INC - Safing

   ROCK WOOL MANUFACTURING CO - Delta Board

   ROCKWOOL MALAYSIA SDN BHD - SAFE

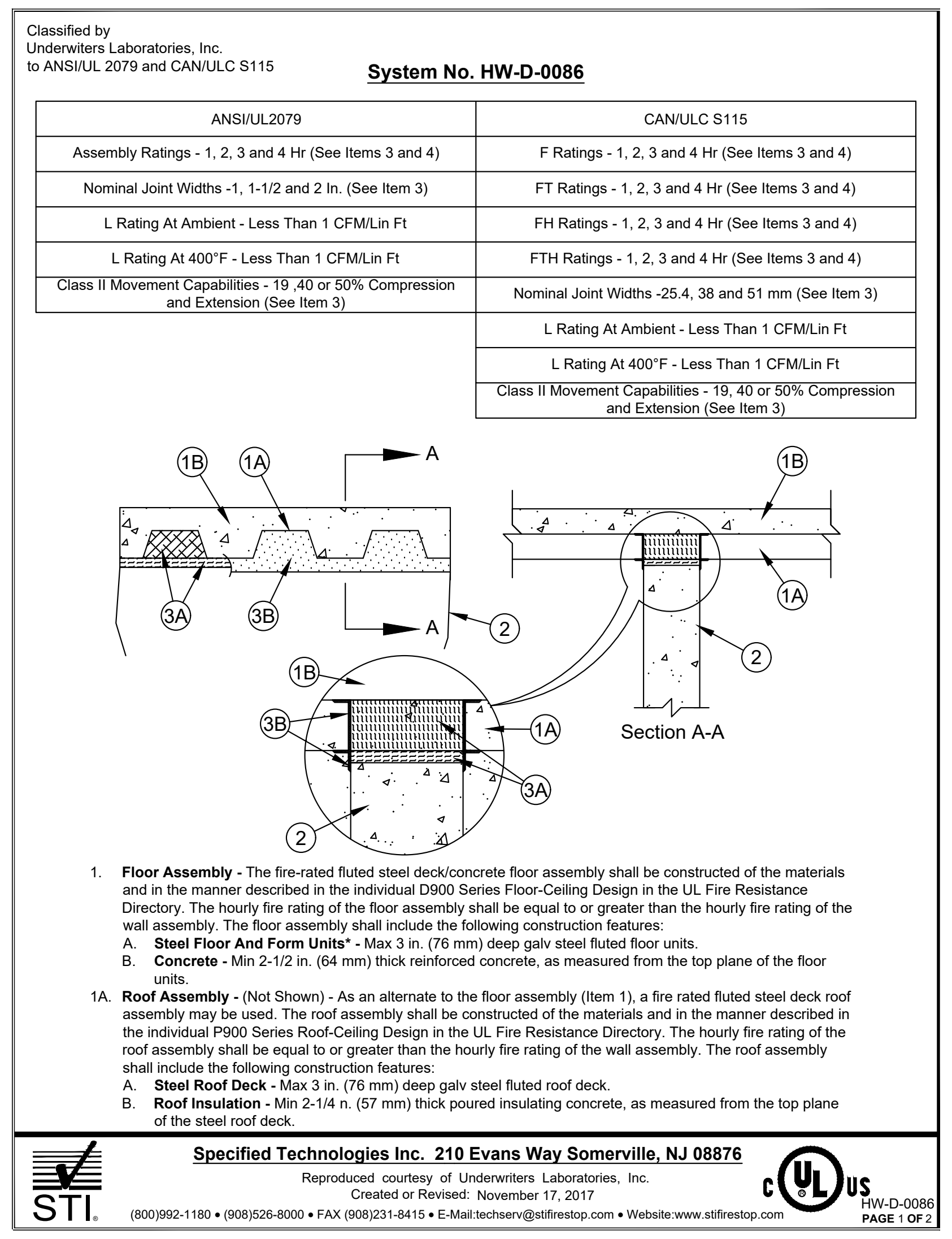
   ROCKWOOL - SAFE

   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 on each side of the wall. Fill material to overlap a min of 1/2 in. (13 mm) onto the concrete wall and a min 2 in. (52 mm) onto the spray applied material on the steel floor unit and on the structural steel support member on both sides of wall. Overlap onto the steel floor units may be decreased to 1/2 in. (13 mm) when spray applied material is omitted.

   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.**

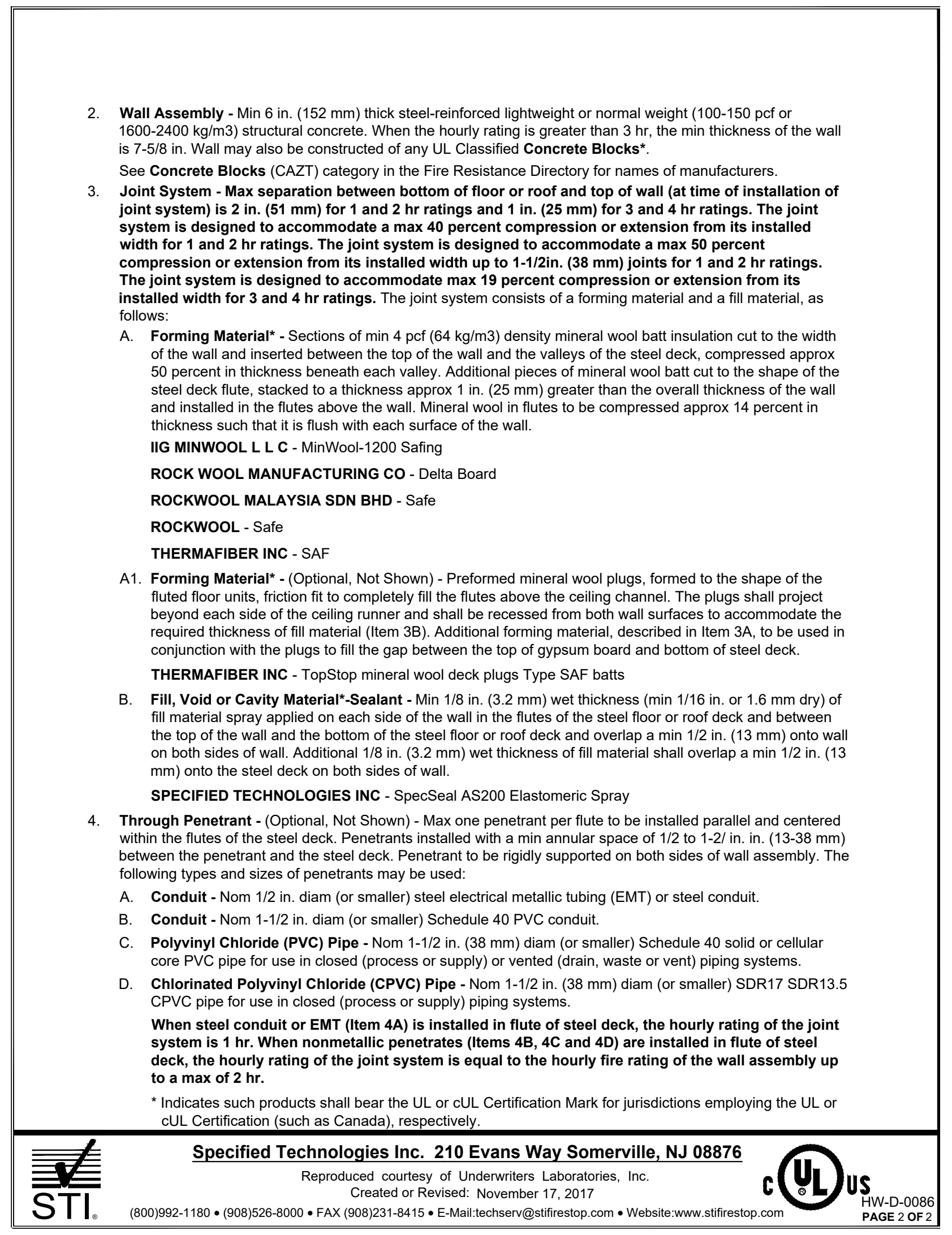

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 2079 and CAN/ULC S115

System No. HW-D-0086

ANSI/UL2079	CAN/ULC S115
Assembly Ratings - 1, 2, 3 and 4 Hr (See Items 3 and 4)	F Ratings - 1, 2, 3 and 4 Hr (See Items 3 and 4)
Nominal Joint Widths -1, 1-1/2 and 2 In. (See Item 3)	FT Ratings - 1, 2, 3 and 4 Hr (See Items 3 and 4)
L Rating At Ambient - Less Than 1 CFM/Lin Ft	FH Ratings - 1, 2, 3 and 4 Hr (See Items 3 and 4)
L Rating At 400°F - Less Than 1 CFM/Lin Ft	FTH Ratings - 1, 2, 3 and 4 Hr (See Items 3 and 4)
Class II Movement Capabilities - 19 ,40 or 50% Compression and Extension (See Item 3)	Nominal Joint Widths -25.4, 38 and 51 mm (See Item 3)
	L Rating At Ambient - Less Than 1 CFM/Lin Ft
	L Rating At 400°F - Less Than 1 CFM/Lin Ft
	Class II Movement Capabilities - 19, 40 or 50% Compression and Extension (See Item 3)

1. **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 features:
   A. **Steel Roof Deck -** Max 3 in. (76 mm) deep galv steel fluted roof deck.
   B. **Roof Insulation -** Min 2-1/4 n. (57 mm) thick poured insulating concrete, as measured from the top plane of the steel roof deck.


2. **Wall Assembly -** Min 6 in. (152 mm) thick steel-reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. When the hourly rating is greater than 3 hr, the min thickness of the wall is 7-5/8 in. Wall may also be constructed of any UL Classified **Concrete Blocks***.

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

3. **Joint System - Max separation between bottom of floor or roof and top of wall (at time of installation of joint system) is 2 in. (51 mm) for 1 and 2 hr ratings and 1 in. (25 mm) for 3 and 4 hr ratings. The joint system is designed to accommodate a max 40 percent compression or extension from its installed width for 1 and 2 hr ratings. The joint system is designed to accommodate a max 50 percent compression or extension from its installed width up to 1-1/2in. (38 mm) joints for 1 and 2 hr ratings. The joint system is designed to accommodate max 19 percent compression or extension from its installed width for 3 and 4 hr ratings.** The joint system consists of a forming material and a fill material, as follows:
   A. **Forming Material* -** Sections of min 4 pcf (64 kg/m3) density mineral wool batt insulation cut to the width of the wall and inserted between the top of the wall and the valleys of the steel deck, compressed approx 50 percent in thickness beneath each valley. Additional pieces of mineral wool batt cut to the shape of the steel deck flute, stacked to a thickness approx 1 in. (25 mm) greater than the overall thickness of the wall and installed in the flutes above the wall. Mineral wool in flutes to be compressed approx 14 percent in thickness such that it is flush with each surface of the wall.

   IIG MINWOOL L L C - MinWool-1200 Safing

   ROCK WOOL MANUFACTURING CO - Delta Board

   ROCKWOOL MALAYSIA SDN BHD - Safe

   ROCKWOOL - Safe

   THERMAFIBER INC - SAF

   A1. **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 runner and shall be recessed from both wall surfaces to accommodate the required thickness of fill material (Item 3B). Additional forming material, described in Item 3A, to be used in conjunction with the plugs to fill the gap between the top of gypsum board and bottom of steel deck.

   THERMAFIBER INC - TopStop mineral wool deck plugs Type SAF batts

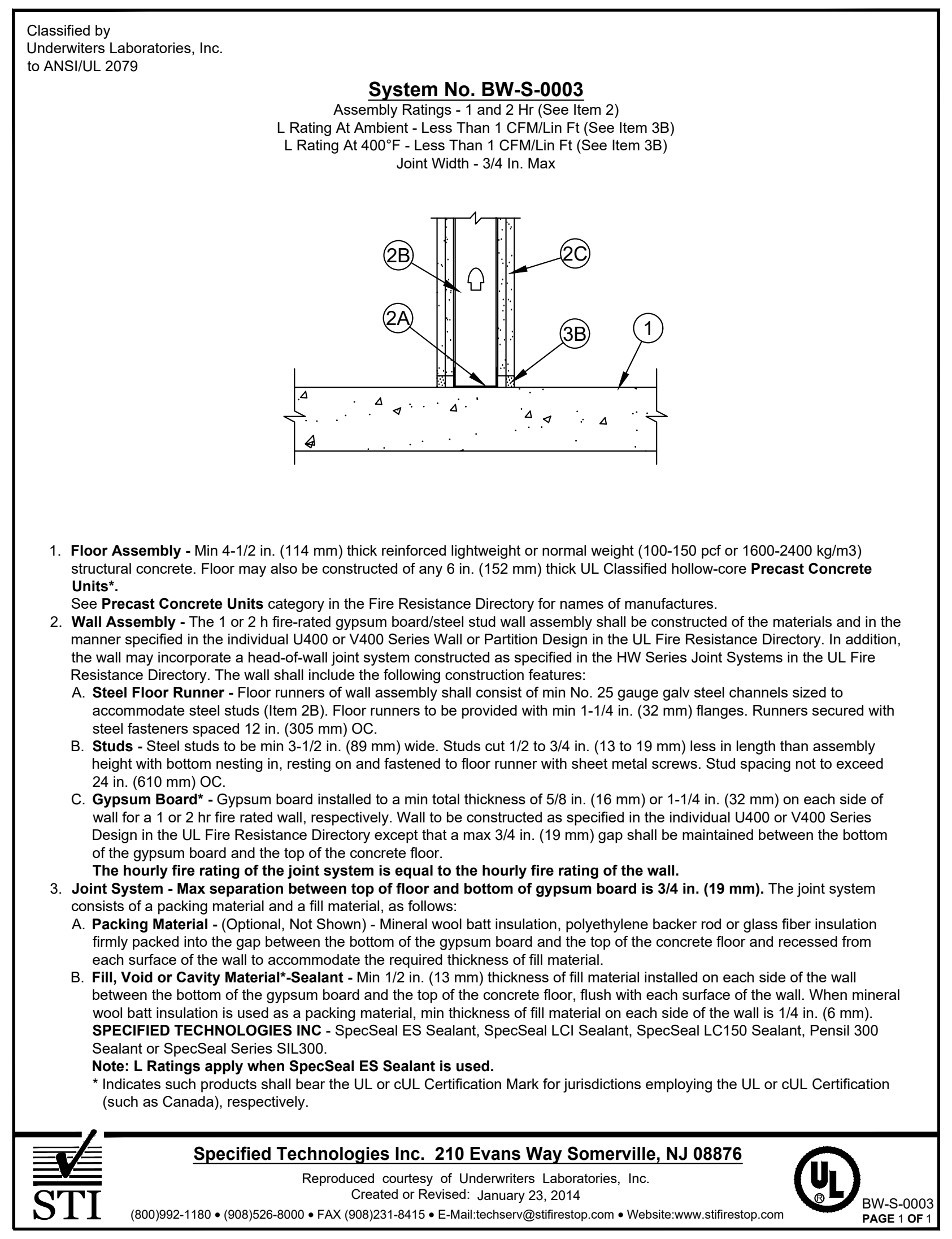
   B. **Fill, Void or Cavity Material*-Sealant -** Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or 1.6 mm dry) of fill material spray applied on each side of the wall in the flutes of the steel floor or roof deck and between the top of the wall and the bottom of the steel floor or roof deck and overlap a min 1/2 in. (13 mm) onto wall on both sides of wall. Additional 1/8 in. (3.2 mm) wet thickness of fill material shall overlap a min 1/2 in. (13 mm) onto the steel deck on both sides of wall.

   SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray

4. **Through Penetrant -** (Optional, Not Shown) - 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 used:
   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 4A) is installed in flute of steel deck, the hourly rating of the joint system is 1 hr. When nonmetallic penetrates (Items 4B, 4C and 4D) 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.

   * 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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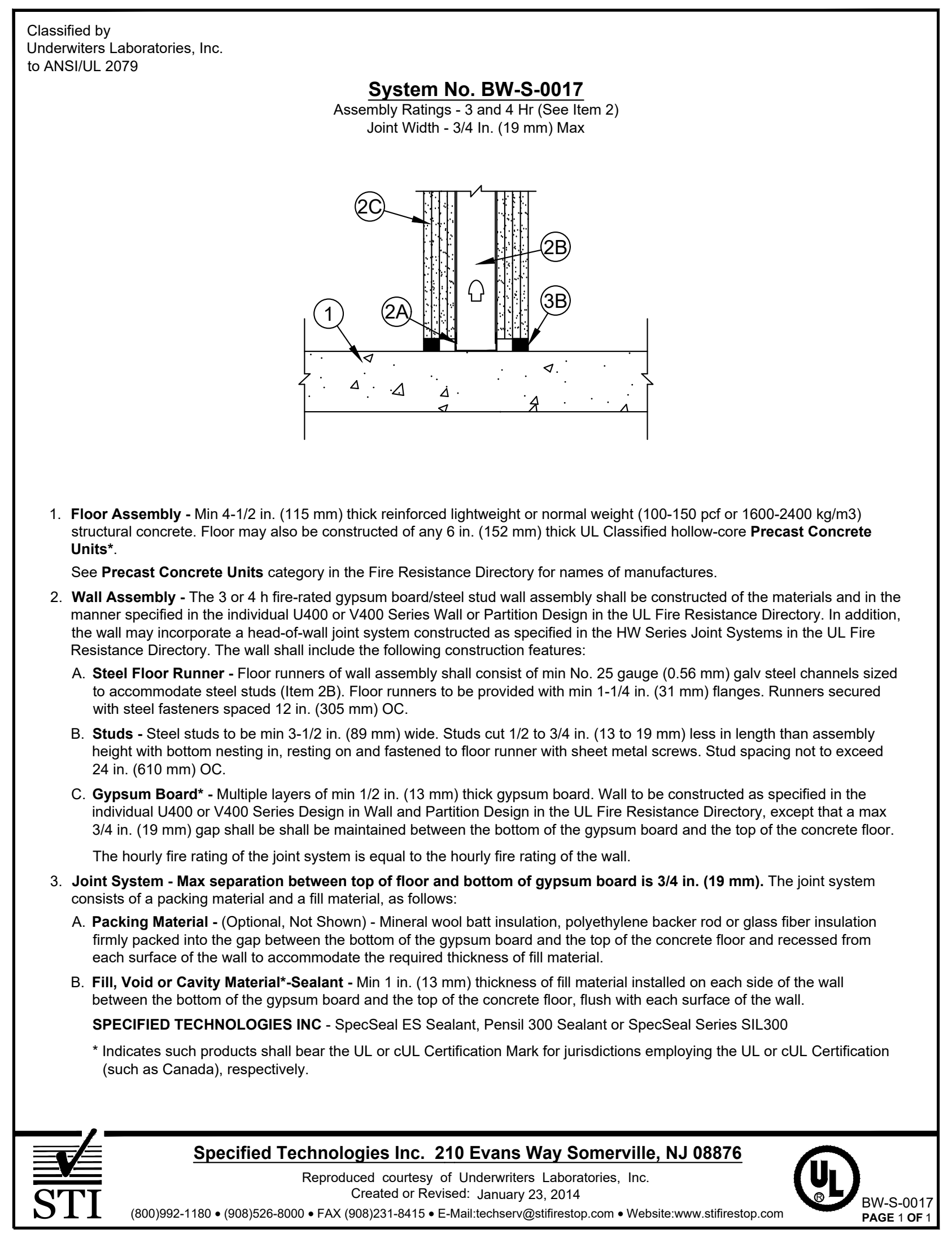
Underwiters Laboratories, Inc.
to ANSI/UL 2079

System No. BW-S-0003

Assembly Ratings - 1 and 2 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/Lin Ft (See Item 3B)
L Rating At 400°F - Less Than 1 CFM/Lin Ft (See Item 3B)
Joint Width - 3/4 In. Max

1. **Floor Assembly -** 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 6 in. (152 mm) thick UL Classified hollow-core **Precast Concrete Units*.**
   See **Precast Concrete Units** category in the Fire Resistance Directory for names of manufactures.
2. **Wall Assembly -** The 1 or 2 h fire-rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory. In addition, the wall may incorporate a head-of-wall joint system constructed as specified in the HW Series Joint Systems in the UL Fire Resistance Directory. The wall shall include the following construction features:
   A. **Steel Floor Runner -** Floor runners of wall assembly shall consist of min No. 25 gauge galv steel channels sized to accommodate steel studs (Item 2B). Floor runners to be provided with min 1-1/4 in. (32 mm) flanges. Runners secured with steel fasteners spaced 12 in. (305 mm) OC.
   B. **Studs -** Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 1/2 to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in, resting on and fastened to floor runner with sheet metal screws. Stud spacing not to exceed 24 in. (610 mm) OC.
   C. **Gypsum Board* -** Gypsum board installed to a min total thickness of 5/8 in. (16 mm) or 1-1/4 in. (32 mm) on each side of wall for a 1 or 2 hr fire rated wall, respectively. Wall to be constructed as specified in the individual U400 or V400 Series Design in the UL Fire Resistance Directory except that a max 3/4 in. (19 mm) gap shall be maintained between the bottom of the gypsum board and the top of the concrete floor.
   The hourly fire rating of the joint system is equal to the hourly fire rating of the wall.
3. **Joint System - Max separation between top of floor and bottom of gypsum board is 3/4 in. (19 mm).** The joint system consists of a packing material and a fill material, as follows:
   A. **Packing Material -** (Optional, Not Shown) - Mineral wool batt insulation, polyethylene backer rod or glass fiber insulation firmly packed into the gap between the bottom of the gypsum board and the top of the concrete floor and recessed from each surface of the wall to accommodate the required thickness of fill material.
   B. **Fill, Void or Cavity Material*-Sealant -** Min 1/2 in. (13 mm) thickness of fill material installed on each side of the wall between the bottom of the gypsum board and the top of the concrete floor, flush with each surface of the wall. When mineral wool batt insulation is used as a packing material, min thickness of fill material on each side of the wall is 1/4 in. (6 mm).
   SPECIFIED TECHNOLOGIES INC - SpecSeal ES Sealant, SpecSeal LCI Sealant, SpecSeal LC150 Sealant, Pensil 300 Sealant or SpecSeal Series SIL300.
   Note: L Ratings apply when SpecSeal ES Sealant is used.
   * 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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to ANSI/UL 2079

System No. BW-S-0017

Assembly Ratings - 3 and 4 Hr (See Item 2)
Joint Width - 3/4 In. (19 mm) Max

1. **Floor Assembly -** Min 4-1/2 in. (115 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Floor may also be constructed of any 6 in. (152 mm) thick UL Classified hollow-core **Precast Concrete Units***.

   See **Precast Concrete Units** category in the Fire Resistance Directory for names of manufactures.

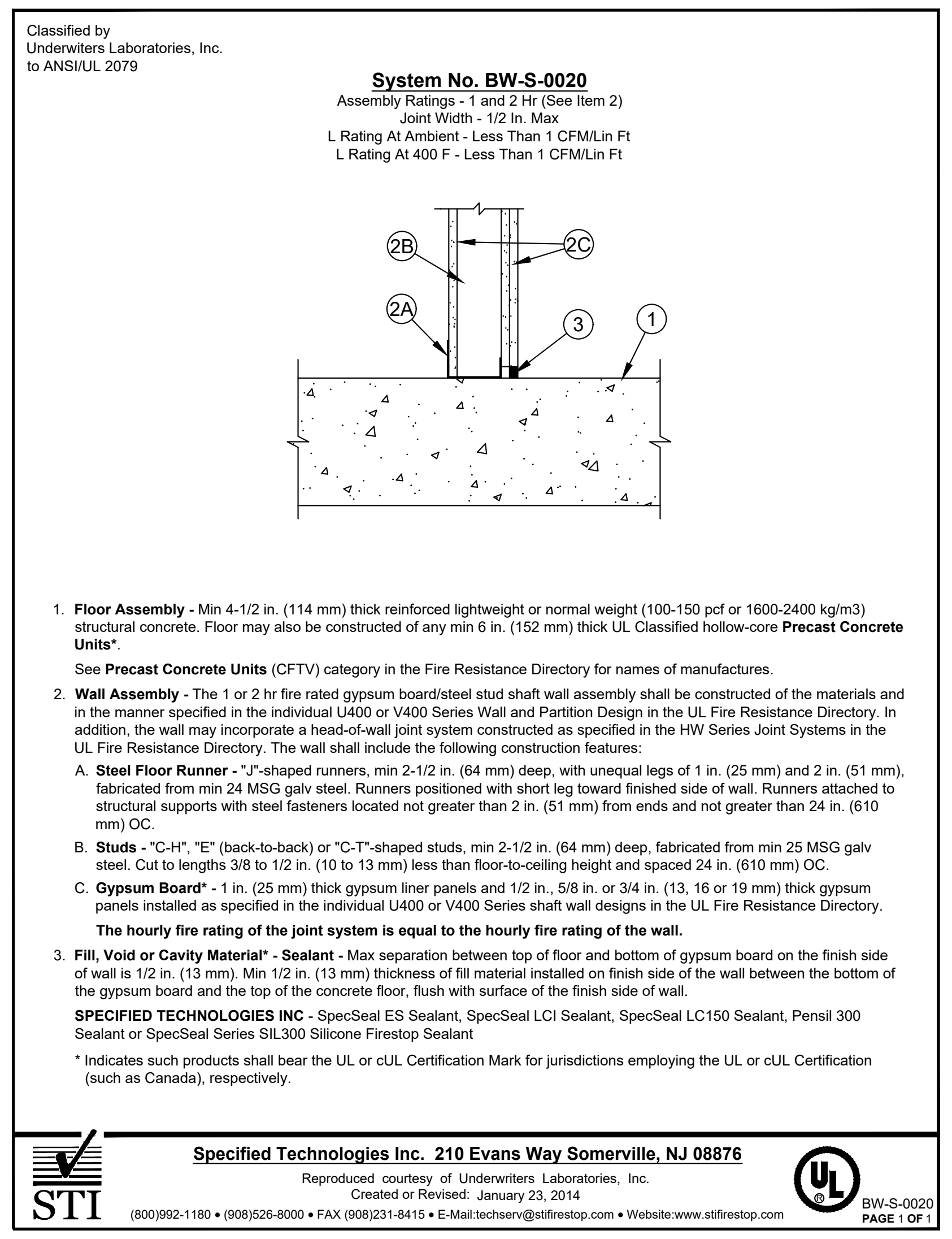
2. **Wall Assembly -** The 3 or 4 h fire-rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory. In addition, the wall may incorporate a head-of-wall joint system constructed as specified in the HW Series Joint Systems in the UL Fire Resistance Directory. The wall shall include the following construction features:
   A. **Steel Floor Runner -** Floor runners of wall assembly shall consist of min No. 25 gauge (0.56 mm) galv steel channels sized to accommodate steel studs (Item 2B). Floor runners to be provided with min 1-1/4 in. (31 mm) flanges. Runners secured with steel fasteners spaced 12 in. (305 mm) OC.
   B. **Studs -** Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 1/2 to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in, resting on and fastened to floor runner with sheet metal screws. Stud spacing not to exceed 24 in. (610 mm) OC.
   C. **Gypsum Board* -** Multiple layers of min 1/2 in. (13 mm) thick gypsum board. Wall to be constructed as specified in the individual U400 or V400 Series Design in Wall and Partition Design in the UL Fire Resistance Directory, except that a max 3/4 in. (19 mm) gap shall be shall be maintained between the bottom of the gypsum board and the top of the concrete floor.

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

3. **Joint System - Max separation between top of floor and bottom of gypsum board is 3/4 in. (19 mm).** The joint system consists of a packing material and a fill material, as follows:
   A. **Packing Material -** (Optional, Not Shown) - Mineral wool batt insulation, polyethylene backer rod or glass fiber insulation firmly packed into the gap between the bottom of the gypsum board and the top of the concrete floor and recessed from each surface of the wall to accommodate the required thickness of fill material.
   B. **Fill, Void or Cavity Material*-Sealant -** Min 1 in. (13 mm) thickness of fill material installed on each side of the wall between the bottom of the gypsum board and the top of the concrete floor, flush with each surface of the wall.

   SPECIFIED TECHNOLOGIES INC - SpecSeal ES Sealant, Pensil 300 Sealant or SpecSeal Series SIL300

   * 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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to ANSI/UL 2079

System No. BW-S-0020

Assembly Ratings - 1 and 2 Hr (See Item 2)
Joint Width - 1/2 In. Max
L Rating At Ambient - Less Than 1 CFM/Lin Ft
L Rating At 400 F - Less Than 1 CFM/Lin Ft

1. **Floor Assembly -** 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 min 6 in. (152 mm) thick UL Classified hollow-core **Precast Concrete Units***.

   See **Precast Concrete Units** (CFTV) category in the Fire Resistance Directory for names of manufactures.

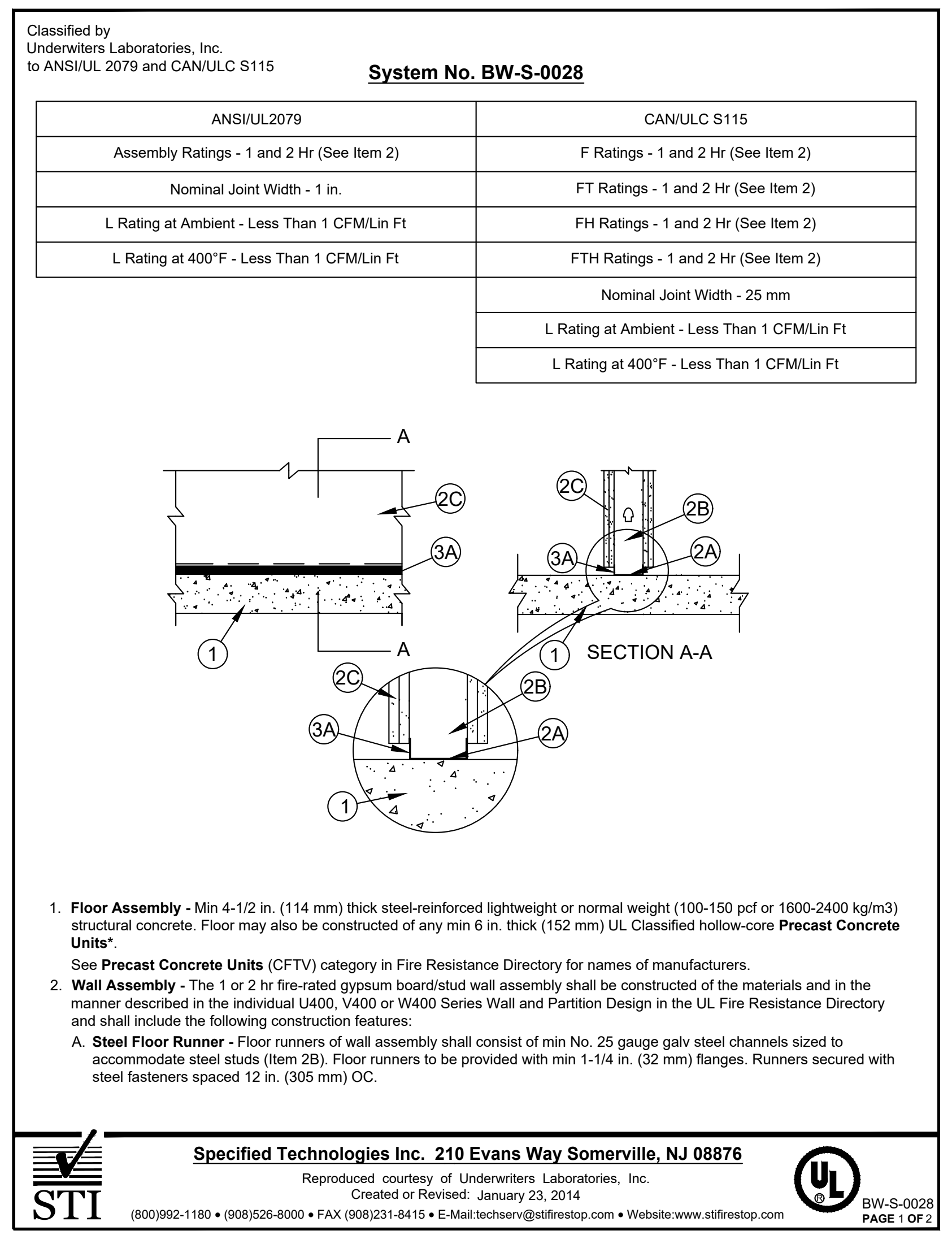
2. **Wall Assembly -** The 1 or 2 hr fire rated gypsum board/steel stud shaft wall assembly shall be constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory. In addition, the wall may incorporate a head-of-wall joint system constructed as specified in the HW Series Joint Systems in the UL Fire Resistance Directory. The wall shall include the following construction features:
   A. **Steel Floor Runner -** "J"-shaped runners, min 2-1/2 in. (64 mm) deep, 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 structural supports with steel fasteners located not greater than 2 in. (51 mm) from ends and not greater than 24 in. (610 mm) OC.
   B. **Studs -** "C-H", "E" (back-to-back) or "C-T"-shaped studs, min 2-1/2 in. (64 mm) deep, fabricated from min 25 MSG galv steel. Cut to lengths 3/8 to 1/2 in. (10 to 13 mm) less than floor-to-ceiling height and spaced 24 in. (610 mm) OC.
   C. **Gypsum Board* -** 1 in. (25 mm) thick gypsum liner panels and 1/2 in., 5/8 in. or 3/4 in. (13, 16 or 19 mm) thick gypsum panels installed as specified in the individual U400 or V400 Series shaft wall designs in the UL Fire Resistance Directory.

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

3. **Fill, Void or Cavity Material* - Sealant -** Max separation between top of floor and bottom of gypsum board on the finish side of wall is 1/2 in. (13 mm). Min 1/2 in. (13 mm) thickness of fill material installed on finish side of the wall between the bottom of the gypsum board and the top of the concrete floor, flush with surface of the finish side of wall.

   SPECIFIED TECHNOLOGIES INC - SpecSeal ES Sealant, SpecSeal LCI Sealant, SpecSeal LC150 Sealant, Pensil 300 Sealant or SpecSeal Series SIL300 Silicone Firestop Sealant

   * 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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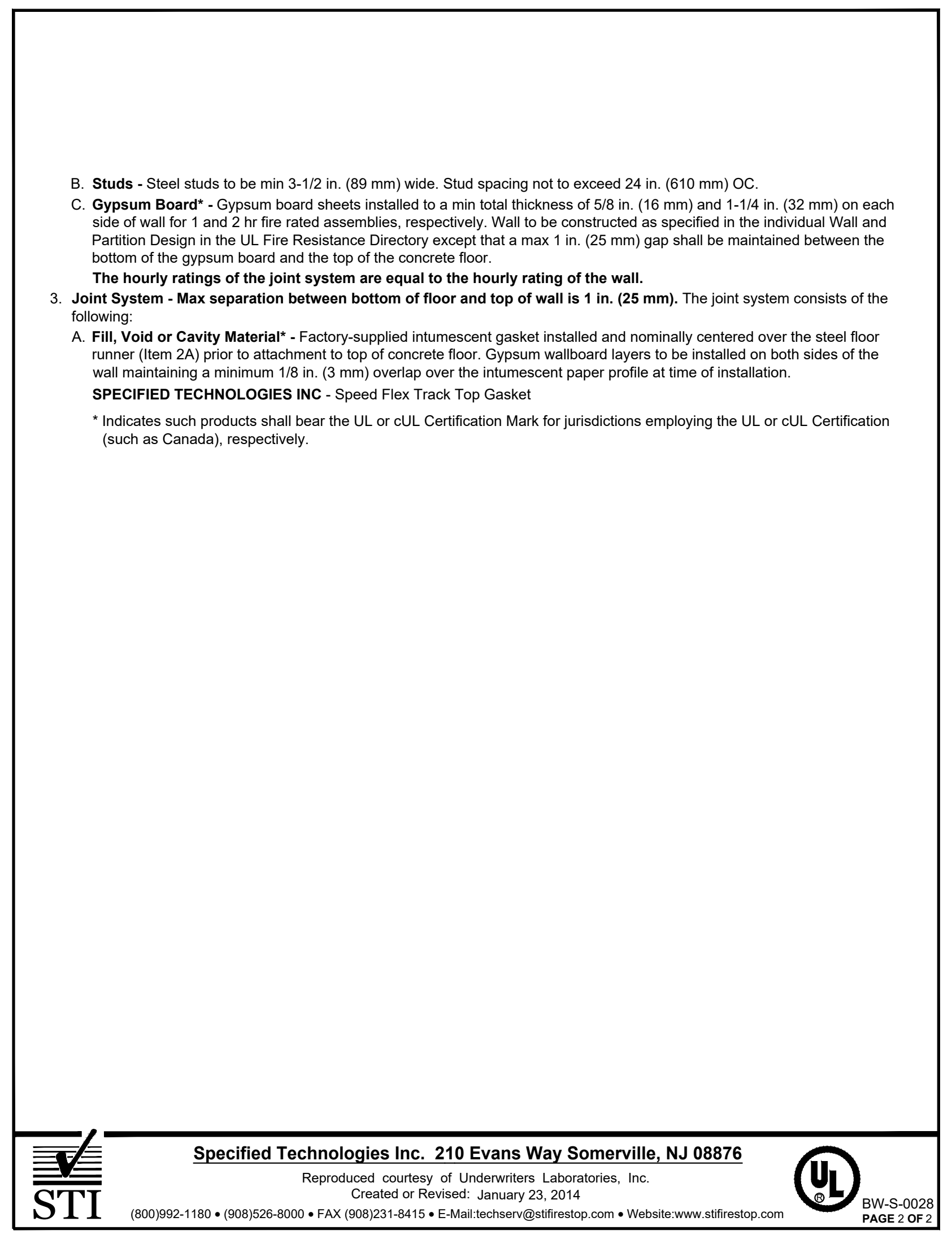
to ANSI/UL 2079 and CAN/ULC S115

System No. BW-S-0028

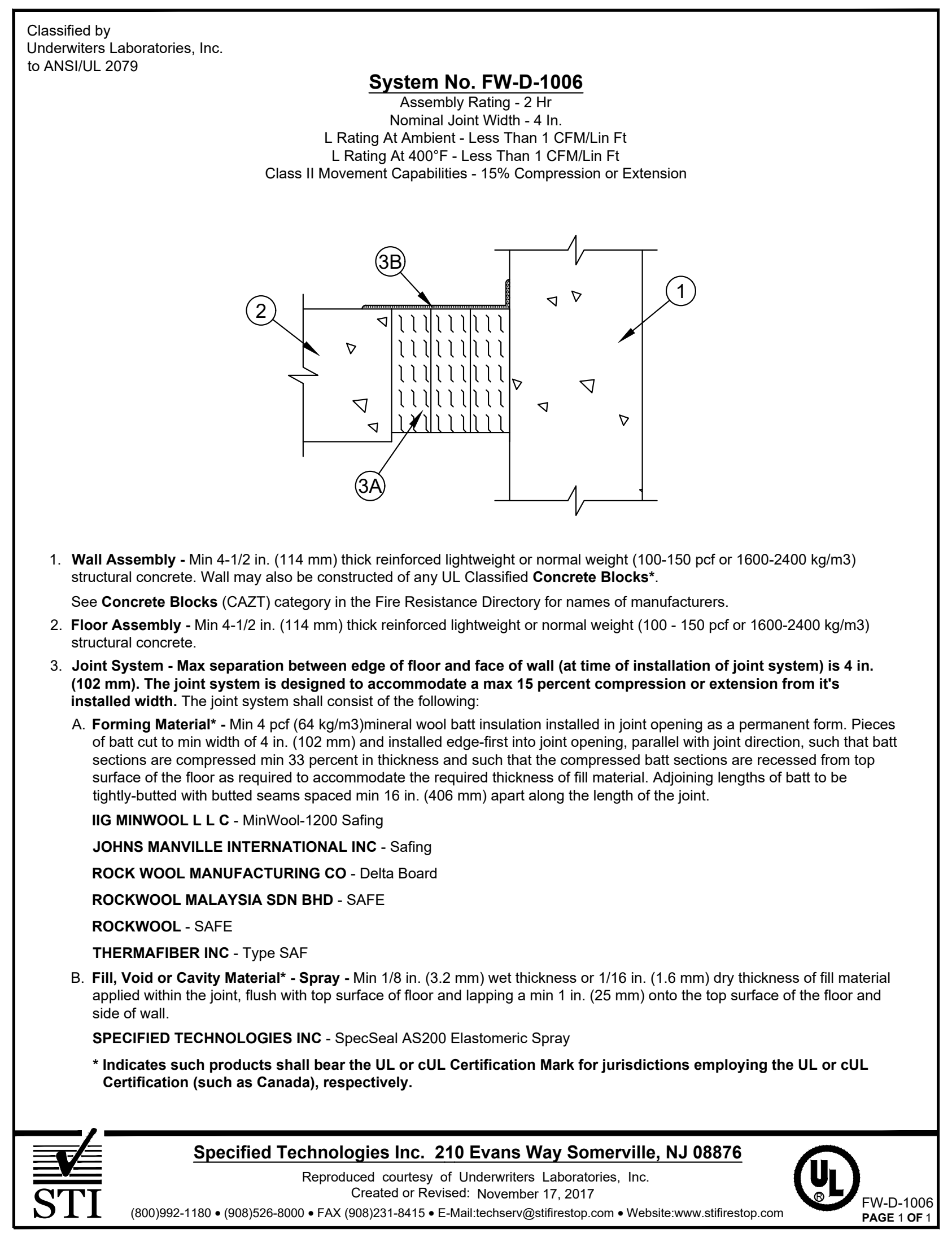
ANSI/UL2079	CAN/ULC S115
Assembly Ratings - 1 and 2 Hr (See Item 2)	F Ratings - 1 and 2 Hr (See Item 2)
Nominal Joint Width - 1 in.	FT Ratings - 1 and 2 Hr (See Item 2)
L Rating at Ambient - Less Than 1 CFM/Lin Ft	FH Ratings - 1 and 2 Hr (See Item 2)
L Rating at 400°F - Less Than 1 CFM/Lin Ft	FTH Ratings - 1 and 2 Hr (See Item 2)
	Nominal Joint Width - 25 mm
	L Rating at Ambient - Less Than 1 CFM/Lin Ft
	L Rating at 400°F - Less Than 1 CFM/Lin Ft

1. **Floor Assembly -** Min 4-1/2 in. (114 mm) thick steel-reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Floor may also be constructed of any min 6 in. thick (152 mm) UL Classified hollow-core **Precast Concrete Units***.

   See **Precast Concrete Units** (CFTV) category in Fire Resistance Directory for names of manufacturers.
2. **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 Runner -** Floor runners of wall assembly shall consist of min No. 25 gauge galv steel channels sized to accommodate steel studs (Item 2B). Floor runners to be provided with min 1-1/4 in. (32 mm) flanges. Runners secured with steel fasteners spaced 12 in. (305 mm) OC.


   B. **Studs -** Steel studs to be min 3-1/2 in. (89 mm) wide. 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 max 1 in. (25 mm) gap shall be maintained between the bottom of the gypsum board and the top of the concrete floor.
   The hourly ratings of the joint system are equal to the hourly rating of the wall.
3. **Joint System - Max separation between bottom of floor and top of wall is 1 in. (25 mm).** The joint system consists of the following:
   A. **Fill, Void or Cavity Material* -** Factory-supplied intumescent gasket installed and nominally centered over the steel floor runner (Item 2A) prior to attachment to top of concrete floor. Gypsum wallboard layers to be installed on both sides of the wall maintaining a minimum 1/8 in. (3 mm) overlap over the intumescent paper profile at time of installation.
   SPECIFIED TECHNOLOGIES INC - Speed Flex Track Top Gasket

   * 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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to ANSI/UL 2079

System No. FW-D-1006

Assembly Rating - 2 Hr
Nominal Joint Width - 4 In.
L Rating At Ambient - Less Than 1 CFM/Lin Ft
L Rating At 400°F - Less Than 1 CFM/Lin Ft
Class II Movement Capabilities - 15% Compression or Extension

1. **Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***.

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

2. **Floor Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100 - 150 pcf or 1600-2400 kg/m3) structural concrete.

3. **Joint System - Max separation between edge of floor and face of wall (at time of installation of joint system) is 4 in. (102 mm). The joint system is designed to accommodate a max 15 percent compression or extension from it's installed width.** The joint system shall consist of the following:
   A. **Forming Material* -** Min 4 pcf (64 kg/m3)mineral wool batt insulation installed in joint opening as a permanent form. Pieces of batt cut to min width of 4 in. (102 mm) and installed edge-first into joint opening, parallel with joint direction, such that batt sections are compressed min 33 percent in thickness and such that the compressed batt sections are recessed from top surface of the floor as required to accommodate the required thickness of fill material. Adjoining lengths of batt to be tightly-butted with butted seams spaced min 16 in. (406 mm) apart along the length of the joint.

   IIG MINWOOL L L C - MinWool-1200 Safing

   JOHNS MANVILLE INTERNATIONAL INC - Safing

   ROCK WOOL MANUFACTURING CO - Delta Board

   ROCKWOOL MALAYSIA SDN BHD - SAFE

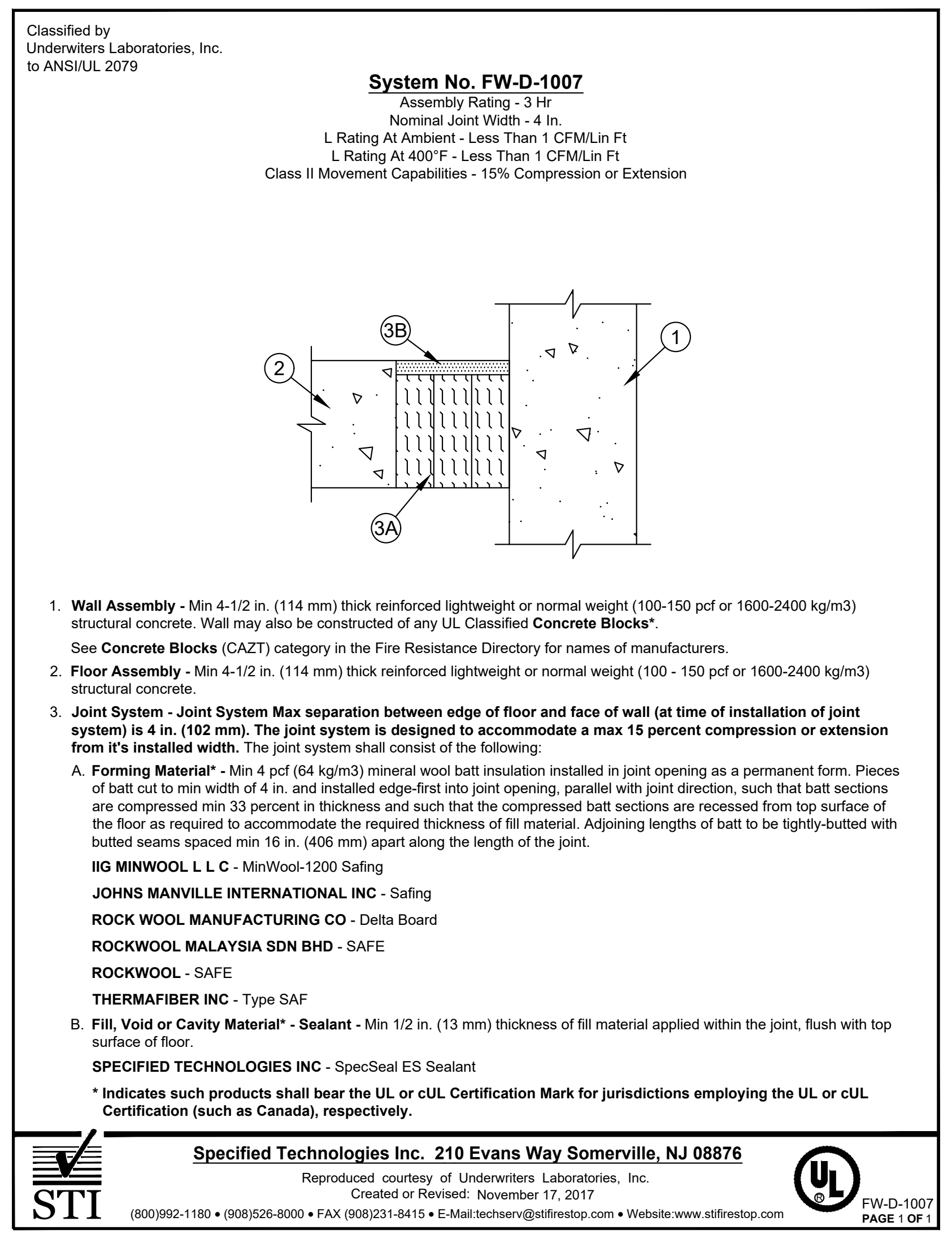
   ROCKWOOL - SAFE

   THERMAFIBER INC - Type SAF

   B. **Fill, Void or Cavity Material* - Spray -** Min 1/8 in. (3.2 mm) wet thickness or 1/16 in. (1.6 mm) dry thickness of fill material applied within the joint, flush with top surface of floor and lapping a min 1 in. (25 mm) onto the top surface of the floor and 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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System No. FW-D-1007

Assembly Rating - 3 Hr
Nominal Joint Width - 4 In.
L Rating At Ambient - Less Than 1 CFM/Lin Ft
L Rating At 400°F - Less Than 1 CFM/Lin Ft
Class II Movement Capabilities - 15% Compression or Extension

1. **Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***.

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

2. **Floor Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100 - 150 pcf or 1600-2400 kg/m3) structural concrete.

3. **Joint System - Joint System Max separation between edge of floor and face of wall (at time of installation of joint system) is 4 in. (102 mm). The joint system is designed to accommodate a max 15 percent compression or extension from it's installed width.** The joint system shall consist of the following:
   A. **Forming Material* -** Min 4 pcf (64 kg/m3) mineral wool batt insulation installed in joint opening as a permanent form. Pieces of batt cut to min width of 4 in. and installed edge-first into joint opening, parallel with joint direction, such that batt sections are compressed min 33 percent in thickness and such that the compressed batt sections are recessed from top surface of the floor as required to accommodate the required thickness of fill material. Adjoining lengths of batt to be tightly-butted with butted seams spaced min 16 in. (406 mm) apart along the length of the joint.

   IIG MINWOOL L L C - MinWool-1200 Safing

   JOHNS MANVILLE INTERNATIONAL INC - Safing

   ROCK WOOL MANUFACTURING CO - Delta Board

   ROCKWOOL MALAYSIA SDN BHD - SAFE

   ROCKWOOL - SAFE

   THERMAFIBER INC - Type SAF

   B. **Fill, Void or Cavity Material* - Sealant -** Min 1/2 in. (13 mm) thickness of fill material applied within the joint, flush with top surface of floor.

   SPECIFIED TECHNOLOGIES INC - SpecSeal ES Sealant

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

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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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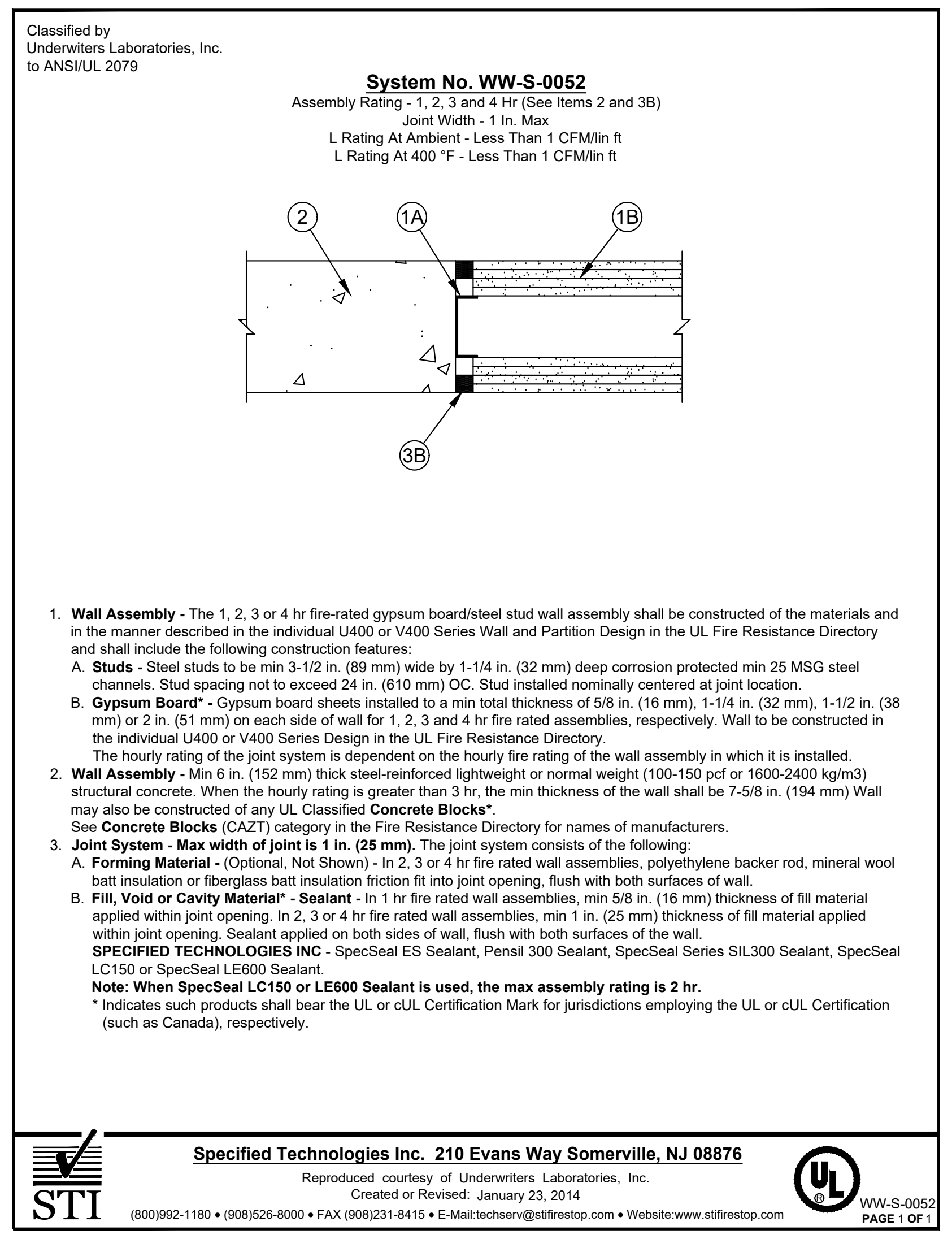

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to ANSI/UL 2079

System No. WW-S-0052

Assembly Rating - 1, 2, 3 and 4 Hr (See Items 2 and 3B)
Joint Width - 1 In. Max
L Rating At Ambient - Less Than 1 CFM/lin ft
L Rating At 400 °F - Less Than 1 CFM/lin ft

1. **Wall Assembly -** The 1, 2, 3 or 4 hr fire-rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Steel studs to be min 3-1/2 in. (89 mm) wide by 1-1/4 in. (32 mm) deep corrosion protected min 25 MSG steel channels. Stud spacing not to exceed 24 in. (610 mm) OC. Stud installed nominally centered at joint location.
   B. **Gypsum Board* -** Gypsum board sheets installed to a min total thickness of 5/8 in. (16 mm), 1-1/4 in. (32 mm), 1-1/2 in. (38 mm) or 2 in. (51 mm) on each side of wall for 1, 2, 3 and 4 hr fire rated assemblies, respectively. Wall to be constructed in the individual U400 or V400 Series Design in the UL Fire Resistance Directory.
   The hourly rating of the joint system is dependent on the hourly fire rating of the wall assembly in which it is installed.
2. **Wall Assembly -** Min 6 in. (152 mm) thick steel-reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. When the hourly rating is greater than 3 hr, the min thickness of the wall shall be 7-5/8 in. (194 mm) Wall may also be constructed of any UL Classified **Concrete Blocks***.
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
3. **Joint System - Max width of joint is 1 in. (25 mm).** The joint system consists of the following:
   A. **Forming Material -** (Optional, Not Shown) - In 2, 3 or 4 hr fire rated wall assemblies, polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction fit into joint opening, flush with both surfaces of wall.
   B. **Fill, Void or Cavity Material* - Sealant -** In 1 hr fire rated wall assemblies, min 5/8 in. (16 mm) thickness of fill material applied within joint opening. In 2, 3 or 4 hr fire rated wall assemblies, min 1 in. (25 mm) thickness of fill material applied within joint opening. Sealant applied on both sides of wall, flush with both surfaces of the wall.
   SPECIFIED TECHNOLOGIES INC - SpecSeal ES Sealant, Pensil 300 Sealant, SpecSeal Series SIL300 Sealant, SpecSeal LC150 or SpecSeal LE600 Sealant.
   Note: When SpecSeal LC150 or LE600 Sealant is used, the max assembly rating is 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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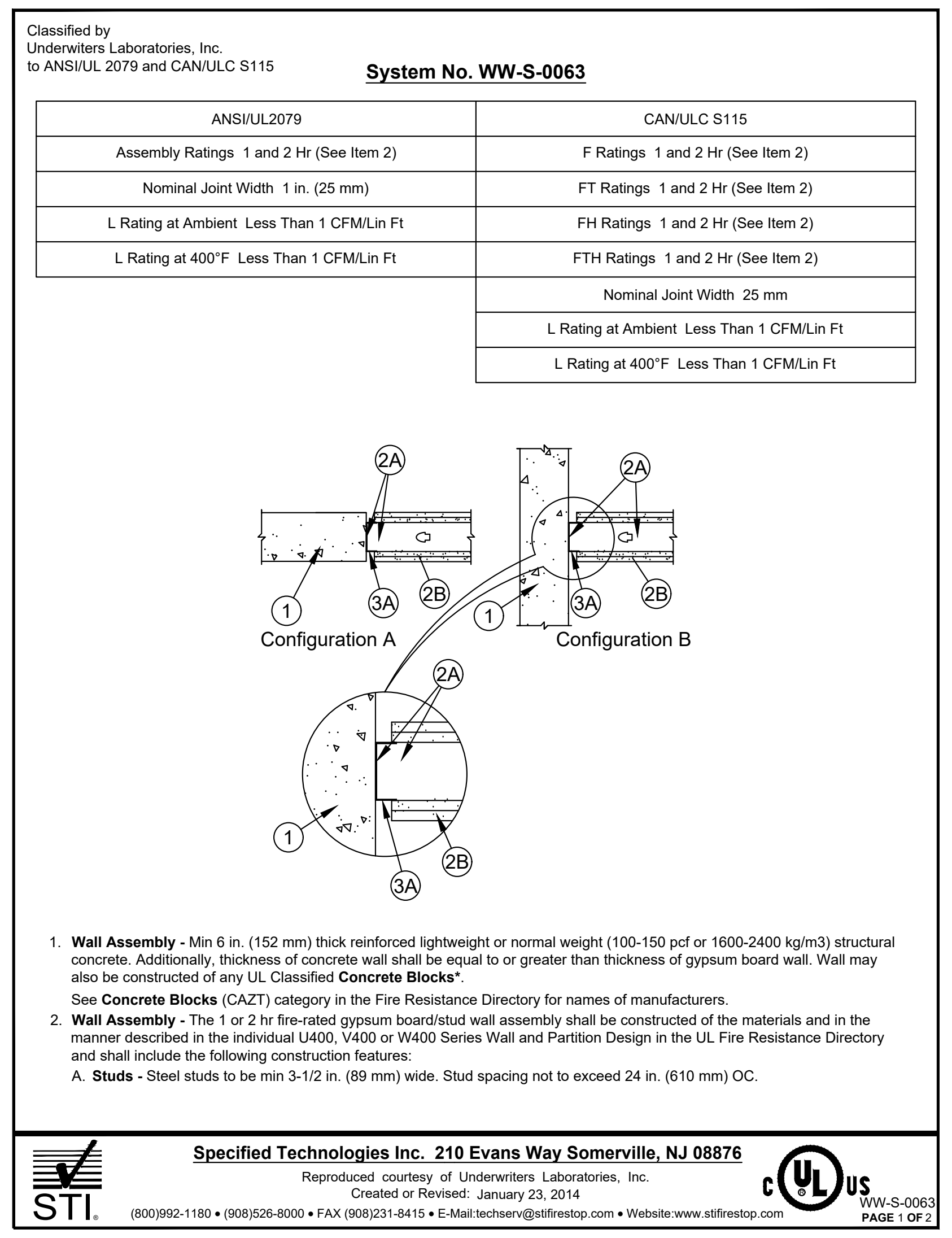

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to ANSI/UL 2079 and CAN/ULC S115

System No. WW-S-0063

ANSI/UL2079	CAN/ULC S115
Assembly Ratings 1 and 2 Hr (See Item 2)	F Ratings 1 and 2 Hr (See Item 2)
Nominal Joint Width 1 in. (25 mm)	FT Ratings 1 and 2 Hr (See Item 2)
L Rating at Ambient Less Than 1 CFM/Lin Ft	FH Ratings 1 and 2 Hr (See Item 2)
L Rating at 400°F Less Than 1 CFM/Lin Ft	FTH Ratings 1 and 2 Hr (See Item 2)
	Nominal Joint Width 25 mm
	L Rating at Ambient Less Than 1 CFM/Lin Ft
	L Rating at 400°F Less Than 1 CFM/Lin Ft

1. **Wall Assembly -** Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Additionally, thickness of concrete wall shall be equal to or greater than thickness of gypsum board wall. Wall may also be constructed of any UL Classified **Concrete Blocks***.
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. **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. **Studs -** Steel studs to be min 3-1/2 in. (89 mm) wide. Stud spacing not to exceed 24 in. (610 mm) OC.

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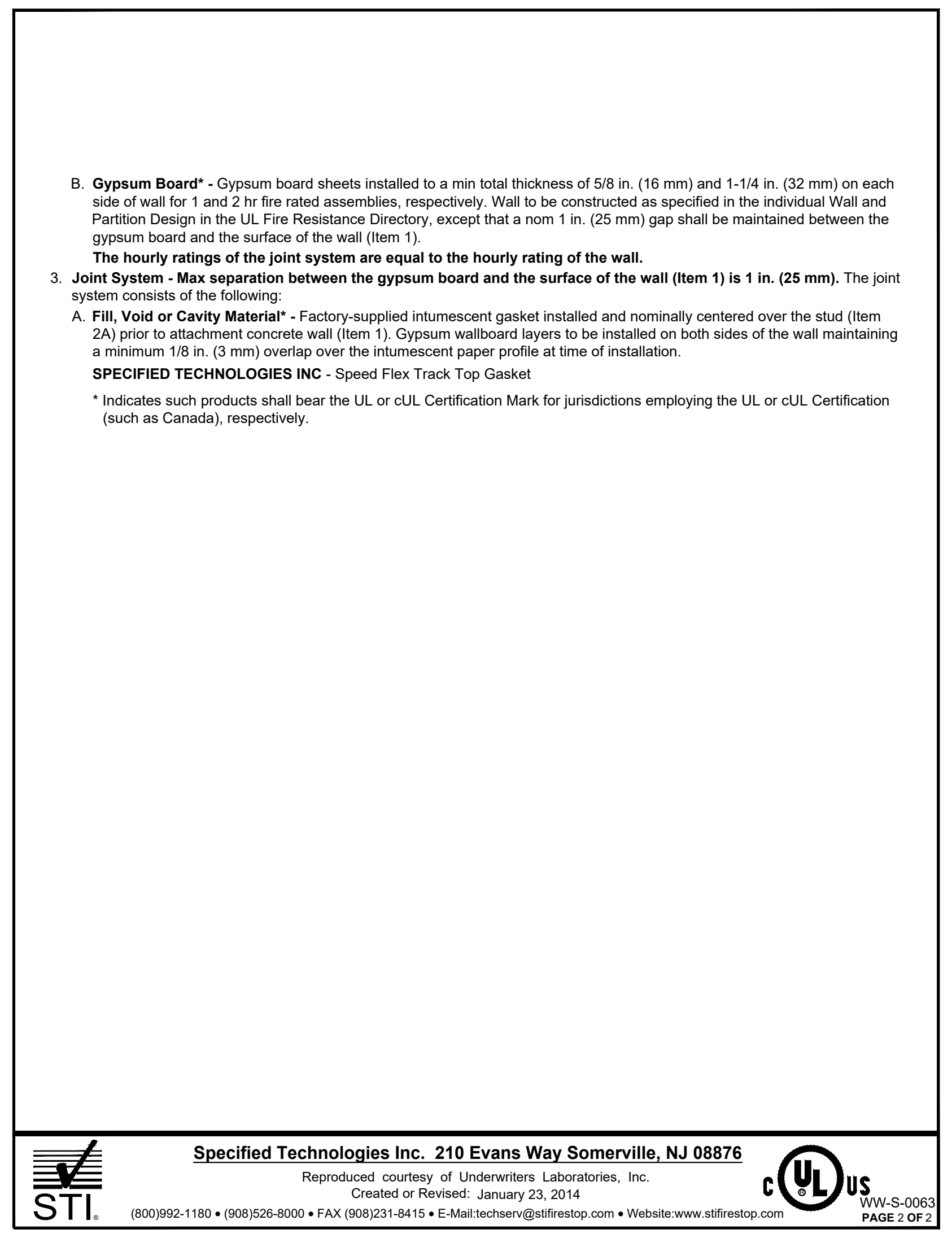

B. **Gypsum Board* -** Gypsum board sheets installed to a min total thickness of 5/8 in. (16 mm) and 1-1/4 in. (32 mm) on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a nom 1 in. (25 mm) gap shall be maintained between the gypsum board and the surface of the wall (Item 1).
The hourly ratings of the joint system are equal to the hourly rating of the wall.

3. **Joint System - Max separation between the gypsum board and the surface of the wall (Item 1) is 1 in. (25 mm).** The joint system consists of the following:
   A. **Fill, Void or Cavity Material* -** Factory-supplied intumescent gasket installed and nominally centered over the stud (Item 2A) prior to attachment concrete wall (Item 1). Gypsum wallboard layers to be installed on both sides of the wall maintaining a minimum 1/8 in. (3 mm) overlap over the intumescent paper profile at time of installation.
   SPECIFIED TECHNOLOGIES INC - Speed Flex Track Top Gasket
   * 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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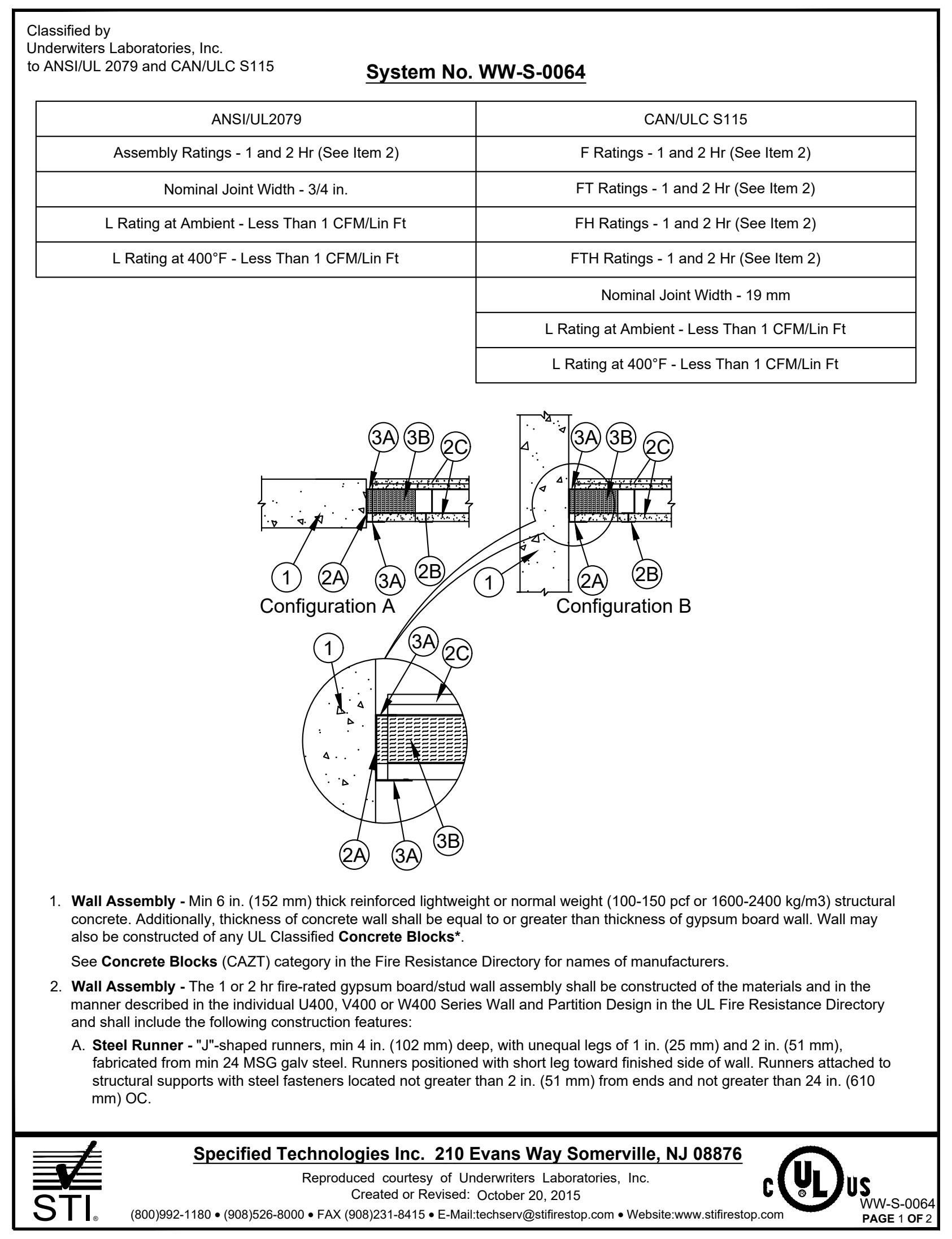

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to ANSI/UL 2079 and CAN/ULC S115

System No. WW-S-0064

ANSI/UL2079	CAN/ULC S115
Assembly Ratings - 1 and 2 Hr (See Item 2)	F Ratings - 1 and 2 Hr (See Item 2)
Nominal Joint Width - 3/4 in.	FT Ratings - 1 and 2 Hr (See Item 2)
L Rating at Ambient - Less Than 1 CFM/Lin Ft	FH Ratings - 1 and 2 Hr (See Item 2)
L Rating at 400°F - Less Than 1 CFM/Lin Ft	FTH Ratings - 1 and 2 Hr (See Item 2)
	Nominal Joint Width - 19 mm
	L Rating at Ambient - Less Than 1 CFM/Lin Ft
	L Rating at 400°F - Less Than 1 CFM/Lin Ft

1. **Wall Assembly -** Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Additionally, thickness of concrete wall shall be equal to or greater than thickness of gypsum board wall. Wall may also be constructed of any UL Classified **Concrete Blocks***.
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. **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 Runner -** "J"-shaped runners, min 4 in. (102 mm) deep, 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 structural supports with steel fasteners located not greater than 2 in. (51 mm) from ends and not greater than 24 in. (610 mm) OC.

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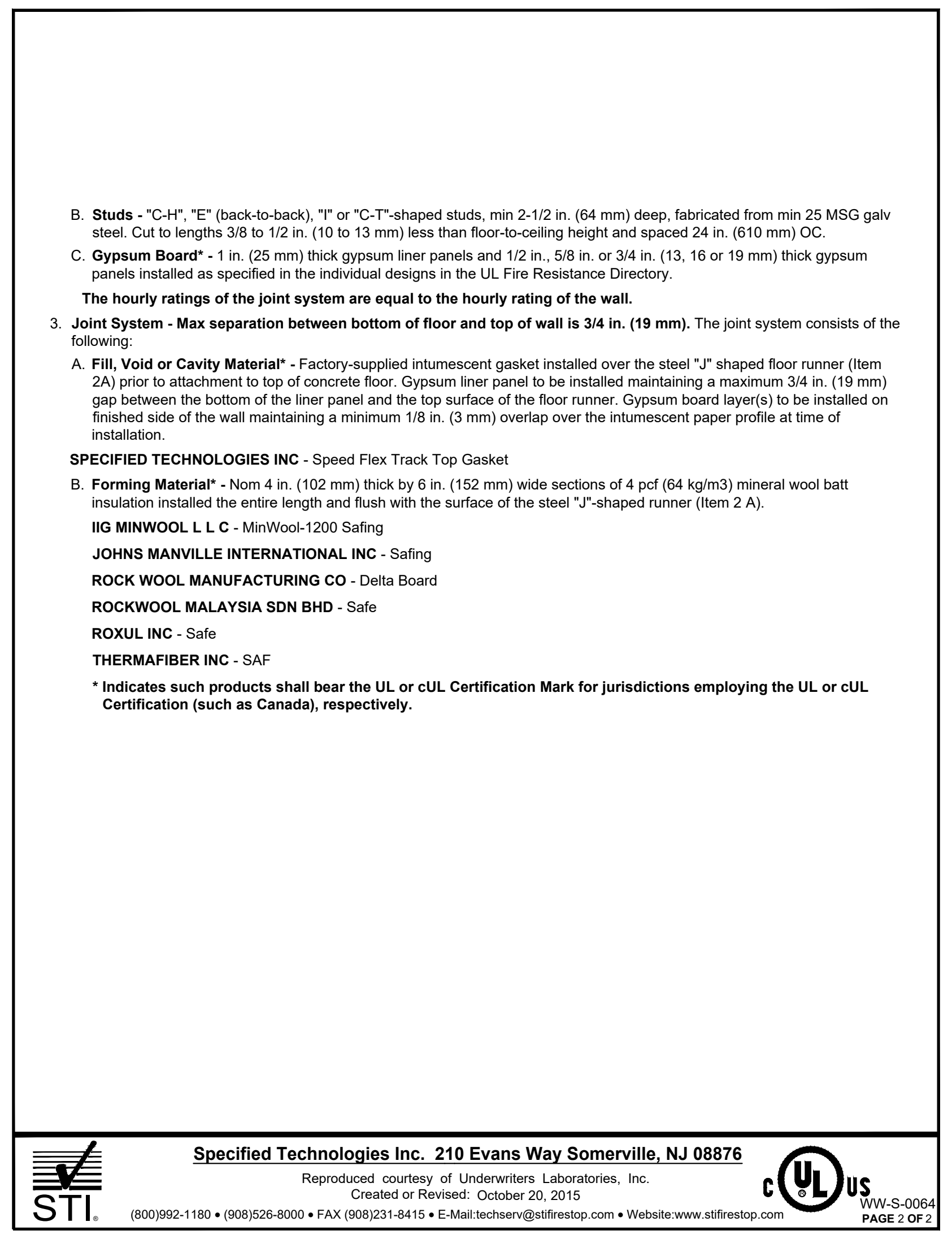

B. **Studs -** "C-H", "E" (back-to-back), "I" or "C-T"-shaped studs, min 2-1/2 in. (64 mm) deep, fabricated from min 25 MSG galv steel. Cut to lengths 3/8 to 1/2 in. (10 to 13 mm) less than floor-to-ceiling height and spaced 24 in. (610 mm) OC.
C. **Gypsum Board* -** 1 in. (25 mm) thick gypsum liner panels and 1/2 in., 5/8 in. or 3/4 in. (13, 16 or 19 mm) thick gypsum panels installed as specified in the individual designs in the UL Fire Resistance Directory.

The hourly ratings of the joint system are equal to the hourly rating of the wall.

3. **Joint System - Max separation between bottom of floor and top of wall is 3/4 in. (19 mm).** The joint system consists of the following:
   A. **Fill, Void or Cavity Material* -** Factory-supplied intumescent gasket installed over the steel "J" shaped floor runner (Item 2A) prior to attachment to top of concrete floor. Gypsum liner panel to be installed maintaining a maximum 3/4 in. (19 mm) gap between the bottom of the liner panel and the top surface of the floor runner. Gypsum board layer(s) to be installed on finished side of the wall maintaining a minimum 1/8 in. (3 mm) overlap over the intumescent paper profile at time of installation.
   SPECIFIED TECHNOLOGIES INC - Speed Flex Track Top Gasket
   B. **Forming Material* -** Nom 4 in. (102 mm) thick by 6 in. (152 mm) wide sections of 4 pcf (64 kg/m3) mineral wool batt insulation installed the entire length and flush with the surface of the steel "J"-shaped runner (Item 2 A).
   IIG MINWOOL L L C - MinWool-1200 Safing
   JOHNS MANVILLE INTERNATIONAL INC - Safing
   ROCK WOOL MANUFACTURING CO - Delta Board
   ROCKWOOL MALAYSIA SDN BHD - Safe
   ROXUL INC - Safe
   THERMAFIBER INC - SAF
   *** 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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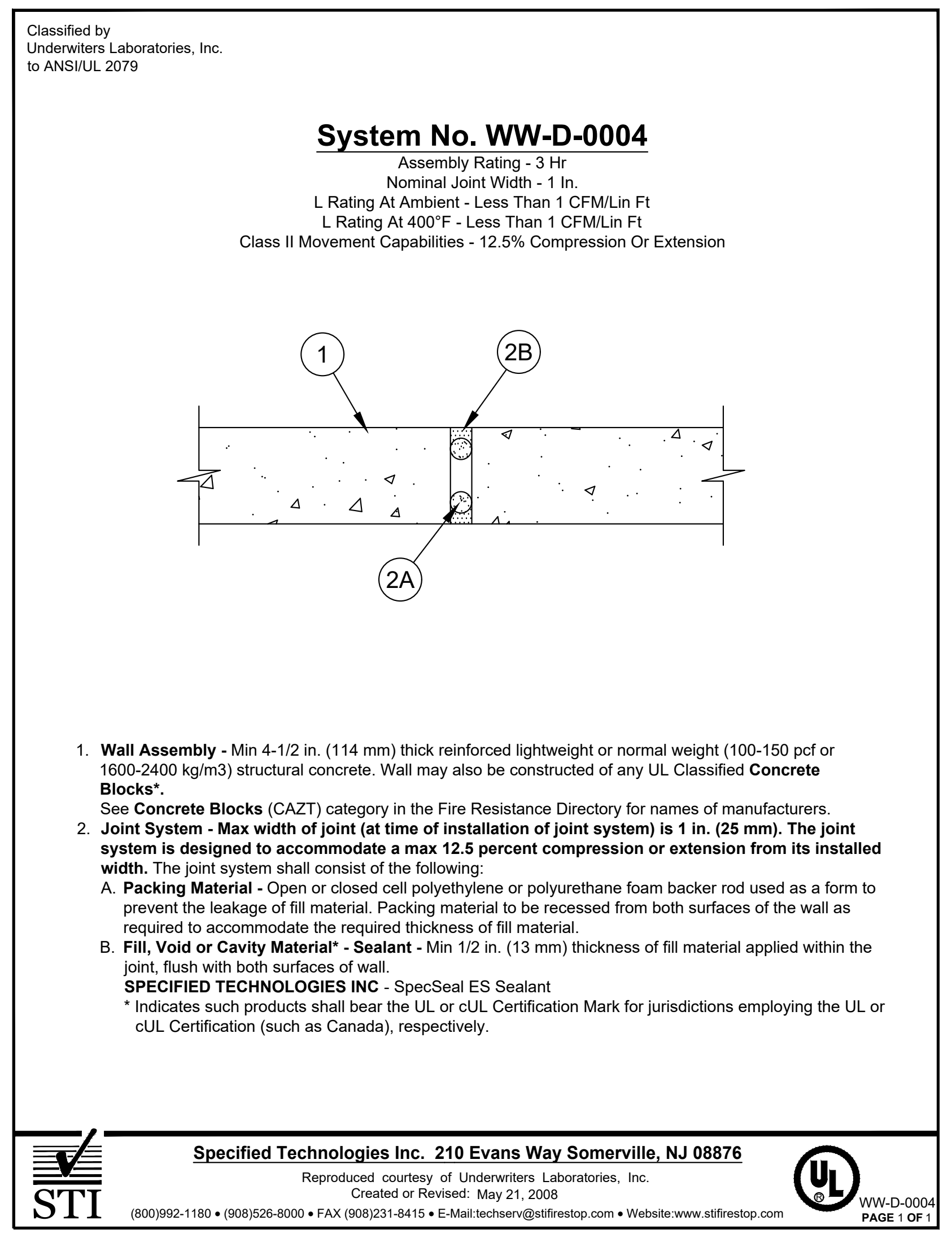

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System No. WW-D-0004

Assembly Rating - 3 Hr
Nominal Joint Width - 1 In.
L Rating At Ambient - Less Than 1 CFM/Lin Ft
L Rating At 400°F - Less Than 1 CFM/Lin Ft
Class II Movement Capabilities - 12.5% Compression Or Extension

1. **Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.**
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. **Joint System - Max width of joint (at time of installation of joint system) is 1 in. (25 mm). The joint system is designed to accommodate a max 12.5 percent compression or extension from its installed width.** The joint system shall consist of the following:
   A. **Packing Material -** Open or closed cell polyethylene or polyurethane foam backer rod used as a form to prevent the leakage of fill material. Packing material to be recessed from both surfaces of the wall as required to accommodate the required thickness of fill material.
   B. **Fill, Void or Cavity Material* - Sealant -** Min 1/2 in. (13 mm) thickness of fill material applied within the joint, flush with both surfaces of wall.
   SPECIFIED TECHNOLOGIES INC - SpecSeal ES Sealant
   * 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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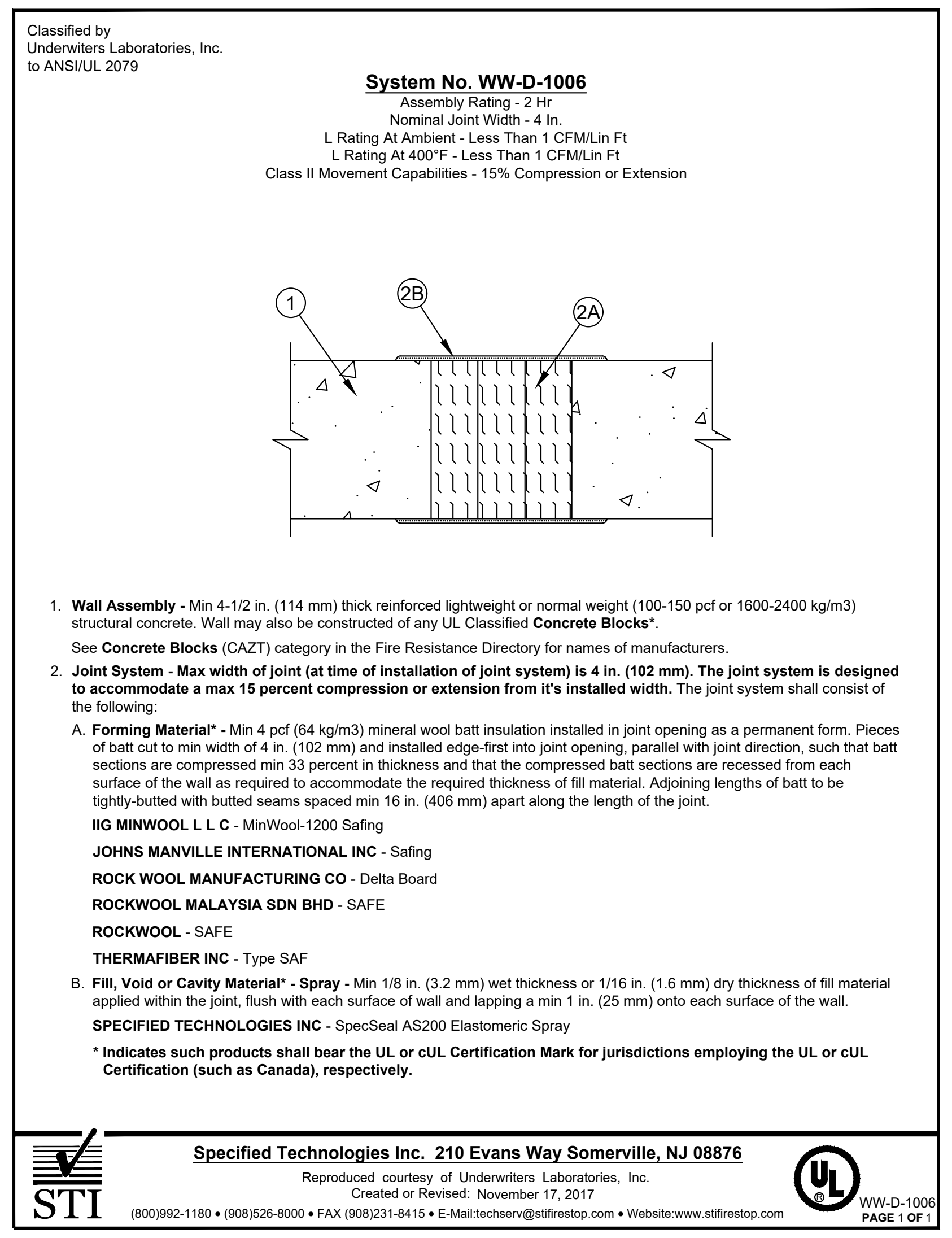

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 2079

System No. WW-D-1006

Assembly Rating - 2 Hr
Nominal Joint Width - 4 In.
L Rating At Ambient - Less Than 1 CFM/Lin Ft
L Rating At 400°F - Less Than 1 CFM/Lin Ft
Class II Movement Capabilities - 15% Compression or Extension

1. **Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***.
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. **Joint System - Max width of joint (at time of installation of joint system) is 4 in. (102 mm). The joint system is designed to accommodate a max 15 percent compression or extension from it's installed width.** The joint system shall consist of the following:
   A. **Forming Material* -** Min 4 pcf (64 kg/m3) mineral wool batt insulation installed in joint opening as a permanent form. Pieces of batt cut to min width of 4 in. (102 mm) and installed edge-first into joint opening, parallel with joint direction, such that batt sections are compressed min 33 percent in thickness and that the compressed batt sections are recessed from each surface of the wall as required to accommodate the required thickness of fill material. Adjoining lengths of batt to be tightly-butted with butted seams spaced min 16 in. (406 mm) apart along the length of the joint.
   IIG MINWOOL L L C - MinWool-1200 Safing
   JOHNS MANVILLE INTERNATIONAL INC - Safing
   ROCK WOOL MANUFACTURING CO - Delta Board
   ROCKWOOL MALAYSIA SDN BHD - SAFE
   ROCKWOOL - SAFE
   THERMAFIBER INC - Type SAF
   B. **Fill, Void or Cavity Material* - Spray -** Min 1/8 in. (3.2 mm) wet thickness or 1/16 in. (1.6 mm) dry thickness of fill material applied within the joint, flush with each surface of wall and lapping a min 1 in. (25 mm) onto each surface of the 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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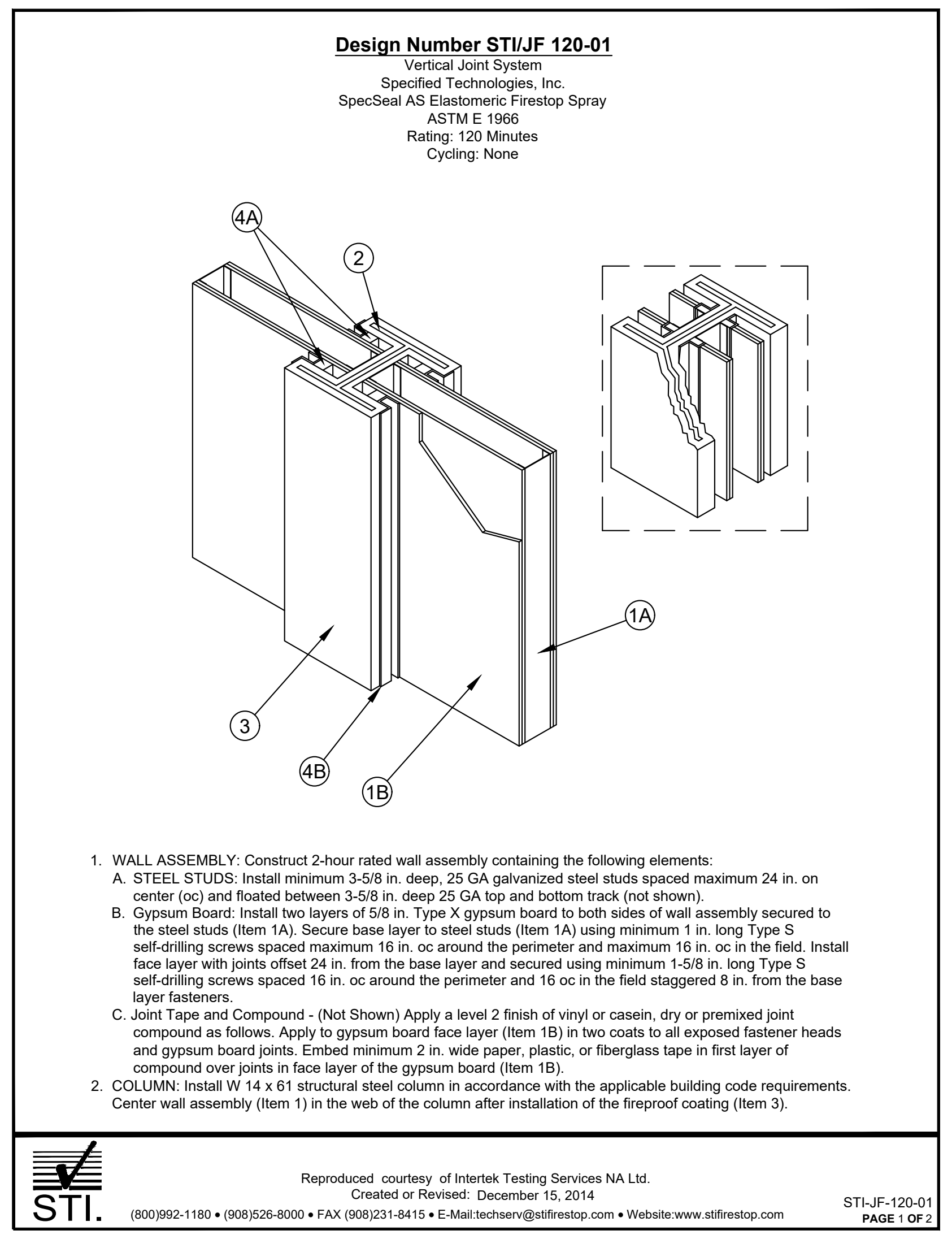

Design Number STI/JF 120-01

Vertical Joint System
Specified Technologies, Inc.
SpecSeal AS Elastomeric Firestop Spray
ASTM E 1966
Rating: 120 Minutes
Cycling: None

1. WALL ASSEMBLY: Construct 2-hour rated wall assembly containing the following elements:
   A. STEEL STUDS: Install minimum 3-5/8 in. deep, 25 GA galvanized steel studs spaced maximum 24 in. on center (oc) and floated between 3-5/8 in. deep 25 GA top and bottom track (not shown).
   B. Gypsum Board: Install two layers of 5/8 in. Type X gypsum board to both sides of wall assembly secured to the steel studs (Item 1A). Secure base layer to steel studs (Item 1A) using minimum 1 in. long Type S self-drilling screws spaced maximum 16 in. oc around the perimeter and maximum 16 in. oc in the field. Install face layer with joints offset 24 in. from the base layer and secured using minimum 1-5/8 in. long Type S self-drilling screws spaced 16 in. oc around the perimeter and 16 oc in the field staggered 8 in. from the base layer fasteners.
   C. Joint Tape and Compound - (Not Shown) Apply a level 2 finish of vinyl or casein, dry or premixed joint compound as follows. Apply to gypsum board face layer (Item 1B) in two coats to all exposed fastener heads and gypsum board joints. Embed minimum 2 in. wide paper, plastic, or fiberglass tape in first layer of compound over joints in face layer of the gypsum board (Item 1B).
2. COLUMN: Install W 14 x 61 structural steel column in accordance with the applicable building code requirements. Center wall assembly (Item 1) in the web of the column after installation of the fireproof coating (Item 3).

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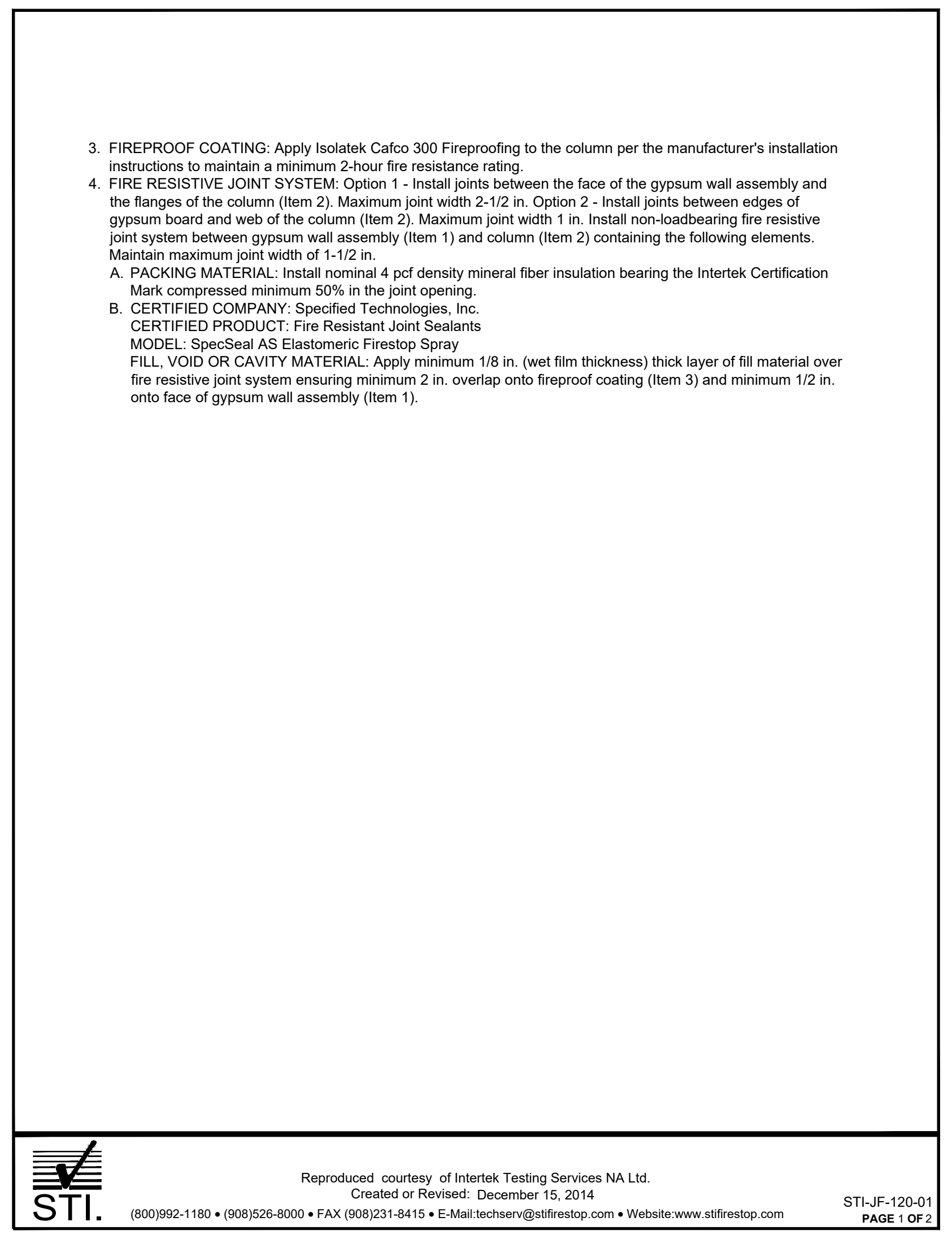

3. FIREPROOF COATING: Apply Isolatek Cafco 300 Fireproofing to the column per the manufacturer's installation instructions to maintain a minimum 2-hour fire resistance rating.
4. FIRE RESISTIVE JOINT SYSTEM: Option 1 - Install joints between the face of the gypsum wall assembly and the flanges of the column (Item 2). Maximum joint width 2-1/2 in. Option 2 - Install joints between edges of gypsum board and web of the column (Item 2). Maximum joint width 1 in. Install non-loadbearing fire resistive joint system between gypsum wall assembly (Item 1) and column (Item 2) containing the following elements. Maintain maximum joint width of 1-1/2 in.
   A. PACKING MATERIAL: Install nominal 4 pcf density mineral fiber insulation bearing the Intertek Certification Mark compressed minimum 50% in the joint opening.
   B. CERTIFIED COMPANY: Specified Technologies, Inc.
   CERTIFIED PRODUCT: Fire Resistant Joint Sealants
   MODEL: SpecSeal AS Elastomeric Firestop Spray
   FILL, VOID OR CAVITY MATERIAL: Apply minimum 1/8 in. (wet film thickness) thick layer of fill material over fire resistive joint system ensuring minimum 2 in. overlap onto fireproof coating (Item 3) and minimum 1/2 in. onto face of gypsum wall assembly (Item 1).

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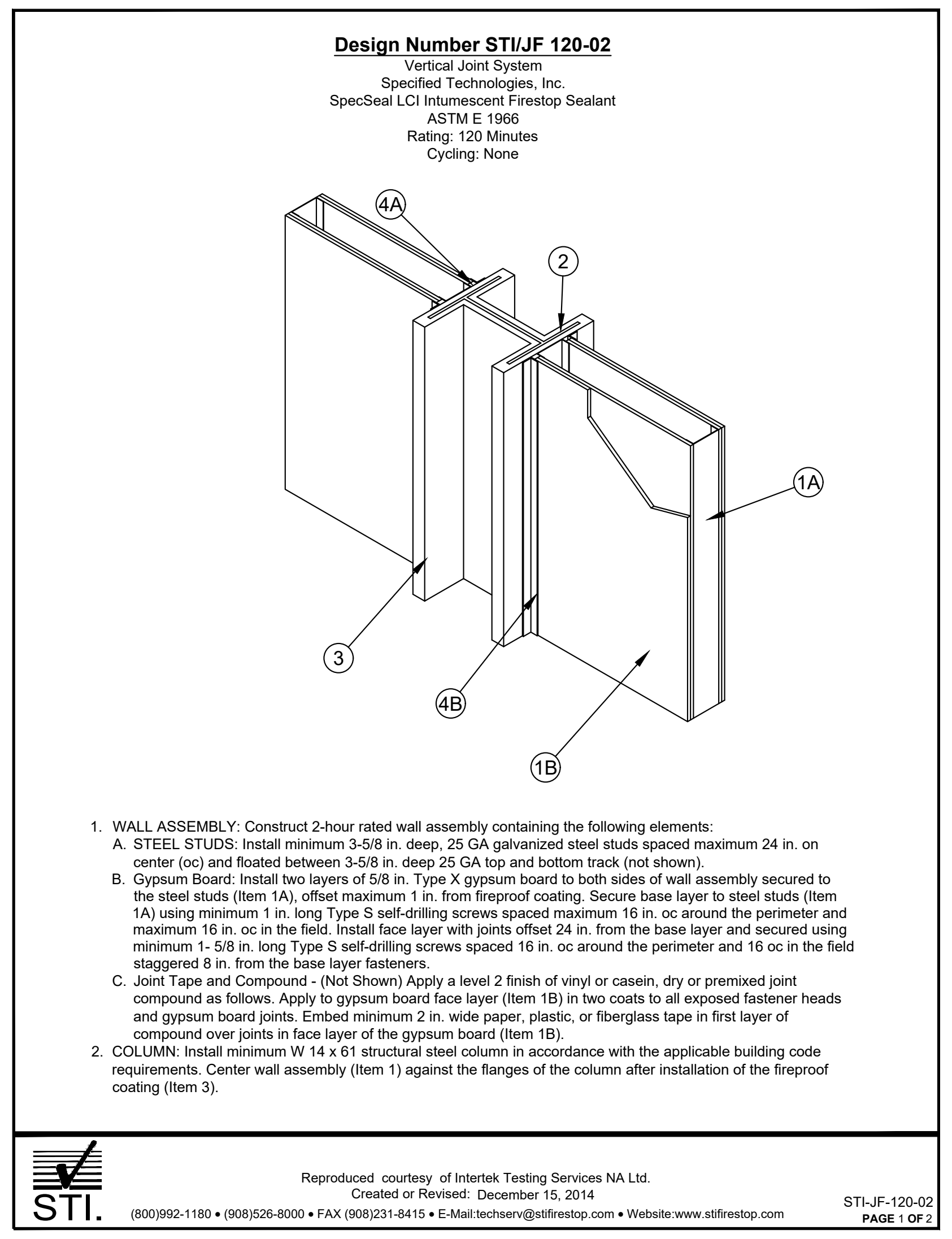

Design Number STI/JF 120-02

Vertical Joint System
Specified Technologies, Inc.
SpecSeal LCI Intumescent Firestop Sealant
ASTM E 1966
Rating: 120 Minutes
Cycling: None

1. WALL ASSEMBLY: Construct 2-hour rated wall assembly containing the following elements:
   A. STEEL STUDS: Install minimum 3-5/8 in. deep, 25 GA galvanized steel studs spaced maximum 24 in. on center (oc) and floated between 3-5/8 in. deep 25 GA top and bottom track (not shown).
   B. Gypsum Board: Install two layers of 5/8 in. Type X gypsum board to both sides of wall assembly secured to the steel studs (Item 1A), offset maximum 1 in. from fireproof coating. Secure base layer to steel studs (Item 1A) using minimum 1 in. long Type S self-drilling screws spaced maximum 16 in. oc around the perimeter and maximum 16 in. oc in the field. Install face layer with joints offset 24 in. from the base layer and secured using minimum 1- 5/8 in. long Type S self-drilling screws spaced 16 in. oc around the perimeter and 16 oc in the field staggered 8 in. from the base layer fasteners.
   C. Joint Tape and Compound - (Not Shown) Apply a level 2 finish of vinyl or casein, dry or premixed joint compound as follows. Apply to gypsum board face layer (Item 1B) in two coats to all exposed fastener heads and gypsum board joints. Embed minimum 2 in. wide paper, plastic, or fiberglass tape in first layer of compound over joints in face layer of the gypsum board (Item 1B).
2. COLUMN: Install minimum W 14 x 61 structural steel column in accordance with the applicable building code requirements. Center wall assembly (Item 1) against the flanges of the column after installation of the fireproof coating (Item 3).

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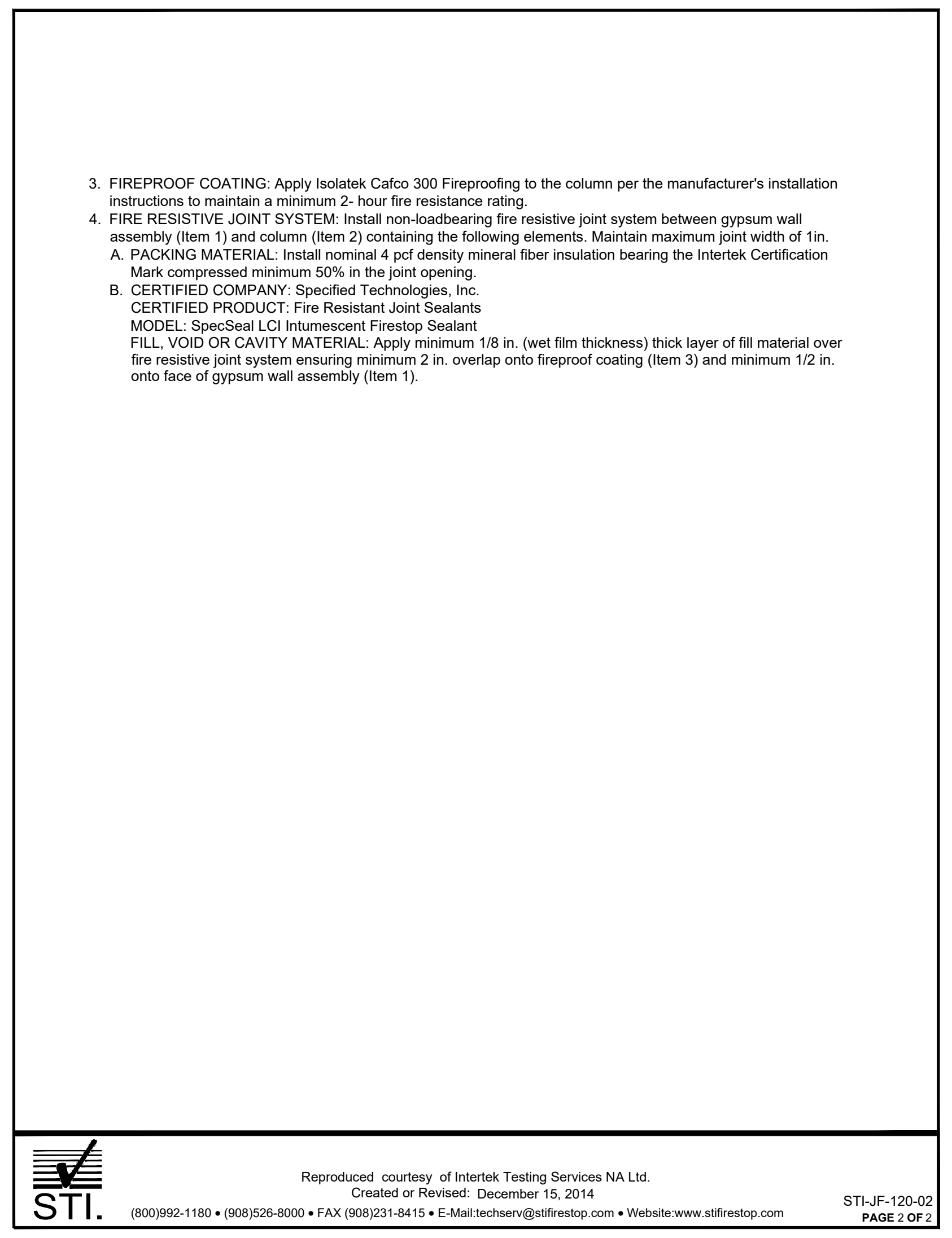

3. FIREPROOF COATING: Apply Isolatek Cafco 300 Fireproofing to the column per the manufacturer's installation instructions to maintain a minimum 2- hour fire resistance rating.
4. FIRE RESISTIVE JOINT SYSTEM: Install non-loadbearing fire resistive joint system between gypsum wall assembly (Item 1) and column (Item 2) containing the following elements. Maintain maximum joint width of 1in.
   A. PACKING MATERIAL: Install nominal 4 pcf density mineral fiber insulation bearing the Intertek Certification Mark compressed minimum 50% in the joint opening.
   B. CERTIFIED COMPANY: Specified Technologies, Inc.
   CERTIFIED PRODUCT: Fire Resistant Joint Sealants
   MODEL: SpecSeal LCI Intumescent Firestop Sealant
   FILL, VOID OR CAVITY MATERIAL: Apply minimum 1/8 in. (wet film thickness) thick layer of fill material over fire resistive joint system ensuring minimum 2 in. overlap onto fireproof coating (Item 3) and minimum 1/2 in. onto face of gypsum wall assembly (Item 1).

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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:

ARCHITECT/CONSULTANT:

TITLE:

STI FIRESTOP SYSTEMS

Specified Technologies Inc.
210 Evans Way Somerville, NJ 08876

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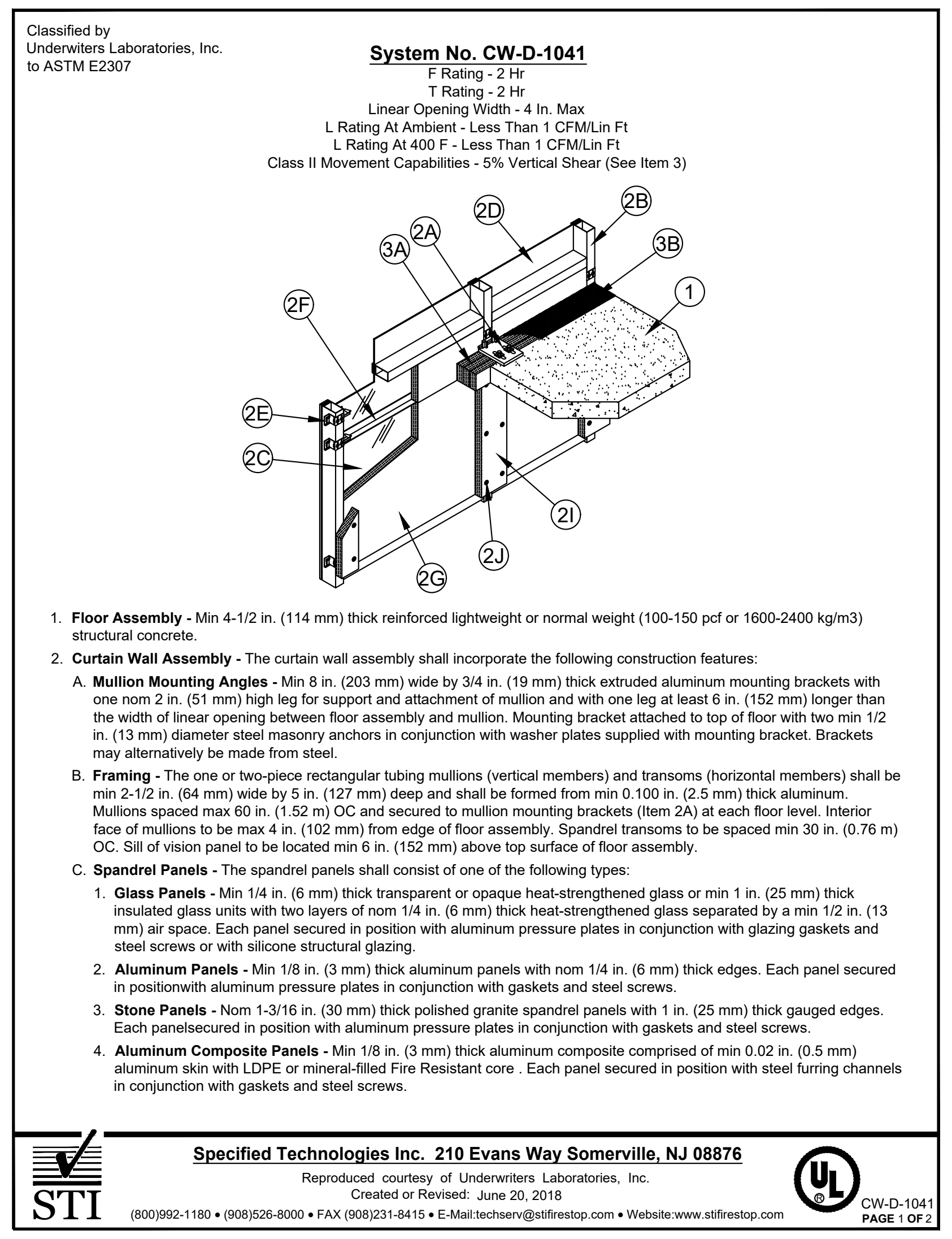

Classified by
Underwiters Laboratories, Inc.
to ASTM E2307

System No. CW-D-1041
F Rating - 2 Hr
T Rating - 2 Hr
Linear Opening Width - 4 In. Max
L Rating At Ambient - Less Than 1 CFM/Lin Ft
L Rating At 400 F - Less Than 1 CFM/Lin Ft
Class II Movement Capabilities - 5% Vertical Shear (See Item 3)

1. **Floor Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete.
2. **Curtain Wall Assembly -** The curtain wall assembly shall incorporate the following construction features:
   A. **Mullion Mounting Angles -** Min 8 in. (203 mm) wide by 3/4 in. (19 mm) thick extruded aluminum mounting brackets with one nom 2 in. (51 mm) high leg for support and attachment of mullion and with one leg at least 6 in. (152 mm) longer than the width of linear opening between floor assembly and mullion. Mounting bracket attached to top of floor with two min 1/2 in. (13 mm) diameter steel masonry anchors in conjunction with washer plates supplied with mounting bracket. Brackets may alternatively be made from steel.
   B. **Framing -** The one or two-piece rectangular tubing mullions (vertical members) and transoms (horizontal members) shall be min 2-1/2 in. (64 mm) wide by 5 in. (127 mm) deep and shall be formed from min 0.100 in. (2.5 mm) thick aluminum. Mullions spaced max 60 in. (1.52 m) OC and secured to mullion mounting brackets (Item 2A) at each floor level. Interior face of mullions to be max 4 in. (102 mm) from edge of floor assembly. Spandrel transoms to be spaced min 30 in. (0.76 m) OC. Sill of vision panel to be located min 6 in. (152 mm) above top surface of floor assembly.
   C. **Spandrel Panels -** The spandrel panels shall consist of one of the following types:
      1. **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.
      2. **Aluminum Panels -** Min 1/8 in. (3 mm) thick aluminum panels with nom 1/4 in. (6 mm) thick edges. Each panel secured in positionwith aluminum pressure plates in conjunction with gaskets and steel screws.
      3. **Stone Panels -** Nom 1-3/16 in. (30 mm) thick polished granite spandrel panels with 1 in. (25 mm) thick gauged edges. Each panelsecured in position with aluminum pressure plates in conjunction with gaskets and steel screws.
      4. **Aluminum Composite Panels -** 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.

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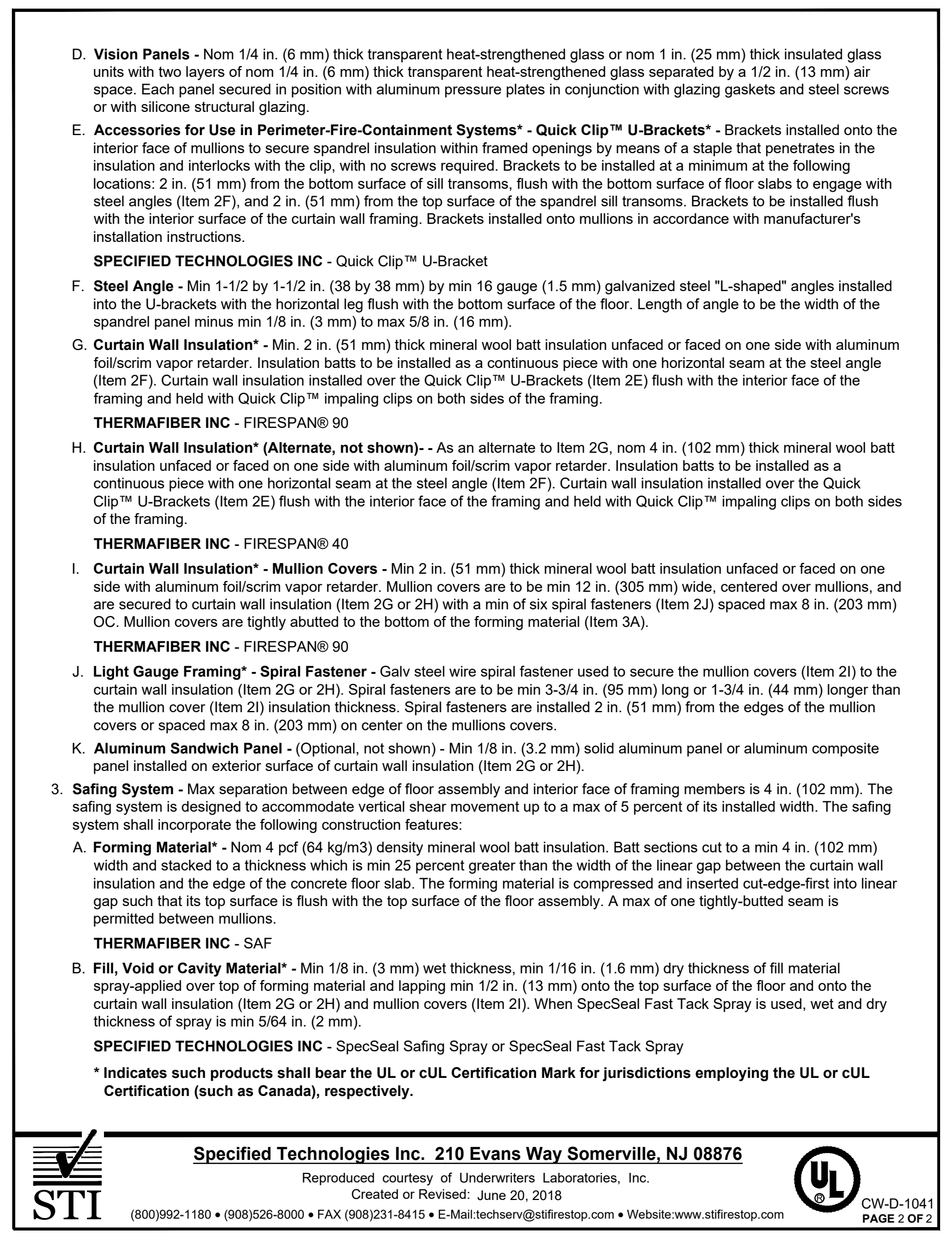

D. **Vision Panels -** Nom 1/4 in. (6 mm) thick transparent heat-strengthened glass or nom 1 in. (25 mm) thick insulated glass units with two layers of nom 1/4 in. (6 mm) thick transparent heat-strengthened glass separated by a 1/2 in. (13 mm) air space. Each panel secured in position with aluminum pressure plates in conjunction with glazing gaskets and steel screws or with silicone structural glazing.

E. **Accessories for Use in Perimeter-Fire-Containment Systems* - Quick Clip™ U-Brackets* -** Brackets installed onto the interior face of mullions to secure spandrel insulation within framed openings by means of a staple that penetrates in the insulation and interlocks with the clip, with no screws required. Brackets to be installed at a minimum at the following locations: 2 in. (51 mm) from the bottom surface of sill transoms, flush with the bottom surface of floor slabs to engage with steel angles (Item 2F), and 2 in. (51 mm) from the top surface of the spandrel sill transoms. Brackets to be installed flush with the interior surface of the curtain wall framing. Brackets installed onto mullions in accordance with manufacturer's installation instructions.

SPECIFIED TECHNOLOGIES INC - Quick Clip™ U-Bracket

F. **Steel Angle -** Min 1-1/2 by 1-1/2 in. (38 by 38 mm) by min 16 gauge (1.5 mm) galvanized steel "L-shaped" angles installed into the U-brackets with the horizontal leg flush with the bottom surface of the floor. Length of angle to be the width of the spandrel panel minus min 1/8 in. (3 mm) to max 5/8 in. (16 mm).

G. **Curtain Wall Insulation* -** Min. 2 in. (51 mm) thick mineral wool batt insulation unfaced or faced on one side with aluminum foil/scrim vapor retarder. Insulation batts to be installed as a continuous piece with one horizontal seam at the steel angle (Item 2F). Curtain wall insulation installed over the Quick Clip™ U-Brackets (Item 2E) flush with the interior face of the framing and held with Quick Clip™ impaling clips on both sides of the framing.

THERMAFIBER INC - FIRESPAN® 90

H. **Curtain Wall Insulation* (Alternate, not shown)- -** As an alternate to Item 2G, nom 4 in. (102 mm) thick mineral wool batt insulation unfaced or faced on one side with aluminum foil/scrim vapor retarder. Insulation batts to be installed as a continuous piece with one horizontal seam at the steel angle (Item 2F). Curtain wall insulation installed over the Quick Clip™ U-Brackets (Item 2E) flush with the interior face of the framing and held with Quick Clip™ impaling clips on both sides of the framing.

THERMAFIBER INC - FIRESPAN® 40

I. **Curtain Wall Insulation* - Mullion Covers -** Min 2 in. (51 mm) thick mineral wool batt insulation unfaced or faced on one side with aluminum foil/scrim vapor retarder. Mullion covers are to be min 12 in. (305 mm) wide, centered over mullions, and are secured to curtain wall insulation (Item 2G or 2H) with a min of six spiral fasteners (Item 2J) spaced max 8 in. (203 mm) OC. Mullion covers are tightly abutted to the bottom of the forming material (Item 3A).

THERMAFIBER INC - FIRESPAN® 90

J. **Light Gauge Framing* - Spiral Fastener -** Galv steel wire spiral fastener used to secure the mullion covers (Item 2I) to the curtain wall insulation (Item 2G or 2H). Spiral fasteners are to be min 3-3/4 in. (95 mm) long or 1-3/4 in. (44 mm) longer than the mullion cover (Item 2I) insulation thickness. Spiral fasteners are installed 2 in. (51 mm) from the edges of the mullion covers or spaced max 8 in. (203 mm) on center on the mullions covers.

K. **Aluminum Sandwich Panel -** (Optional, not shown) - Min 1/8 in. (3.2 mm) solid aluminum panel or aluminum composite panel installed on exterior surface of curtain wall insulation (Item 2G or 2H).

3. **Safing System -** Max separation between edge of floor assembly and interior face of framing members is 4 in. (102 mm). The safing system is designed to accommodate vertical shear movement up to a max of 5 percent of its installed width. The safing system shall incorporate the following construction features:
   A. **Forming Material* -** Nom 4 pcf (64 kg/m3) density mineral wool batt insulation. Batt sections cut to a min 4 in. (102 mm) width and stacked to a thickness which is min 25 percent greater than the width of the linear gap between the curtain wall insulation and the edge of the concrete floor slab. The forming material is compressed and inserted cut-edge-first into linear gap such that its top surface is flush with the top surface of the floor assembly. A max of one tightly-butted seam is permitted between mullions.

   THERMAFIBER INC - SAF

   B. **Fill, Void or Cavity Material* -** Min 1/8 in. (3 mm) wet thickness, min 1/16 in. (1.6 mm) dry thickness of fill material spray-applied over top of forming material and lapping min 1/2 in. (13 mm) onto the top surface of the floor and onto the curtain wall insulation (Item 2G or 2H) and mullion covers (Item 2I). When SpecSeal Fast Tack Spray is used, wet and dry thickness of spray is min 5/64 in. (2 mm).

   SPECIFIED TECHNOLOGIES INC - SpecSeal Safing Spray or SpecSeal Fast Tack 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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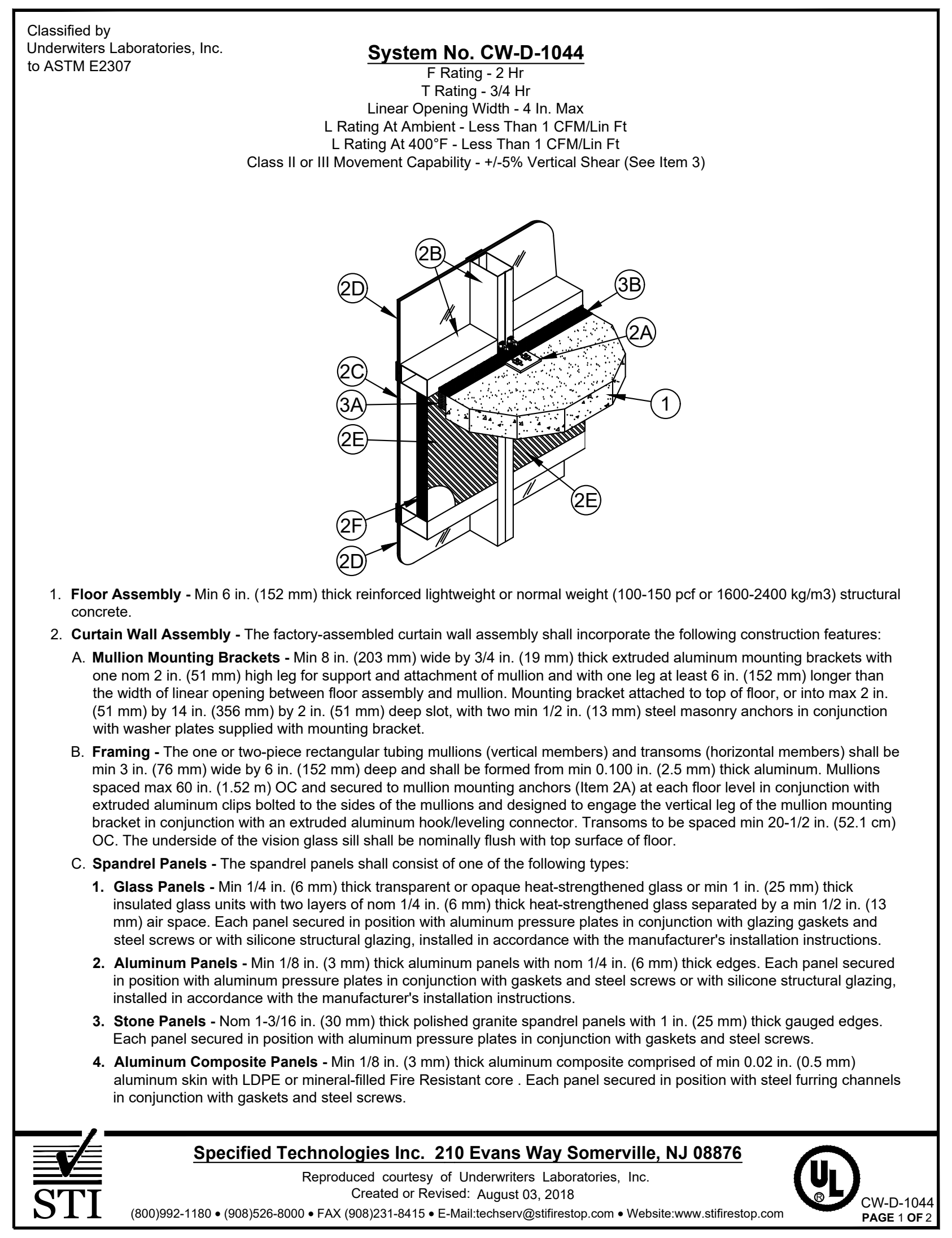

Classified by
Underwiters Laboratories, Inc.
to ASTM E2307

System No. CW-D-1044
F Rating - 2 Hr
T Rating - 3/4 Hr
Linear Opening Width - 4 In. Max
L Rating At Ambient - Less Than 1 CFM/Lin Ft
L Rating At 400°F - Less Than 1 CFM/Lin Ft
Class II or III Movement Capability - +/-5% Vertical Shear (See Item 3)

1. **Floor Assembly -** Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete.
2. **Curtain Wall Assembly -** The factory-assembled curtain wall assembly shall incorporate the following construction features:
   A. **Mullion Mounting Brackets -** Min 8 in. (203 mm) wide by 3/4 in. (19 mm) thick extruded aluminum mounting brackets with one nom 2 in. (51 mm) high leg for support and attachment of mullion and with one leg at least 6 in. (152 mm) longer than the width of linear opening between floor assembly and mullion. Mounting bracket attached to top of floor, or into max 2 in. (51 mm) by 14 in. (356 mm) by 2 in. (51 mm) deep slot, with two min 1/2 in. (13 mm) steel masonry anchors in conjunction with washer plates supplied with mounting bracket.
   B. **Framing -** The one or two-piece rectangular tubing mullions (vertical members) and transoms (horizontal members) shall be min 3 in. (76 mm) wide by 6 in. (152 mm) deep and shall be formed from min 0.100 in. (2.5 mm) thick aluminum. Mullions spaced max 60 in. (1.52 m) OC and secured to mullion mounting anchors (Item 2A) at each floor level in conjunction with extruded aluminum clips bolted to the sides of the mullions and designed to engage the vertical leg of the mullion mounting bracket in conjunction with an extruded aluminum hook/leveling connector. Transoms to be spaced min 20-1/2 in. (52.1 cm) OC. The underside of the vision glass sill shall be nominally flush with top surface of floor.
   C. **Spandrel Panels -** The spandrel panels shall consist of one of the following types:
      1. 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, installed in accordance with the manufacturer's installation instructions.
      2. Aluminum Panels - 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 steel screws or with silicone structural glazing, installed in accordance with the manufacturer's installation instructions.
      3. Stone Panels - Nom 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.
      4. Aluminum Composite Panels - 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.

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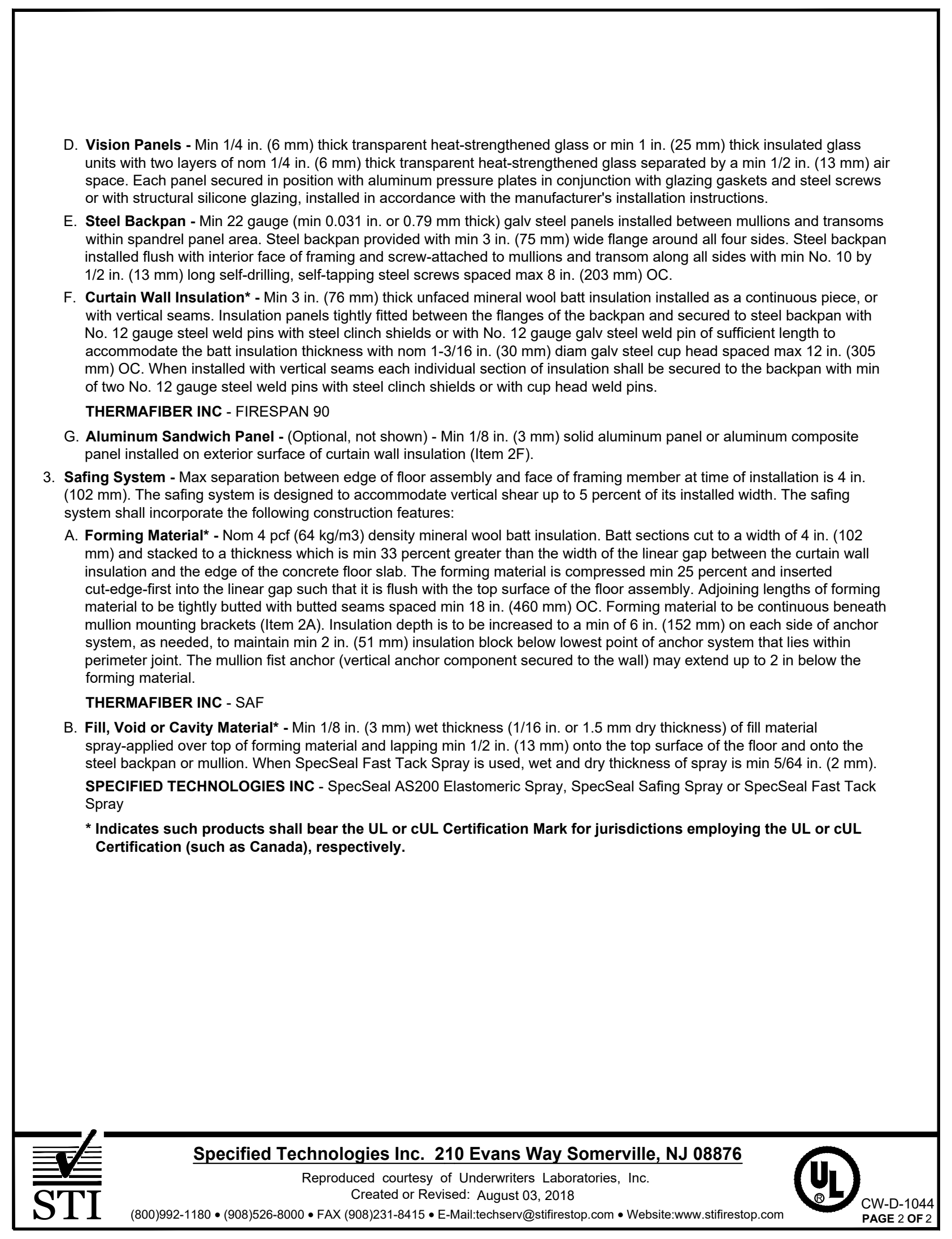

D. **Vision Panels -** Min 1/4 in. (6 mm) thick transparent heat-strengthened glass or min 1 in. (25 mm) thick insulated glass units with two layers of nom 1/4 in. (6 mm) thick transparent heat-strengthened glass separated by a min 1/2 in. (13 mm) air space. Each panel secured in position with aluminum pressure plates in conjunction with glazing gaskets and steel screws or with structural silicone glazing, installed in accordance with the manufacturer's installation instructions.

E. **Steel Backpan -** Min 22 gauge (min 0.031 in. or 0.79 mm thick) galv steel panels installed between mullions and transoms within spandrel panel area. Steel backpan provided with min 3 in. (75 mm) wide flange around all four sides. Steel backpan installed flush with interior face of framing and screw-attached to mullions and transom along all sides with min No. 10 by 1/2 in. (13 mm) long self-drilling, self-tapping steel screws spaced max 8 in. (203 mm) OC.

F. **Curtain Wall Insulation* -** Min 3 in. (76 mm) thick unfaced mineral wool batt insulation installed as a continuous piece, or with vertical seams. Insulation panels tightly fitted between the flanges of the backpan and secured to steel backpan with No. 12 gauge steel weld pins with steel clinch shields or with No. 12 gauge galv steel weld pin of sufficient length to accommodate the batt insulation thickness with nom 1-3/16 in. (30 mm) diam galv steel cup head spaced max 12 in. (305 mm) OC. When installed with vertical seams each individual section of insulation shall be secured to the backpan with min of two No. 12 gauge steel weld pins with steel clinch shields or with cup head weld pins.

THERMAFIBER INC - FIRESPAN 90

G. **Aluminum Sandwich Panel -** (Optional, not shown) - Min 1/8 in. (3 mm) solid aluminum panel or aluminum composite panel installed on exterior surface of curtain wall insulation (Item 2F).

3. **Safing System -** Max separation between edge of floor assembly and face of framing member at time of installation is 4 in. (102 mm). The safing system is designed to accommodate vertical shear up to 5 percent of its installed width. The safing system shall incorporate the following construction features:
   A. **Forming Material* -** Nom 4 pcf (64 kg/m3) density mineral wool batt insulation. Batt sections cut to a width of 4 in. (102 mm) and stacked to a thickness which is min 33 percent greater than the width of the linear gap between the curtain wall insulation and the edge of the concrete floor slab. The forming material is compressed min 25 percent and inserted cut-edge-first into the linear gap such that it is flush with the top surface of the floor assembly. Adjoining lengths of forming material to be tightly butted with butted seams spaced min 18 in. (460 mm) OC. Forming material to be continuous beneath mullion mounting brackets (Item 2A). Insulation depth is to be increased to a min of 6 in. (152 mm) on each side of anchor system, as needed, to maintain min 2 in. (51 mm) insulation block below lowest point of anchor system that lies within perimeter joint. The mullion fist anchor (vertical anchor component secured to the wall) may extend up to 2 in below the forming material.

   THERMAFIBER INC - SAF

   B. **Fill, Void or Cavity Material* -** Min 1/8 in. (3 mm) wet thickness (1/16 in. or 1.5 mm dry thickness) of fill material spray-applied over top of forming material and lapping min 1/2 in. (13 mm) onto the top surface of the floor and onto the steel backpan or mullion. When SpecSeal Fast Tack Spray is used, wet and dry thickness of spray is min 5/64 in. (2 mm).

   SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray, SpecSeal Safing Spray or SpecSeal Fast Tack 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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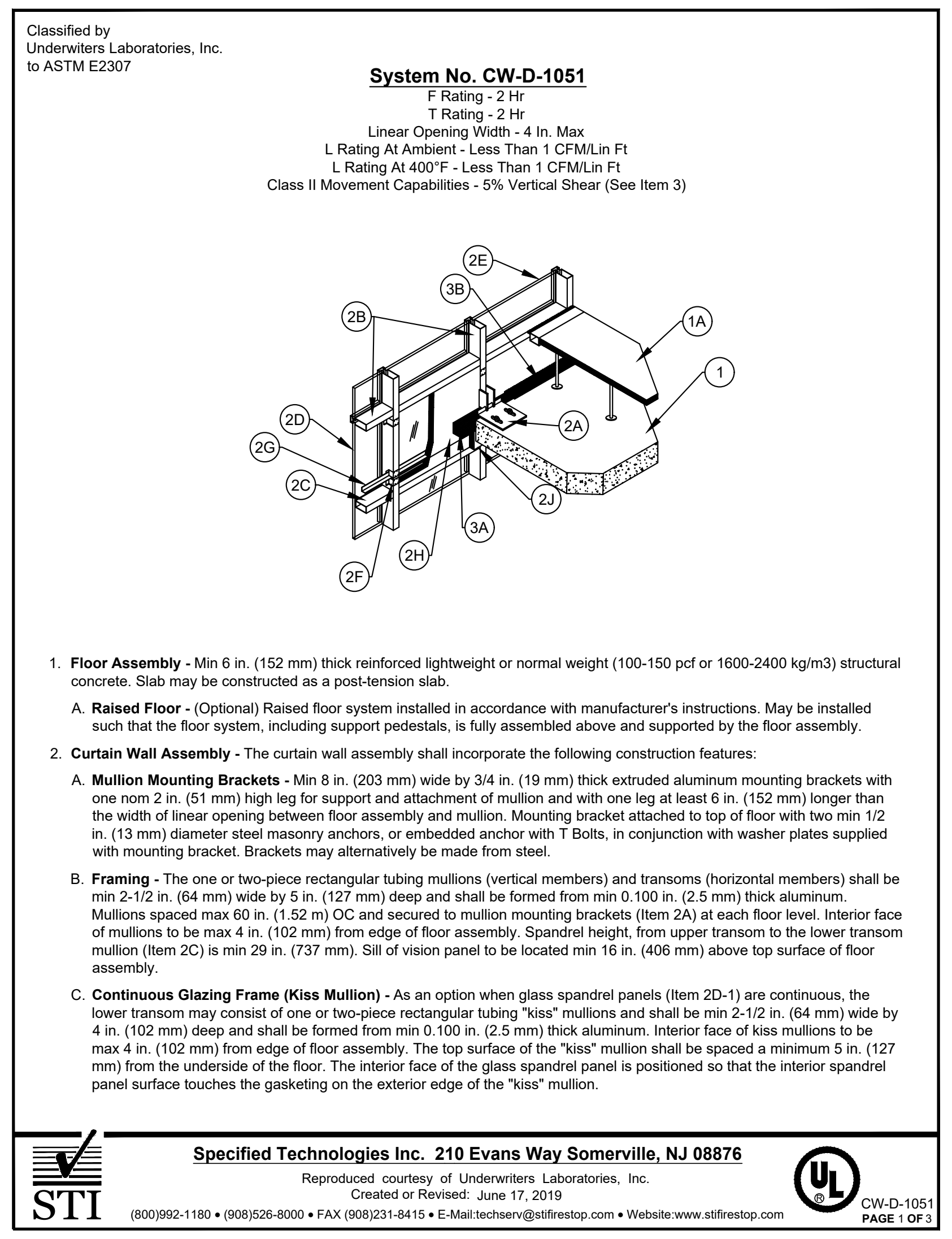

Classified by
Underwiters Laboratories, Inc.
to ASTM E2307

System No. CW-D-1051
F Rating - 2 Hr
T Rating - 2 Hr
Linear Opening Width - 4 In. Max
L Rating At Ambient - Less Than 1 CFM/Lin Ft
L Rating At 400°F - Less Than 1 CFM/Lin Ft
Class II Movement Capabilities - 5% Vertical Shear (See Item 3)

1. **Floor Assembly -** Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Slab may be constructed as a post-tension slab.
   A. **Raised Floor -** (Optional) Raised floor system installed in accordance with manufacturer's instructions. May be installed such that the floor system, including support pedestals, is fully assembled above and supported by the floor assembly.
2. **Curtain Wall Assembly -** The curtain wall assembly shall incorporate the following construction features:
   A. **Mullion Mounting Brackets -** Min 8 in. (203 mm) wide by 3/4 in. (19 mm) thick extruded aluminum mounting brackets with one nom 2 in. (51 mm) high leg for support and attachment of mullion and with one leg at least 6 in. (152 mm) longer than the width of linear opening between floor assembly and mullion. Mounting bracket attached to top of floor with two min 1/2 in. (13 mm) diameter steel masonry anchors, or embedded anchor with T Bolts, in conjunction with washer plates supplied with mounting bracket. Brackets may alternatively be made from steel.
   B. **Framing -** The one or two-piece rectangular tubing mullions (vertical members) and transoms (horizontal members) shall be min 2-1/2 in. (64 mm) wide by 5 in. (127 mm) deep and shall be formed from min 0.100 in. (2.5 mm) thick aluminum. Mullions spaced max 60 in. (1.52 m) OC and secured to mullion mounting brackets (Item 2A) at each floor level. Interior face of mullions to be max 4 in. (102 mm) from edge of floor assembly. Spandrel height, from upper transom to the lower transom mullion (Item 2C) is min 29 in. (737 mm). Sill of vision panel to be located min 16 in. (406 mm) above top surface of floor assembly.
   C. **Continuous Glazing Frame (Kiss Mullion) -** As an option when glass spandrel panels (Item 2D-1) are continuous, the 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 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 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 panel surface touches the gasketing on the exterior edge of the "kiss" mullion.

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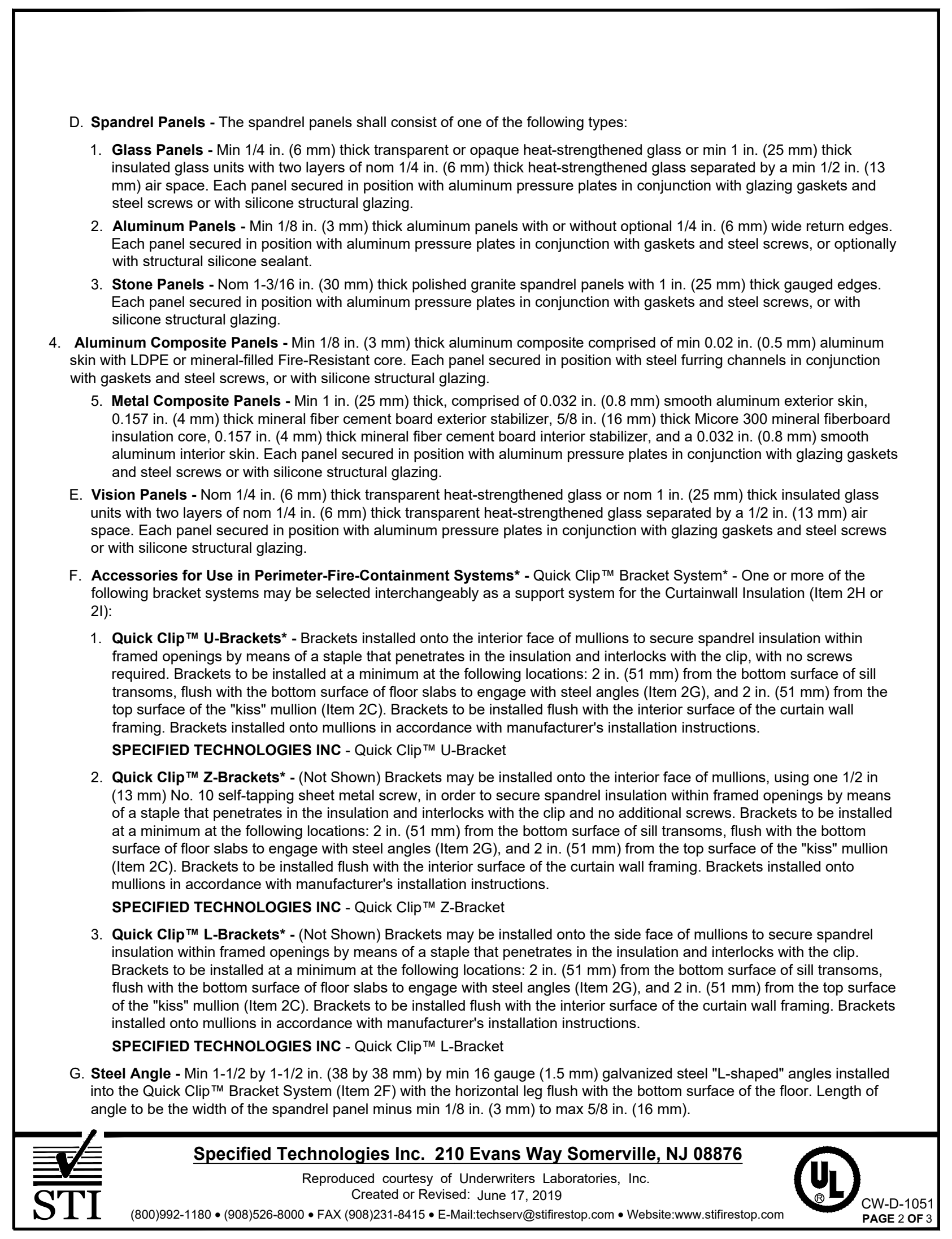

D. **Spandrel Panels -** The spandrel panels shall consist of one of the following types:
   1. **Glass Panels -** Min 1/4 in. (6 mm) thick transparent or opaque heat-strengthened glass or min 1 in. (25 mm) thick insulated glass units with two layers of nom 1/4 in. (6 mm) thick heat-strengthened glass 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.
   2. **Aluminum Panels -** Min 1/8 in. (3 mm) thick aluminum panels with or without optional 1/4 in. (6 mm) wide return edges. Each panel secured in position with aluminum pressure plates in conjunction with gaskets and steel screws, or optionally with structural silicone sealant.
   3. **Stone Panels -** Nom 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, or with silicone structural glazing.

4. **Aluminum Composite Panels -** 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, or with silicone structural glazing.
   5. **Metal Composite Panels -** 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.

E. **Vision Panels -** Nom 1/4 in. (6 mm) thick transparent heat-strengthened glass or nom 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.

F. **Accessories for Use in Perimeter-Fire-Containment Systems* -** Quick Clip™ Bracket System* - One or more of the following bracket systems may be selected interchangeably as a support system for the Curtainwall Insulation (Item 2H or 2I):
   1. **Quick Clip™ U-Brackets* -** Brackets installed onto the interior face of mullions to secure spandrel insulation within framed openings by means of a staple that penetrates in the insulation and interlocks with the clip, with no screws required. Brackets to be installed at a minimum at the following locations: 2 in. (51 mm) from the bottom surface of sill transoms, flush with the bottom surface of floor slabs to engage with steel angles (Item 2G), and 2 in. (51 mm) from the top surface of the "kiss" mullion (Item 2C). Brackets to be installed flush with the interior surface of the curtain wall framing. Brackets installed onto mullions in accordance with manufacturer's installation instructions.

      SPECIFIED TECHNOLOGIES INC - Quick Clip™ U-Bracket
   2. **Quick Clip™ Z-Brackets* -** (Not Shown) Brackets may be installed onto the interior face of mullions, using one 1/2 in (13 mm) No. 10 self-tapping sheet metal screw, in order to secure spandrel insulation within framed openings by means of a staple that penetrates in the insulation and interlocks with the clip and no additional screws. Brackets to be installed at a minimum at the following locations: 2 in. (51 mm) from the bottom surface of sill transoms, flush with the bottom surface of floor slabs to engage with steel angles (Item 2G), and 2 in. (51 mm) from the top surface of the "kiss" mullion (Item 2C). Brackets to be installed flush with the interior surface of the curtain wall framing. Brackets installed onto mullions in accordance with manufacturer's installation instructions.

      SPECIFIED TECHNOLOGIES INC - Quick Clip™ Z-Bracket
   3. **Quick Clip™ L-Brackets* -** (Not Shown) Brackets may be installed onto the side face of mullions to secure spandrel insulation within framed openings by means of a staple that penetrates in the insulation and interlocks with the clip. Brackets to be installed at a minimum at the following locations: 2 in. (51 mm) from the bottom surface of sill transoms, flush with the bottom surface of floor slabs to engage with steel angles (Item 2G), and 2 in. (51 mm) from the top surface of the "kiss" mullion (Item 2C). Brackets to be installed flush with the interior surface of the curtain wall framing. Brackets installed onto mullions in accordance with manufacturer's installation instructions.

      SPECIFIED TECHNOLOGIES INC - Quick Clip™ L-Bracket

G. **Steel Angle -** Min 1-1/2 by 1-1/2 in. (38 by 38 mm) by min 16 gauge (1.5 mm) galvanized steel "L-shaped" angles installed into the Quick Clip™ Bracket System (Item 2F) with the horizontal leg flush with the bottom surface of the floor. Length of 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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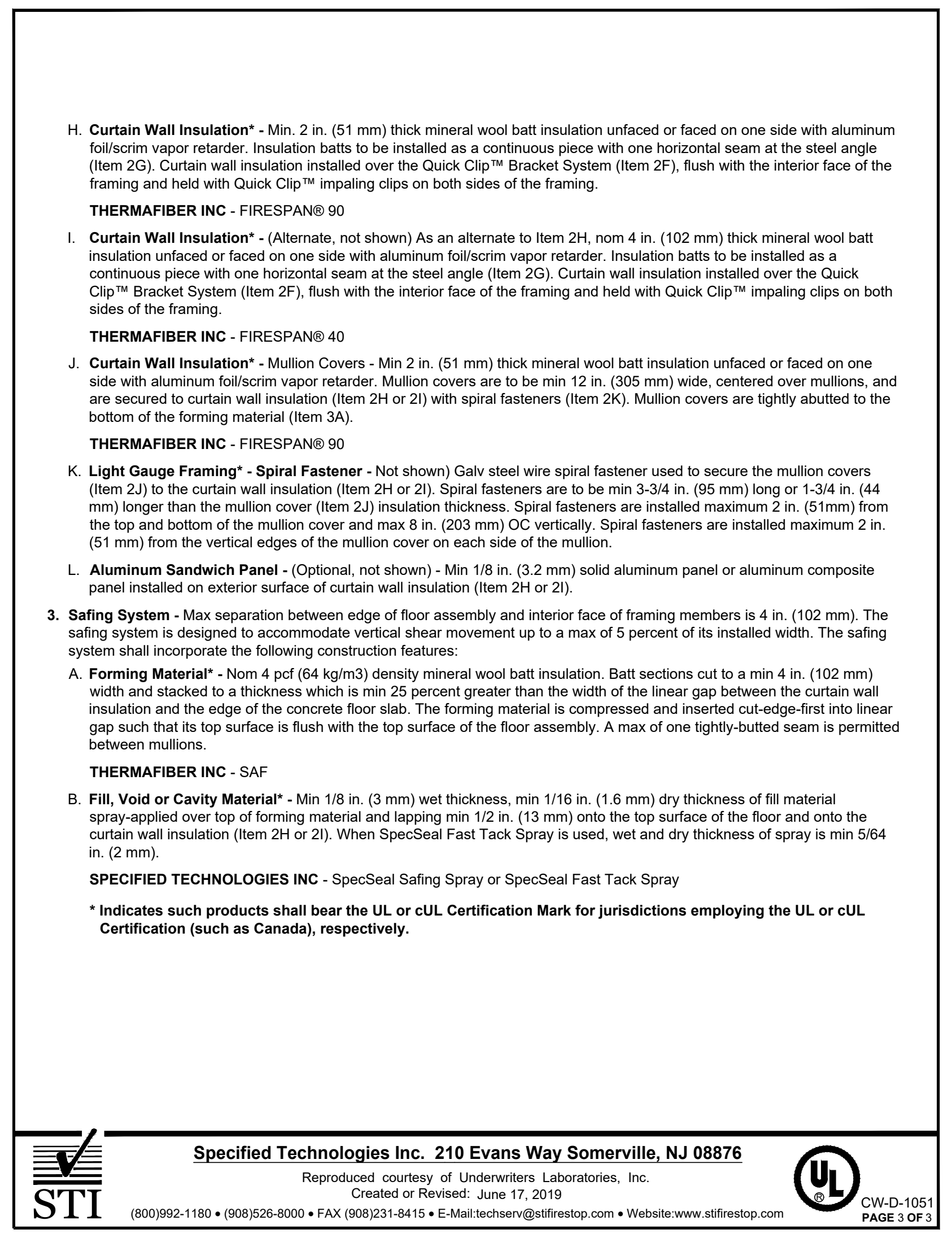

H. **Curtain Wall Insulation* -** Min. 2 in. (51 mm) thick mineral wool batt insulation unfaced or faced on one side with aluminum foil/scrim vapor retarder. Insulation batts to be installed as a continuous piece with one horizontal seam at the steel angle (Item 2G). Curtain wall insulation installed over the Quick Clip™ Bracket System (Item 2F), flush with the interior face of the framing and held with Quick Clip™ impaling clips on both sides of the framing.

THERMAFIBER INC - FIRESPAN® 90

I. **Curtain Wall Insulation* -** (Alternate, not shown) As an alternate to Item 2H, nom 4 in. (102 mm) thick mineral wool batt insulation unfaced or faced on one side with aluminum foil/scrim vapor retarder. Insulation batts to be installed as a continuous piece with one horizontal seam at the steel angle (Item 2G). Curtain wall insulation installed over the Quick Clip™ Bracket System (Item 2F), flush with the interior face of the framing and held with Quick Clip™ impaling clips on both sides of the framing.

THERMAFIBER INC - FIRESPAN® 40

J. **Curtain Wall Insulation* -** Mullion Covers - Min 2 in. (51 mm) thick mineral wool batt insulation unfaced or faced on one side with aluminum foil/scrim vapor retarder. Mullion covers are to be min 12 in. (305 mm) wide, centered over mullions, and are secured to curtain wall insulation (Item 2H or 2I) with spiral fasteners (Item 2K). Mullion covers are tightly abutted to the bottom of the forming material (Item 3A).

THERMAFIBER INC - FIRESPAN® 90

K. **Light Gauge Framing* - Spiral Fastener -** Not shown) Galv steel wire spiral fastener used to secure the mullion covers (Item 2J) to the curtain wall insulation (Item 2H or 2I). Spiral fasteners are to be min 3-3/4 in. (95 mm) long or 1-3/4 in. (44 mm) longer than the mullion cover (Item 2J) insulation thickness. Spiral fasteners are installed maximum 2 in. (51mm) from the top and bottom of the mullion cover and max 8 in. (203 mm) OC vertically. Spiral fasteners are installed maximum 2 in. (51 mm) from the vertical edges of the mullion cover on each side of the mullion.

L. **Aluminum Sandwich Panel -** (Optional, not shown) - Min 1/8 in. (3.2 mm) solid aluminum panel or aluminum composite panel installed on exterior surface of curtain wall insulation (Item 2H or 2I).

3. **Safing System -** Max separation between edge of floor assembly and interior face of framing members is 4 in. (102 mm). The safing system is designed to accommodate vertical shear movement up to a max of 5 percent of its installed width. The safing system shall incorporate the following construction features:
   A. **Forming Material* -** Nom 4 pcf (64 kg/m3) density mineral wool batt insulation. Batt sections cut to a min 4 in. (102 mm) width and stacked to a thickness which is min 25 percent greater than the width of the linear gap between the curtain wall insulation and the edge of the concrete floor slab. The forming material is compressed and inserted cut-edge-first into linear gap such that its top surface is flush with the top surface of the floor assembly. A max of one tightly-butted seam is permitted between mullions.

   THERMAFIBER INC - SAF

   B. **Fill, Void or Cavity Material* -** Min 1/8 in. (3 mm) wet thickness, min 1/16 in. (1.6 mm) dry thickness of fill material spray-applied over top of forming material and lapping min 1/2 in. (13 mm) onto the top surface of the floor and onto the curtain wall insulation (Item 2H or 2I). When SpecSeal Fast Tack Spray is used, wet and dry thickness of spray is min 5/64 in. (2 mm).

   SPECIFIED TECHNOLOGIES INC - SpecSeal Safing Spray or SpecSeal Fast Tack 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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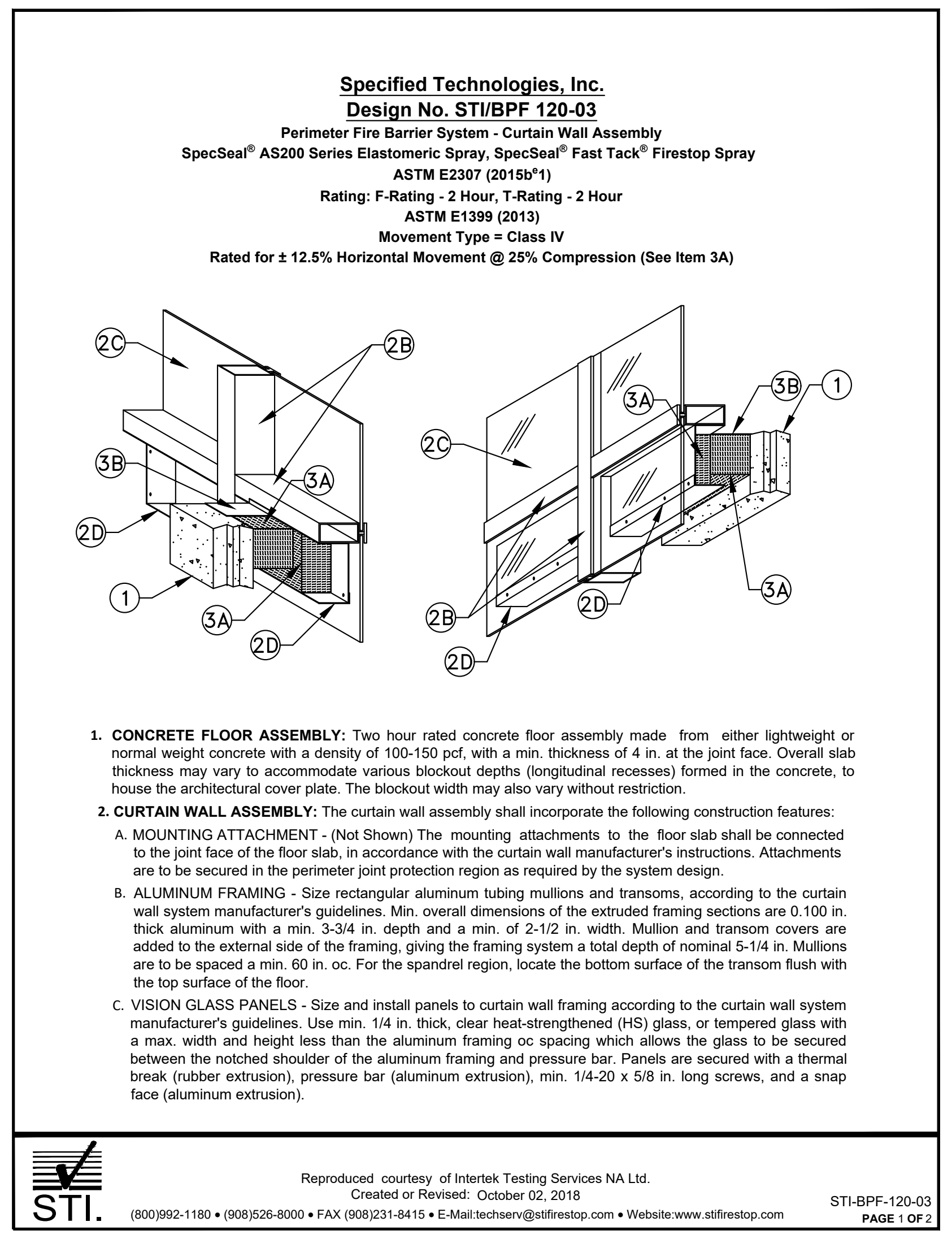

Specified Technologies, Inc.
Design No. STI/BPF 120-03
Perimeter Fire Barrier System - Curtain Wall Assembly
SpecSeal® AS200 Series Elastomeric Spray, SpecSeal® Fast Tack® Firestop Spray
ASTM E2307 (2015b^{e}1)
Rating: F-Rating - 2 Hour, T-Rating - 2 Hour
ASTM E1399 (2013)
Movement Type = Class IV
Rated for ± 12.5% Horizontal Movement @ 25% Compression (See Item 3A)

1. **CONCRETE FLOOR ASSEMBLY:** Two hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf, with a min. thickness of 4 in. at the joint face. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction.
2. **CURTAIN WALL ASSEMBLY:** The curtain wall assembly shall incorporate the following construction features:
   A. MOUNTING ATTACHMENT - (Not Shown) The mounting attachments to the floor slab shall be connected to the joint face of the floor slab, in accordance with the curtain wall manufacturer's instructions. Attachments are to be secured in the perimeter joint protection region as required by the system design.
   B. ALUMINUM FRAMING - Size rectangular aluminum tubing mullions and transoms, according to the curtain wall system manufacturer's guidelines. Min. overall dimensions of the extruded framing sections are 0.100 in. thick aluminum with a min. 3-3/4 in. depth and a min. of 2-1/2 in. width. Mullion and transom covers are added to the external side of the framing, giving the framing system a total depth of nominal 5-1/4 in. Mullions are to be spaced a min. 60 in. oc. For the spandrel region, locate the bottom surface of the transom flush with the top surface of the floor.
   C. VISION GLASS PANELS - Size and install panels to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use min. 1/4 in. thick, clear heat-strengthened (HS) glass, or tempered glass with a max. width and height less than the aluminum framing oc spacing which allows the glass to be secured between the notched shoulder of the aluminum framing and pressure bar. Panels are secured with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4-20 x 5/8 in. long screws, and a snap face (aluminum extrusion).

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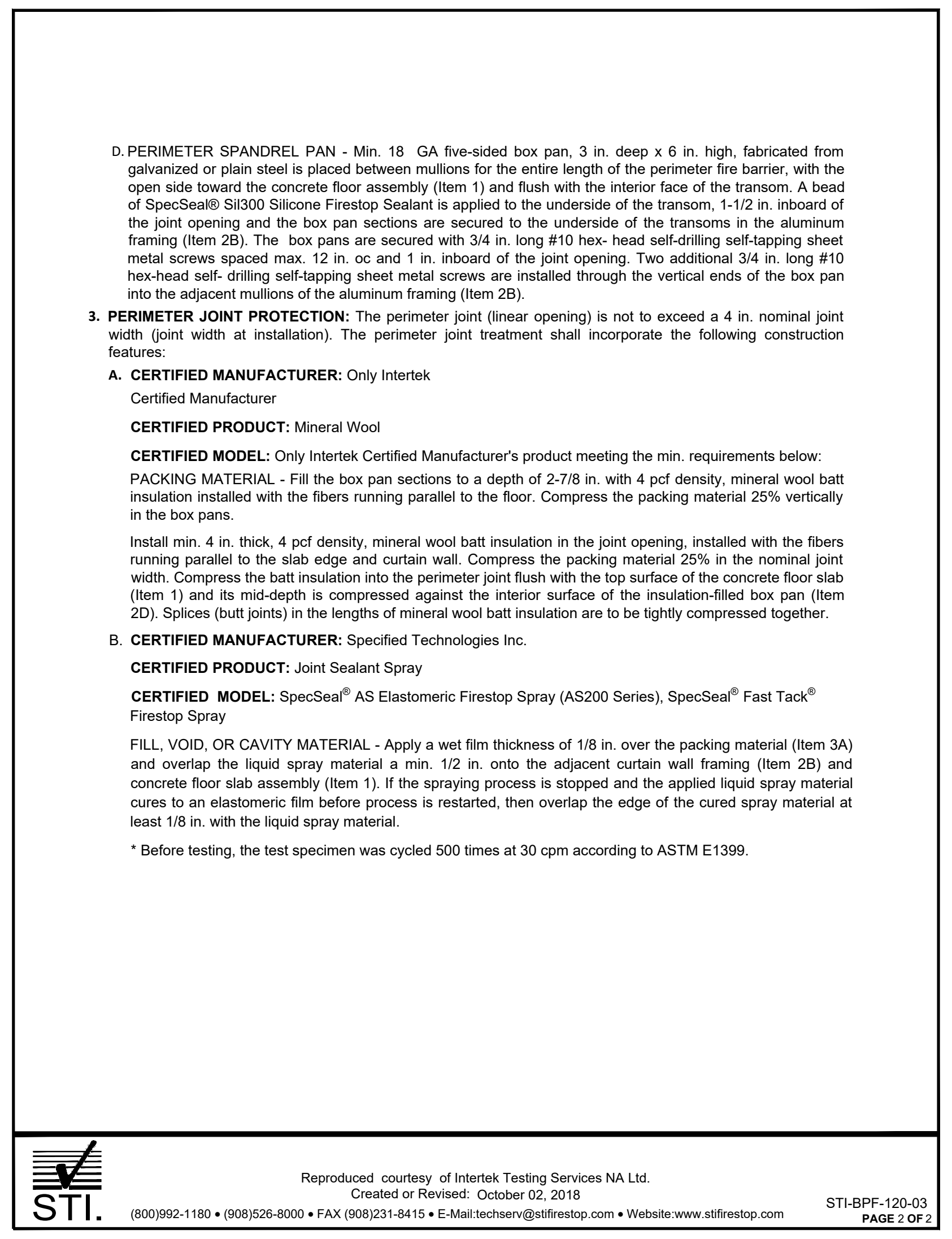

D. PERIMETER SPANDREL PAN - Min. 18 GA five-sided box pan, 3 in. deep x 6 in. high, fabricated from galvanized or plain steel is placed between mullions for the entire length of the perimeter fire barrier, with the open side toward the concrete floor assembly (Item 1) and flush with the interior face of the transom. A bead of SpecSeal® Sil300 Silicone Firestop Sealant is applied to the underside of the transom, 1-1/2 in. inboard of the joint opening and the box pan sections are secured to the underside of the transoms in the aluminum framing (Item 2B). The box pans are secured with 3/4 in. long #10 hex- head self-drilling self-tapping sheet metal screws spaced max. 12 in. oc and 1 in. inboard of the joint opening. Two additional 3/4 in. long #10 hex-head self- drilling self-tapping sheet metal screws are installed through the vertical ends of the box pan into the adjacent mullions of the aluminum framing (Item 2B).

3. **PERIMETER JOINT PROTECTION:** The perimeter joint (linear opening) is not to exceed a 4 in. nominal joint width (joint width at installation). The perimeter joint treatment shall incorporate the following construction features:
   A. **CERTIFIED MANUFACTURER:** Only Intertek
   Certified Manufacturer

   CERTIFIED PRODUCT: Mineral Wool

   CERTIFIED MODEL: Only Intertek Certified Manufacturer's product meeting the min. requirements below:

   PACKING MATERIAL - Fill the box pan sections to a depth of 2-7/8 in. with 4 pcf density, mineral wool batt insulation installed with the fibers running parallel to the floor. Compress the packing material 25% vertically in the box pans.

   Install min. 4 in. thick, 4 pcf density, mineral wool batt insulation in the joint opening, installed with the fibers running parallel to the slab edge and curtain wall. Compress the packing material 25% in the nominal joint width. Compress the batt insulation into the perimeter joint flush with the top surface of the concrete floor slab (Item 1) and its mid-depth is compressed against the interior surface of the insulation-filled box pan (Item 2D). Splices (butt joints) in the lengths of mineral wool batt insulation are to be tightly compressed together.

   B. **CERTIFIED MANUFACTURER:** Specified Technologies Inc.

   CERTIFIED PRODUCT: Joint Sealant Spray

   CERTIFIED MODEL: SpecSeal® AS Elastomeric Firestop Spray (AS200 Series), SpecSeal® Fast Tack® Firestop Spray

   FILL, VOID, OR CAVITY MATERIAL - Apply a wet film thickness of 1/8 in. over the packing material (Item 3A) and overlap the liquid spray material a min. 1/2 in. onto the adjacent curtain wall framing (Item 2B) and concrete floor slab assembly (Item 1). If the spraying process is stopped and the applied liquid spray material cures to an elastomeric film before process is restarted, then overlap the edge of the cured spray material at least 1/8 in. with the liquid spray material.

   * Before testing, the test specimen was cycled 500 times at 30 cpm according to ASTM E1399.

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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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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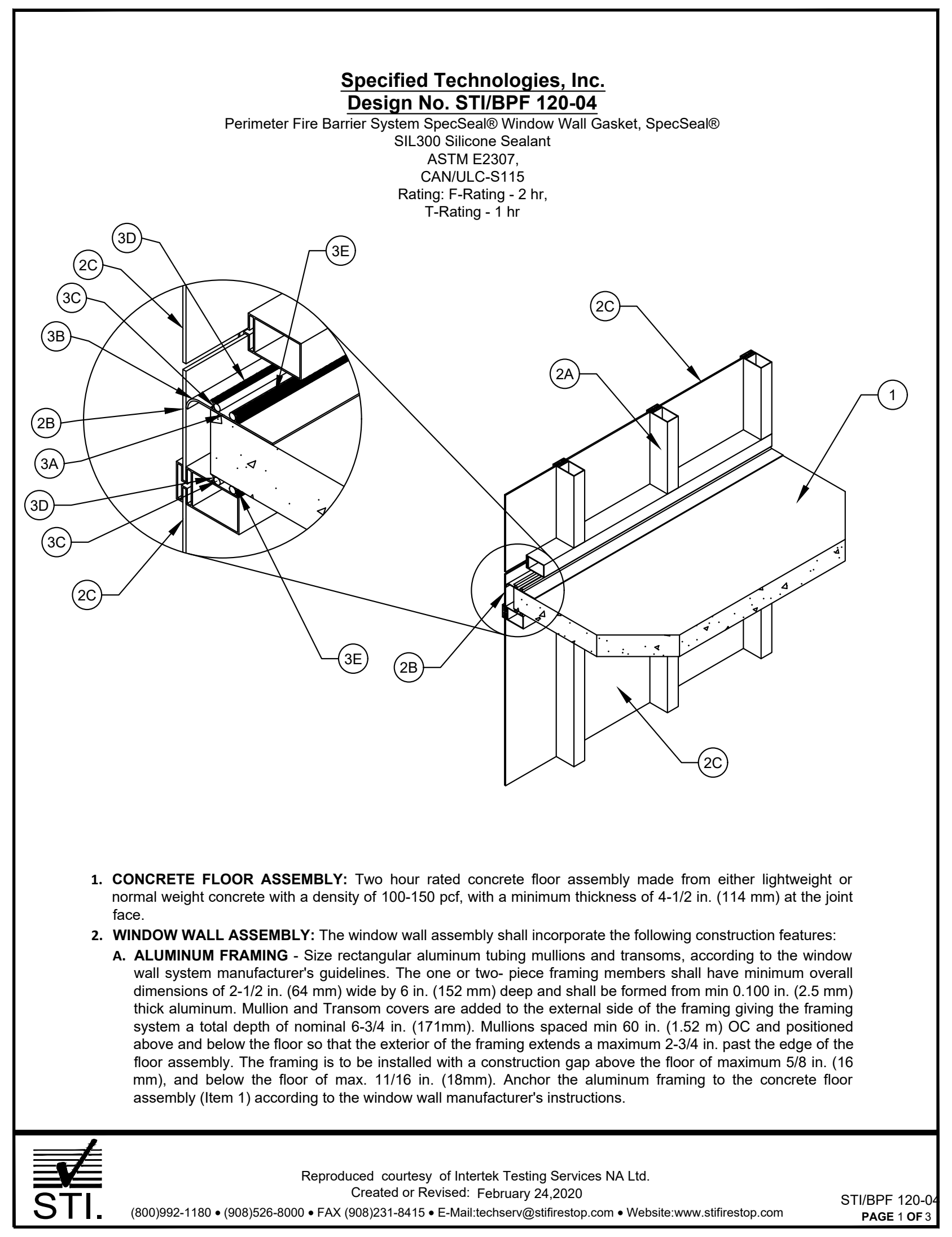

Specified Technologies, Inc.
Design No. STI/BPF 120-04
Perimeter Fire Barrier System SpecSeal® Window Wall Gasket, SpecSeal®
SIL300 Silicone Sealant
ASTM E2307,
CAN/ULC-S115
Rating: F-Rating - 2 hr,
T-Rating - 1 hr

1. **CONCRETE FLOOR ASSEMBLY:** Two hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf, with a minimum thickness of 4-1/2 in. (114 mm) at the joint face.
2. **WINDOW WALL ASSEMBLY:** The window wall assembly shall incorporate the following construction features:
   A. **ALUMINUM FRAMING** - Size rectangular aluminum tubing mullions and transoms, according to the window wall system manufacturer's guidelines. The one or two- piece framing members shall have minimum overall dimensions of 2-1/2 in. (64 mm) wide by 6 in. (152 mm) deep and shall be formed from min 0.100 in. (2.5 mm) thick aluminum. Mullion and Transom covers are added to the external side of the framing giving the framing system a total depth of nominal 6-3/4 in. (171mm). Mullions spaced min 60 in. (1.52 m) OC and positioned above and below the floor so that the exterior of the framing extends a maximum 2-3/4 in. past the edge of the floor assembly. The framing is to be installed with a construction gap above the floor of maximum 5/8 in. (16 mm), and below the floor of max. 11/16 in. (18mm). Anchor the aluminum framing to the concrete floor assembly (Item 1) according to the window wall manufacturer's instructions.

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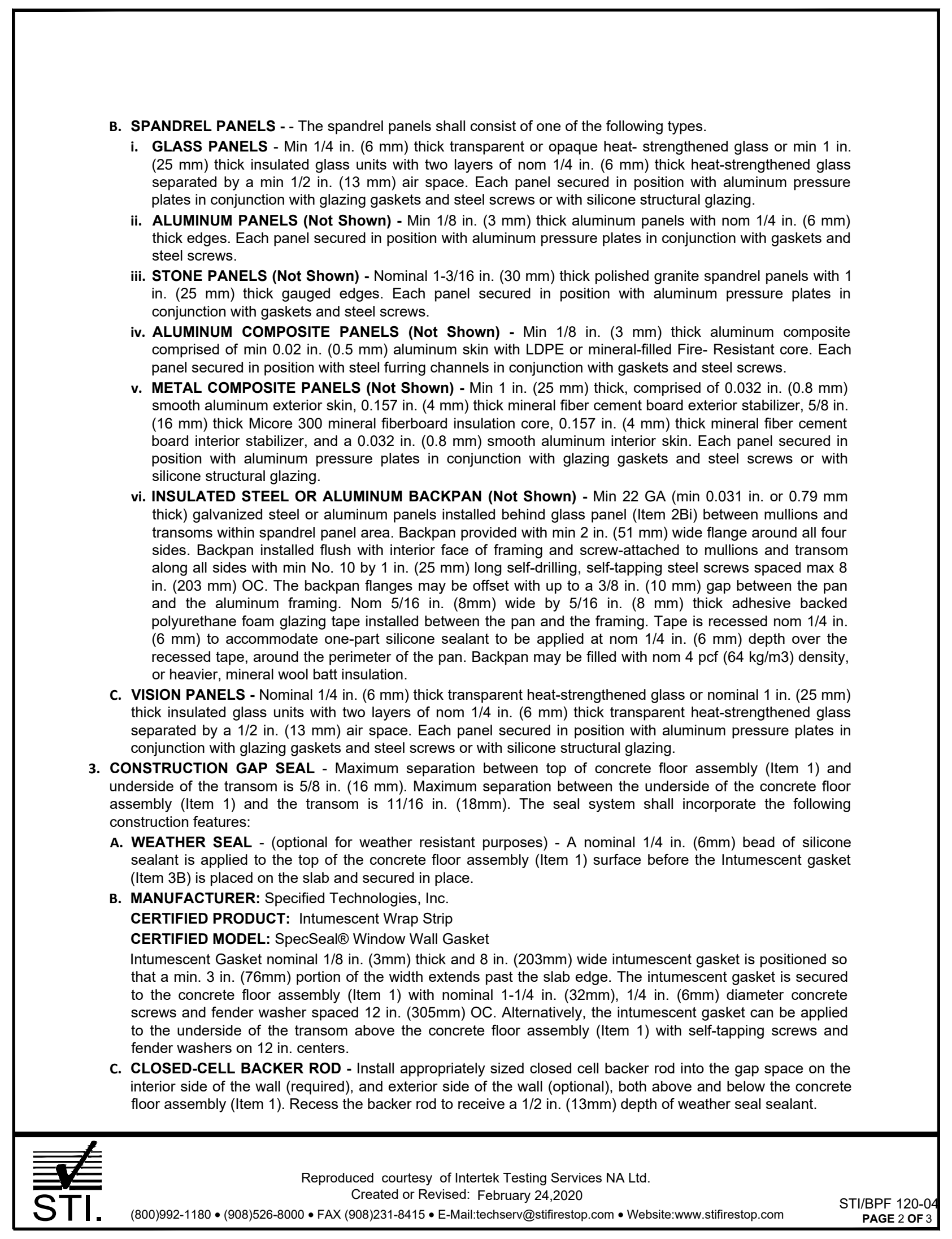

B. **SPANDREL PANELS - -** The spandrel panels shall consist of one of the following types.
   i. **GLASS PANELS** - Min 1/4 in. (6 mm) thick transparent or opaque heat- strengthened glass or min 1 in. (25 mm) thick insulated glass units with two layers of nom 1/4 in. (6 mm) thick heat-strengthened glass 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 steel screws.
   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. (8mm) 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.

C. **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 construction features:
   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 interior side of the wall (required), and exterior side of the wall (optional), both above and below the concrete floor assembly (Item 1). Recess the backer rod to receive a 1/2 in. (13mm) depth of weather seal sealant.

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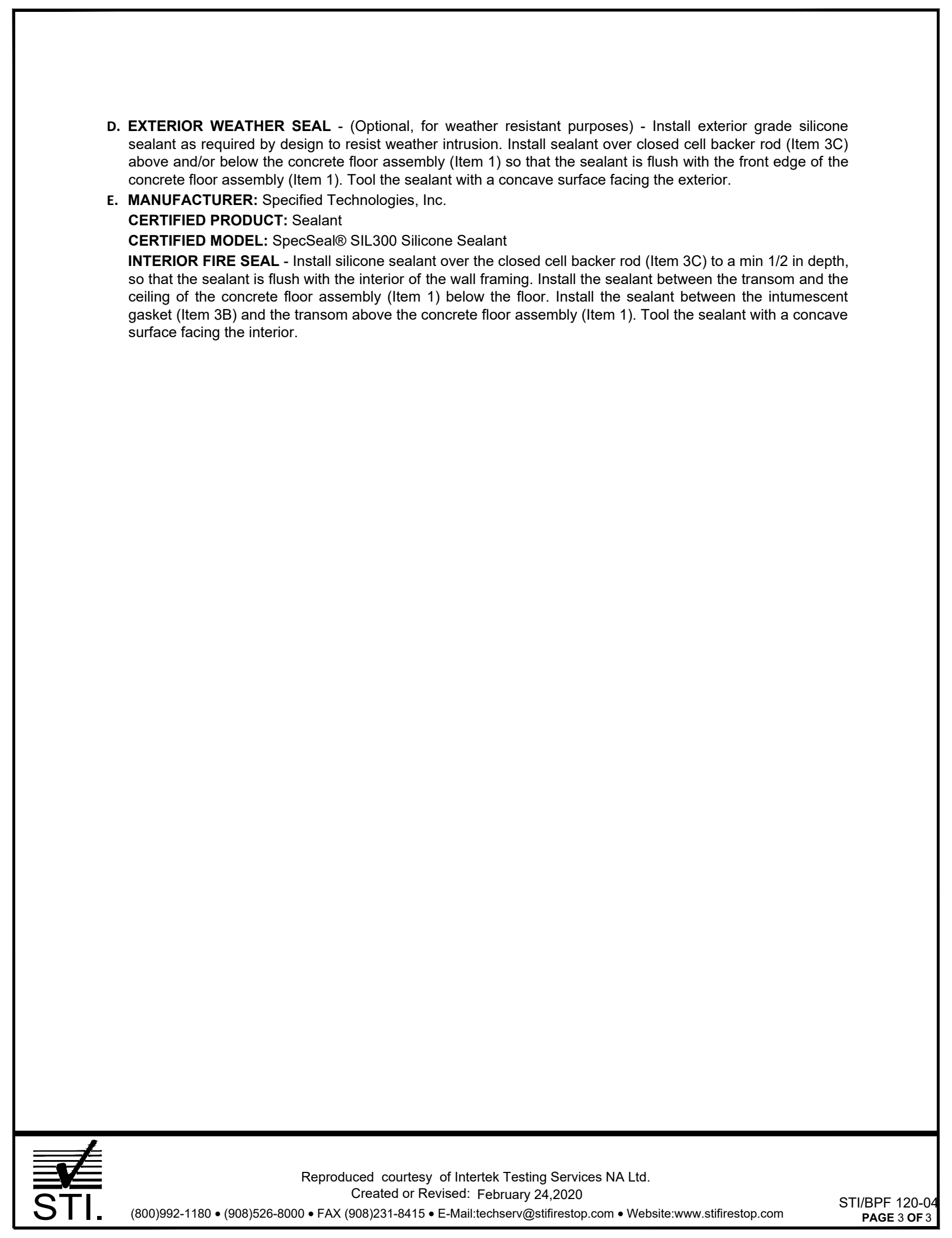

D. **EXTERIOR WEATHER SEAL** - (Optional, for weather resistant purposes) - Install exterior grade silicone sealant as required by design to resist weather intrusion. Install sealant over closed cell backer rod (Item 3C) above and/or below the concrete floor assembly (Item 1) so that the sealant is flush with the front edge of the concrete floor assembly (Item 1). Tool the sealant with a concave surface facing the exterior.

E. **MANUFACTURER:** Specified Technologies, Inc.
CERTIFIED PRODUCT: Sealant
CERTIFIED MODEL: SpecSeal® SIL300 Silicone Sealant
INTERIOR FIRE SEAL - Install silicone sealant over the closed cell backer rod (Item 3C) to a min 1/2 in depth, so that the sealant is flush with the interior of the wall framing. Install the sealant between the transom and the ceiling of the concrete floor assembly (Item 1) below the floor. Install the sealant between the intumescent gasket (Item 3B) and the transom above the concrete floor assembly (Item 1). Tool the sealant with a concave surface facing the interior.

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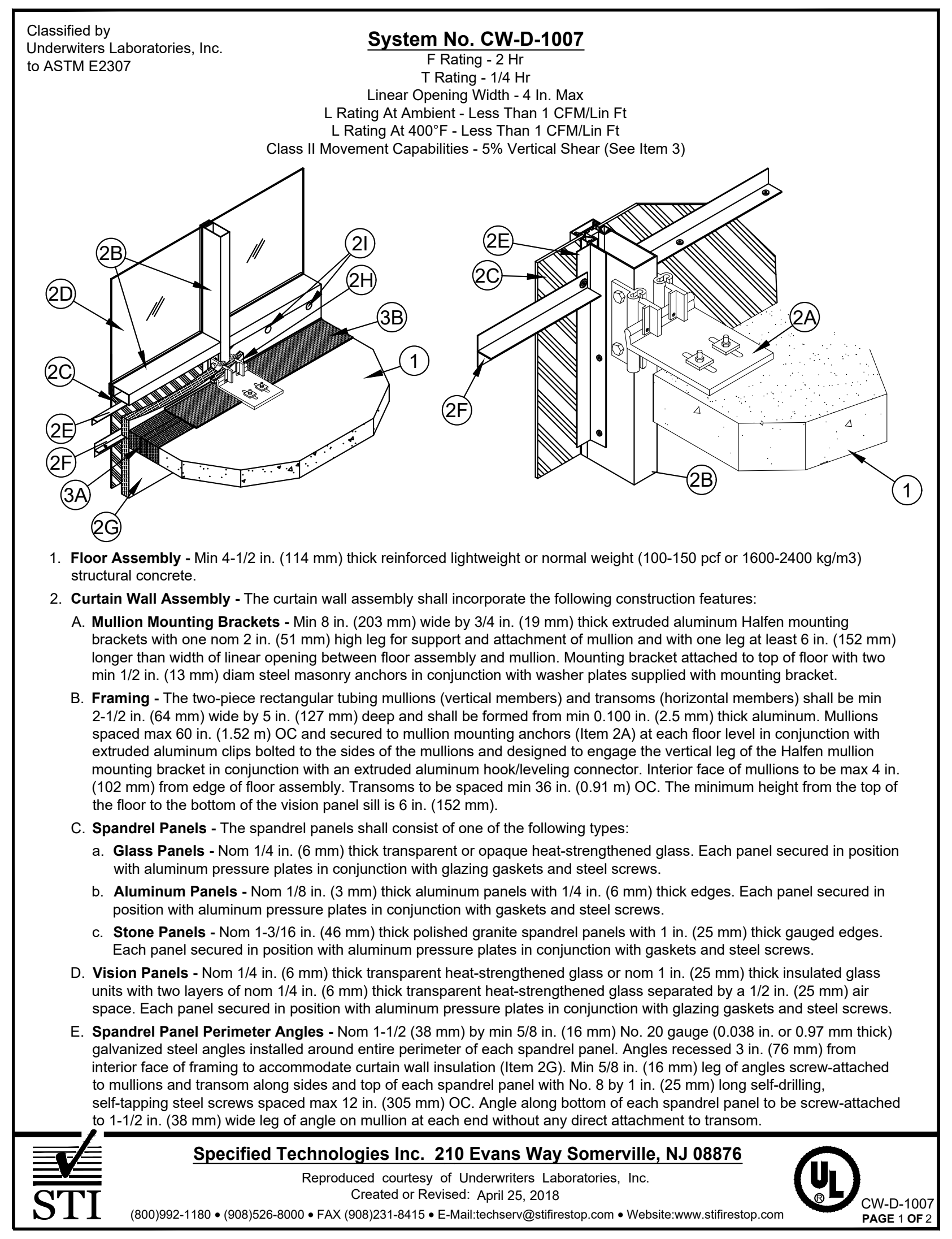

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to ASTM E2307

System No. CW-D-1007
F Rating - 2 Hr
T Rating - 1/4 Hr
Linear Opening Width - 4 In. Max
L Rating At Ambient - Less Than 1 CFM/Lin Ft
L Rating At 400°F - Less Than 1 CFM/Lin Ft
Class II Movement Capabilities - 5% Vertical Shear (See Item 3)

1. **Floor Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete.
2. **Curtain Wall Assembly -** The curtain wall assembly shall incorporate the following construction features:
   A. **Mullion Mounting Brackets -** Min 8 in. (203 mm) wide by 3/4 in. (19 mm) thick extruded aluminum Halfen mounting brackets with one nom 2 in. (51 mm) high leg for support and attachment of mullion and with one leg at least 6 in. (152 mm) longer than width of linear opening between floor assembly and mullion. Mounting bracket attached to top of floor with two min 1/2 in. (13 mm) diam steel masonry anchors in conjunction with washer plates supplied with mounting bracket.
   B. **Framing -** The two-piece rectangular tubing mullions (vertical members) and transoms (horizontal members) shall be min 2-1/2 in. (64 mm) wide by 5 in. (127 mm) deep and shall be formed from min 0.100 in. (2.5 mm) thick aluminum. Mullions spaced max 60 in. (1.52 m) OC and secured to mullion mounting anchors (Item 2A) at each floor level in conjunction with extruded aluminum clips bolted to the sides of the mullions and designed to engage the vertical leg of the Halfen mullion mounting bracket in conjunction with an extruded aluminum hook/leveling connector. Interior face of mullions to be max 4 in. (102 mm) from edge of floor assembly. Transoms to be spaced min 36 in. (0.91 m) OC. The minimum height from the top of the floor to the bottom of the vision panel sill is 6 in. (152 mm).
   C. **Spandrel Panels -** The spandrel panels shall consist of one of the following types:
      a. **Glass Panels -** Nom 1/4 in. (6 mm) thick transparent or opaque heat-strengthened glass. Each panel secured in position with aluminum pressure plates in conjunction with glazing gaskets and steel screws.
      b. **Aluminum Panels -** Nom 1/8 in. (3 mm) thick aluminum panels with 1/4 in. (6 mm) thick edges. Each panel secured in position with aluminum pressure plates in conjunction with gaskets and steel screws.
      c. **Stone Panels -** Nom 1-3/16 in. (46 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.
   D. **Vision Panels -** Nom 1/4 in. (6 mm) thick transparent heat-strengthened glass or nom 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. (25 mm) air space. Each panel secured in position with aluminum pressure plates in conjunction with glazing gaskets and steel screws.
   E. **Spandrel Panel Perimeter Angles -** Nom 1-1/2 (38 mm) by min 5/8 in. (16 mm) No. 20 gauge (0.038 in. or 0.97 mm thick) galvanized steel angles installed around entire perimeter of each spandrel panel. Angles recessed 3 in. (76 mm) from interior face of framing to accommodate curtain wall insulation (Item 2G). Min 5/8 in. (16 mm) leg of angles screw-attached to mullions and transom along sides and top of each spandrel panel with No. 8 by 1 in. (25 mm) long self-drilling, self-tapping steel screws spaced max 12 in. (305 mm) OC. Angle along bottom of each spandrel panel to be screw-attached to 1-1/2 in. (38 mm) wide leg of angle on mullion at each end without any direct attachment to transom.

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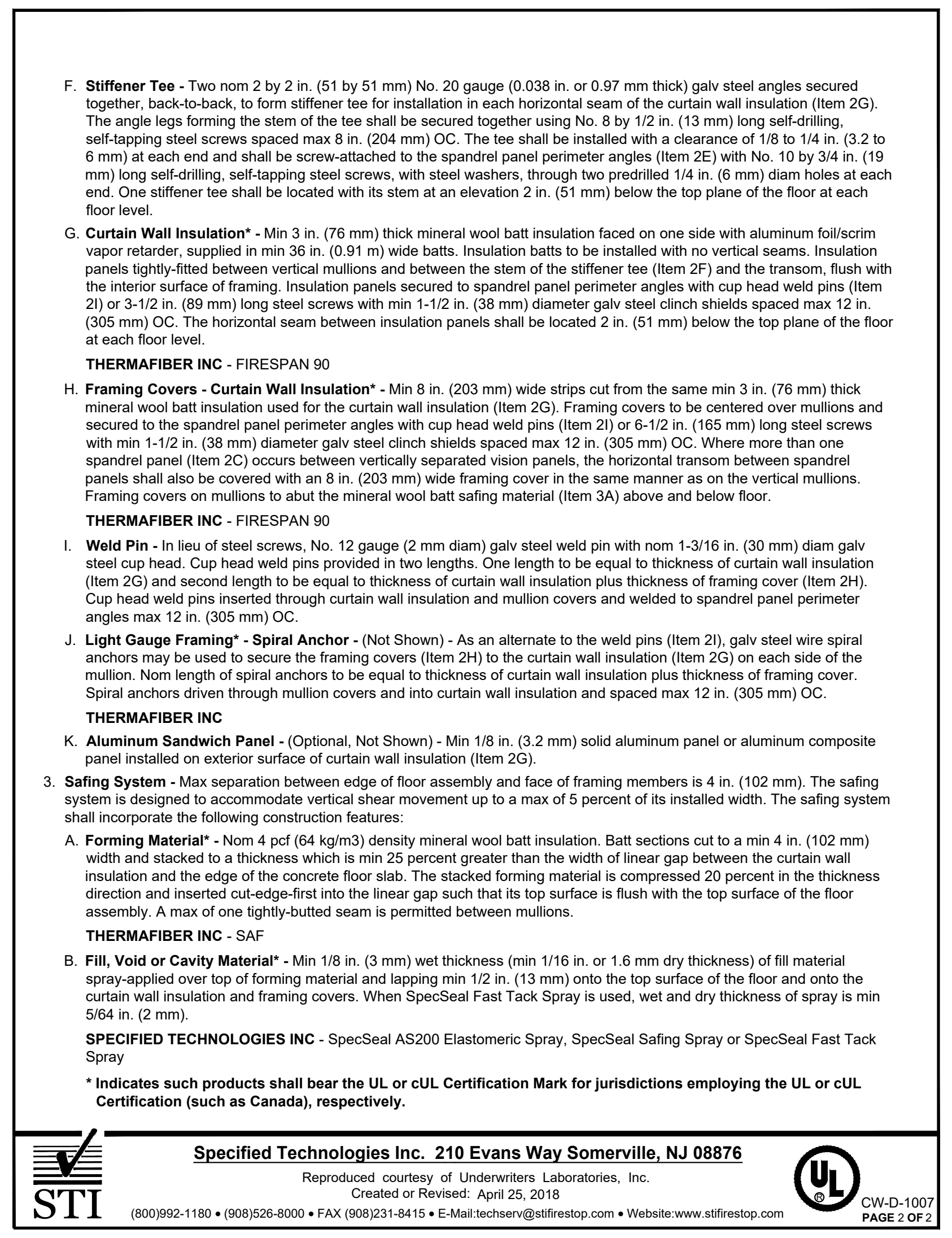

F. **Stiffener Tee -** Two nom 2 by 2 in. (51 by 51 mm) No. 20 gauge (0.038 in. or 0.97 mm thick) galv steel angles secured together, back-to-back, to form stiffener tee for installation in each horizontal seam of the curtain wall insulation (Item 2G). The angle legs forming the stem of the tee shall be secured together using No. 8 by 1/2 in. (13 mm) long self-drilling, self-tapping steel screws spaced max 8 in. (204 mm) OC. The tee shall be installed with a clearance of 1/8 to 1/4 in. (3.2 to 6 mm) at each end and shall be screw-attached to the spandrel panel perimeter angles (Item 2E) with No. 10 by 3/4 in. (19 mm) long self-drilling, self-tapping steel screws, with steel washers, through two predrilled 1/4 in. (6 mm) diam holes at each end. One stiffener tee shall be located with its stem at an elevation 2 in. (51 mm) below the top plane of the floor at each floor level.

G. **Curtain Wall Insulation* -** Min 3 in. (76 mm) thick mineral wool batt insulation faced on one side with aluminum foil/scrim vapor retarder, supplied in min 36 in. (0.91 m) wide batts. Insulation batts to be installed with no vertical seams. Insulation panels tightly-fitted between vertical mullions and between the stem of the stiffener tee (Item 2F) and the transom, flush with the interior surface of framing. Insulation panels secured to spandrel panel perimeter angles with cup head weld pins (Item 2I) or 3-1/2 in. (89 mm) long steel screws with min 1-1/2 in. (38 mm) diameter galv steel clinch shields spaced max 12 in. (305 mm) OC. The horizontal seam between insulation panels shall be located 2 in. (51 mm) below the top plane of the floor at each floor level.

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H. **Framing Covers - Curtain Wall Insulation* -** Min 8 in. (203 mm) wide strips cut from the same min 3 in. (76 mm) thick mineral wool batt insulation used for the curtain wall insulation (Item 2G). Framing covers to be centered over mullions and secured to the spandrel panel perimeter angles with cup head weld pins (Item 2I) or 6-1/2 in. (165 mm) long steel screws with min 1-1/2 in. (38 mm) diameter galv steel clinch shields spaced max 12 in. (305 mm) OC. Where more than one spandrel panel (Item 2C) occurs between vertically separated vision panels, the horizontal transom between spandrel panels shall also be covered with an 8 in. (203 mm) wide framing cover in the same manner as on the vertical mullions. Framing covers on mullions to abut the mineral wool batt safing material (Item 3A) above and below floor.

THERMAFIBER INC - FIRESPAN 90

I. **Weld Pin -** In lieu of steel screws, No. 12 gauge (2 mm diam) galv steel weld pin with nom 1-3/16 in. (30 mm) diam galv steel cup head. Cup head weld pins provided in two lengths. One length to be equal to thickness of curtain wall insulation (Item 2G) and second length to be equal to thickness of curtain wall insulation plus thickness of framing cover (Item 2H). Cup head weld pins inserted through curtain wall insulation and mullion covers and welded to spandrel panel perimeter angles max 12 in. (305 mm) OC.

J. **Light Gauge Framing* - Spiral Anchor -** (Not Shown) - As an alternate to the weld pins (Item 2I), galv steel wire spiral anchors may be used to secure the framing covers (Item 2H) to the curtain wall insulation (Item 2G) on each side of the mullion. Nom length of spiral anchors to be equal to thickness of curtain wall insulation plus thickness of framing cover. Spiral anchors driven through mullion covers and into curtain wall insulation and spaced max 12 in. (305 mm) OC.

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K. **Aluminum Sandwich Panel -** (Optional, Not Shown) - Min 1/8 in. (3.2 mm) solid aluminum panel or aluminum composite panel installed on exterior surface of curtain wall insulation (Item 2G).

3. **Safing System -** Max separation between edge of floor assembly and face of framing members is 4 in. (102 mm). The safing system is designed to accommodate vertical shear movement up to a max of 5 percent of its installed width. The safing system shall incorporate the following construction features:
   A. **Forming Material* -** Nom 4 pcf (64 kg/m3) density mineral wool batt insulation. Batt sections cut to a min 4 in. (102 mm) width and stacked to a thickness which is min 25 percent greater than the width of linear gap between the curtain wall insulation and the edge of the concrete floor slab. The stacked forming material is compressed 20 percent in the thickness direction and inserted cut-edge-first into the linear gap such that its top surface is flush with the top surface of the floor assembly. A max of one tightly-butted seam is permitted between mullions.
   THERMAFIBER INC - SAF
   B. **Fill, Void or Cavity Material* -** Min 1/8 in. (3 mm) wet thickness (min 1/16 in. or 1.6 mm dry thickness) of fill material spray-applied over top of forming material and lapping min 1/2 in. (13 mm) onto the top surface of the floor and onto the curtain wall insulation and framing covers. When SpecSeal Fast Tack Spray is used, wet and dry thickness of spray is min 5/64 in. (2 mm).
   SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray, SpecSeal Safing Spray or SpecSeal Fast Tack 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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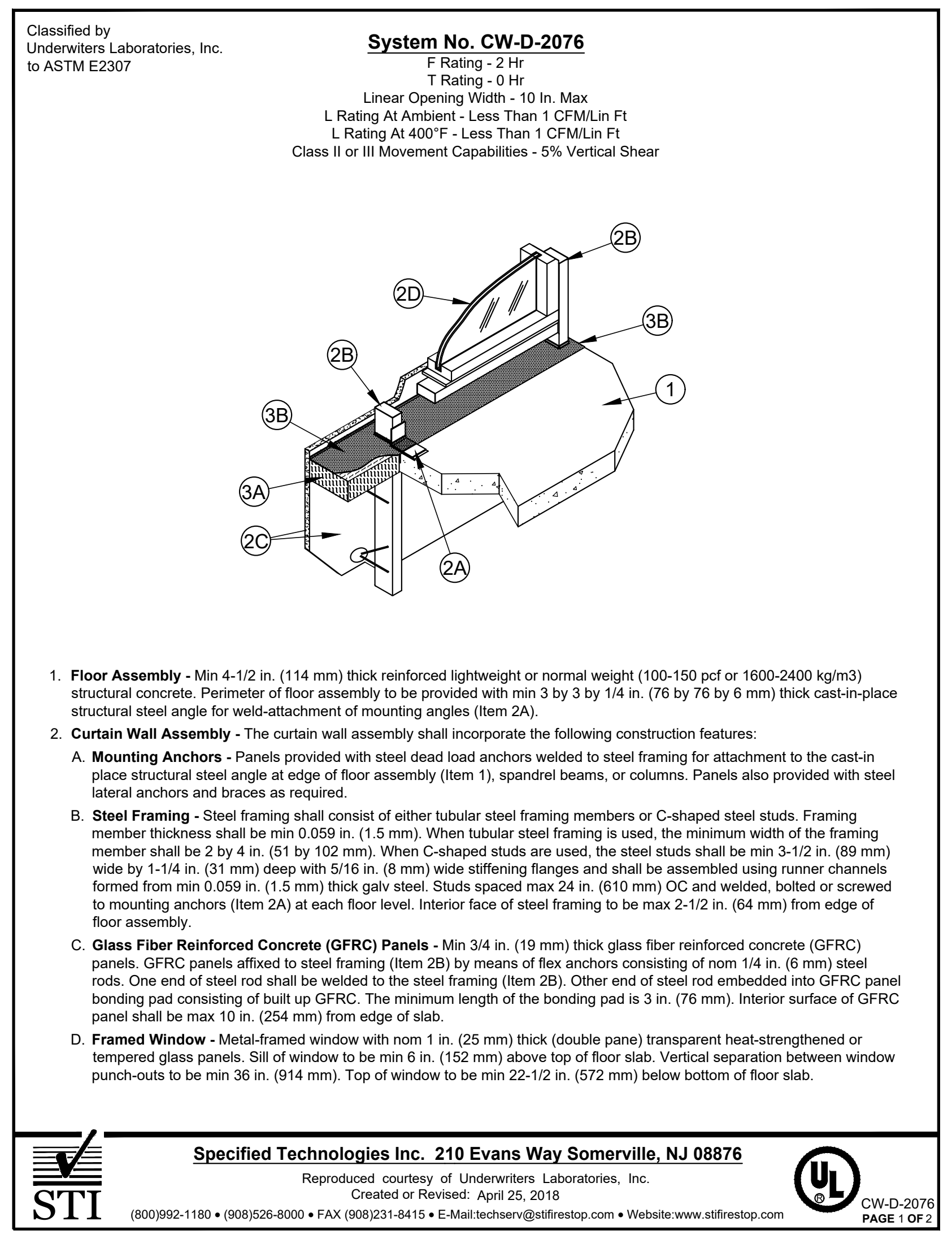

Classified by
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to ASTM E2307

System No. CW-D-2076
F Rating - 2 Hr
T Rating - 0 Hr
Linear Opening Width - 10 In. Max
L Rating At Ambient - Less Than 1 CFM/Lin Ft
L Rating At 400°F - Less Than 1 CFM/Lin Ft
Class II or III Movement Capabilities - 5% Vertical Shear

1. **Floor Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Perimeter of floor assembly to be provided with min 3 by 3 by 1/4 in. (76 by 76 by 6 mm) thick cast-in-place structural steel angle for weld-attachment of mounting angles (Item 2A).
2. **Curtain Wall Assembly -** The curtain wall assembly shall incorporate the following construction features:
   A. **Mounting Anchors -** Panels provided with steel dead load anchors welded to steel framing for attachment to the cast-in place structural steel angle at edge of floor assembly (Item 1), spandrel beams, or columns. Panels also provided with steel lateral anchors and braces as required.
   B. **Steel Framing -** Steel framing shall consist of either tubular steel framing members or C-shaped steel studs. Framing member thickness shall be min 0.059 in. (1.5 mm). When tubular steel framing is used, the minimum width of the framing member shall be 2 by 4 in. (51 by 102 mm). When C-shaped studs are used, the steel studs shall be min 3-1/2 in. (89 mm) wide by 1-1/4 in. (31 mm) deep with 5/16 in. (8 mm) wide stiffening flanges and shall be assembled using runner channels formed from min 0.059 in. (1.5 mm) thick galv steel. Studs spaced max 24 in. (610 mm) OC and welded, bolted or screwed to mounting anchors (Item 2A) at each floor level. Interior face of steel framing to be max 2-1/2 in. (64 mm) from edge of floor assembly.
   C. **Glass Fiber Reinforced Concrete (GFRC) Panels -** Min 3/4 in. (19 mm) thick glass fiber reinforced concrete (GFRC) panels. GFRC panels affixed to steel framing (Item 2B) by means of flex anchors consisting of nom 1/4 in. (6 mm) steel rods. One end of steel rod shall be welded to the steel framing (Item 2B). Other end of steel rod embedded into GFRC panel bonding pad consisting of built up GFRC. The minimum length of the bonding pad is 3 in. (76 mm). Interior surface of GFRC panel shall be max 10 in. (254 mm) from edge of slab.
   D. **Framed Window -** Metal-framed window with nom 1 in. (25 mm) thick (double pane) transparent heat-strengthened or tempered glass panels. Sill of window to be min 6 in. (152 mm) above top of floor slab. Vertical separation between window punch-outs to be min 36 in. (914 mm). Top of window to be min 22-1/2 in. (572 mm) below bottom of floor slab.

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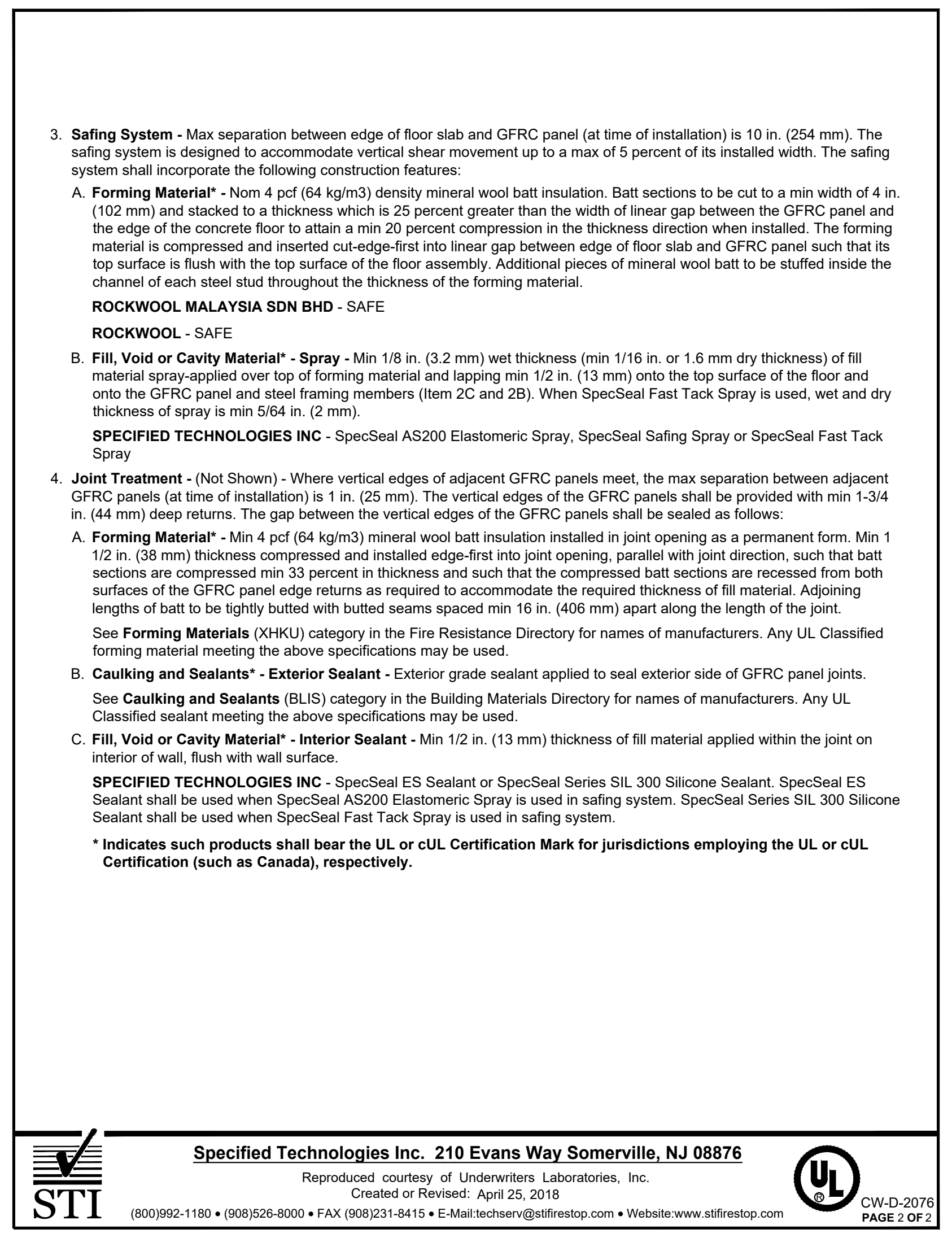

3. **Safing System -** Max separation between edge of floor slab and GFRC panel (at time of installation) is 10 in. (254 mm). The safing system is designed to accommodate vertical shear movement up to a max of 5 percent of its installed width. The safing system shall incorporate the following construction features:
   A. **Forming Material* -** Nom 4 pcf (64 kg/m3) density mineral wool batt insulation. Batt sections to be cut to a min width of 4 in. (102 mm) and stacked to a thickness which is 25 percent greater than the width of linear gap between the GFRC panel and the edge of the concrete floor to attain a min 20 percent compression in the thickness direction when installed. The forming material is compressed and inserted cut-edge-first into linear gap between edge of floor slab and GFRC panel such that its top surface is flush with the top surface of the floor assembly. Additional pieces of mineral wool batt to be stuffed inside the channel of each steel stud throughout the thickness of the forming material.
   ROCKWOOL MALAYSIA SDN BHD - SAFE
   ROCKWOOL - SAFE
   B. **Fill, Void or Cavity Material* - Spray -** Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or 1.6 mm dry thickness) of fill material spray-applied over top of forming material and lapping min 1/2 in. (13 mm) onto the top surface of the floor and onto the GFRC panel and steel framing members (Item 2C and 2B). When SpecSeal Fast Tack Spray is used, wet and dry thickness of spray is min 5/64 in. (2 mm).
   SPECIFIED TECHNOLOGIES INC - SpecSeal AS200 Elastomeric Spray, SpecSeal Safing Spray or SpecSeal Fast Tack Spray
4. **Joint Treatment -** (Not Shown) - Where vertical edges of adjacent GFRC panels meet, the max separation between adjacent GFRC panels (at time of installation) is 1 in. (25 mm). The vertical edges of the GFRC panels shall be provided with min 1-3/4 in. (44 mm) deep returns. The gap between the vertical edges of the GFRC panels shall be sealed as follows:
   A. **Forming Material* -** Min 4 pcf (64 kg/m3) mineral wool batt insulation installed in joint opening as a permanent form. Min 1 1/2 in. (38 mm) thickness compressed and installed edge-first into joint opening, parallel with joint direction, such that batt sections are compressed min 33 percent in thickness and such that the compressed batt sections are recessed from both surfaces of the GFRC panel edge returns as required to accommodate the required thickness of fill material. Adjoining lengths of batt to be tightly butted with butted seams spaced min 16 in. (406 mm) apart along the length of the joint.
   See **Forming Materials** (XHKU) category in the Fire Resistance Directory for names of manufacturers. Any UL Classified forming material meeting the above specifications may be used.
   B. **Caulking and Sealants* - Exterior Sealant -** Exterior grade sealant applied to seal exterior side of GFRC panel joints.
   See **Caulking and Sealants** (BLIS) category in the Building Materials Directory for names of manufacturers. Any UL Classified sealant meeting the above specifications may be used.
   C. **Fill, Void or Cavity Material* - Interior Sealant -** Min 1/2 in. (13 mm) thickness of fill material applied within the joint on interior of wall, flush with wall surface.
   SPECIFIED TECHNOLOGIES INC - SpecSeal ES Sealant or SpecSeal Series SIL 300 Silicone Sealant. SpecSeal ES Sealant shall be used when SpecSeal AS200 Elastomeric Spray is used in safing system. SpecSeal Series SIL 300 Silicone Sealant shall be used when SpecSeal Fast Tack Spray is used in safing system.

*** 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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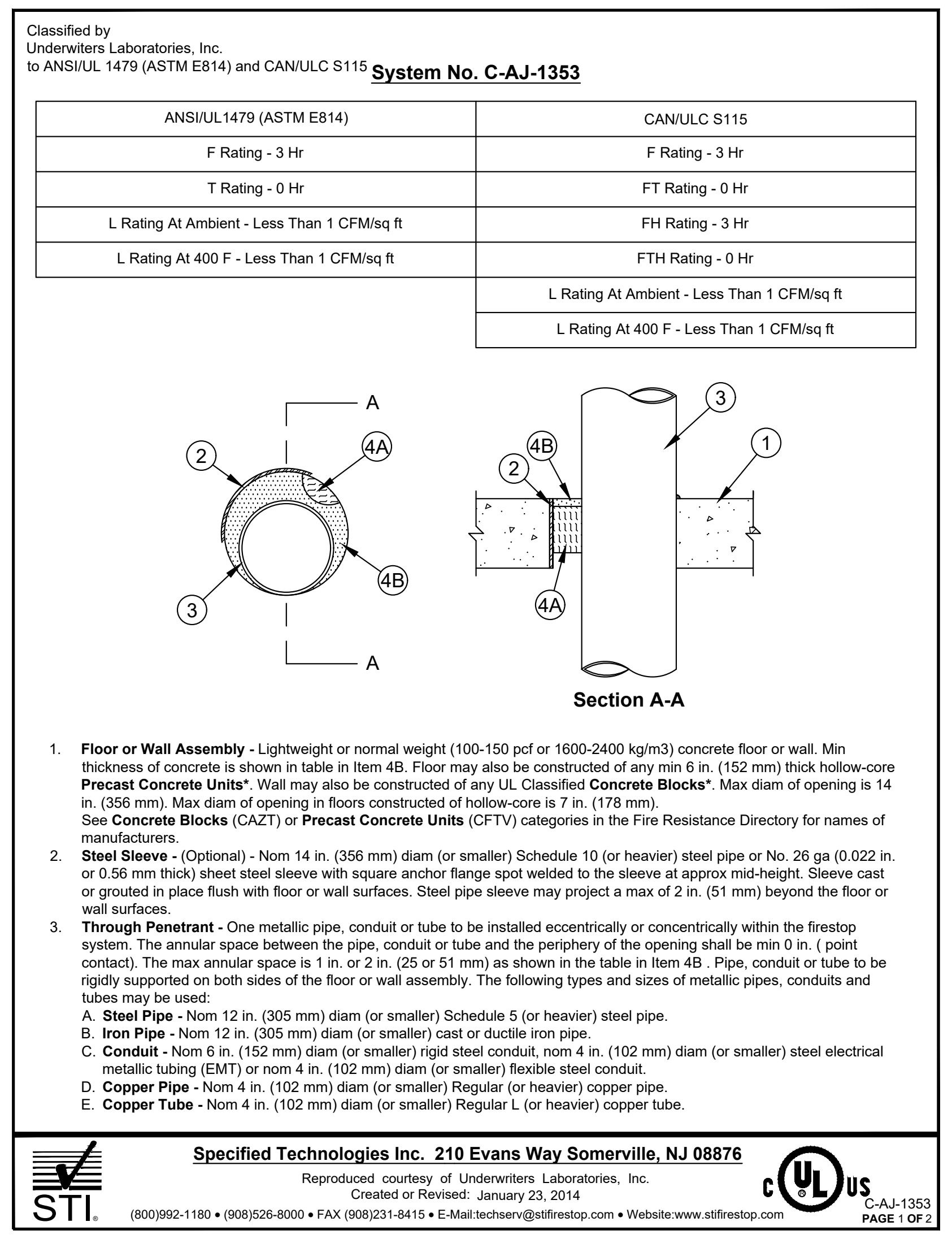

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. C-AJ-1353**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 3 Hr	F Rating - 3 Hr
T Rating - 0 Hr	FT Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Rating - 3 Hr
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Rating - 0 Hr
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft

Section A-A

1. **Floor or Wall Assembly -** Lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor or wall. Min thickness of concrete is shown in table in Item 4B. Floor may also be constructed of any min 6 in. (152 mm) thick hollow-core **Precast Concrete Units***. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening is 14 in. (356 mm). Max diam of opening in floors constructed of hollow-core is 7 in. (178 mm).
   See **Concrete Blocks** (CAZT) or **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve -** (Optional) - Nom 14 in. (356 mm) 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.
3. **Through Penetrant -** One metallic pipe, conduit or tube to be installed eccentrically or concentrically within the firestop system. The annular space between the pipe, conduit or tube and the periphery of the opening shall be min 0 in. (point contact). The max annular space is 1 in. or 2 in. (25 or 51 mm) as shown in the table in Item 4B . Pipe, conduit or tube 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 12 in. (305 mm) diam (or smaller) Schedule 5 (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) steel electrical metallic tubing (EMT) or nom 4 in. (102 mm) diam (or smaller) flexible steel conduit.
   D. **Copper Pipe -** Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
   E. **Copper Tube -** Nom 4 in. (102 mm) diam (or smaller) Regular L (or heavier) copper tube.

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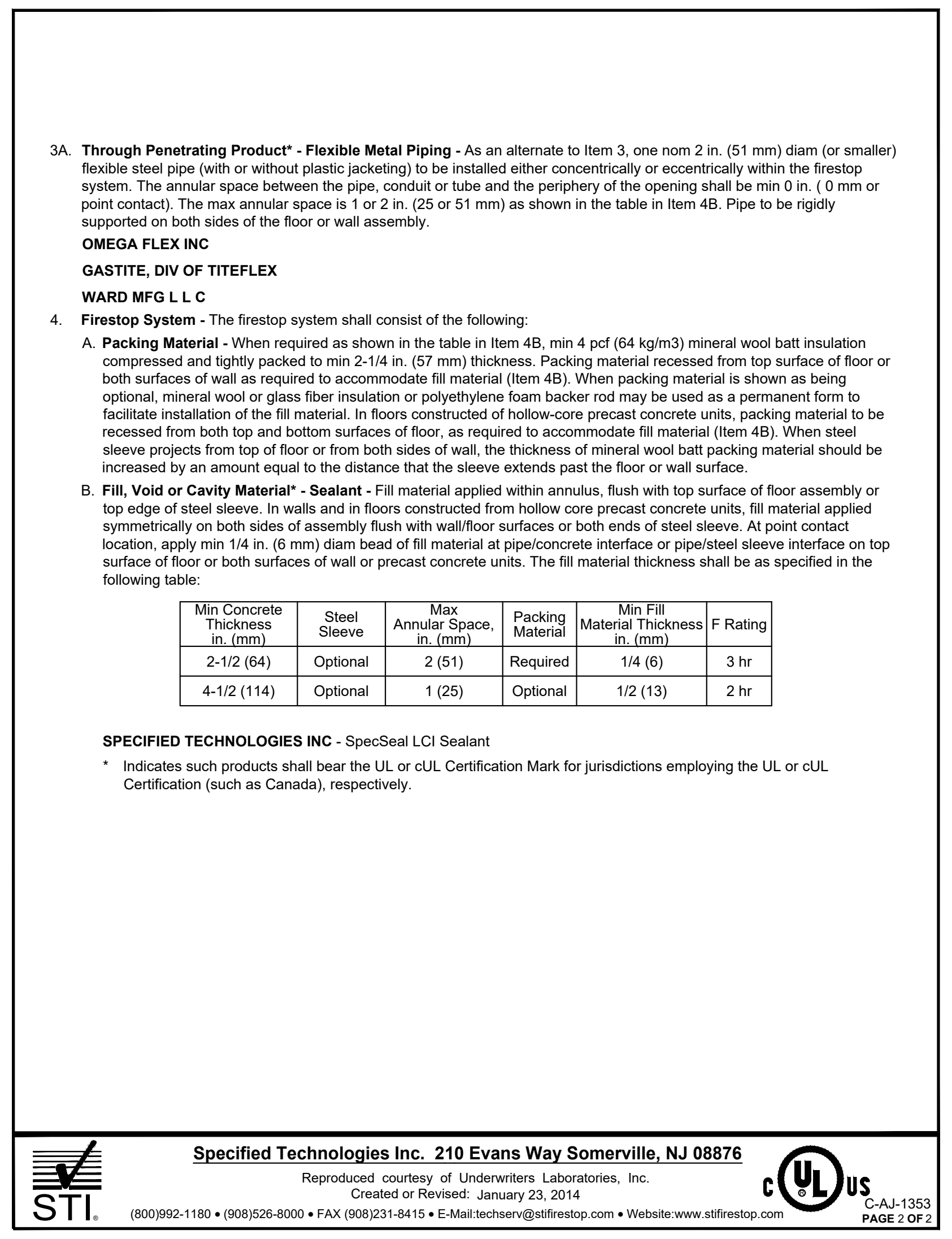

3A. **Through Penetrating Product* - Flexible Metal Piping -** As an alternate to Item 3, one nom 2 in. (51 mm) diam (or smaller) flexible steel pipe (with or without plastic jacketing) to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe, conduit or tube and the periphery of the opening shall be min 0 in. (0 mm or point contact). The max annular space is 1 or 2 in. (25 or 51 mm) as shown in the table in Item 4B. Pipe 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

4. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** When required as shown in the table in Item 4B, min 4 pcf (64 kg/m3) mineral wool batt insulation compressed and tightly packed to min 2-1/4 in. (57 mm) thickness. Packing material recessed from top surface of floor or both surfaces of wall as required to accommodate fill material (Item 4B). When packing material is shown as being optional, mineral wool or glass fiber insulation or polyethylene foam backer rod may be used as a permanent form to facilitate installation of the fill material. In floors constructed of hollow-core precast concrete units, packing material to be recessed from both top and bottom surfaces of floor, as required to accommodate fill material (Item 4B). When steel sleeve projects from top of floor or from both sides of wall, the thickness of mineral wool batt packing material should be increased by an amount equal to the distance that the sleeve extends past the floor or wall surface.
   B. **Fill, Void or Cavity Material* - Sealant -** Fill material applied within annulus, flush with top surface of floor assembly or top edge of steel sleeve. In walls and in floors constructed from hollow core precast concrete units, fill material applied symmetrically on both sides of assembly flush with wall/floor surfaces or both ends of steel sleeve. At point contact location, apply min 1/4 in. (6 mm) diam bead of fill material at pipe/concrete interface or pipe/steel sleeve interface on top surface of floor or both surfaces of wall or precast concrete units. The fill material thickness shall be as specified in the following table:

Min Concrete Thickness in. (mm)	Steel Sleeve	Max Annular Space, in. (mm)	Packing Material	Min Fill Material Thickness in. (mm)	F Rating
2-1/2 (64)	Optional	2 (51)	Required	1/4 (6)	3 hr
4-1/2 (114)	Optional	1 (25)	Optional	1/2 (13)	2 hr

SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

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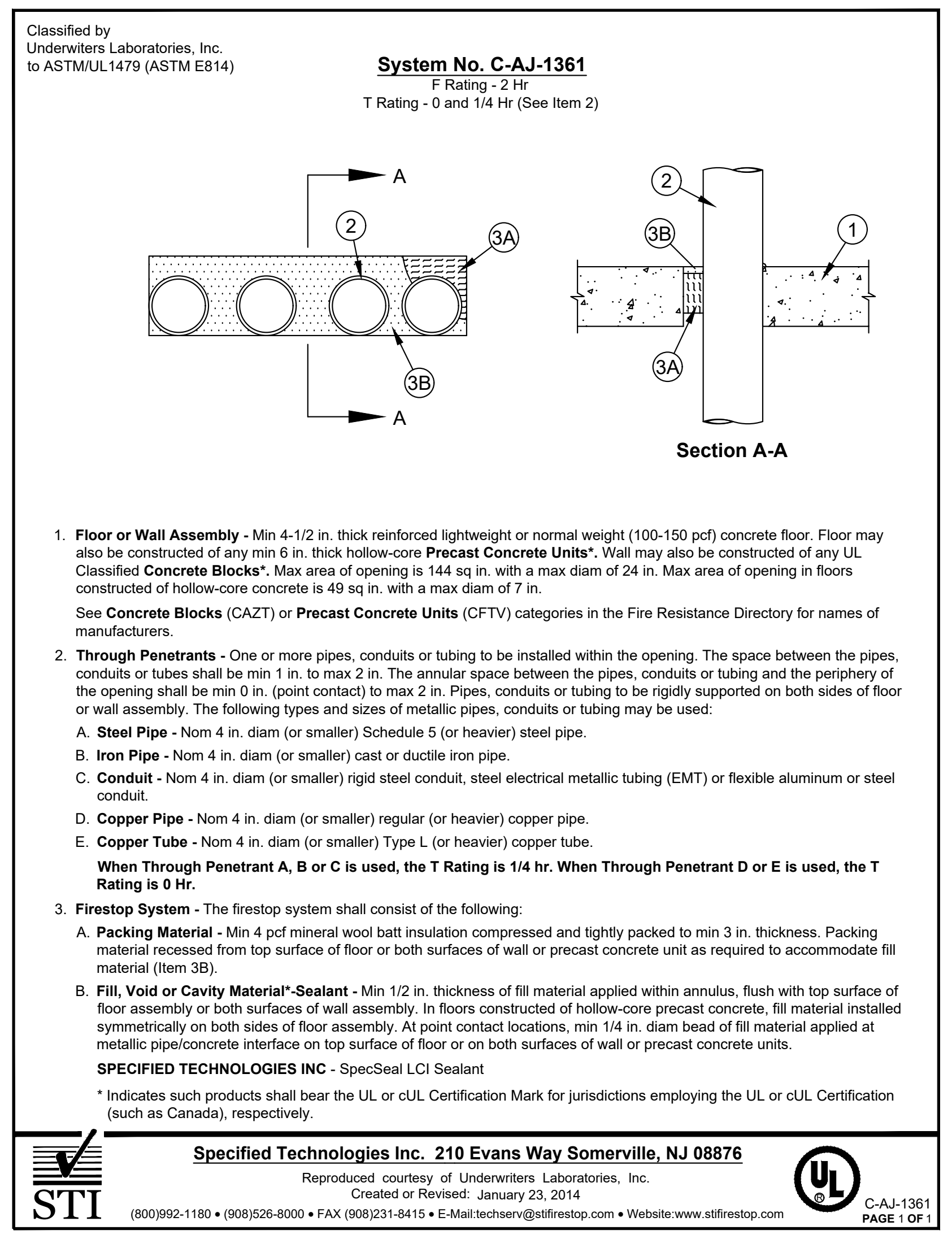

Classified by
Underwiters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. C-AJ-1361
F Rating - 2 Hr
T Rating - 0 and 1/4 Hr (See Item 2)

Section A-A

1. **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 manufacturers.
2. **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:
   A. **Steel Pipe -** Nom 4 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.
   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 conduit.
   D. **Copper Pipe -** Nom 4 in. diam (or smaller) regular (or heavier) copper 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 Rating is 0 Hr.
3. **Firestop System -** The firestop system shall consist of the following:
   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 material (Item 3B).
   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 metallic pipe/concrete interface on top surface of floor or on both surfaces of wall or precast concrete units.
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

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C-AJ-1361
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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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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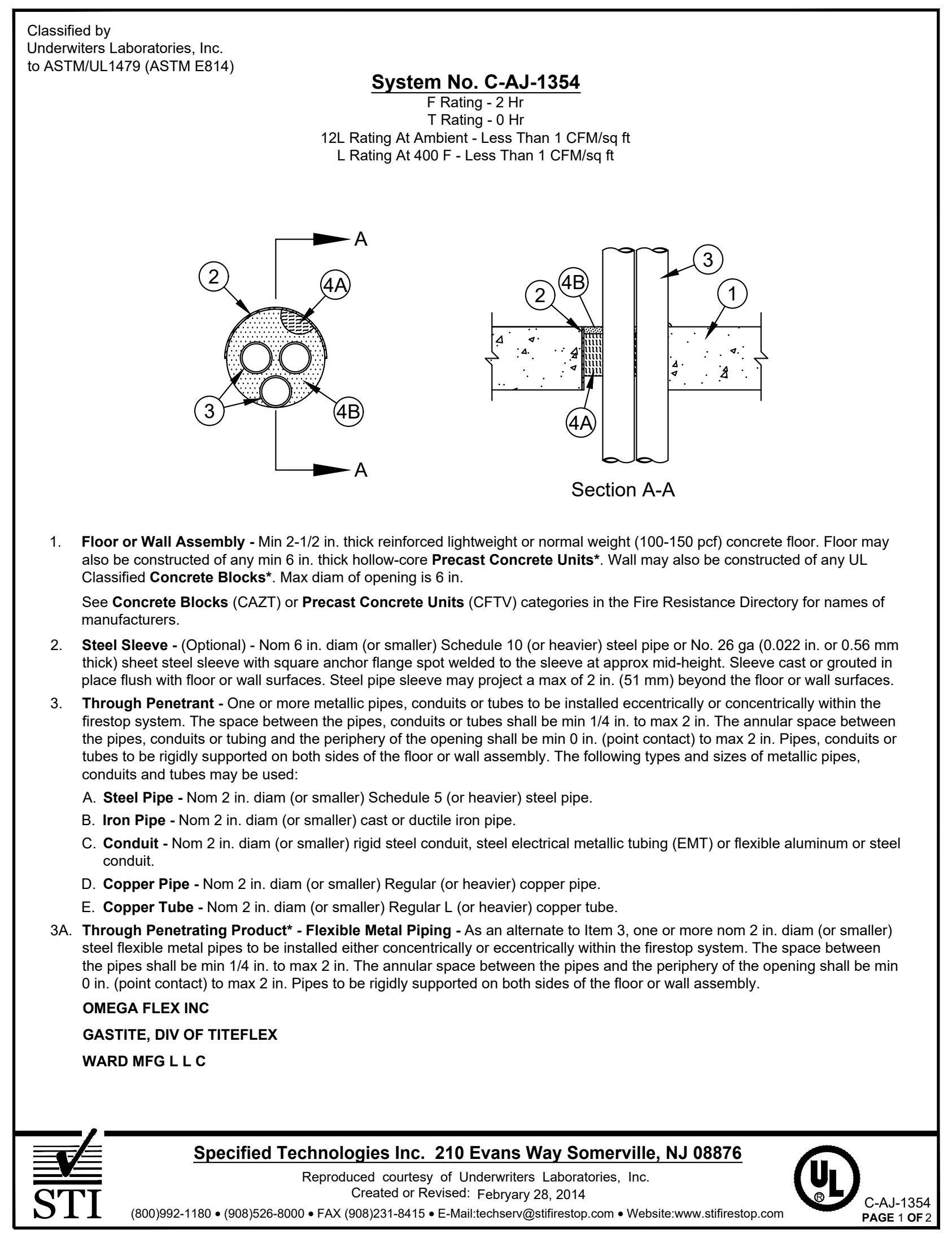

Classified by
Underwiters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. C-AJ-1354

F Rating - 2 Hr
T Rating - 0 Hr
12L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft

1. **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 Classified **Concrete Blocks***. Max diam of opening is 6 in.

   See **Concrete Blocks** (CAZT) or **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **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.
3. **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 conduit.
   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.

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C-AJ-1354
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4. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** Min 4 pcf mineral wool batt insulation compressed and tightly packed to min 2-1/4 in. thickness. Packing material recessed from top surface of floor or both surfaces of wall as required to accommodate fill material (Item 4B). In floors constructed of hollow-core precast concrete units, packing material to be recessed from both top and bottom surfaces of floor, as required to accommodate fill material (Item 4B). When steel sleeve projects from top of floor or from both sides of wall, the thickness of mineral wool batt packing material should be increased by an amount equal to the distance that the sleeve extends past the floor or wall surface.
   B. **Fill, Void or Cavity Material* - Sealant -** Min 1/4 in. thickness of fill material applied within annulus, flush with top surface of floor assembly or top edge of steel sleeve. In walls, min 1/4 in. thickness of fill material applied flush with both surfaces of wall assembly or both ends of steel sleeve. In floors constructed of hollow-core precast concrete units, fill material installed symmetrically on both surfaces of floor. At point contact location, apply min 1/4 in. diam bead of fill material at pipe/concrete interface or pipe/steel sleeve interface on top surface of floor or both surfaces of wall or precast concrete units.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant or SpecSeal SSS Sealant

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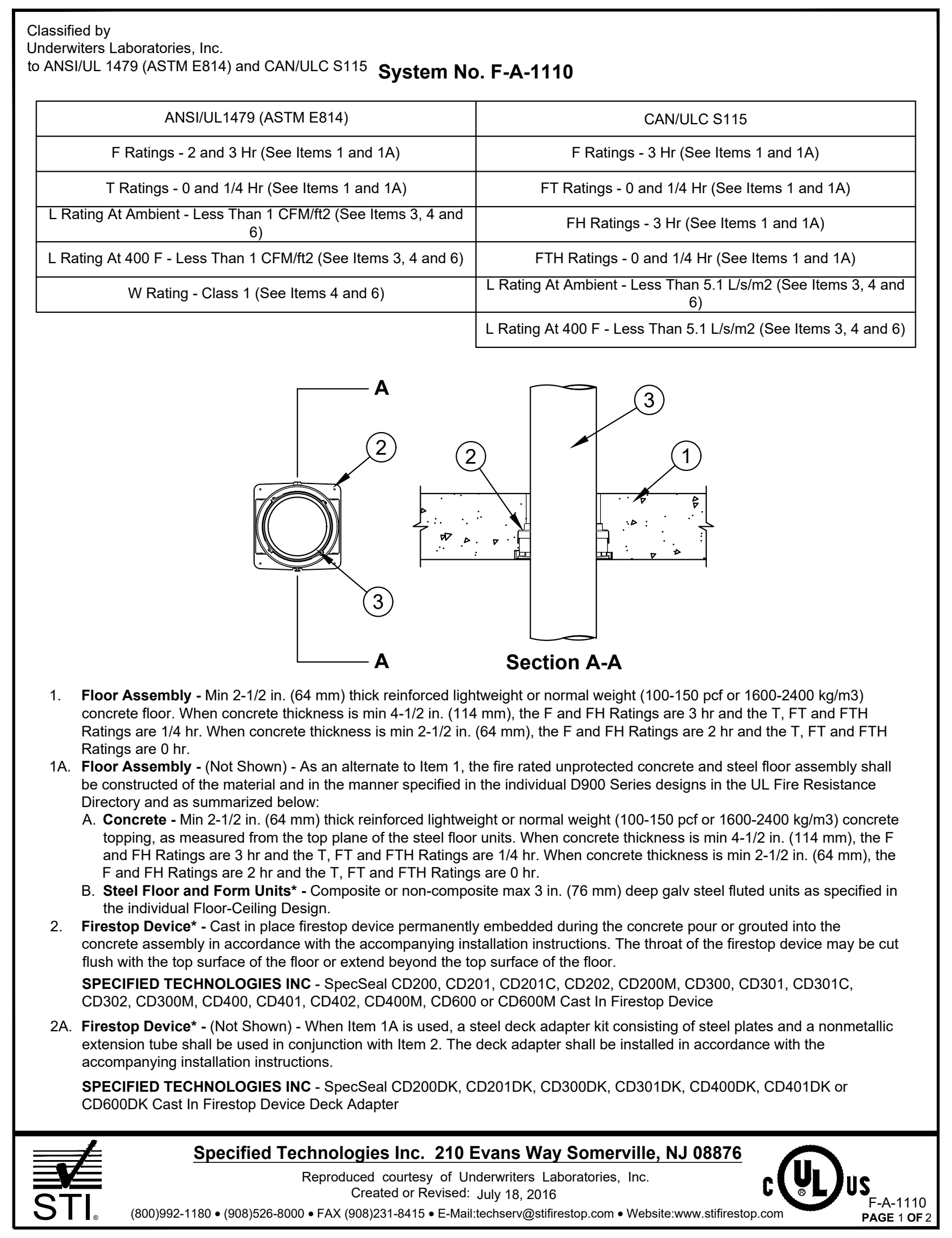

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. F-A-1110

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 2 and 3 Hr (See Items 1 and 1A)	F Ratings - 3 Hr (See Items 1 and 1A)
T Ratings - 0 and 1/4 Hr (See Items 1 and 1A)	FT Ratings - 0 and 1/4 Hr (See Items 1 and 1A)
L Rating At Ambient - Less Than 1 CFM/ft2 (See Items 3, 4 and 6)	FH Ratings - 3 Hr (See Items 1 and 1A)
L Rating At 400 F - Less Than 1 CFM/ft2 (See Items 3, 4 and 6)	FTH Ratings - 0 and 1/4 Hr (See Items 1 and 1A)
W Rating - Class 1 (See Items 4 and 6)	L Rating At Ambient - Less Than 5.1 L/s/m2 (See Items 3, 4 and 6)
	L Rating At 400 F - Less Than 5.1 L/s/m2 (See Items 3, 4 and 6)

1. **Floor Assembly -** Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor. When concrete thickness is min 4-1/2 in. (114 mm), the F and FH Ratings are 3 hr and the T, FT and FTH Ratings are 1/4 hr. When concrete thickness is min 2-1/2 in. (64 mm), the F and FH Ratings are 2 hr and the T, FT and FTH Ratings are 0 hr.

1A. **Floor Assembly -** (Not Shown) - As an alternate to Item 1, the fire rated unprotected concrete and steel floor assembly shall be constructed of the material and in the manner specified in the individual 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 plane of the steel floor units. When concrete thickness is min 4-1/2 in. (114 mm), the F and FH Ratings are 3 hr and the T, FT and FTH Ratings are 1/4 hr. When concrete thickness is min 2-1/2 in. (64 mm), the F and FH Ratings are 2 hr and the T, FT and FTH Ratings are 0 hr.
   B. **Steel Floor and Form Units* -** Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.

2. **Firestop Device* -** Cast in place firestop device permanently embedded during the concrete pour or grouted into the concrete assembly in accordance with the accompanying installation instructions. The throat of the firestop device may be cut flush with the top surface of the floor or extend beyond the top surface of the floor.

   SPECIFIED TECHNOLOGIES INC - SpecSeal CD200, CD201, CD201C, CD202, CD200M, CD300, CD301, CD301C, CD302, CD300M, CD400, CD401, CD402, CD400M, CD600 or CD600M Cast In Firestop Device

2A. **Firestop Device* -** (Not Shown) - When Item 1A is used, a steel deck adapter kit consisting of steel plates and a nonmetallic extension tube shall be used in conjunction with Item 2. The deck adapter shall be installed in accordance with the accompanying installation instructions.

SPECIFIED TECHNOLOGIES INC - SpecSeal CD200DK, CD201DK, CD300DK, CD301DK, CD400DK, CD401DK or CD600DK Cast In Firestop Device Deck Adapter

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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

3. **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) copper pipe.

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).

4. **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).
5. **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
7. **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 assembly.

   *** 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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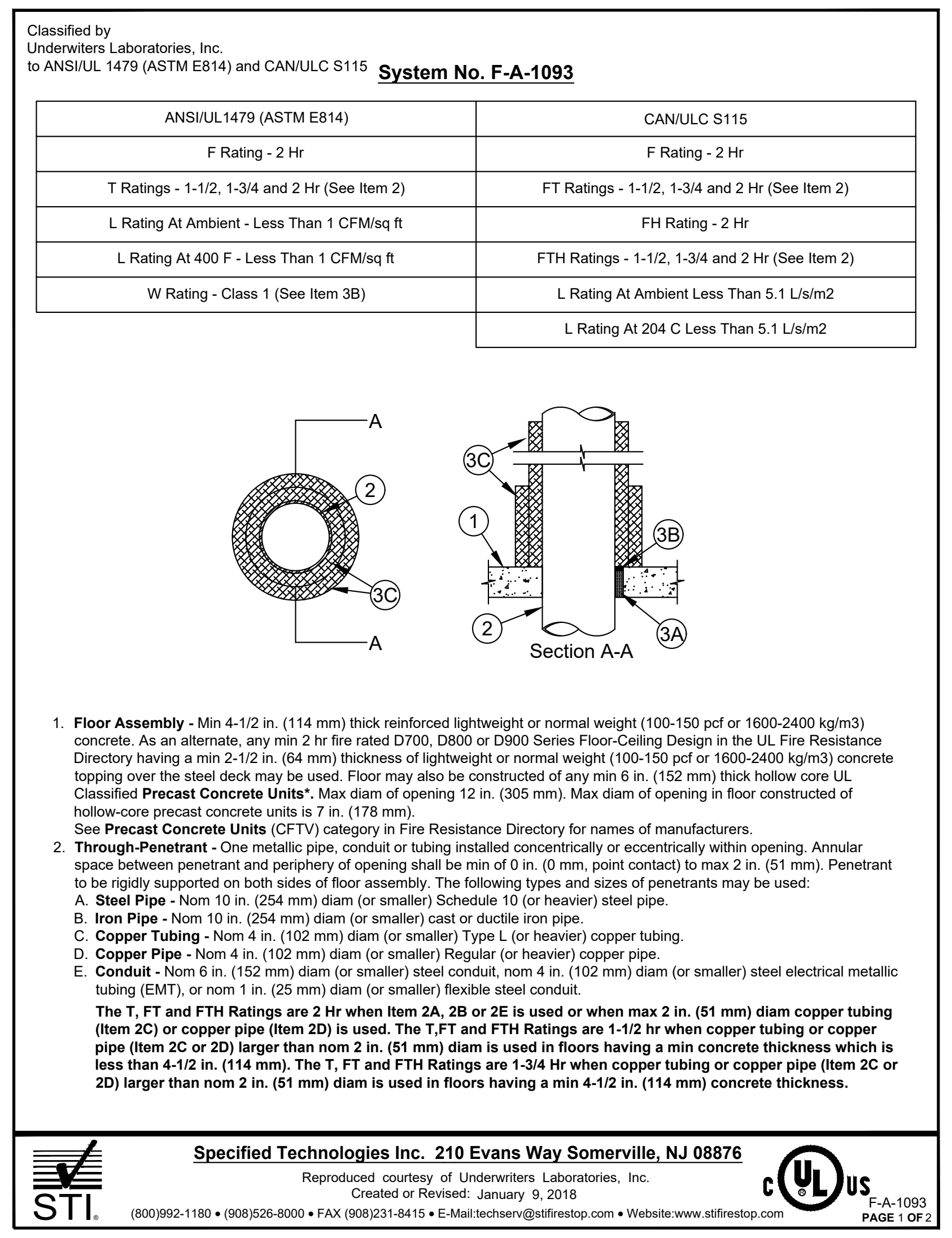

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. F-A-1093

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Ratings - 1-1/2, 1-3/4 and 2 Hr (See Item 2)	FT Ratings - 1-1/2, 1-3/4 and 2 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Rating - 2 Hr
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 1-1/2, 1-3/4 and 2 Hr (See Item 2)
W Rating - Class 1 (See Item 3B)	L Rating At Ambient Less Than 5.1 L/s/m2
	L Rating At 204 C Less Than 5.1 L/s/m2

1. **Floor Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. As an alternate, any min 2 hr fire rated D700, D800 or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory having a min 2-1/2 in. (64 mm) thickness of lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete topping over the steel deck may be used. Floor may also be constructed of any min 6 in. (152 mm) thick hollow core UL Classified **Precast Concrete Units*.** Max diam of opening 12 in. (305 mm). Max diam of opening in floor constructed of hollow-core precast concrete units is 7 in. (178 mm).
   See **Precast Concrete Units** (CFTV) category in Fire Resistance Directory for names of manufacturers.
2. **Through-Penetrant -** One metallic pipe, conduit or tubing installed concentrically or eccentrically within opening. Annular space between penetrant and periphery of opening shall be min of 0 in. (0 mm, point contact) to max 2 in. (51 mm). Penetrant to be rigidly supported on both sides of floor assembly. The following types and sizes of penetrants may be used:
   A. **Steel Pipe -** Nom 10 in. (254 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. **Iron Pipe -** Nom 10 in. (254 mm) diam (or smaller) cast or ductile iron pipe.
   C. **Copper Tubing -** Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
   D. **Copper Pipe -** Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
   E. **Conduit -** Nom 6 in. (152 mm) diam (or smaller) steel conduit, nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT), or nom 1 in. (25 mm) diam (or smaller) flexible steel conduit.

   The T, FT and FTH Ratings are 2 Hr when Item 2A, 2B or 2E is used or when max 2 in. (51 mm) diam copper tubing (Item 2C) or copper pipe (Item 2D) is used. The T,FT and FTH Ratings are 1-1/2 hr when copper tubing or copper pipe (Item 2C or 2D) larger than nom 2 in. (51 mm) diam is used in floors having a min concrete thickness which is less than 4-1/2 in. (114 mm). The T, FT and FTH Ratings are 1-3/4 Hr when copper tubing or copper pipe (Item 2C or 2D) larger than nom 2 in. (51 mm) diam is used in floors having a min 4-1/2 in. (114 mm) concrete thickness.

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F-A-1093
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3. **Firestop System -** The details of the firestop system shall be as follows:
   A. **Packing Material -** Min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to extend through entire thickness of concrete floor except for recess at top surface of floor to accommodate the required thickness of fill material.
   B. **Fill, Void or Cavity Materials* - Sealant or Putty -** Min 1/2 in. (13 mm) thickness of caulk or putty applied within the annulus, flush with top surface of floor. At point contact, apply min 1/4 in. (6 mm) bead at penetrant/concrete interface on top surface of floor.

   SPECIFIED TECHNOLOGIES INC - SpecSeal 100, 101, 102, 105, 120 or 129 Sealant, SpecSeal LCI Sealant, SpecSeal LC150 Sealant, SpecSeal LE600 Sealant, SpecSeal Putty, Pensil 300 Sealant or SpecSeal Series SIL300 Sealant for floors or walls and Pensil 300 SL Sealant or SpecSeal Series SIL300SL Sealant for floors only.

   W Rating applies only when Pensil 300, SpecSeal Series SIL300, Pensil 300 S/L or SpecSeal Series SIL300SL Sealants are used with solid penetrant (not flexible steel conduit).

   C. **Duct Wrap Material* -** Min 1-1/2 in. (38 mm) thick duct wrap tightly wrapped around penetrant to extend 36 in. (914 mm) above floor. An additional layer of min 1-1/2 in. (38 mm) thick duct wrap tightly wrapped around the first layer of duct wrap to extend 12 in. (305 mm) above floor. All longitudinal seams of both layers of duct wrap are sealed with foil tape.

   THERMAL CERAMICS INC - FireMaster FastWrap+, FireMaster FastWrap XL, or Pyroscat Duct Wrap XL.

   *** 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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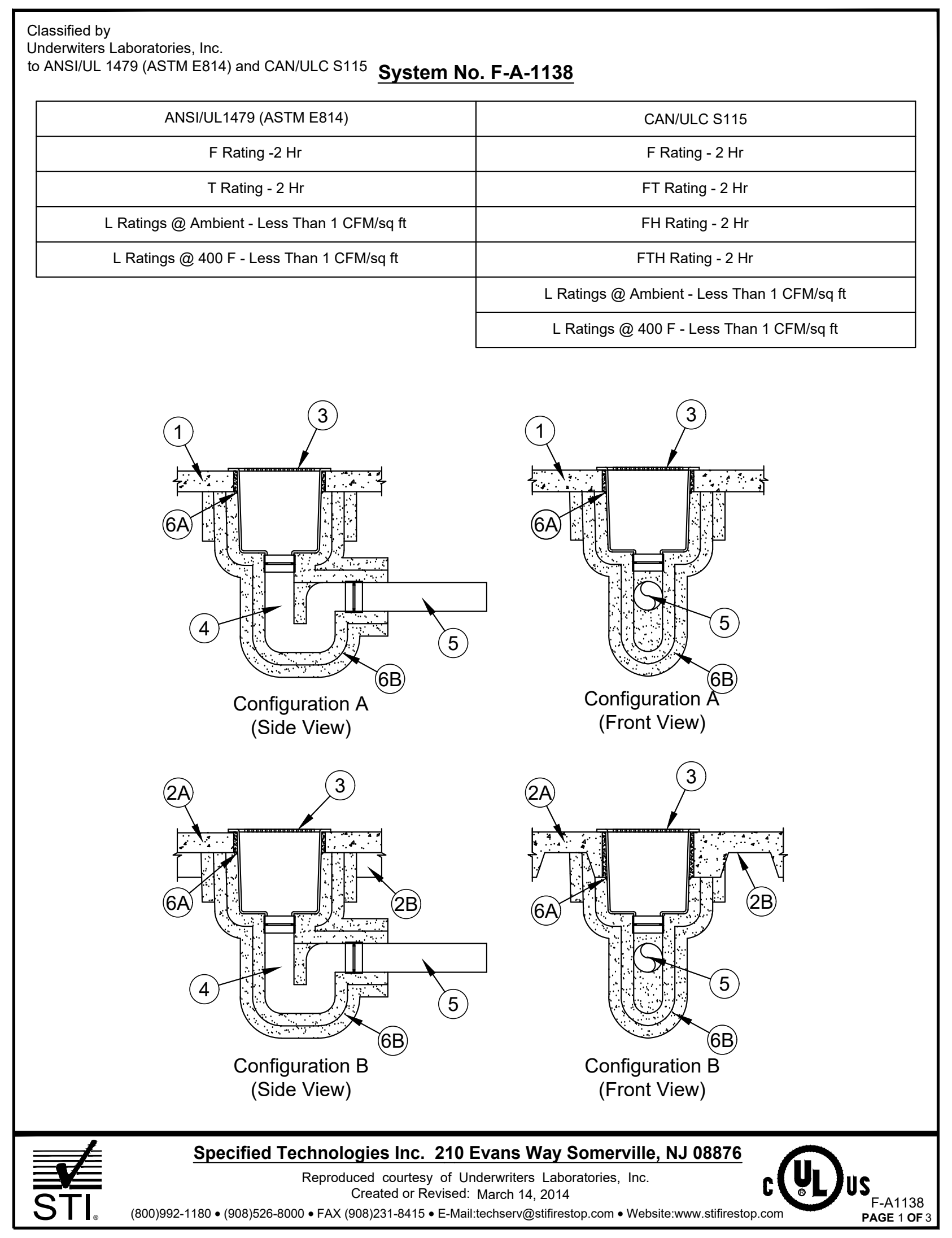

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. F-A-1138

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating -2 Hr	F Rating - 2 Hr
T Rating - 2 Hr	FT Rating - 2 Hr
L Ratings @ Ambient - Less Than 1 CFM/sq ft	FH Rating - 2 Hr
L Ratings @ 400 F - Less Than 1 CFM/sq ft	FTH Rating - 2 Hr
	L Ratings @ Ambient - Less Than 1 CFM/sq ft
	L Ratings @ 400 F - Less Than 1 CFM/sq ft

Configuration A
(Side View)

Configuration A
(Front View)

Configuration B
(Side View)

Configuration B
(Front View)

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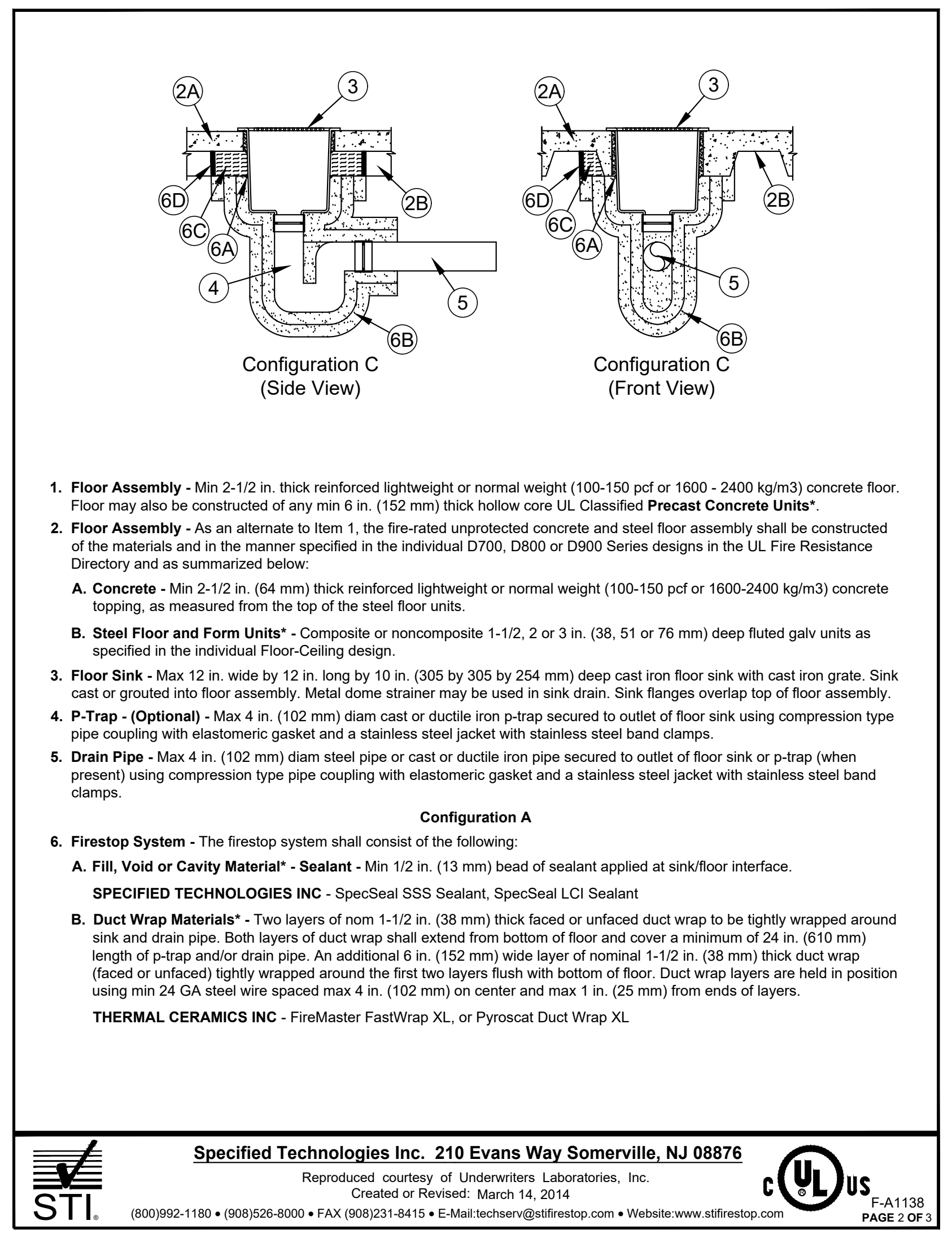

Configuration C
(Side View)

Configuration C
(Front View)

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 clamps.

Configuration A

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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Configuration B

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. Duct wrap cut to the contour of the steel floor and form units (Item 2B). 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

Configuration C

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. Duct wrap abuts bottom plane of the steel floor and form units (Item 2B). 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 plane of the steel floor and form units (Item 2B). 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

   C. **Duct Wrap Materials* -** For exposed openings in fluted deck, sections of nom 1-1/2 in. (38 mm) thick faced or unfaced duct wrap cut to the contour of the fluted deck and friction fitted to fill opening between duct wrap (Item 6B) and steel floor and form units (Item 2B). Recess duct wrap for sealant (Item 6D).

   THERMAL CERAMICS INC - FireMaster FastWrap XL, or Pyroscat Duct Wrap XL

   D. **Fill, Void or Cavity Material* - Sealant -** Min 1/4 in. (13 mm) thickness of sealant applied over duct wrap (Item 6C) installed within exposed fluted openings.

   SPECIFIED TECHNOLOGIES INC - SpecSeal SSS Sealant, 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.

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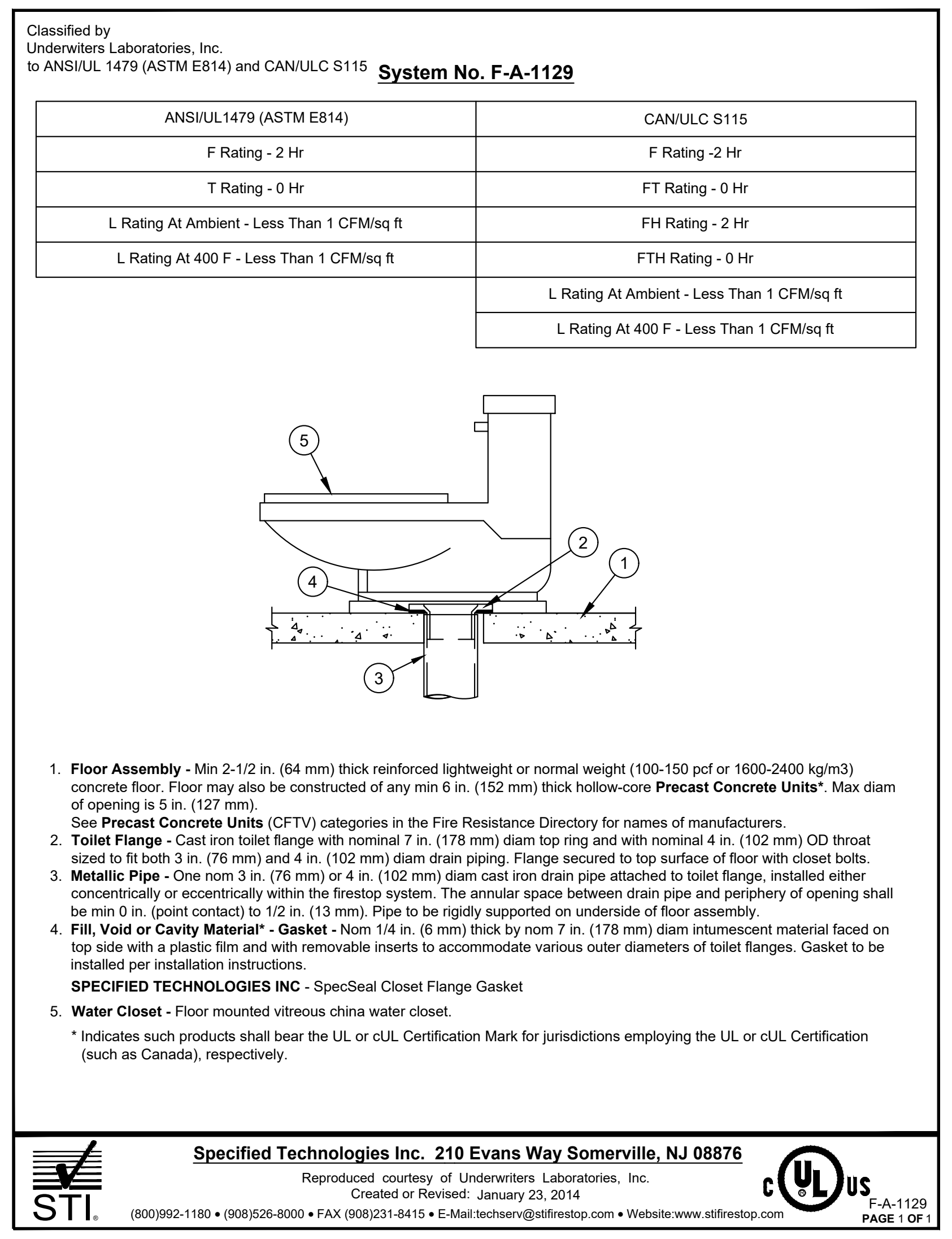

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. F-A-1129

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating -2 Hr
T Rating - 0 Hr	FT Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Rating - 2 Hr
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Rating - 0 Hr
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft

1. **Floor Assembly -** Min 2-1/2 in. (64 mm) 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 **Precast Concrete Units***. Max diam of opening is 5 in. (127 mm).
   See **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Toilet Flange -** Cast iron toilet flange with nominal 7 in. (178 mm) diam 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.
3. **Metallic Pipe -** One nom 3 in. (76 mm) or 4 in. (102 mm) diam cast iron drain pipe attached 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.
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.

   * 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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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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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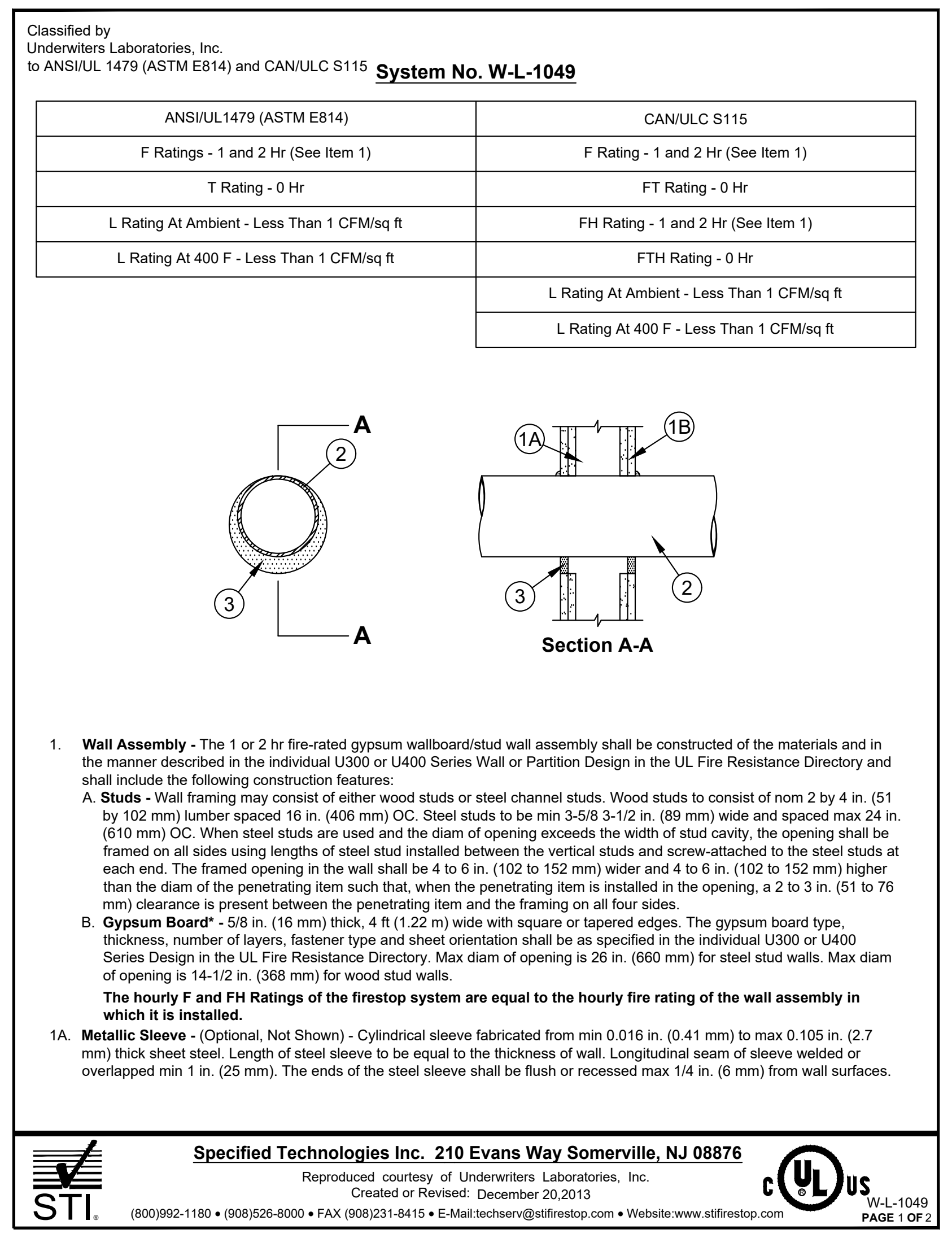

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-1049

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Rating - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr	FT Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Rating - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Rating - 0 Hr
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-5/8 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. When steel studs are used and the diam of opening exceeds the width of stud cavity, the opening shall be framed on all sides using lengths of steel stud installed between the vertical studs and screw-attached to the steel studs at each end. The framed opening in the wall shall be 4 to 6 in. (102 to 152 mm) wider and 4 to 6 in. (102 to 152 mm) higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. (51 to 76 mm) clearance is present between the penetrating item and the framing on all four sides.
   B. **Gypsum Board* -** 5/8 in. (16 mm) thick, 4 ft (1.22 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 26 in. (660 mm) for steel stud walls. Max diam of opening is 14-1/2 in. (368 mm) for wood stud walls.

   The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.

1A. **Metallic Sleeve -** (Optional, Not Shown) - Cylindrical sleeve fabricated from min 0.016 in. (0.41 mm) to max 0.105 in. (2.7 mm) thick sheet steel. Length of steel sleeve to be equal to the thickness of wall. Longitudinal seam of sleeve welded or overlapped min 1 in. (25 mm). The ends of the steel sleeve shall be flush or recessed max 1/4 in. (6 mm) from wall surfaces.

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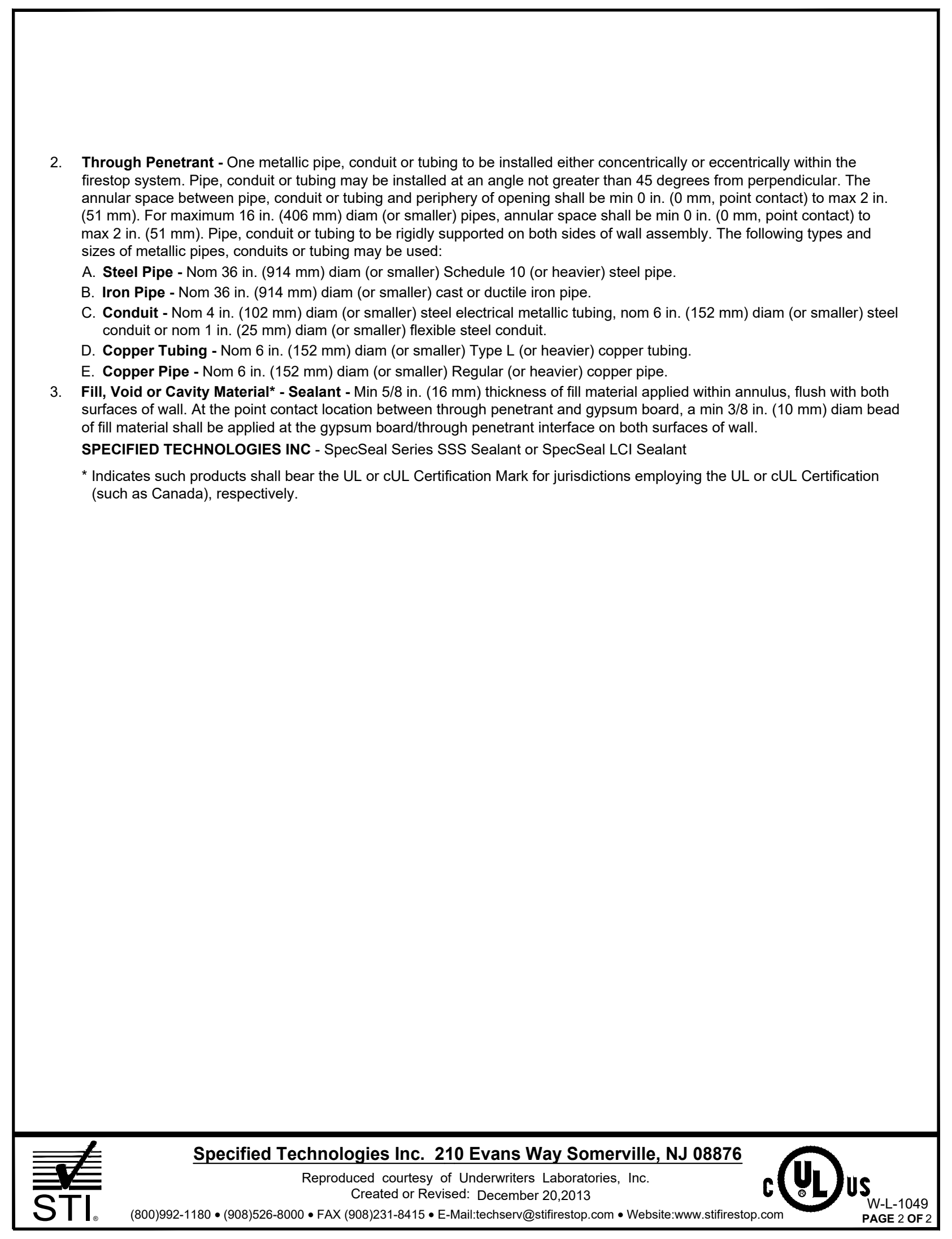

2. **Through Penetrant -** One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. The annular space between pipe, conduit or tubing and 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 max 2 in. (51 mm). Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
   A. **Steel Pipe -** Nom 36 in. (914 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. **Iron Pipe -** Nom 36 in. (914 mm) diam (or smaller) cast or ductile iron pipe.
   C. **Conduit -** Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing, nom 6 in. (152 mm) diam (or smaller) steel conduit or nom 1 in. (25 mm) diam (or smaller) flexible steel conduit.
   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.
3. **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 of fill material shall be applied at the gypsum board/through penetrant interface on both surfaces of 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.

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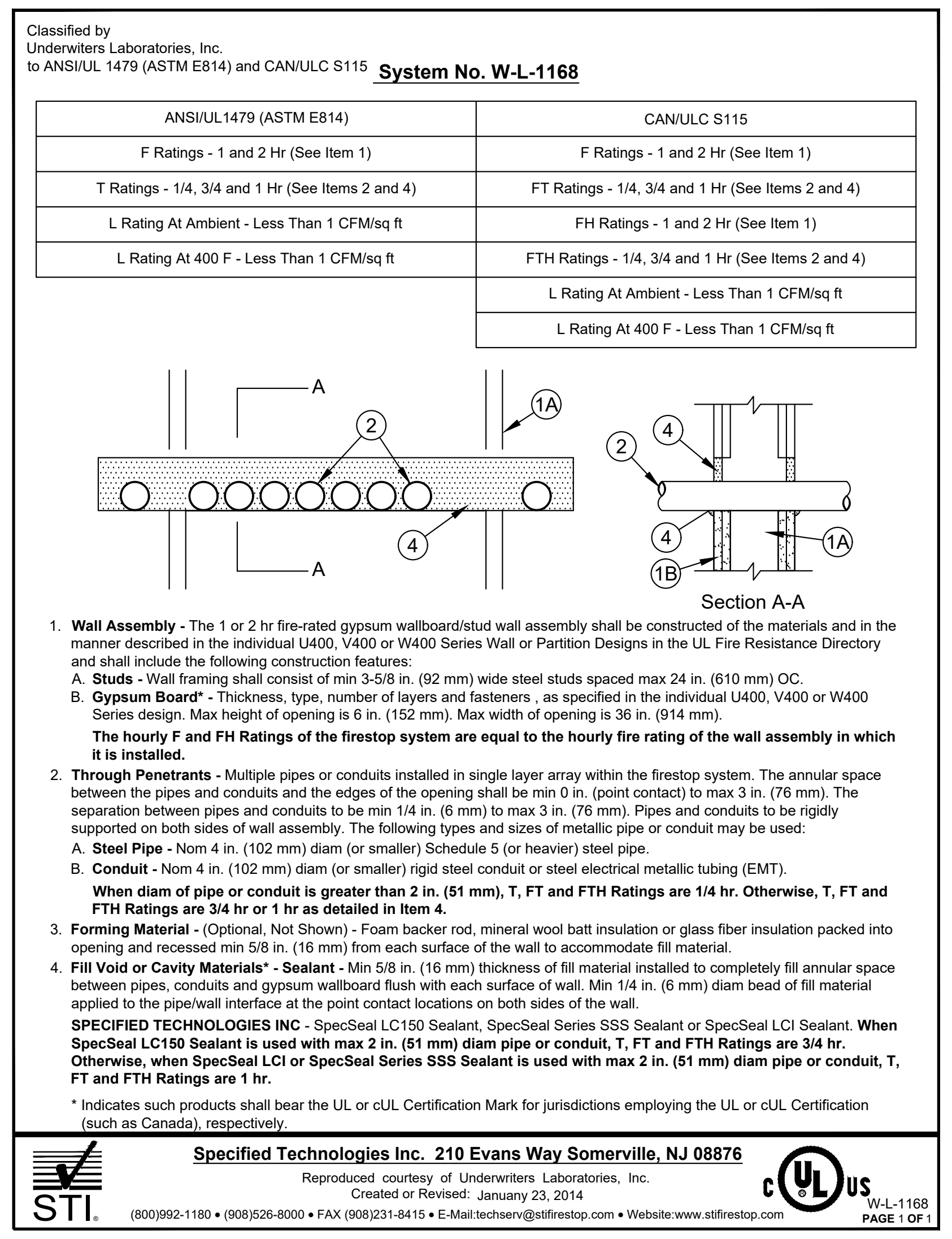

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-1168

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1/4, 3/4 and 1 Hr (See Items 2 and 4)	FT Ratings - 1/4, 3/4 and 1 Hr (See Items 2 and 4)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 1/4, 3/4 and 1 Hr (See Items 2 and 4)
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall or Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing shall consist of min 3-5/8 in. (92 mm) wide steel studs spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board* -** Thickness, type, number of layers and fasteners , as specified in the individual U400, V400 or W400 Series design. Max height of opening is 6 in. (152 mm). Max width of opening is 36 in. (914 mm).

   The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Through Penetrants -** Multiple pipes or conduits installed in single layer array within the firestop system. The annular space between the pipes and conduits and the edges of the opening shall be min 0 in. (point contact) to max 3 in. (76 mm). The separation between pipes and conduits to be min 1/4 in. (6 mm) to max 3 in. (76 mm). Pipes and conduits to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipe or conduit may be used:
   A. **Steel Pipe -** Nom 4 in. (102 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. **Conduit -** Nom 4 in. (102 mm) diam (or smaller) rigid steel conduit or steel electrical metallic tubing (EMT).

   When diam of pipe or conduit is greater than 2 in. (51 mm), T, FT and FTH Ratings are 1/4 hr. Otherwise, T, FT and FTH Ratings are 3/4 hr or 1 hr as detailed in Item 4.
3. **Forming Material -** (Optional, Not Shown) - Foam backer rod, mineral wool batt insulation or glass fiber insulation packed into opening and recessed min 5/8 in. (16 mm) from each surface of the wall to accommodate fill material.
4. **Fill Void or Cavity Materials* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material installed to completely fill annular space between pipes, conduits and gypsum wallboard flush with each surface of wall. Min 1/4 in. (6 mm) diam bead of fill material applied to the pipe/wall interface at the point contact locations on both sides of the wall.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LC150 Sealant, SpecSeal Series SSS Sealant or SpecSeal LCI Sealant. **When SpecSeal LC150 Sealant is used with max 2 in. (51 mm) diam pipe or conduit, T, FT and FTH Ratings are 3/4 hr. Otherwise, when SpecSeal LCI or SpecSeal Series SSS Sealant is used with max 2 in. (51 mm) diam pipe or conduit, T, FT and FTH Ratings are 1 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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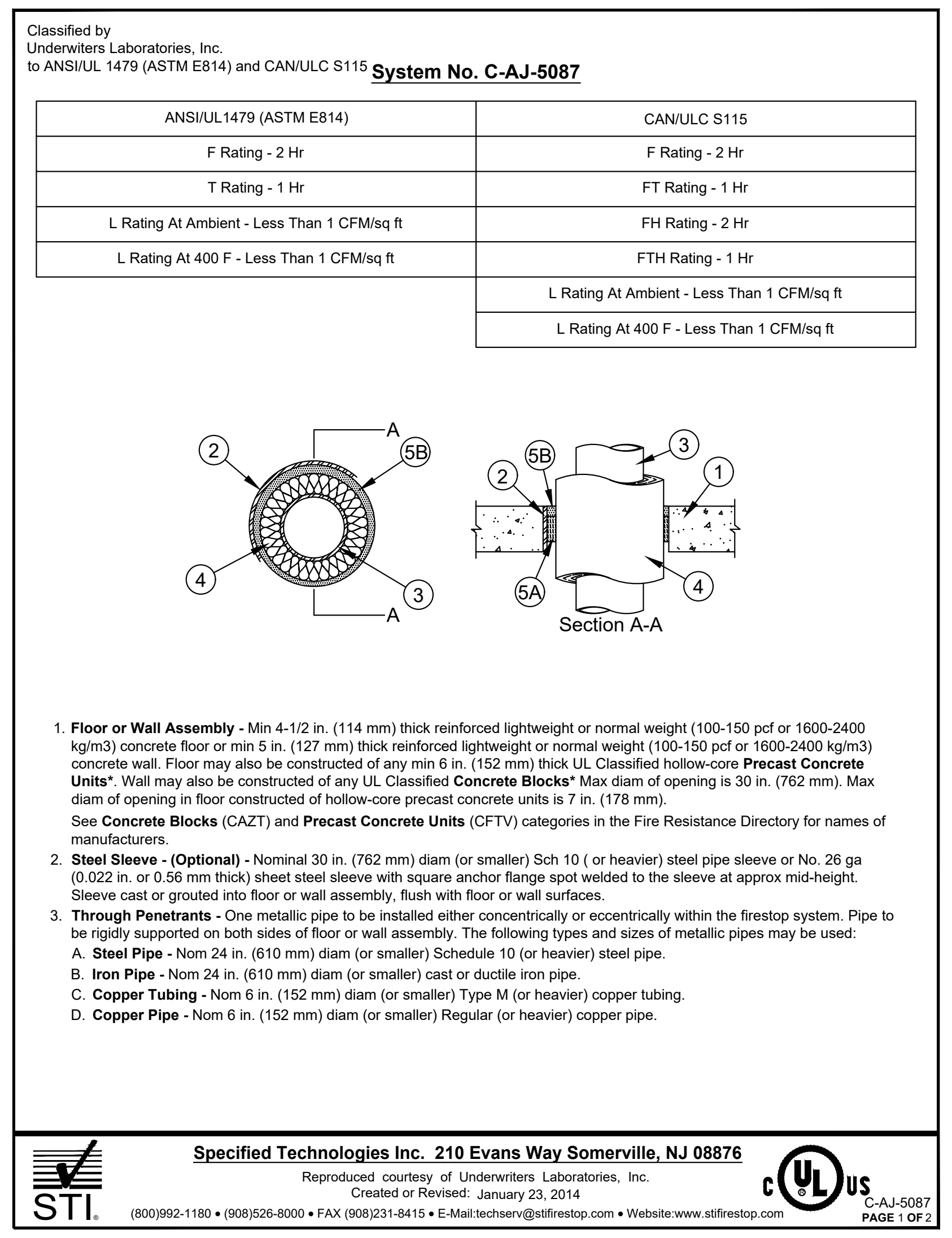

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. C-AJ-5087

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Rating - 1 Hr	FT Rating - 1 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Rating - 2 Hr
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Rating - 1 Hr
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft

1. **Floor or Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor or min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete wall. Floor may also be constructed of any min 6 in. (152 mm) thick UL Classified hollow-core **Precast Concrete Units***. Wall may also be constructed of any UL Classified **Concrete Blocks*** Max diam of opening is 30 in. (762 mm). Max diam of opening in floor constructed of hollow-core precast concrete units is 7 in. (178 mm).

   See **Concrete Blocks** (CAZT) and **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve - (Optional) -** Nominal 30 in. (762 mm) diam (or smaller) Sch 10 (or heavier) steel pipe sleeve 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 into floor or wall assembly, flush with floor or wall surfaces.
3. **Through Penetrants -** One metallic pipe to be installed either concentrically or eccentrically within the firestop system. Pipe to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes may be used:
   A. **Steel Pipe -** Nom 24 in. (610 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. **Iron Pipe -** Nom 24 in. (610 mm) diam (or smaller) cast or ductile iron pipe.
   C. **Copper Tubing -** Nom 6 in. (152 mm) diam (or smaller) Type M (or heavier) copper tubing.
   D. **Copper Pipe -** Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.

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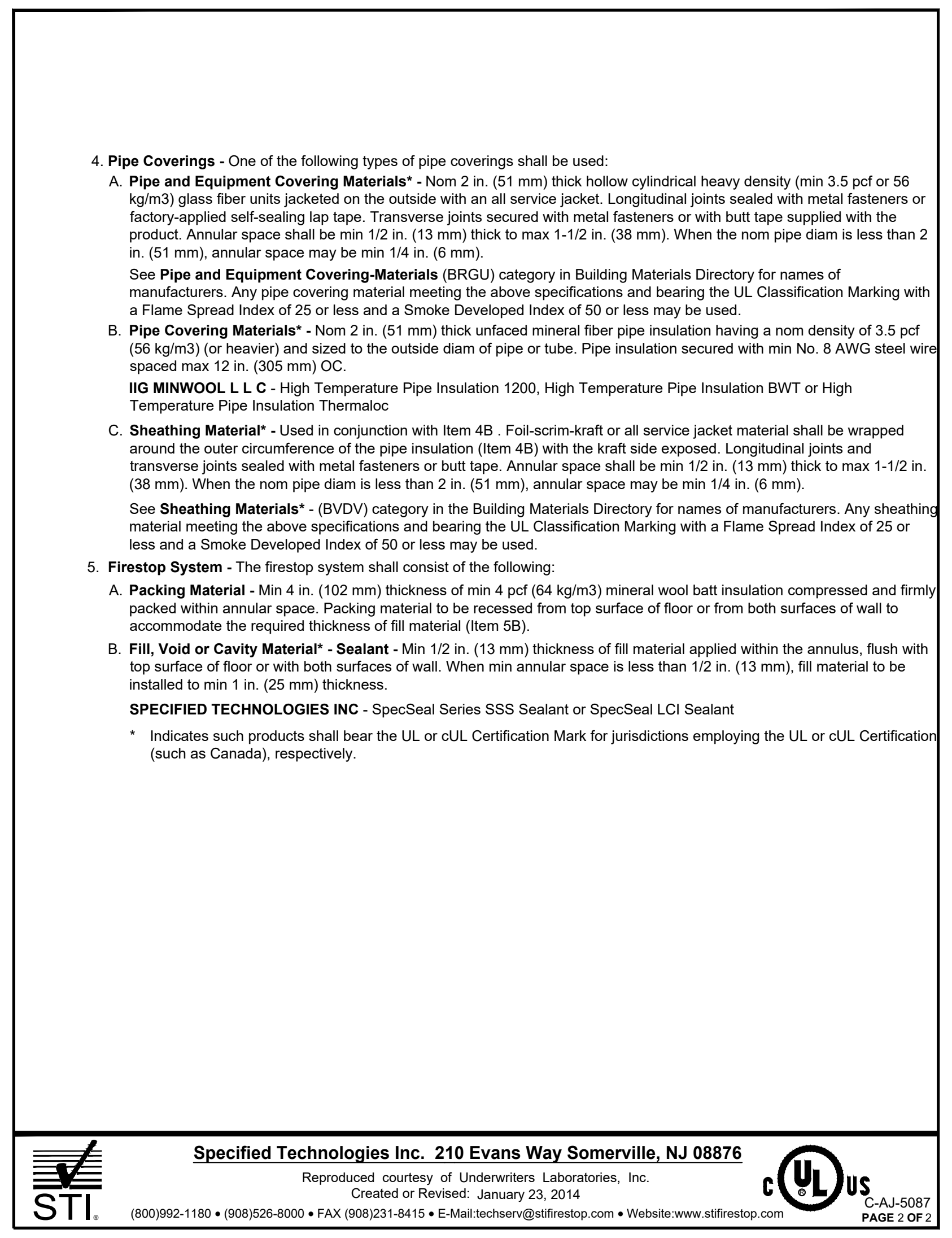

4. **Pipe Coverings -** One of the following types of pipe coverings shall be used:
   A. **Pipe and Equipment Covering Materials* -** Nom 2 in. (51 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 56 kg/m3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal 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. Annular space shall be min 1/2 in. (13 mm) thick to max 1-1/2 in. (38 mm). When the nom pipe diam is less than 2 in. (51 mm), annular space may be min 1/4 in. (6 mm).

      See **Pipe and Equipment Covering-Materials** (BRGU) category in Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
   B. **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 pipe or tube. Pipe insulation secured with min No. 8 AWG steel wire spaced max 12 in. (305 mm) OC.

      IIG MINWOOL L L C - High Temperature Pipe Insulation 1200, High Temperature Pipe Insulation BWT or High Temperature Pipe Insulation Thermaloc
   C. **Sheathing Material* -** Used in conjunction with Item 4B . Foil-scrim-kraft or all service jacket material shall be wrapped around the outer circumference of the pipe insulation (Item 4B) with the kraft side exposed. Longitudinal joints and transverse joints sealed with metal fasteners or butt tape. Annular space shall be min 1/2 in. (13 mm) thick to max 1-1/2 in. (38 mm). When the nom pipe diam is less than 2 in. (51 mm), annular space may be min 1/4 in. (6 mm).

      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.
5. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation compressed and firmly packed within annular space. Packing material to be recessed from top surface of floor or from both surfaces of wall to accommodate the required thickness of fill material (Item 5B).
   B. **Fill, Void or Cavity Material* - Sealant -** Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall. When min annular space is less than 1/2 in. (13 mm), fill material to be installed to min 1 in. (25 mm) thickness.

      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.

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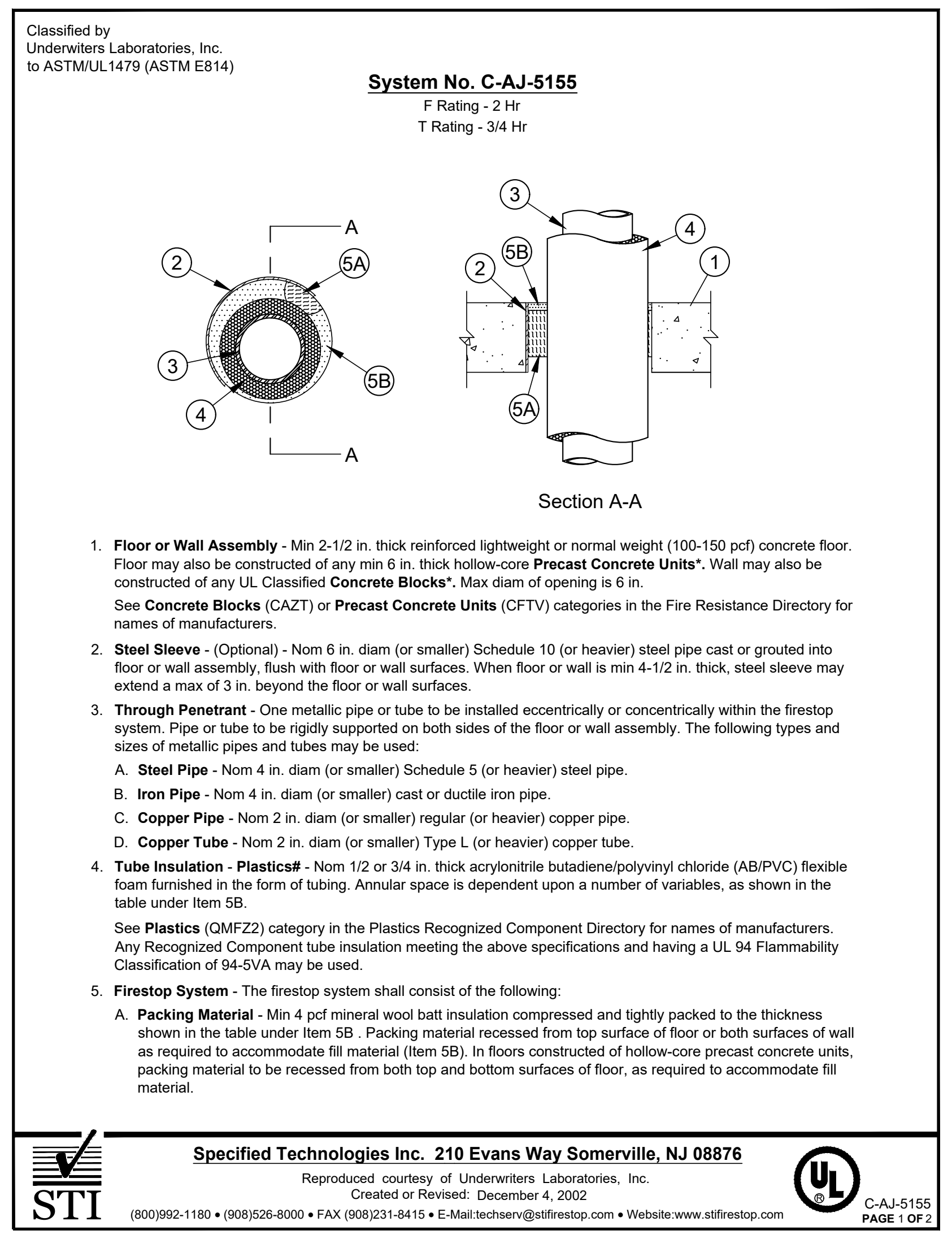

Classified by
Underwiters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. C-AJ-5155

F Rating - 2 Hr
T Rating - 3/4 Hr

1. **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 Classified **Concrete Blocks*.** Max diam of opening is 6 in.

   See **Concrete Blocks** (CAZT) or **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve** - (Optional) - Nom 6 in. diam (or smaller) Schedule 10 (or heavier) steel pipe cast or grouted into floor or wall assembly, flush with floor or wall surfaces. When floor or wall is min 4-1/2 in. thick, steel sleeve may extend a max of 3 in. beyond the floor or wall surfaces.
3. **Through Penetrant** - One metallic pipe or tube to be installed eccentrically or concentrically within the firestop system. Pipe or tube to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of metallic pipes and tubes may be used:
   A. **Steel Pipe** - Nom 4 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. **Iron Pipe** - Nom 4 in. diam (or smaller) cast or ductile iron pipe.
   C. **Copper Pipe** - Nom 2 in. diam (or smaller) regular (or heavier) copper pipe.
   D. **Copper Tube** - Nom 2 in. diam (or smaller) Type L (or heavier) copper tube.
4. **Tube Insulation** - **Plastics#** - Nom 1/2 or 3/4 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. Annular space is dependent upon a number of variables, as shown in the table under Item 5B.

   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.
5. **Firestop System** - The firestop system shall consist of the following:
   A. **Packing Material** - Min 4 pcf mineral wool batt insulation compressed and tightly packed to the thickness shown in the table under Item 5B . Packing material recessed from top surface of floor or both surfaces of wall as required to accommodate fill material (Item 5B). In floors constructed of hollow-core precast concrete units, packing material to be recessed from both top and bottom surfaces of floor, as required to accommodate fill material.

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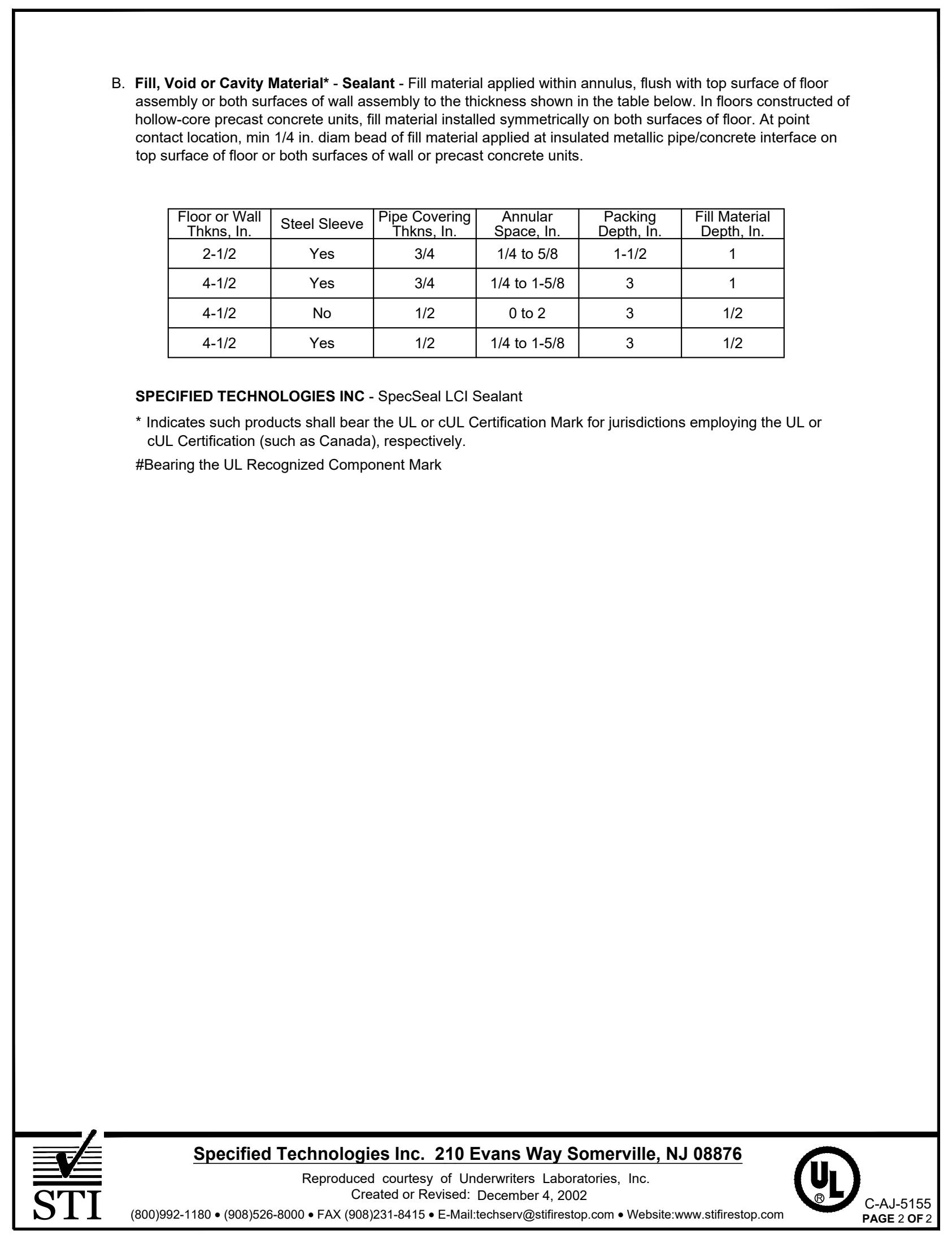

B. **Fill, Void or Cavity Material*** - **Sealant** - Fill material applied within annulus, flush with top surface of floor assembly or both surfaces of wall assembly to the thickness shown in the table below. In floors constructed of hollow-core precast concrete units, fill material installed symmetrically on both surfaces of floor. At point contact location, min 1/4 in. diam bead of fill material applied at insulated metallic pipe/concrete interface on top surface of floor or both surfaces of wall or precast concrete units.

Floor or Wall Thkns, In.	Steel Sleeve	Pipe Covering Thkns, In.	Annular Space, In.	Packing Depth, In.	Fill Material Depth, In.
2-1/2	Yes	3/4	1/4 to 5/8	1-1/2	1
4-1/2	Yes	3/4	1/4 to 1-5/8	3	1
4-1/2	No	1/2	0 to 2	3	1/2
4-1/2	Yes	1/2	1/4 to 1-5/8	3	1/2

SPECIFIED TECHNOLOGIES INC - 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 Component Mark

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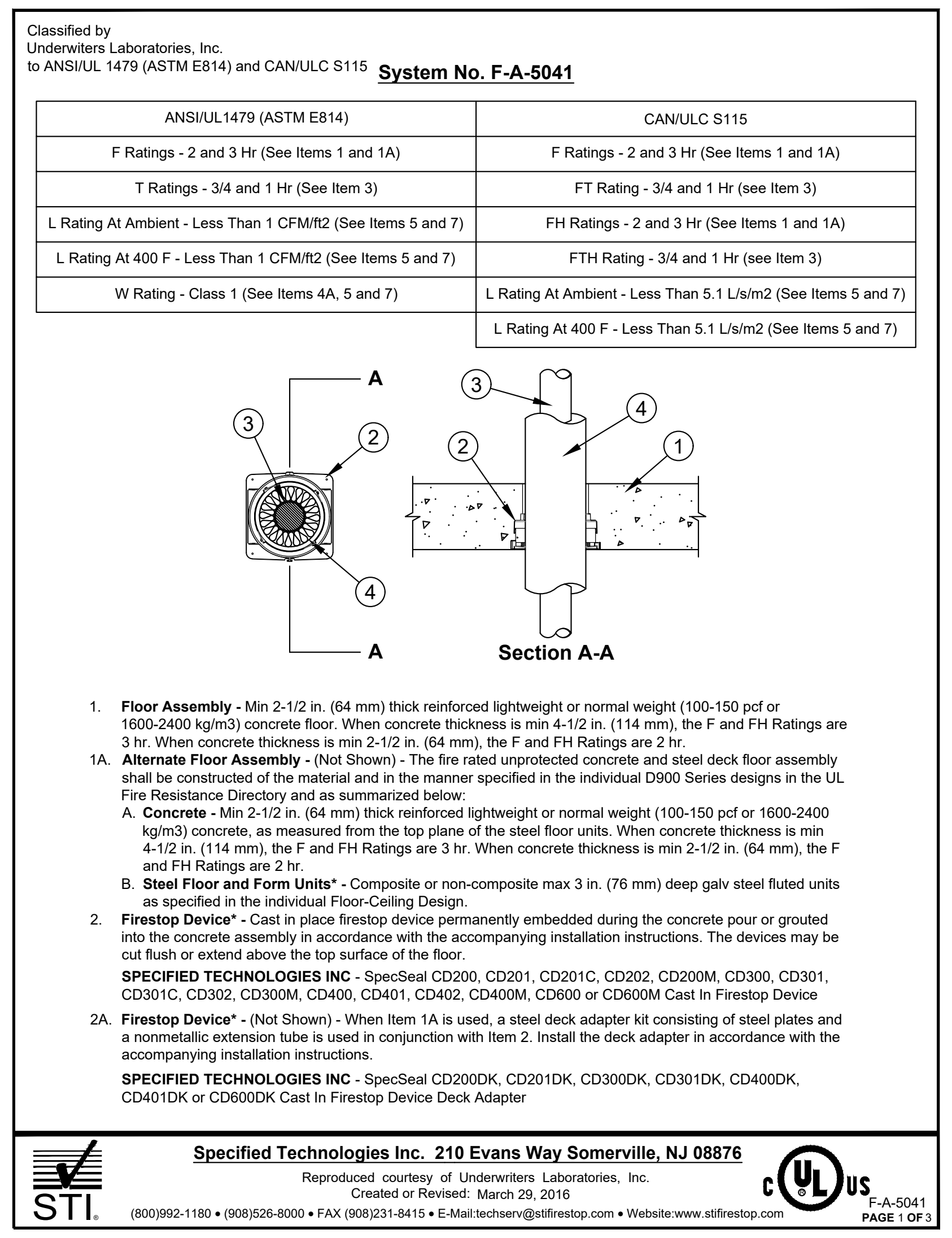

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. F-A-5041

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 2 and 3 Hr (See Items 1 and 1A)	F Ratings - 2 and 3 Hr (See Items 1 and 1A)
T Ratings - 3/4 and 1 Hr (See Item 3)	FT Rating - 3/4 and 1 Hr (see Item 3)
L Rating At Ambient - Less Than 1 CFM/ft2 (See Items 5 and 7)	FH Ratings - 2 and 3 Hr (See Items 1 and 1A)
L Rating At 400 F - Less Than 1 CFM/ft2 (See Items 5 and 7)	FTH Rating - 3/4 and 1 Hr (see Item 3)
W Rating - Class 1 (See Items 4A, 5 and 7)	L Rating At Ambient - Less Than 5.1 L/s/m2 (See Items 5 and 7)
	L Rating At 400 F - Less Than 5.1 L/s/m2 (See Items 5 and 7)

1. **Floor Assembly -** Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor. When concrete thickness is min 4-1/2 in. (114 mm), the F and FH Ratings are 3 hr. When concrete thickness is min 2-1/2 in. (64 mm), the F and FH Ratings are 2 hr.

1A. **Alternate Floor Assembly -** (Not Shown) - The fire rated unprotected concrete and steel deck floor assembly shall be constructed of the material and in the manner specified in the individual 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, as measured from the top plane of the steel floor units. When concrete thickness is min 4-1/2 in. (114 mm), the F and FH Ratings are 3 hr. When concrete thickness is min 2-1/2 in. (64 mm), the F and FH Ratings are 2 hr.
   B. **Steel Floor and Form Units* -** Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.

2. **Firestop Device* -** Cast in place firestop device permanently embedded during the concrete pour or grouted into the concrete assembly in accordance with the accompanying installation instructions. The devices may be cut flush or extend above the top surface of the floor.

   SPECIFIED TECHNOLOGIES INC - SpecSeal CD200, CD201, CD201C, CD202, CD200M, CD300, CD301, CD301C, CD302, CD300M, CD400, CD401, CD402, CD400M, CD600 or CD600M Cast In Firestop Device

2A. **Firestop Device* -** (Not Shown) - When Item 1A is used, a steel deck adapter kit consisting of steel plates and a nonmetallic extension tube is used in conjunction with Item 2. Install the deck adapter in accordance with the accompanying installation instructions.

   SPECIFIED TECHNOLOGIES INC - SpecSeal CD200DK, CD201DK, CD300DK, CD301DK, CD400DK, CD401DK or CD600DK Cast In Firestop Device Deck Adapter

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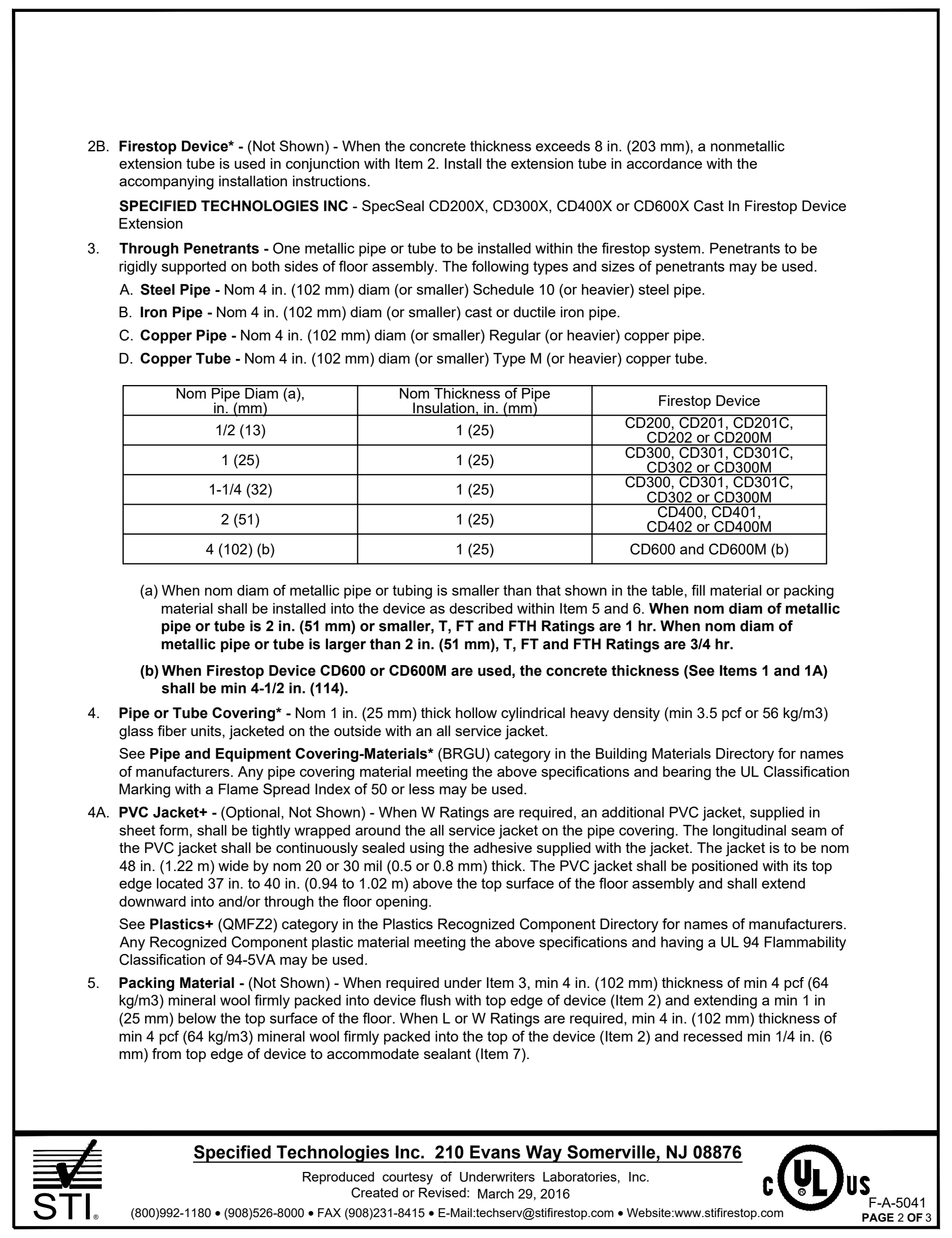

2B. **Firestop Device* -** (Not Shown) - When the concrete thickness exceeds 8 in. (203 mm), a nonmetallic extension tube is used in conjunction with Item 2. Install the extension tube in accordance with the accompanying installation instructions.

   SPECIFIED TECHNOLOGIES INC - SpecSeal CD200X, CD300X, CD400X or CD600X Cast In Firestop Device Extension

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 Pipe Diam (a), in. (mm)	Nom Thickness of Pipe Insulation, in. (mm)	Firestop Device
1/2 (13)	1 (25)	CD200, CD201, CD201C, CD202 or CD200M
1 (25)	1 (25)	CD300, CD301, CD301C, CD302 or CD300M
1-1/4 (32)	1 (25)	CD300, CD301, CD301C, CD302 or CD300M
2 (51)	1 (25)	CD400, CD401, CD402 or CD400M
4 (102) (b)	1 (25)	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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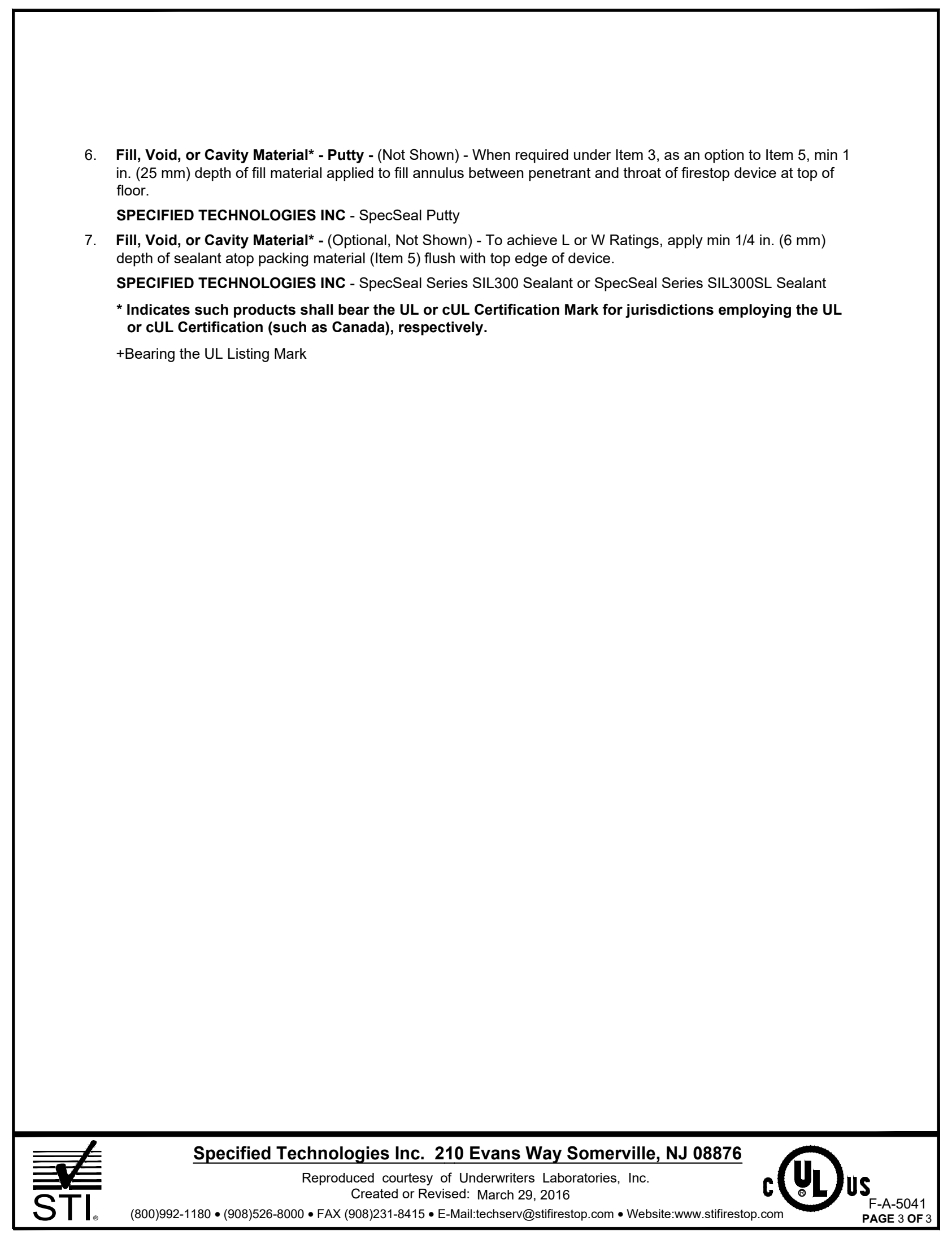

6. **Fill, Void, or Cavity Material* - Putty -** (Not Shown) - When required under Item 3, as an option to Item 5, min 1 in. (25 mm) depth of fill material applied to fill annulus between penetrant and throat of firestop device at top of floor.

   SPECIFIED TECHNOLOGIES INC - SpecSeal Putty
7. **Fill, Void, or Cavity Material* -** (Optional, Not Shown) - To achieve L or W Ratings, apply min 1/4 in. (6 mm) depth of sealant atop packing material (Item 5) flush with top edge of device.

   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 or cUL Certification (such as Canada), respectively.**

   +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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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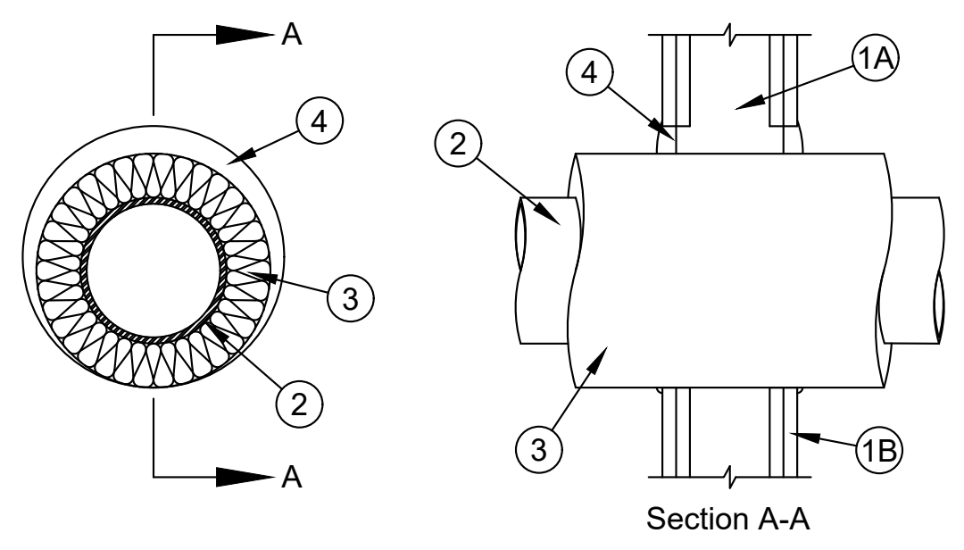
Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-5014

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 1 Hr	FT Rating - 1 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Rating - 1 Hr
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300, U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-5/8 in. (92 mm) wide and spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board* -** 5/8 in. (16 mm) thick, 4 ft (1.2 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 18 in. (457 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.

1A. **Metallic Sleeve -** (Optional, Not Shown) - Cylindrical sleeve fabricated from min 0.016 in. (0.41 mm) to max 0.105 in. (2.7 mm) thick sheet steel. Length of steel sleeve to be equal to the thickness of wall. Longitudinal seam of sleeve welded or overlapped min 1 in. (25 mm). The ends of the steel sleeve shall be flush or recessed max 1/4 in. (6 mm) from wall surfaces.

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2. **Through Penetrants -** One metallic pipe or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or tubing may be used:
   A. **Steel Pipe -** Nom 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. **Copper Tubing -** Nom 4 in. (102 mm) diam (or smaller) Type M (or heavier) copper tube.
   D. **Copper Pipe -** Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
3. **Pipe Coverings* -** One of the following types of pipe coverings shall be used:
   A. **Pipe and Equipment Covering Materials* -** Max 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. The annular space between insulated penetrating item and the edge of the through opening shall be min 0 in. (point contact) to max 1-1/4 in. (32 mm).

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

   B. **Pipe Covering Materials* -** Max 2 in. (51 mm) thick unfaced mineral fiber pipe insulation sized to the outside diam of pipe or tube. Pipe insulation secured with min 18 SWG steel wire spaced max 12 in. (305 mm) OC. The annular space between insulated penetrating item and the edge of the through opening shall be min 0 in. (point contact) to max 1-1/4 in. (32 mm).

   IIG MINWOOL L L C - High Temperature Pipe Insulation 1200, High Temperature Pipe Insulation BWT or High Temperature Pipe Insulation Thermaloc.

   C. **Sheathing Material* -** Used 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 joints 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.
4. **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 point contact location between insulated through penetrant and gypsum board, a min 3/8 in. (10 mm) bead of fill material shall be applied to the insulated through penetrant/gypsum board interface on both sides 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.

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Classified by
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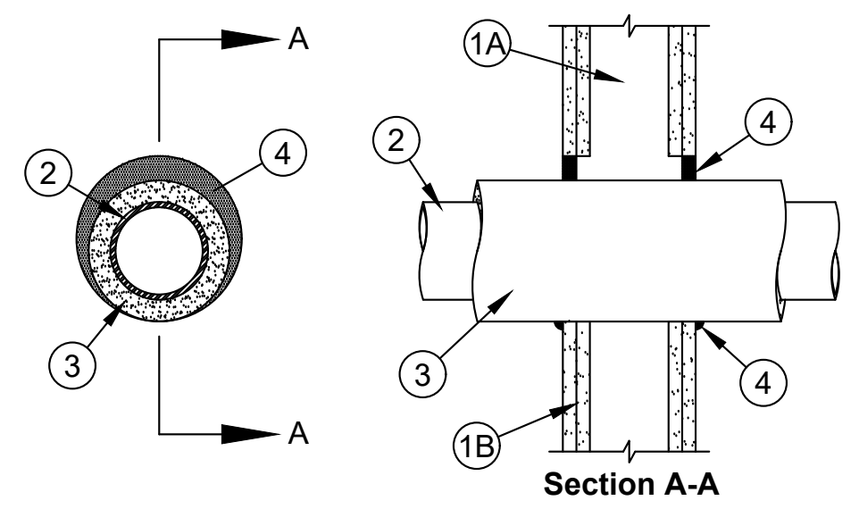
to ASTM/UL1479 (ASTM E814)

System No. W-L-5054

F Ratings - 1 & 2 Hr. (See Item 1)
T Ratings - 3/4 and 1 Hr.



1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. O.C. with nom 2 by 4 in. lumber end plates and cross braces. Steel studs to be min 3-1/2 in. wide and spaced max 24 in. O.C.
   B. **Gypsum Board* -** 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 7-5/8 in.

   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Through Penetrant -** One metallic pipe or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or tubing may be used:
   A. **Steel Pipe -** Nom 4 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. **Iron Pipe -** Nom 4 in. diam (or smaller) cast or ductile iron pipe.
   C. **Copper Tubing -** Nom 4 in. diam (or smaller) Type L (or heavier) copper tubing.
   D. **Copper Pipe -** Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe.
3. **Tube Insulation - Plastics+ -** Nom 3/4 in. or 1 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. The annular space between penetrating item and periphery of opening shall be min 0 in. (point contact) to max 1-1/2 in. **When 1 in. thick AB/PVC insulation is used, T Rating is 3/4 hr. When 3/4 in. thick AB/PVC insulation is used, T Rating is 1 hr.**

   See **Plastics+** (QMFZ2) category in the Recognized Component Directory of names for manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.
4. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. Thickness of fill material applied within annulus, flush with both surfaces of wall. Min 1/4 in. diam bead of sealant to be applied at the point contact location between the AB/PVC insulation and the gypsum board.

   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.

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Classified by
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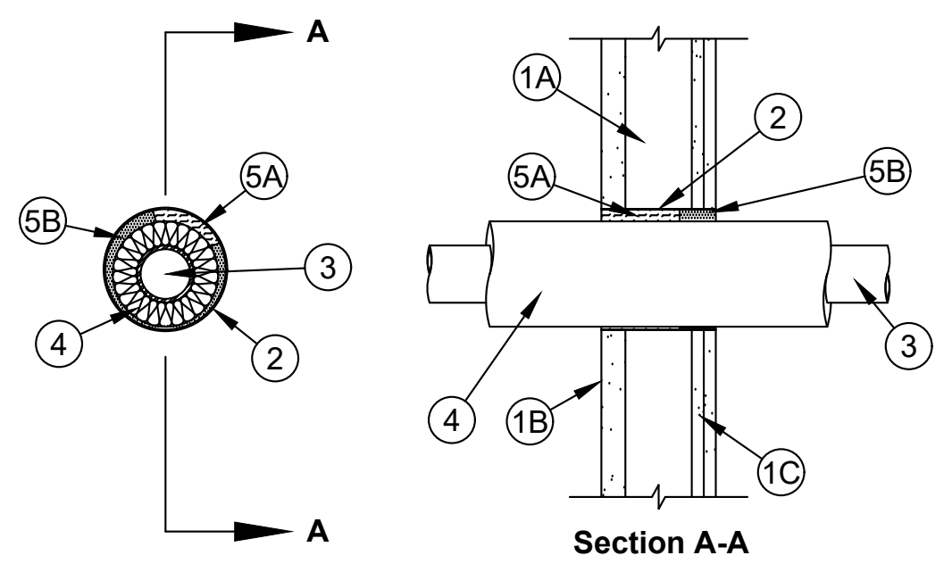
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-5262

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 1-1/4 Hr (See Item 1)	FT Ratings - 1 and 1-1/4 Hr (See Item 1)
	FH Ratings - 1 and 2 Hr (See Item 1)
	FTH Ratings - 1 and 1-1/4 Hr (See Item 1)



1. **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. Max diam of circular cutout in gypsum liner panel is 5 in. (127 mm).
   C. **Gypsum Board* -** 1/2 in. or 5/8 in. (13 or 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. Max diam of circular cutout in gypsum board is 5 in. (127 mm).

   The hourly F Rating of the firestop system is equal to the hourly rating of the wall assembly in which it is installed. The hourly T Rating is 1 hr in 1 hr walls and 1-1/4 hr in 2 hr walls.
2. **Metallic Sleeve -** Cylindrical sleeve fabricated from min No. 30 gauge (0.3 mm thick) galv sheet steel and having a min 2 in. (51 mm) lap along the longitudinal seam. Length of the sleeve to be equal to the thickness of the wall. Sleeve installed by coiling the sheet steel to a diam smaller than the through opening, inserting the coil through the opening and releasing the coil to let it uncoil against the circular cutouts in the gypsum board layers. The ends of the steel sleeve shall be flush with each surface of the wall.
3. **Through Penetrant -** One metallic pipe, tube or conduit installed concentrically or eccentrically within the firestop system. Pipe, tube or conduit to be rigidly supported on both sides of wall assembly. One of the following types and sizes of pipe, tube or conduit may be used:
   A. **Steel Pipe -** Nom 2 in. (51 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. **Iron Pipe -** Nom 2 in. (51 mm) diam (or smaller) cast or ductile iron pipe.
   C. **Copper Pipe or Tube -** Nom 2 in. (51 mm) diam (or smaller) Regular (or heavier) copper pipe or Type L (or heavier) copper tube.

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4. **Pipe Coverings* -** One of the following types of pipe coverings shall be used:
   A. **Pipe and Equipment Covering Materials* -** Max 1 in. (25 mm) thick hollow cylindrical heavy density (min 3.5 pcf (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. The annular space between insulated penetrating item and the edge of the through opening shall be min 1/8 in. (3 mm) to max 3/4 in. (19 mm).

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

   B. **Pipe Covering Materials* -** Max 1 in. (25 mm) thick unfaced mineral fiber pipe insulation sized to the outside diam of pipe or tube. Pipe insulation secured with min 8 AWG steel wire spaced max 12 in. (305 mm) OC. The annular space between insulated penetrating item and the edge of the through opening shall be min 1/8 in. (3.2 mm) to 3/4 in. (19 mm) max.

   IIG MINWOOL L L C - High Temperature Pipe Insulation 1200, High Temperature Pipe Insulation BWT or High Temperature Pipe Insulation Thermaloc.

   C. **Sheathing Material* -** Used 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 joints 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.
5. **Firestop System -** The firestop system shall consist of the following:
   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 1-1/2 in. (38 mm) deep recess on the finished side of wall to accommodate the fill material.
   B. **Fill, Void or Cavity Material* - Sealant or Putty -** Min 1-1/2 in. (38 mm) thickness of fill material applied within sleeve, flush with finished surface of wall.

   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, or 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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Classified by
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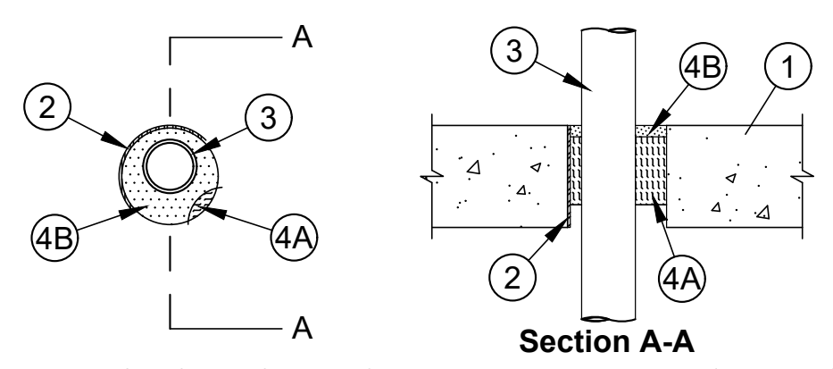
to ASTM/UL1479 (ASTM E814)

System No. C-AJ-2578

F Rating - 3 Hr
T Rating - 3 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft
W Rating - Class 1 (See Item 4B)



1. **Floor or Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor or min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete wall . Wall may also be constructed of any UL Classified **Concrete Blocks***. Floor may also be constructed of any 6 in. (152 mm) thick UL Classified hollow core **Precast Concrete Units.** Max diam of opening is 4 in. (102 mm).

   See **Concrete Blocks** (CAZT) and **Precast Concrete Units*** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve -** (Optional) Nom 4 in. (102 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe or nom 4 in. (102 mm) diam (or smaller) No. 26 GA (0.022 in. or 0.56 mm thick) sheet metal sleeve with square flange spot welded to the sleeve at approx mid-height and sized to be a min of 2 in. larger than the sleeve diam cast or grouted into floor or wall assembly cast or grouted into floor or wall assembly, flush with floor or wall surfaces.
3. **Through Penetrants -** One nonmetallic pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and sleeve (Item 2) shall be min 1/4 in. (6 mm) to max 1-3/8 in. (35 mm). When steel sleeve (Item 2) is not provided, the annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 1-5/8 in. (41 mm). Pipe to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of nonmetallic pipes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom. 2 in. (51 mm) diam (or smaller) Schedule 40 solid-core or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 2 in. (51 mm) diam (or smaller) SDR17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   C. **Rigid Nonmetallic Conduit+ -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70).
   D. **Crosslinked Polyethylene (PEX) Tubing -** Nom 2 in. (51 mm) diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems.
4. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or both surfaces of wall to accommodate the required thickness of fill material. When precast concrete units are used, packing material to be recessed from top surface of floor to accommodate the required thickness of fill material and to be installed flush with bottom surface of floor.
   B. **Fill, Void or Cavity Material* - Sealant -** Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of floor or both surfaces of wall assembly. Additionally, nom 1/2 in. (13 mm) bead of fill material applied between concrete and penetrant interface.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant, SpecSeal Series SSS Sealant, Pensil 300 Silicone Sealant, or SpecSeal Series SIL300 Sealant for floors or walls and Pensil 300 S/L Silicone Sealant or SpecSeal Series SIL300SL Sealant for floors only.

   W Ratings apply when Pensil 300, SpecSeal Series SIL300, Pensil 300S/L SpecSeal Series SIL300SL Sealants are used.

   * 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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Classified by
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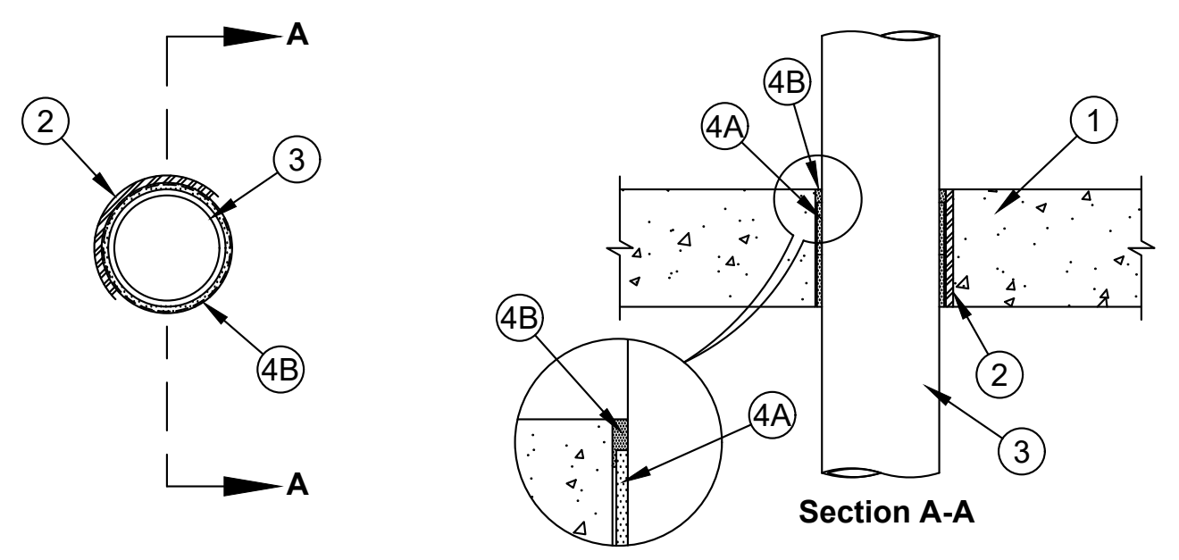
to ASTM/UL1479 (ASTM E814)

System No. C-AJ-2282

F Rating - 2 Hr
T Rating - 1 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft
W Rating - Class 1 (See Item 4B)



1. **Floor Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor or min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete wall. Floor may also be constructed of min 6 in. (152 mm) thick hollow core UL Classified **Precast Concrete Units***. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 5 in. (127 mm).

   See **Precast Concrete Units** (CFTV) or **Concrete Blocks** (CAZT) categories in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve -** (Optional) -Nom 5 in. (127 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe or nom 5 in. (127 mm) diam (or smaller) No. 26 GA (0.022 in. or 0.56 mm thick) sheet metal sleeve with square flange spot welded to the sleeve at approx mid-height and sized to be a min of 2 in. larger than the sleeve diam cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

2A. **Nonmetallic Sleeve -** (Optional) - Nom 5 in. (127 mm) diam (or smaller) polyvinyl chloride (PVC) sleeve cast into floor at time of concrete placement.

2B. **Sheet Metal Sleeve -** (Optional) - No. 26 GA (0.022 in. or 0.56 mm thick) galvanized steel sleeve friction-fit in floor or wall assembly, flush with both sides of floor or wall. Longitudinal seam to overlap a min 1 in. (25 mm). The friction-fit sleeve is required for floors using Precast Concrete Units.

3. **Through Penetrant -** One nonmetallic pipe, conduit or tube to be centered within the firestop system. The annular space between the pipe or conduit and the periphery of the opening shall be nom 1/4 in. (6 mm). Pipe to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 4 in. (102 mm) diam (or smaller) Schedule 40 cellular or solid core polyvinyl chloride (PVC) pipe for use in vented (drain, waste or vent) or closed (process or supply) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 4 in. (102 mm) diam (or smaller) SDR 13.5 chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ -** Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).
   D. **Electrical Nonmetallic Tubing+ -** Nom 2 in. (51 mm) diam (or smaller) PVC tubing installed in accordance with the National Electrical Code (NFPA No. 70).

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   E. **Acrylonitrile Butadiene Styrene (ABS) -** Pipe Nom 4 in. (102 mm) diam (or smaller) Schedule 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

   When floor assembly is Precast Concrete Units, only nom 3 in. (76 mm) and nom 4 in. (102 mm) pipes or conduits are acceptable.
4. **Firestop System -** The firestop system shall consist of the following:
   A. **Fill, Void or Cavity Material* -Wrap Strip -** Nom 1/8 in. (3.2 mm) or 3/16 in. (4.8 mm) thick intumescent material faced on both sides with a plastic film, supplied in 2 in. (51 mm) wide strips. For nom 2-1/2 in. (64 mm) through 4 in. (102 mm) diam through penetrants, two stacks of wrap strip, each consisting of one wrap strip layer are individually wrapped around the through penetrant with the ends butted and held in place with a layer of aluminum foil tape. For nom 2 in. (51 mm) diam or smaller through penetrants, one layer of wrap strip wrapped around the through penetrant with the ends butted and held in place with a layer of aluminum foil tape. For nom 2-1/2 in. (64 mm) through 4 in. (102 mm) diam through penetrants, the wrap strips are installed such that the bottom edge is flush with the bottom surface of the floor. For nom 2 in. (51 mm) diam through penetrants, the wrap strips are installed such that the bottom edge is recessed 2 in. (51 mm) from the bottom of the floor. In walls, the wrap strips are installed with the exposed edges recessed 1/2 in. (13 mm) from each surface.

   SPECIFIED TECHNOLOGIES INC - SpecSeal BLU Wrap Strip or SpecSeal BLU2 Wrap Strip.

   A1. **Fill, Void, or Cavity Material* - Wrap Strip -** As an alternate to Item 4A, nom 1/8 in. (3.2 mm) thick intumescent material faced on both sides with a plastic film sized to fit the OD of the pipe. See table for min width of intumescent wrap strip. The wrap strip is continuously wrapped around the outer circumference of the pipe once and slid into the annular space and held in place with one layer of aluminum foil tape. For nom 3 in. (76 mm) and 4 in. (102 mm) diam through penetrants, the wrap strips are installed such that the bottom edge is flush with the bottom surface of the floor. For nom 2 in. (51 mm) diam through penetrants, the wrap strips are installed such that the bottom edge is recessed 2 in. (51 mm) from the bottom of the floor. In walls, the wrap strips are installed with the exposed edges recessed 1/2 in. (13 mm) from each surface.

Nom Pipe Diam, In. (mm)	Wrap Strip	Wrap Strip Width, In (mm)
2 (51)	BLU 220	1-1/2 (38)
3 (78)	BLU 230	3 (76)
4 (102)	BLU 240	4 (102)

   SPECIFIED TECHNOLOGIES INC - SpecSeal BLU220, BLU230, or BLU240 Wrap Strip

   B. **Fill, Void or Cavity Material*-Sealant -** In floors, min 1/2 in. (13 mm) thickness of fill material applied within the annulus on top surface of floor. In walls, min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with each surface of the wall. When required as specified in Item 4A, min 1/2 in. (13 mm) thickness of fill material applied within the annulus flush with both surfaces of floor. As an option in floors, generous bead of sealant applied to leading edge of wrap strip prior to insertion into annular space. Sufficient sealant shall be applied to cover lead edge of wrap strip and to fill annular space between the wrap strip and the concrete.

   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, Pensil 300 Silicone Sealant or SpecSeal Series SIL300 Sealant for floors or walls and Pensil 300 S/L Silicone Sealant or SpecSeal Series SIL300SL Sealant for floors only.

   W Ratings apply when min 1/2 in. (13 mm) thickness of Pensil 300, SpecSeal Series SIL300 Sealant, Pensil 300 S/L or SpecSeal Series SIL300SL Sealant is applied flush with top surface of floor.

   *Bearing the UL Classification Mark

   +Bearing the UL Listing Mark

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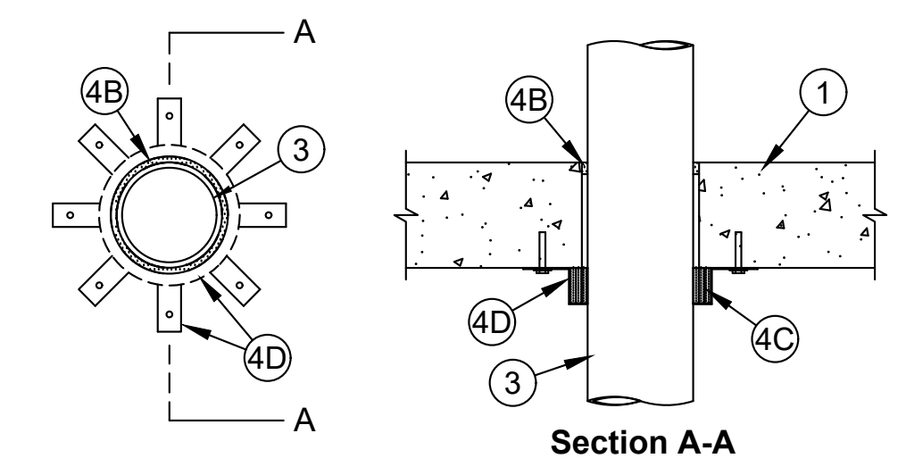
Classified by
Underwiters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. C-AJ-2297

F Ratings - 2 and 3 Hr (See Item 4C)
T Ratings - 0, 1, 2 and 3 Hr (See Item 4C)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft
W Rating - Class 1 (See Item 4B)



1. **Floor or Wall Assembly -** Lightweight or normal weight (100-150 pcf or 1600-2400 kg/ m3) concrete. Except as footnoted in the table under Item 4C, min thickness of concrete floor or wall assembly is 4-1/2 in. (114 mm). Floor may also be constructed of any min 6 in. (152 mm) thick hollow-core **Precast Concrete Units***. Wall may also be constructed of any UL Classified **Concrete Blocks***. Diam of opening to be min 1/8 in. (3.2 mm) to max 1-1/2 in. (38 mm) larger than outside diam of pipe or conduit.

   See **Concrete Blocks** (CAZT) or **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve -** (Optional, Not Shown) - Nom 5 in. (127 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe or nom 5 in. (127 mm) diam (or smaller) No. 26 ga (0.022 in. or 0.56 mm thick) sheet steel sleeve with nom 2 in. wide square or circular anchor flange spot welded to the sleeve at it\'s approx mid-height. Sleeve cast or grouted into min 4-1/2 in. (114 mm) thick floor or wall assembly, flush with floor or wall surfaces.
3. **Through Penetrant -** One nonmetallic pipe or conduit to be installed eccentrically or concentrically within the firestop system. Pipe or conduit to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 6 in. (152 mm) diam (or smaller) solid or cellular core Schedule 40 polyvinyl chloride (PVC) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 6 in. (152 mm) diam (or smaller) SDR 13.5 chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ -** Nom 6 in. (152 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70).
   D. **Acrylonitrile Butadiene Styrene (ABS) Pipe -** Nom 6 in. (152 mm) diam (or smaller) solid or cellular core Schedule 40 acrylonitrile butadiene styrene (ABS) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   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 (process or supply) piping systems.
4. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** (Not Shown) - When required, min 4 pcf (64 kg/m3) mineral wool batt insulation compressed and installed to the thickness specified in the table under Item 4C. Packing material to be recessed from top surface of floor or both surfaces of wall as required to accommodate sealant (Item 4B).

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   B. **Fill, Void or Cavity Material* - Sealant or Putty -** Fill material installed flush with top surface of floor or both surfaces of wall, as specified in the table under Item 4C.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant, SpecSeal Series SSS Sealant, SpecSeal Putty, Pensil 300 Sealant or SpecSeal Series SIL300 Sealant for floors or walls and Pensil 300 S/L Sealant or SpecSeal Series SIL300 Sealant for floors only.

   W Rating applies only when a min 1/2 in. (13 mm) depth of Pensil 300, SpecSeal Series SIL300 Sealant ,Pensil 300 S/L or SpecSeal Series SIL300SL Sealants are used.

   C. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/8 in. (3.2 mm) by 1-1/2 in. (38 mm) wide (RED2), nom 1/4 in. (6 mm) thick by 1-1/2 in. (38 mm) wide (RED), 3/16 in. (4.8 mm) by 2 in. (51 mm) wide (BLU) or 1/8 in. (3.2 mm) by 2 in. (51 mm) wide (BLU2) intumescent strips faced on both sides with a plastic film. Strips tightly wrapped around nonmetallic pipe with edges butted against the underside of the floor or both surfaces of the wall. The wrap strips may be installed with butted seams with butted seams in successive layers aligned or offset or continuously wrapped around through penetrant. Wrap strips are temporarily held in place with masking tape. The min number of layers required is dependent upon the pipe type, nom pipe diam, floor or wall thickness and the hourly F and T Ratings required, as shown in the following table:

Pipe Type	Max Diam. Pipe in. (mm)	Min Concrete Thickness, Layers	Wrap Strip Type	Min No of Wrap Strip Layers	F Rating, Hr	T Rating, Hr	Min Packing Material Depth in. (mm)	Min Fill Material Depth in. (mm)	Max Annulur Space in. (mm)
PVC, ccPVC, CPVC RNC, ABS, ccABS	2 (51)	2-1/2 (64)	RED, RED2, BLU or BLU2	1	2	1	NA	1/2 (13)	1/16 (1.6)
HDPE	2 (51)	2-1/2 (64)	RED, RED2, BLU or BLU2	1	2	2	NA	1/2 (13)	1/16 (1.6)
PVC, ccPVC, CPVC RNC, ABS, ccABS	2 (51)	2-1/2 (64)	RED, RED2, BLU or BLU2	1	2	1	2 (51)	1/2 (13)	3/4 (19)
HDPE	2 (51)	2-1/2 (64)	RED, RED2, BLU or BLU2	1	2	2	2 (51)	1/2 (13)	3/4 (19)
PVC, ccPVC, CPVC RNC, ABS, ccABS	4 (102)	2-1/2 (64)	RED, RED2, BLU or BLU2	2	2	1	2 (51)	1/2 (13)	3/4 (19)
HDPE	4 (102)	2-1/2 (64)	RED, RED2, BLU or BLU2	2	2	2	2 (51)	1/2 (13)	3/4 (19)
PVC, ccPVC, CPVC, RNC	2 (51)	4-1/2 (114)	RED, RED2, BLU or BLU2	1	3	2	NA	1/4 (6)	1/4 (6)
HDPE	2 (51)	4-1/2 (114)	RED, RED2, BLU or BLU2	1	3	2	NA	1/4 (6)	1/4 (6)
PVC, ccPVC, CPVC, RNC	3 (76)	4-1/2 (114)	RED, RED2, BLU or BLU2	2	3	2	NA	1/4 (6)	1/4 (6)
HDPE	3 (76)	4-1/2 (114)	RED, RED2, BLU or BLU2	2	3	2	NA	1/4 (6)	1/4 (6)
PVC, ccPVC, CPVC, RNC	4 (102)	4-1/2 (114)	RED, RED2, BLU or BLU2	3	3	2	NA	1/4 (6)	1/4 (6)
HDPE	4 (102)	4-1/2 (114)	RED, RED2, BLU or BLU2	3	3	2	NA	1/4 (6)	1/4 (6)
PVC, ccPVC, CPVC, RNC	6 (152)	4-1/2 (114)	RED, RED2	3(a)	3	0	NA	1/4 (6)	1/2 (13)
PVC, CPVC, RNC	6 (152)	4-1/2 (114)	RED, RED2, BLU or BLU2	4*	3	3	4 (102)	1/2 (13)	1/4 (6)
PVC, ccPVC, CPVC, RNC, FRPP	6 (152)	4-1/2 (114)	BLU or BLU2	3(a)	3	2	NA	1/4 (6)	3/16 (4.8)
ABS, ccABS	2 (51)	4-1/2 (114)	RED, RED2	1	3	0	NA	1/4 (6)	1/2 (13)
ABS, ccABS	2 (51)	4-1/2 (114)	BLU or BLU2	1	3	2	NA	1/4 (6)	1/2 (13)
ABS, ccABS	3 (76)	4-1/2 (114)	RED, RED2	2	2	0	NA	1/4 (6)	1/2 (13)
ABS, ccABS	3 (76)	4-1/2 (114)	BLU or BLU2	2	3	2	NA	1/4 (6)	1/2 (13)
ABS, ccABS	4 (102)	4-1/2 (114)	RED, RED2	3	2	0	NA	1/4 (6)	1/2 (13)
ABS, ccABS	4 (102)	4-1/2 (114)	BLU or BLU2	3	3	2	NA	1/4 (6)	1/2 (13)
ABS, ccABS	6 (152)	4-1/2 (114)	RED, RED2, BLU or BLU2	4*	2	2	4 (102)	1/2 (13)	1/4 (6)
ABS, ccABS	6 (152)	4-1/2 (114)	RED, RED2	3(a)	3	0	NA	1/2 (13)	3/8 (10)
ABS, ccABS, FRPP	6 (152)	4-1/2 (114)	BLU or BLU2	3(a)	3	3	NA	1/2 (13)	3/8 (10)

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(a) Where indicated, two sets of three wrap strip layers are "stacked" to attain a 3 in. (76 mm) wrap strip width for RED or RED2 wrap strip or a 4 in. (102 mm) wrap strip width for BLU or BLU2 wrap strip

* One stack of four layers of wrap strip, two layers of steel collar. See Item 4D.

SPECIFIED TECHNOLOGIES INC - SpecSeal RED Wrap Strip, SpecSeal RED2 Wrap Strip, SpecSeal BLU Wrap Strip or SpecSeal BLU2 Wrap Strip

   C1. **Fill, Void, or Cavity Material - Wrap Strip -** (Not Shown) - As an alternate to Item 4C for nom 2 in., 3 in. and 4 in. (51, 76 and 102 mm) diam pipes, precut intumescent wrap strip faced on both sides with a plastic film sized to fit the OD of the pipe. The size of the intumescent wrap strip for each pipe size is tabulated below:

Nom Pipe Diam. In. (mm)	Wrap Strip	Wrap Strip Size, thick. x width x length, in. (mm)
2 (51)	SSW 125	1/8 x 1-1/2 x 8-1/8 (3 x 38 x 206)
3 (76)	SSW 250	1/4 x 1-1/2 x 12-1/8 (6 x 38 x 308)
4 (102)	SSW 375	3/8 x 1-1/2 x16 (10 x 38 x 406)

   SPECIFIED TECHNOLOGIES INC - SpecSeal SSW125, SSW250, or SSW375 Wrap Strip

   D. **Steel Collar -** Nom 1-1/2 in. (38 mm), 2 in. (51 mm), 3 in. (76 mm) or 4 in. (102 mm) deep collar, dependent upon wrap strip width, with 1 in. (25 mm) wide by 2 in. (51 mm) long anchor tabs for attachment to concrete and min 3/4 in. (19 mm) wide retaining tabs tapering down to 1/4 in. (6 mm) wide and located opposite the anchor tabs. Steel collar, with anchor tabs bent outward 90 deg, wrapped tightly around wrap strip layers with min 1 in. (25 mm) overlap at seam. Retainer tabs to be bent 90 deg toward pipe to lock wrap strips in position. Anchor tabs to be pressed tightly against floor or wall surface(s), and collar to be secured in place with one 1/2 in. (13 mm) wide by 0.028 in. (0.7 mm) thick stainless steel hose clamp. Two band clamps are required for 3 in. high (or higher) collar on 6 in. (152 mm) pipe. As an alternate to the hose clamps on 1-1/2 in. (38 mm) and 2 in. (51 mm) deep collar, collar secured together by means of three No. 8 by 1/4 in. (6 mm) long steel screws. Collar to be secured to floor or wall surface(s) with 1/4 in. (6 mm) diam by min 1-1/4 in. (32 mm) long steel concrete screws in conjunction with min 1 in. (25 mm) diam steel fender washers. As an alternate to the steel concrete screws, nom 1-1/4 in. (32 mm) long steel powder actuated fasteners provided with 3/4 in. (19 mm) diam steel washers or nom 3/4 in. (19 mm) long steel powder actuated fasteners provided with 1 in. (25 mm) diam steel washers may be used to secure anchor tabs. The number of fasteners is dependent upon the nom diam of the through penetrant. Min two fasteners , symmetrically located, are required for nom 1-1/2 in. (38 mm) through 2 in. (51 mm) diam through penetrants. Min three fasteners , symmetrically located, are required for nom 2-1/2 in. (64 mm) through 3 in. (76 mm) diam through penetrants. Min four fasteners , symmetrically located, are required for nom 3-1/2 in. (89 mm) through 4 in. (102 mm) diam through penetrants. Min six fasteners , symmetrically located, are required for nom 6 in. (152 mm) diam through penetrants.

   *When using one stack of four layers of wrap strip for nom 6 in. (152 mm) diam pipes, two layers of nom 1-1/2 or 2 in. (38 or 51 mm) deep collar (dependent upon wrap strip width) is to be wrapped around wrap strip and penetrant with min 1 in. (25 mm) overlap.

   E. **Firestop Device* -** (Not Shown) - As an alternate to Items C and D, a firestop device consisting of a galv steel collar lined with an intumescent material sized to fit the specific diam of the through penetrant may be used. Device shall be installed around through-penetrant in accordance with the accompanying installation instructions. Device incorporates anchor tabs for securement to bottom surface of floor or both surfaces of wall assembly by means of 1/4 in. (6 mm) diam by min 1-1/4 in. (32 mm) long steel concrete screws in conjunction with min 1 in. (25 mm) diam steel fender washers. As an alternate to the steel concrete screws, nom 1-1/4 in. (32 mm) long steel powder actuated fasteners provided with 3/4 in. (19 mm) diam steel washers or nom 3/4 in. (19 mm) long steel powder actuated fasteners provided with 1 in. (25 mm) diam steel washers may be used to secure anchor tabs.

   SPECIFIED TECHNOLOGIES INC - SpecSeal Firestop Collar, SpecSeal LCC Firestop Collar or SpecSeal SSC Collar.

   +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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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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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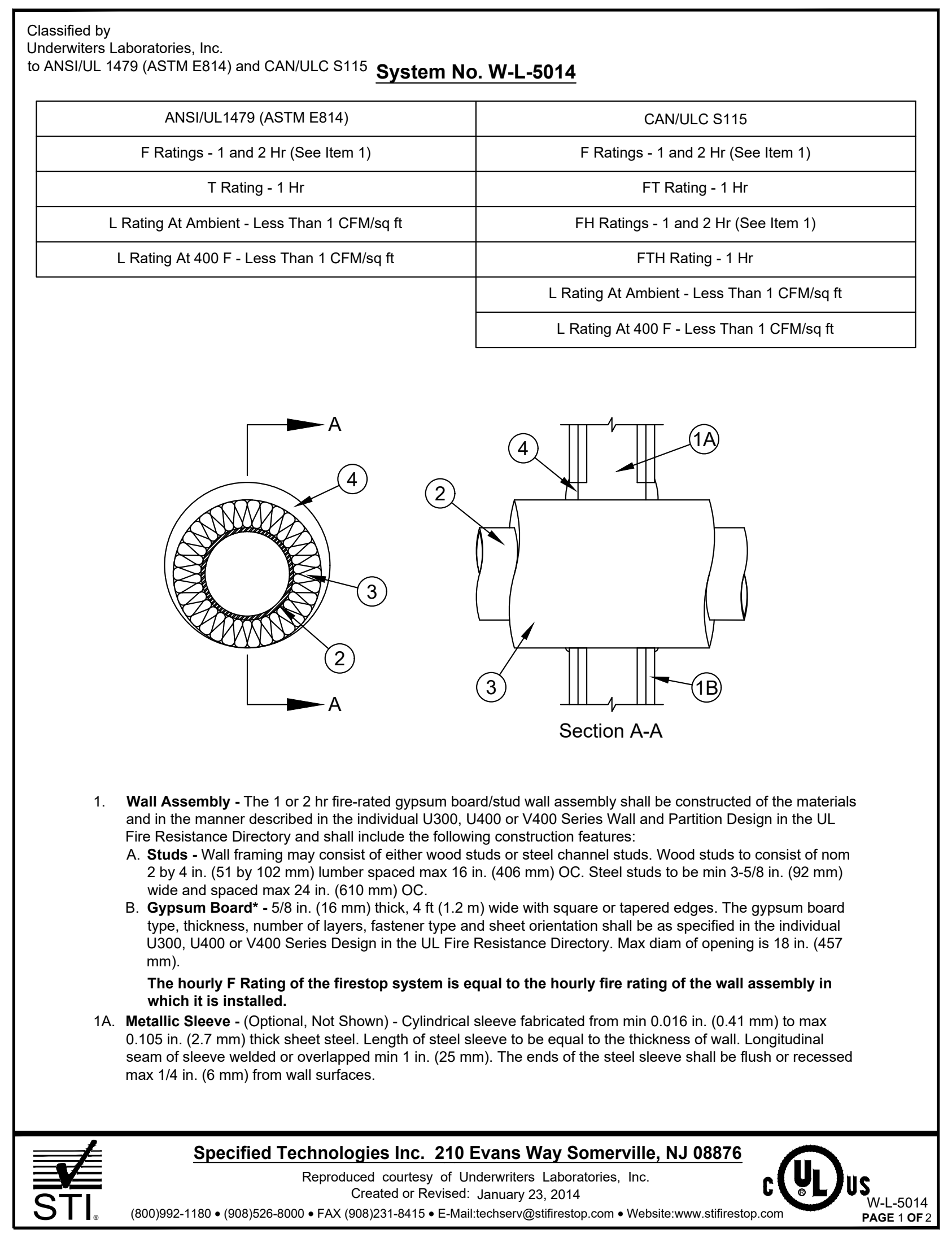

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-5014

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 1 Hr	FT Rating - 1 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Rating - 1 Hr
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft

Section A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300, U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-5/8 in. (92 mm) wide and spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board* -** 5/8 in. (16 mm) thick, 4 ft (1.2 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 18 in. (457 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.

1A. **Metallic Sleeve -** (Optional, Not Shown) - Cylindrical sleeve fabricated from min 0.016 in. (0.41 mm) to max 0.105 in. (2.7 mm) thick sheet steel. Length of steel sleeve to be equal to the thickness of wall. Longitudinal seam of sleeve welded or overlapped min 1 in. (25 mm). The ends of the steel sleeve shall be flush or recessed max 1/4 in. (6 mm) from wall surfaces.

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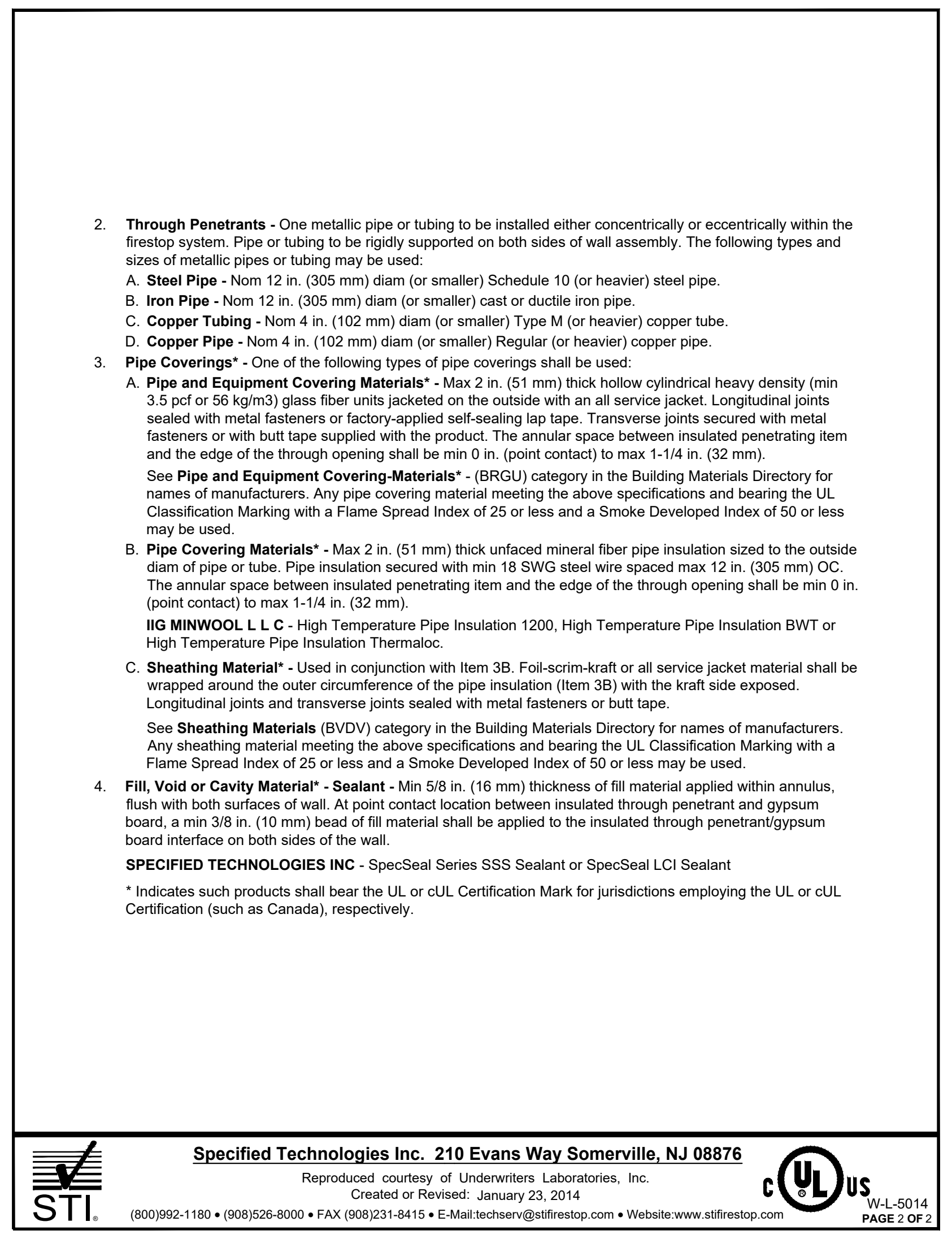

2. **Through Penetrants -** One metallic pipe or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or tubing may be used:
   A. **Steel Pipe -** Nom 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. **Copper Tubing -** Nom 4 in. (102 mm) diam (or smaller) Type M (or heavier) copper tube.
   D. **Copper Pipe -** Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
3. **Pipe Coverings* -** One of the following types of pipe coverings shall be used:
   A. **Pipe and Equipment Covering Materials* -** Max 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. The annular space between insulated penetrating item and the edge of the through opening shall be min 0 in. (point contact) to max 1-1/4 in. (32 mm).

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

   B. **Pipe Covering Materials* -** Max 2 in. (51 mm) thick unfaced mineral fiber pipe insulation sized to the outside diam of pipe or tube. Pipe insulation secured with min 18 SWG steel wire spaced max 12 in. (305 mm) OC. The annular space between insulated penetrating item and the edge of the through opening shall be min 0 in. (point contact) to max 1-1/4 in. (32 mm).

   IIG MINWOOL L L C - High Temperature Pipe Insulation 1200, High Temperature Pipe Insulation BWT or High Temperature Pipe Insulation Thermaloc.

   C. **Sheathing Material* -** Used 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 joints 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.

4. **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 point contact location between insulated through penetrant and gypsum board, a min 3/8 in. (10 mm) bead of fill material shall be applied to the insulated through penetrant/gypsum board interface on both sides 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.

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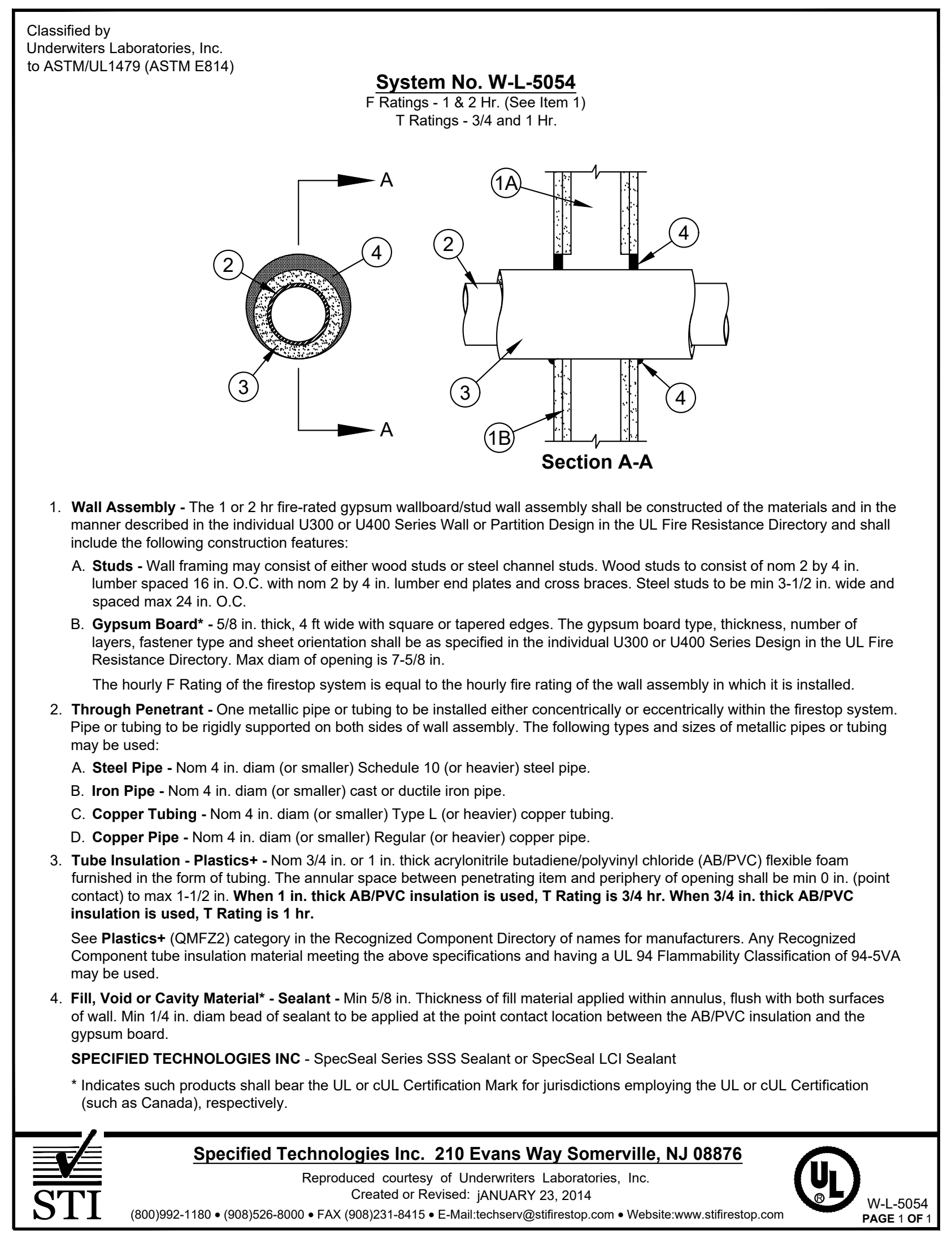

Classified by
Underwiters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. W-L-5054

F Ratings - 1 & 2 Hr. (See Item 1)
T Ratings - 3/4 and 1 Hr.

Section A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. O.C. with nom 2 by 4 in. lumber end plates and cross braces. Steel studs to be min 3-1/2 in. wide and spaced max 24 in. O.C.
   B. **Gypsum Board* -** 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 7-5/8 in.

   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Through Penetrant -** One metallic pipe or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or tubing may be used:
   A. **Steel Pipe -** Nom 4 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. **Iron Pipe -** Nom 4 in. diam (or smaller) cast or ductile iron pipe.
   C. **Copper Tubing -** Nom 4 in. diam (or smaller) Type L (or heavier) copper tubing.
   D. **Copper Pipe -** Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe.
3. **Tube Insulation - Plastics+ -** Nom 3/4 in. or 1 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. The annular space between penetrating item and periphery of opening shall be min 0 in. (point contact) to max 1-1/2 in. **When 1 in. thick AB/PVC insulation is used, T Rating is 3/4 hr. When 3/4 in. thick AB/PVC insulation is used, T Rating is 1 hr.**

   See **Plastics+** (QMFZ2) category in the Recognized Component Directory of names for manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.
4. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. Thickness of fill material applied within annulus, flush with both surfaces of wall. Min 1/4 in. diam bead of sealant to be applied at the point contact location between the AB/PVC insulation and the gypsum board.

   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.

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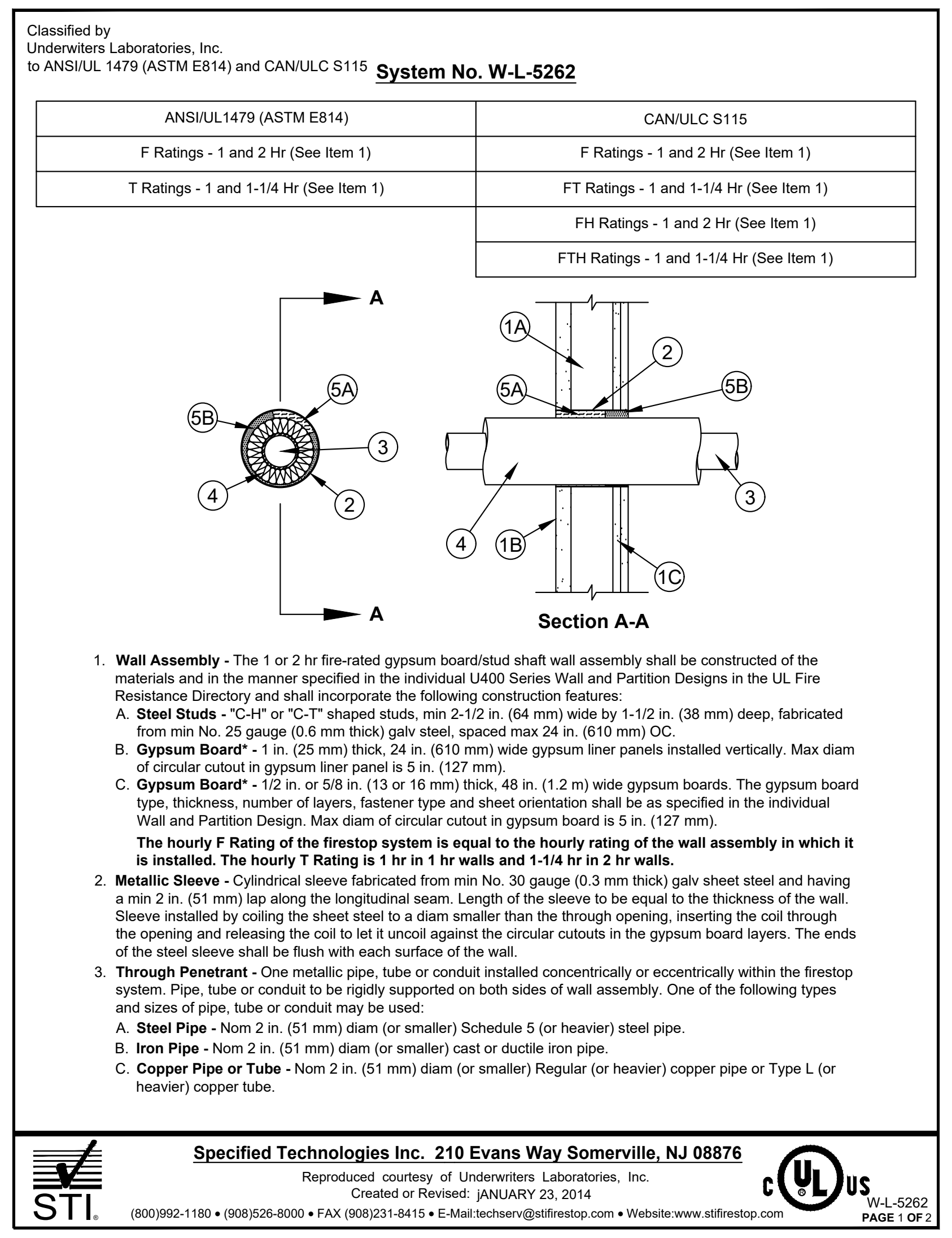

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-5262

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 1-1/4 Hr (See Item 1)	FT Ratings - 1 and 1-1/4 Hr (See Item 1)
	FH Ratings - 1 and 2 Hr (See Item 1)
	FTH Ratings - 1 and 1-1/4 Hr (See Item 1)

Section A-A

1. **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. Max diam of circular cutout in gypsum liner panel is 5 in. (127 mm).
   C. **Gypsum Board* -** 1/2 in. or 5/8 in. (13 or 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. Max diam of circular cutout in gypsum board is 5 in. (127 mm).

   The hourly F Rating of the firestop system is equal to the hourly rating of the wall assembly in which it is installed. The hourly T Rating is 1 hr in 1 hr walls and 1-1/4 hr in 2 hr walls.
2. **Metallic Sleeve -** Cylindrical sleeve fabricated from min No. 30 gauge (0.3 mm thick) galv sheet steel and having a min 2 in. (51 mm) lap along the longitudinal seam. Length of the sleeve to be equal to the thickness of the wall. Sleeve installed by coiling the sheet steel to a diam smaller than the through opening, inserting the coil through the opening and releasing the coil to let it uncoil against the circular cutouts in the gypsum board layers. The ends of the steel sleeve shall be flush with each surface of the wall.
3. **Through Penetrant -** One metallic pipe, tube or conduit installed concentrically or eccentrically within the firestop system. Pipe, tube or conduit to be rigidly supported on both sides of wall assembly. One of the following types and sizes of pipe, tube or conduit may be used:
   A. **Steel Pipe -** Nom 2 in. (51 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. **Iron Pipe -** Nom 2 in. (51 mm) diam (or smaller) cast or ductile iron pipe.
   C. **Copper Pipe or Tube -** Nom 2 in. (51 mm) diam (or smaller) Regular (or heavier) copper pipe or Type L (or heavier) copper tube.

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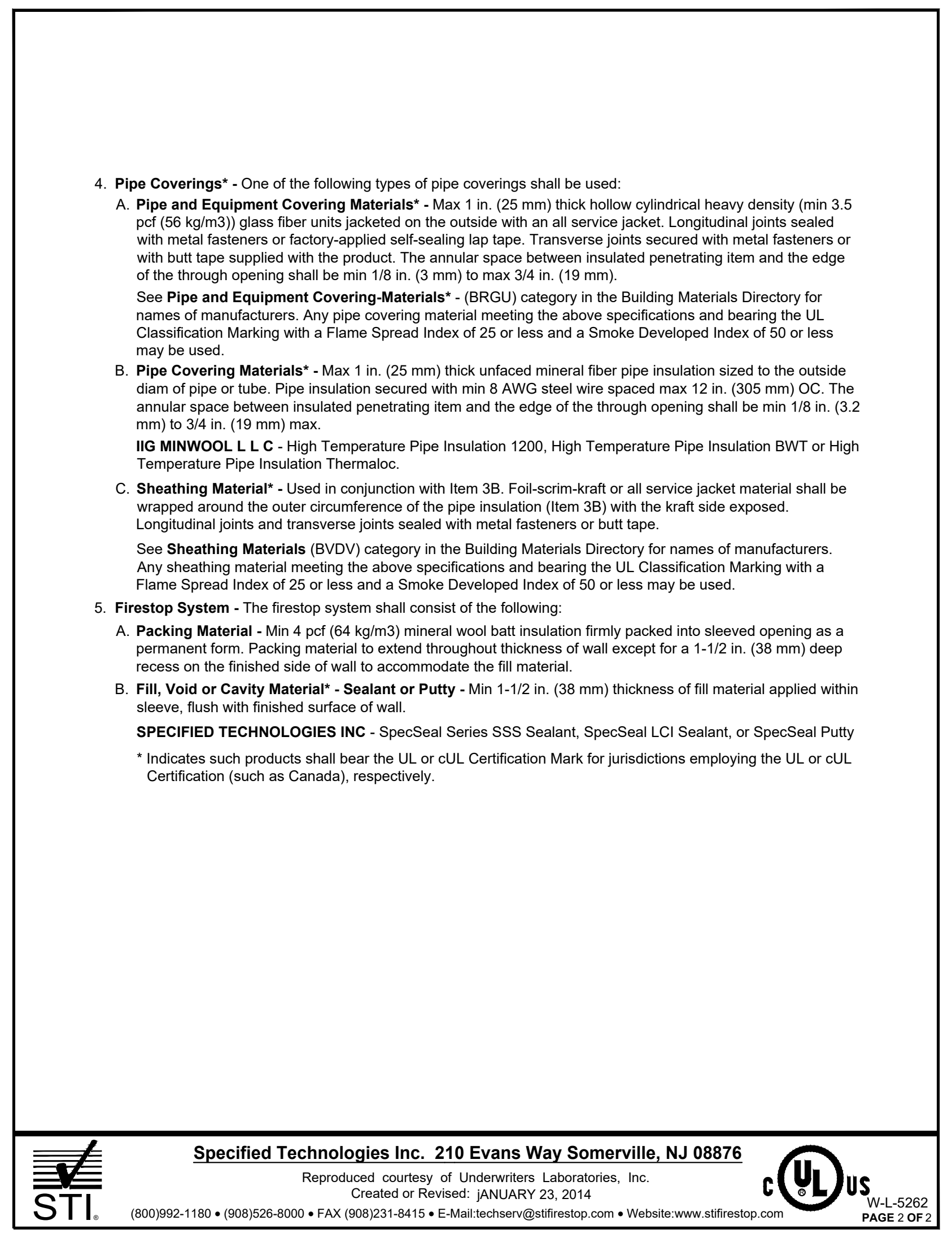

4. **Pipe Coverings* -** One of the following types of pipe coverings shall be used:
   A. **Pipe and Equipment Covering Materials* -** Max 1 in. (25 mm) thick hollow cylindrical heavy density (min 3.5 pcf (56 kg/m3)) glass fiber units jacketed on the outside with an all service jacket. Longitudinal 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. The annular space between insulated penetrating item and the edge of the through opening shall be min 1/8 in. (3 mm) to max 3/4 in. (19 mm).

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

   B. **Pipe Covering Materials* -** Max 1 in. (25 mm) thick unfaced mineral fiber pipe insulation sized to the outside diam of pipe or tube. Pipe insulation secured with min 8 AWG steel wire spaced max 12 in. (305 mm) OC. The annular space between insulated penetrating item and the edge of the through opening shall be min 1/8 in. (3.2 mm) to 3/4 in. (19 mm) max.

   IIG MINWOOL L L C - High Temperature Pipe Insulation 1200, High Temperature Pipe Insulation BWT or High Temperature Pipe Insulation Thermaloc.

   C. **Sheathing Material* -** Used 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 joints 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.
5. **Firestop System -** The firestop system shall consist of the following:
   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 1-1/2 in. (38 mm) deep recess on the finished side of wall to accommodate the fill material.
   B. **Fill, Void or Cavity Material* - Sealant or Putty -** Min 1-1/2 in. (38 mm) thickness of fill material applied within sleeve, flush with finished surface of wall.

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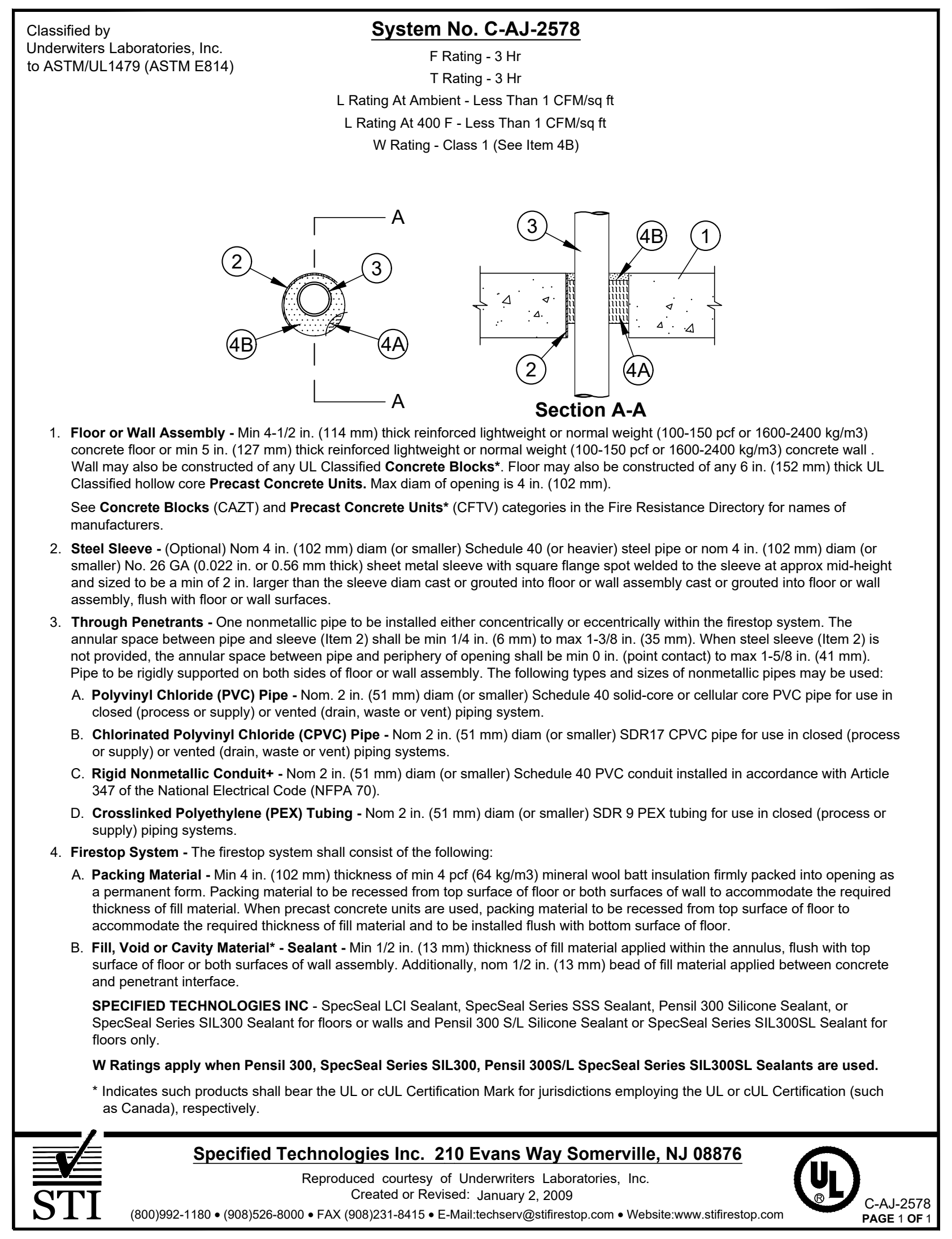

Classified by
Underwiters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. C-AJ-2578

F Rating - 3 Hr
T Rating - 3 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft
W Rating - Class 1 (See Item 4B)

Section A-A

1. **Floor or Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor or min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete wall . Wall may also be constructed of any UL Classified **Concrete Blocks***. Floor may also be constructed of any 6 in. (152 mm) thick UL Classified hollow core **Precast Concrete Units.** Max diam of opening is 4 in. (102 mm).

   See **Concrete Blocks** (CAZT) and **Precast Concrete Units*** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve -** (Optional) Nom 4 in. (102 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe or nom 4 in. (102 mm) diam (or smaller) No. 26 GA (0.022 in. or 0.56 mm thick) sheet metal sleeve with square flange spot welded to the sleeve at approx mid-height and sized to be a min of 2 in. larger than the sleeve diam cast or grouted into floor or wall assembly cast or grouted into floor or wall assembly, flush with floor or wall surfaces.
3. **Through Penetrants -** One nonmetallic pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and sleeve (Item 2) shall be min 1/4 in. (6 mm) to max 1-3/8 in. (35 mm). When steel sleeve (Item 2) is not provided, the annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 1-5/8 in. (41 mm). Pipe to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of nonmetallic pipes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom. 2 in. (51 mm) diam (or smaller) Schedule 40 solid-core or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 2 in. (51 mm) diam (or smaller) SDR17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   C. **Rigid Nonmetallic Conduit+ -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70).
   D. **Crosslinked Polyethylene (PEX) Tubing -** Nom 2 in. (51 mm) diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems.
4. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or both surfaces of wall to accommodate the required thickness of fill material. When precast concrete units are used, packing material to be recessed from top surface of floor to accommodate the required thickness of fill material and to be installed flush with bottom surface of floor.
   B. **Fill, Void or Cavity Material* - Sealant -** Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of floor or both surfaces of wall assembly. Additionally, nom 1/2 in. (13 mm) bead of fill material applied between concrete and penetrant interface.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant, SpecSeal Series SSS Sealant, Pensil 300 Silicone Sealant, or SpecSeal Series SIL300 Sealant for floors or walls and Pensil 300 S/L Silicone Sealant or SpecSeal Series SIL300SL Sealant for floors only.

   W Ratings apply when Pensil 300, SpecSeal Series SIL300, Pensil 300S/L SpecSeal Series SIL300SL Sealants are used.

   * 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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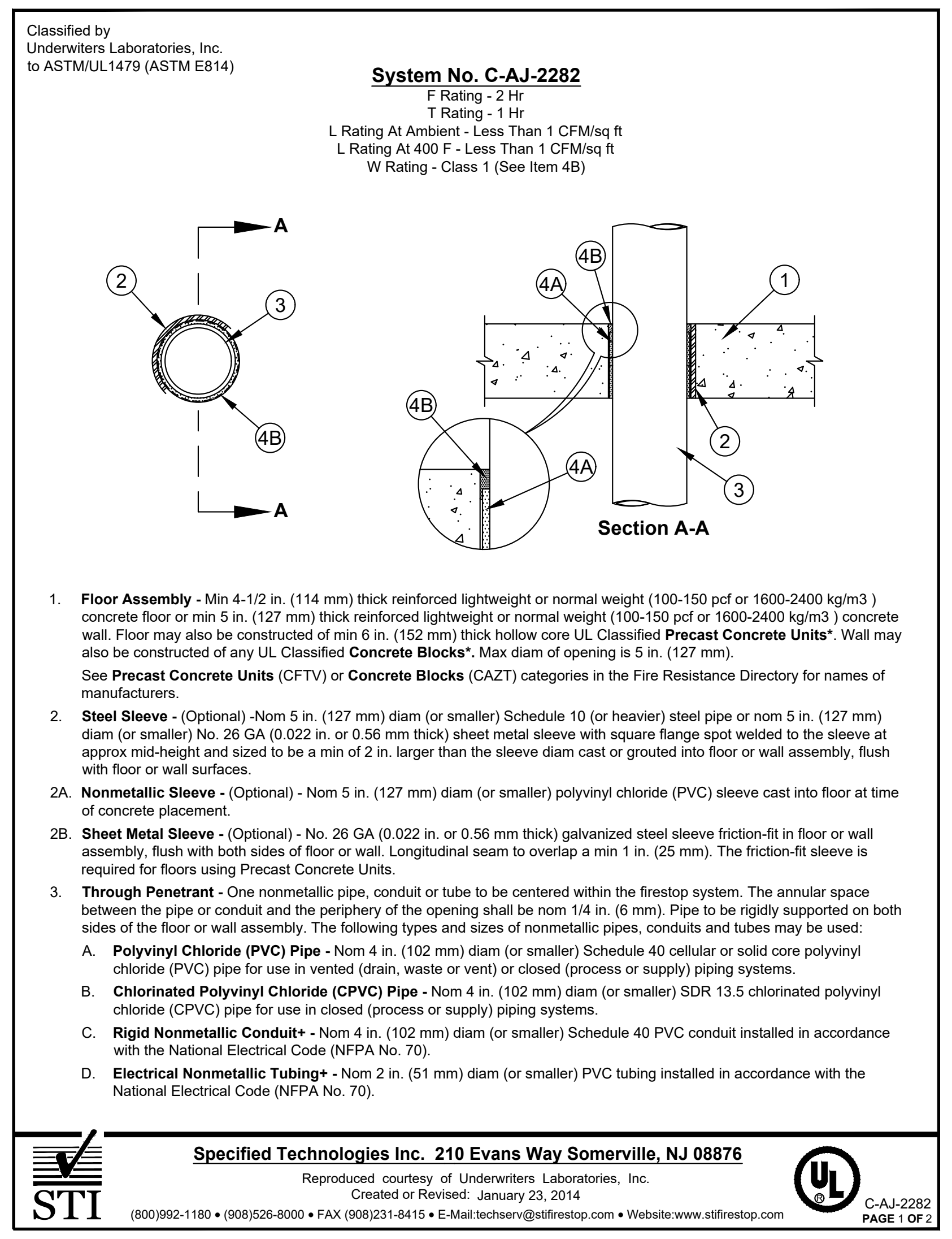

Classified by
Underwiters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. C-AJ-2282

F Rating - 2 Hr
T Rating - 1 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft
W Rating - Class 1 (See Item 4B)

Section A-A

1. **Floor Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor or min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete wall. Floor may also be constructed of min 6 in. (152 mm) thick hollow core UL Classified **Precast Concrete Units***. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 5 in. (127 mm).

   See **Precast Concrete Units** (CFTV) or **Concrete Blocks** (CAZT) categories in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve -** (Optional) -Nom 5 in. (127 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe or nom 5 in. (127 mm) diam (or smaller) No. 26 GA (0.022 in. or 0.56 mm thick) sheet metal sleeve with square flange spot welded to the sleeve at approx mid-height and sized to be a min of 2 in. larger than the sleeve diam cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

2A. **Nonmetallic Sleeve -** (Optional) - Nom 5 in. (127 mm) diam (or smaller) polyvinyl chloride (PVC) sleeve cast into floor at time of concrete placement.

2B. **Sheet Metal Sleeve -** (Optional) - No. 26 GA (0.022 in. or 0.56 mm thick) galvanized steel sleeve friction-fit in floor or wall assembly, flush with both sides of floor or wall. Longitudinal seam to overlap a min 1 in. (25 mm). The friction-fit sleeve is required for floors using Precast Concrete Units.

3. **Through Penetrant -** One nonmetallic pipe, conduit or tube to be centered within the firestop system. The annular space between the pipe or conduit and the periphery of the opening shall be nom 1/4 in. (6 mm). Pipe to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 4 in. (102 mm) diam (or smaller) Schedule 40 cellular or solid core polyvinyl chloride (PVC) pipe for use in vented (drain, waste or vent) or closed (process or supply) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 4 in. (102 mm) diam (or smaller) SDR 13.5 chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ -** Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).
   D. **Electrical Nonmetallic Tubing+ -** Nom 2 in. (51 mm) diam (or smaller) PVC tubing installed in accordance with the National Electrical Code (NFPA No. 70).

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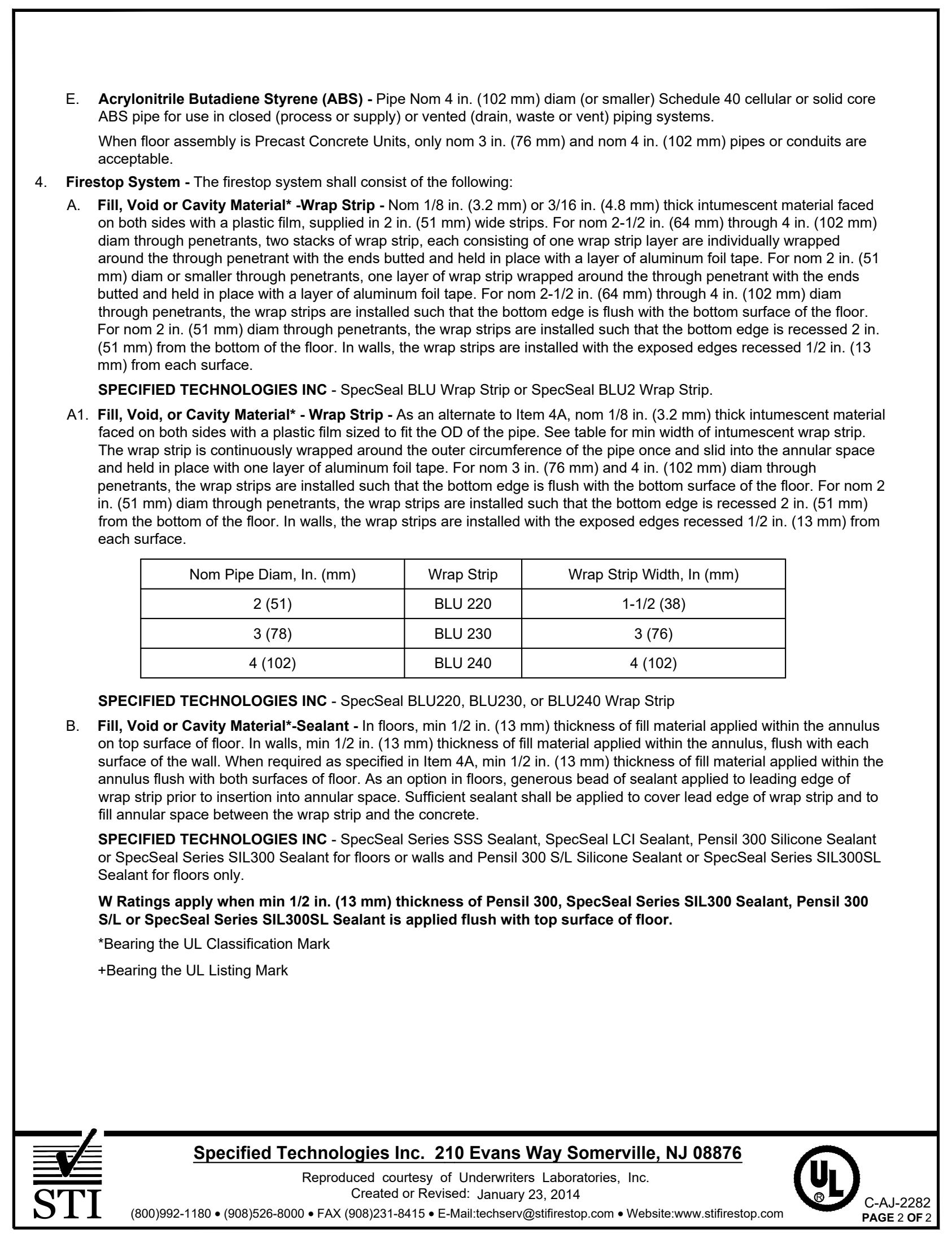

   E. **Acrylonitrile Butadiene Styrene (ABS) -** Pipe Nom 4 in. (102 mm) diam (or smaller) Schedule 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

   When floor assembly is Precast Concrete Units, only nom 3 in. (76 mm) and nom 4 in. (102 mm) pipes or conduits are acceptable.
4. **Firestop System -** The firestop system shall consist of the following:
   A. **Fill, Void or Cavity Material* -Wrap Strip -** Nom 1/8 in. (3.2 mm) or 3/16 in. (4.8 mm) thick intumescent material faced on both sides with a plastic film, supplied in 2 in. (51 mm) wide strips. For nom 2-1/2 in. (64 mm) through 4 in. (102 mm) diam through penetrants, two stacks of wrap strip, each consisting of one wrap strip layer are individually wrapped around the through penetrant with the ends butted and held in place with a layer of aluminum foil tape. For nom 2 in. (51 mm) diam or smaller through penetrants, one layer of wrap strip wrapped around the through penetrant with the ends butted and held in place with a layer of aluminum foil tape. For nom 2-1/2 in. (64 mm) through 4 in. (102 mm) diam through penetrants, the wrap strips are installed such that the bottom edge is flush with the bottom surface of the floor. For nom 2 in. (51 mm) diam through penetrants, the wrap strips are installed such that the bottom edge is recessed 2 in. (51 mm) from the bottom of the floor. In walls, the wrap strips are installed with the exposed edges recessed 1/2 in. (13 mm) from each surface.

   SPECIFIED TECHNOLOGIES INC - SpecSeal BLU Wrap Strip or SpecSeal BLU2 Wrap Strip.

   A1. **Fill, Void, or Cavity Material* - Wrap Strip -** As an alternate to Item 4A, nom 1/8 in. (3.2 mm) thick intumescent material faced on both sides with a plastic film sized to fit the OD of the pipe. See table for min width of intumescent wrap strip. The wrap strip is continuously wrapped around the outer circumference of the pipe once and slid into the annular space and held in place with one layer of aluminum foil tape. For nom 3 in. (76 mm) and 4 in. (102 mm) diam through penetrants, the wrap strips are installed such that the bottom edge is flush with the bottom surface of the floor. For nom 2 in. (51 mm) diam through penetrants, the wrap strips are installed such that the bottom edge is recessed 2 in. (51 mm) from the bottom of the floor. In walls, the wrap strips are installed with the exposed edges recessed 1/2 in. (13 mm) from each surface.

Nom Pipe Diam, In. (mm)	Wrap Strip	Wrap Strip Width, In (mm)
2 (51)	BLU 220	1-1/2 (38)
3 (78)	BLU 230	3 (76)
4 (102)	BLU 240	4 (102)

   SPECIFIED TECHNOLOGIES INC - SpecSeal BLU220, BLU230, or BLU240 Wrap Strip

   B. **Fill, Void or Cavity Material*-Sealant -** In floors, min 1/2 in. (13 mm) thickness of fill material applied within the annulus on top surface of floor. In walls, min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with each surface of the wall. When required as specified in Item 4A, min 1/2 in. (13 mm) thickness of fill material applied within the annulus flush with both surfaces of floor. As an option in floors, generous bead of sealant applied to leading edge of wrap strip prior to insertion into annular space. Sufficient sealant shall be applied to cover lead edge of wrap strip and to fill annular space between the wrap strip and the concrete.

   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, Pensil 300 Silicone Sealant or SpecSeal Series SIL300 Sealant for floors or walls and Pensil 300 S/L Silicone Sealant or SpecSeal Series SIL300SL Sealant for floors only.

   W Ratings apply when min 1/2 in. (13 mm) thickness of Pensil 300, SpecSeal Series SIL300 Sealant, Pensil 300 S/L or SpecSeal Series SIL300SL Sealant is applied flush with top surface of floor.

   *Bearing the UL Classification Mark

   +Bearing the UL Listing Mark

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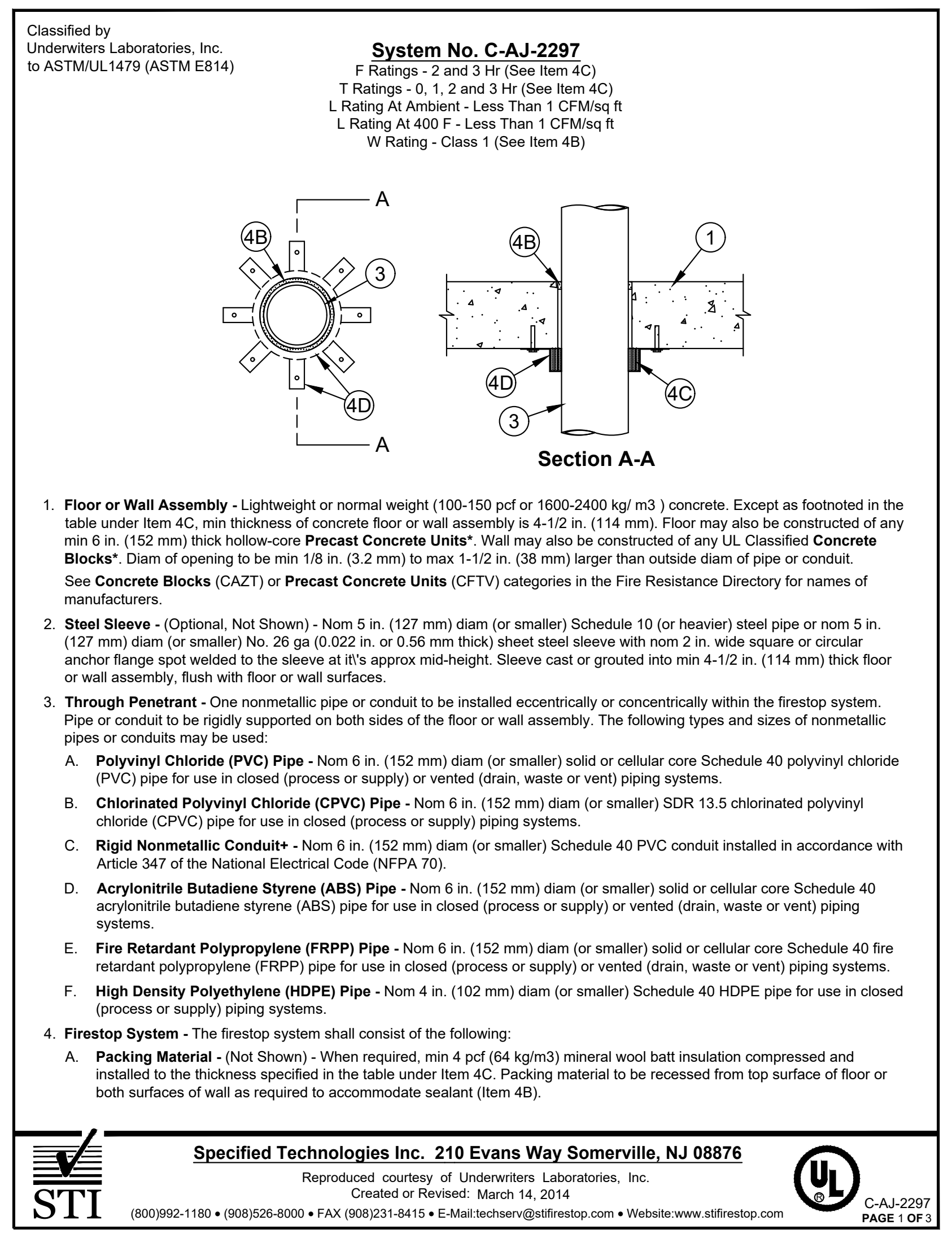

Classified by
Underwiters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. C-AJ-2297

F Ratings - 2 and 3 Hr (See Item 4C)
T Ratings - 0, 1, 2 and 3 Hr (See Item 4C)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft
W Rating - Class 1 (See Item 4B)

Section A-A

1. **Floor or Wall Assembly -** Lightweight or normal weight (100-150 pcf or 1600-2400 kg/ m3) concrete. Except as footnoted in the table under Item 4C, min thickness of concrete floor or wall assembly is 4-1/2 in. (114 mm). Floor may also be constructed of any min 6 in. (152 mm) thick hollow-core **Precast Concrete Units***. Wall may also be constructed of any UL Classified **Concrete Blocks***. Diam of opening to be min 1/8 in. (3.2 mm) to max 1-1/2 in. (38 mm) larger than outside diam of pipe or conduit.

   See **Concrete Blocks** (CAZT) or **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve -** (Optional, Not Shown) - Nom 5 in. (127 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe or nom 5 in. (127 mm) diam (or smaller) No. 26 ga (0.022 in. or 0.56 mm thick) sheet steel sleeve with nom 2 in. wide square or circular anchor flange spot welded to the sleeve at it\'s approx mid-height. Sleeve cast or grouted into min 4-1/2 in. (114 mm) thick floor or wall assembly, flush with floor or wall surfaces.
3. **Through Penetrant -** One nonmetallic pipe or conduit to be installed eccentrically or concentrically within the firestop system. Pipe or conduit to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 6 in. (152 mm) diam (or smaller) solid or cellular core Schedule 40 polyvinyl chloride (PVC) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 6 in. (152 mm) diam (or smaller) SDR 13.5 chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ -** Nom 6 in. (152 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70).
   D. **Acrylonitrile Butadiene Styrene (ABS) Pipe -** Nom 6 in. (152 mm) diam (or smaller) solid or cellular core Schedule 40 acrylonitrile butadiene styrene (ABS) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   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 (process or supply) piping systems.
4. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** (Not Shown) - When required, min 4 pcf (64 kg/m3) mineral wool batt insulation compressed and installed to the thickness specified in the table under Item 4C. Packing material to be recessed from top surface of floor or both surfaces of wall as required to accommodate sealant (Item 4B).

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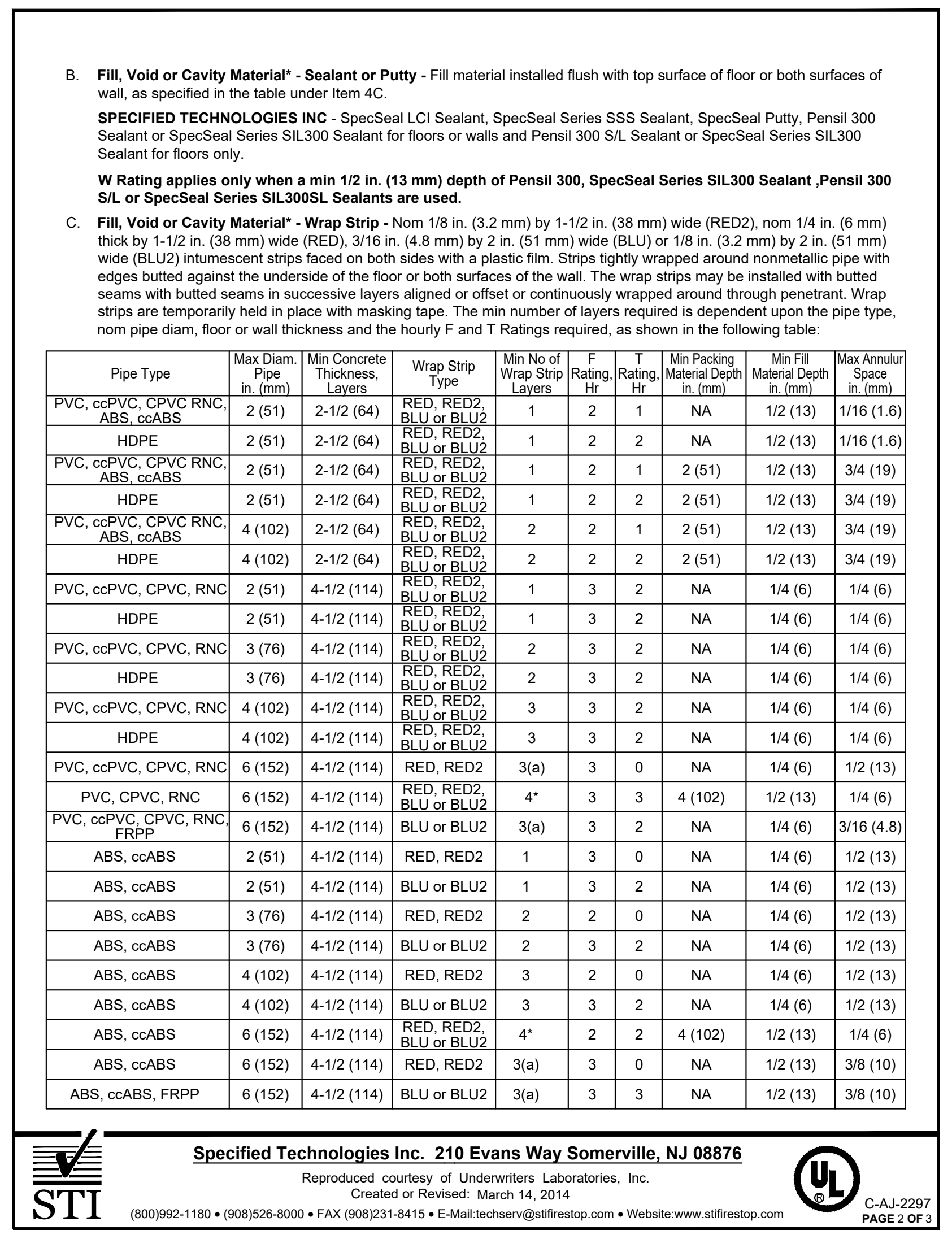

   B. **Fill, Void or Cavity Material* - Sealant or Putty -** Fill material installed flush with top surface of floor or both surfaces of wall, as specified in the table under Item 4C.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant, SpecSeal Series SSS Sealant, SpecSeal Putty, Pensil 300 Sealant or SpecSeal Series SIL300 Sealant for floors or walls and Pensil 300 S/L Sealant or SpecSeal Series SIL300 Sealant for floors only.

   W Rating applies only when a min 1/2 in. (13 mm) depth of Pensil 300, SpecSeal Series SIL300 Sealant ,Pensil 300 S/L or SpecSeal Series SIL300SL Sealants are used.

   C. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/8 in. (3.2 mm) by 1-1/2 in. (38 mm) wide (RED2), nom 1/4 in. (6 mm) thick by 1-1/2 in. (38 mm) wide (RED), 3/16 in. (4.8 mm) by 2 in. (51 mm) wide (BLU) or 1/8 in. (3.2 mm) by 2 in. (51 mm) wide (BLU2) intumescent strips faced on both sides with a plastic film. Strips tightly wrapped around nonmetallic pipe with edges butted against the underside of the floor or both surfaces of the wall. The wrap strips may be installed with butted seams with butted seams in successive layers aligned or offset or continuously wrapped around through penetrant. Wrap strips are temporarily held in place with masking tape. The min number of layers required is dependent upon the pipe type, nom pipe diam, floor or wall thickness and the hourly F and T Ratings required, as shown in the following table:

Pipe Type	Max Diam. Pipe in. (mm)	Min Concrete Thickness, Layers	Wrap Strip Type	Min No of Wrap Strip Layers	F Rating, Hr	T Rating, Hr	Min Packing Material Depth in. (mm)	Min Fill Material Depth in. (mm)	Max Annulur Space in. (mm)
PVC, ccPVC, CPVC RNC, ABS, ccABS	2 (51)	2-1/2 (64)	RED, RED2, BLU or BLU2	1	2	1	NA	1/2 (13)	1/16 (1.6)
HDPE	2 (51)	2-1/2 (64)	RED, RED2, BLU or BLU2	1	2	2	NA	1/2 (13)	1/16 (1.6)
PVC, ccPVC, CPVC RNC, ABS, ccABS	2 (51)	2-1/2 (64)	RED, RED2, BLU or BLU2	1	2	1	2 (51)	1/2 (13)	3/4 (19)
HDPE	2 (51)	2-1/2 (64)	RED, RED2, BLU or BLU2	1	2	2	2 (51)	1/2 (13)	3/4 (19)
PVC, ccPVC, CPVC RNC, ABS, ccABS	4 (102)	2-1/2 (64)	RED, RED2, BLU or BLU2	2	2	1	2 (51)	1/2 (13)	3/4 (19)
HDPE	4 (102)	2-1/2 (64)	RED, RED2, BLU or BLU2	2	2	2	2 (51)	1/2 (13)	3/4 (19)
PVC, ccPVC, CPVC, RNC	2 (51)	4-1/2 (114)	RED, RED2, BLU or BLU2	1	3	2	NA	1/4 (6)	1/4 (6)
HDPE	2 (51)	4-1/2 (114)	RED, RED2, BLU or BLU2	1	3	2	NA	1/4 (6)	1/4 (6)
PVC, ccPVC, CPVC, RNC	3 (76)	4-1/2 (114)	RED, RED2, BLU or BLU2	2	3	2	NA	1/4 (6)	1/4 (6)
HDPE	3 (76)	4-1/2 (114)	RED, RED2, BLU or BLU2	2	3	2	NA	1/4 (6)	1/4 (6)
PVC, ccPVC, CPVC, RNC	4 (102)	4-1/2 (114)	RED, RED2, BLU or BLU2	3	3	2	NA	1/4 (6)	1/4 (6)
HDPE	4 (102)	4-1/2 (114)	RED, RED2, BLU or BLU2	3	3	2	NA	1/4 (6)	1/4 (6)
PVC, ccPVC, CPVC, RNC	6 (152)	4-1/2 (114)	RED, RED2	3(a)	3	0	NA	1/4 (6)	1/2 (13)
PVC, CPVC, RNC	6 (152)	4-1/2 (114)	RED, RED2, BLU or BLU2	4*	3	3	4 (102)	1/2 (13)	1/4 (6)
PVC, ccPVC, CPVC, RNC, FRPP	6 (152)	4-1/2 (114)	BLU or BLU2	3(a)	3	2	NA	1/4 (6)	3/16 (4.8)
ABS, ccABS	2 (51)	4-1/2 (114)	RED, RED2	1	3	0	NA	1/4 (6)	1/2 (13)
ABS, ccABS	2 (51)	4-1/2 (114)	BLU or BLU2	1	3	2	NA	1/4 (6)	1/2 (13)
ABS, ccABS	3 (76)	4-1/2 (114)	RED, RED2	2	2	0	NA	1/4 (6)	1/2 (13)
ABS, ccABS	3 (76)	4-1/2 (114)	BLU or BLU2	2	3	2	NA	1/4 (6)	1/2 (13)
ABS, ccABS	4 (102)	4-1/2 (114)	RED, RED2	3	2	0	NA	1/4 (6)	1/2 (13)
ABS, ccABS	4 (102)	4-1/2 (114)	BLU or BLU2	3	3	2	NA	1/4 (6)	1/2 (13)
ABS, ccABS	6 (152)	4-1/2 (114)	RED, RED2, BLU or BLU2	4*	2	2	4 (102)	1/2 (13)	1/4 (6)
ABS, ccABS	6 (152)	4-1/2 (114)	RED, RED2	3(a)	3	0	NA	1/2 (13)	3/8 (10)
ABS, ccABS, FRPP	6 (152)	4-1/2 (114)	BLU or BLU2	3(a)	3	3	NA	1/2 (13)	3/8 (10)

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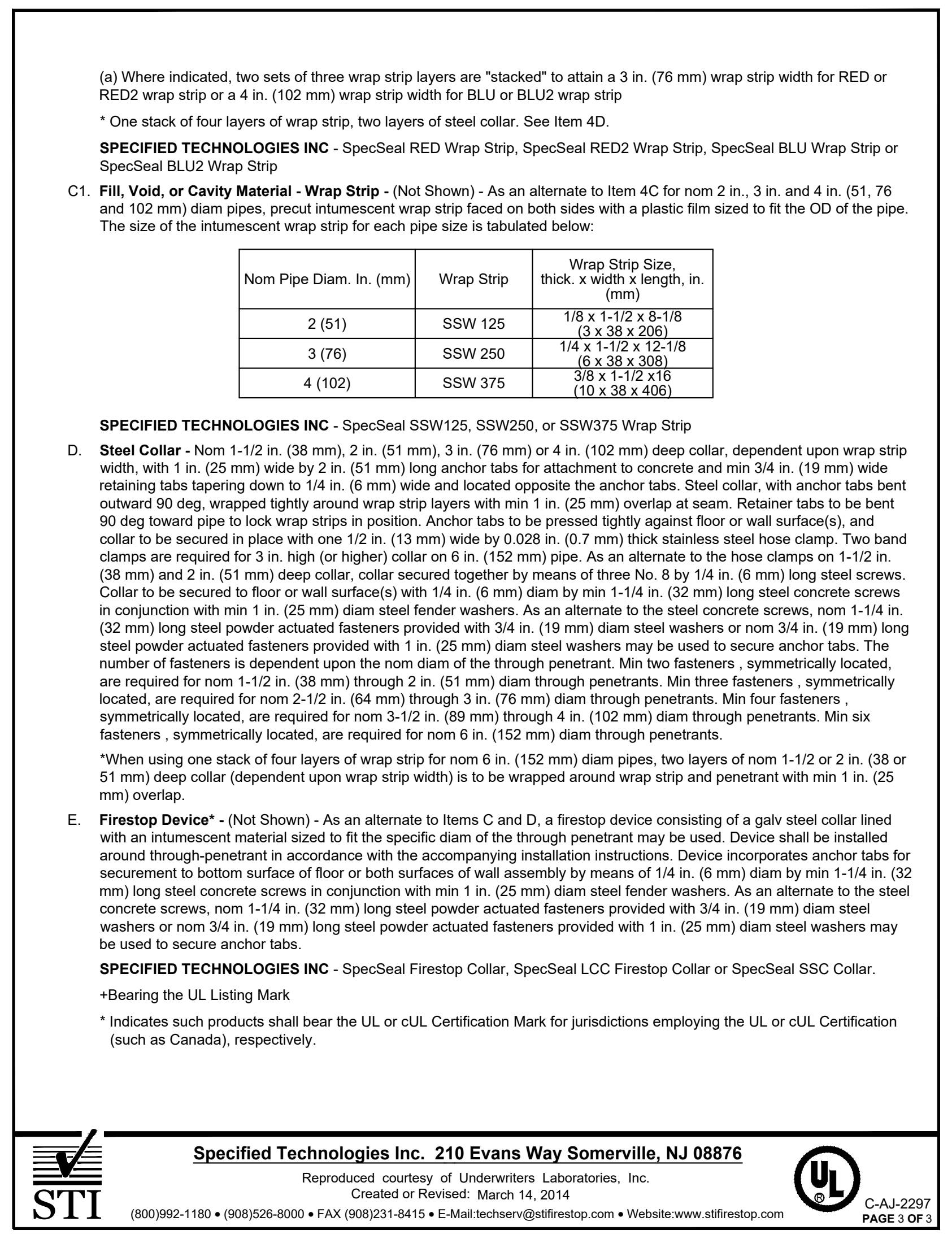

(a) Where indicated, two sets of three wrap strip layers are "stacked" to attain a 3 in. (76 mm) wrap strip width for RED or RED2 wrap strip or a 4 in. (102 mm) wrap strip width for BLU or BLU2 wrap strip

* One stack of four layers of wrap strip, two layers of steel collar. See Item 4D.

SPECIFIED TECHNOLOGIES INC - SpecSeal RED Wrap Strip, SpecSeal RED2 Wrap Strip, SpecSeal BLU Wrap Strip or SpecSeal BLU2 Wrap Strip

C1. **Fill, Void, or Cavity Material - Wrap Strip -** (Not Shown) - As an alternate to Item 4C for nom 2 in., 3 in. and 4 in. (51, 76 and 102 mm) diam pipes, precut intumescent wrap strip faced on both sides with a plastic film sized to fit the OD of the pipe. The size of the intumescent wrap strip for each pipe size is tabulated below:

Nom Pipe Diam. In. (mm)	Wrap Strip	Wrap Strip Size, thick. x width x length, in. (mm)
2 (51)	SSW 125	1/8 x 1-1/2 x 8-1/8 (3 x 38 x 206)
3 (76)	SSW 250	1/4 x 1-1/2 x 12-1/8 (6 x 38 x 308)
4 (102)	SSW 375	3/8 x 1-1/2 x16 (10 x 38 x 406)

SPECIFIED TECHNOLOGIES INC - SpecSeal SSW125, SSW250, or SSW375 Wrap Strip

D. **Steel Collar -** Nom 1-1/2 in. (38 mm), 2 in. (51 mm), 3 in. (76 mm) or 4 in. (102 mm) deep collar, dependent upon wrap strip width, with 1 in. (25 mm) wide by 2 in. (51 mm) long anchor tabs for attachment to concrete and min 3/4 in. (19 mm) wide retaining tabs tapering down to 1/4 in. (6 mm) wide and located opposite the anchor tabs. Steel collar, with anchor tabs bent outward 90 deg, wrapped tightly around wrap strip layers with min 1 in. (25 mm) overlap at seam. Retainer tabs to be bent 90 deg toward pipe to lock wrap strips in position. Anchor tabs to be pressed tightly against floor or wall surface(s), and collar to be secured in place with one 1/2 in. (13 mm) wide by 0.028 in. (0.7 mm) thick stainless steel hose clamp. Two band clamps are required for 3 in. high (or higher) collar on 6 in. (152 mm) pipe. As an alternate to the hose clamps on 1-1/2 in. (38 mm) and 2 in. (51 mm) deep collar, collar secured together by means of three No. 8 by 1/4 in. (6 mm) long steel screws. Collar to be secured to floor or wall surface(s) with 1/4 in. (6 mm) diam by min 1-1/4 in. (32 mm) long steel concrete screws in conjunction with min 1 in. (25 mm) diam steel fender washers. As an alternate to the steel concrete screws, nom 1-1/4 in. (32 mm) long steel powder actuated fasteners provided with 3/4 in. (19 mm) diam steel washers or nom 3/4 in. (19 mm) long steel powder actuated fasteners provided with 1 in. (25 mm) diam steel washers may be used to secure anchor tabs. The number of fasteners is dependent upon the nom diam of the through penetrant. Min two fasteners , symmetrically located, are required for nom 1-1/2 in. (38 mm) through 2 in. (51 mm) diam through penetrants. Min three fasteners , symmetrically located, are required for nom 2-1/2 in. (64 mm) through 3 in. (76 mm) diam through penetrants. Min four fasteners , symmetrically located, are required for nom 3-1/2 in. (89 mm) through 4 in. (102 mm) diam through penetrants. Min six fasteners , symmetrically located, are required for nom 6 in. (152 mm) diam through penetrants.

*When using one stack of four layers of wrap strip for nom 6 in. (152 mm) diam pipes, two layers of nom 1-1/2 or 2 in. (38 or 51 mm) deep collar (dependent upon wrap strip width) is to be wrapped around wrap strip and penetrant with min 1 in. (25 mm) overlap.

E. **Firestop Device* -** (Not Shown) - As an alternate to Items C and D, a firestop device consisting of a galv steel collar lined with an intumescent material sized to fit the specific diam of the through penetrant may be used. Device shall be installed around through-penetrant in accordance with the accompanying installation instructions. Device incorporates anchor tabs for securement to bottom surface of floor or both surfaces of wall assembly by means of 1/4 in. (6 mm) diam by min 1-1/4 in. (32 mm) long steel concrete screws in conjunction with min 1 in. (25 mm) diam steel fender washers. As an alternate to the steel concrete screws, nom 1-1/4 in. (32 mm) long steel powder actuated fasteners provided with 3/4 in. (19 mm) diam steel washers or nom 3/4 in. (19 mm) long steel powder actuated fasteners provided with 1 in. (25 mm) diam steel washers may be used to secure anchor tabs.

SPECIFIED TECHNOLOGIES INC - SpecSeal Firestop Collar, SpecSeal LCC Firestop Collar or SpecSeal SSC Collar.

+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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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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

Specified Technologies Inc.
210 Evans Way Somerville, NJ 08876

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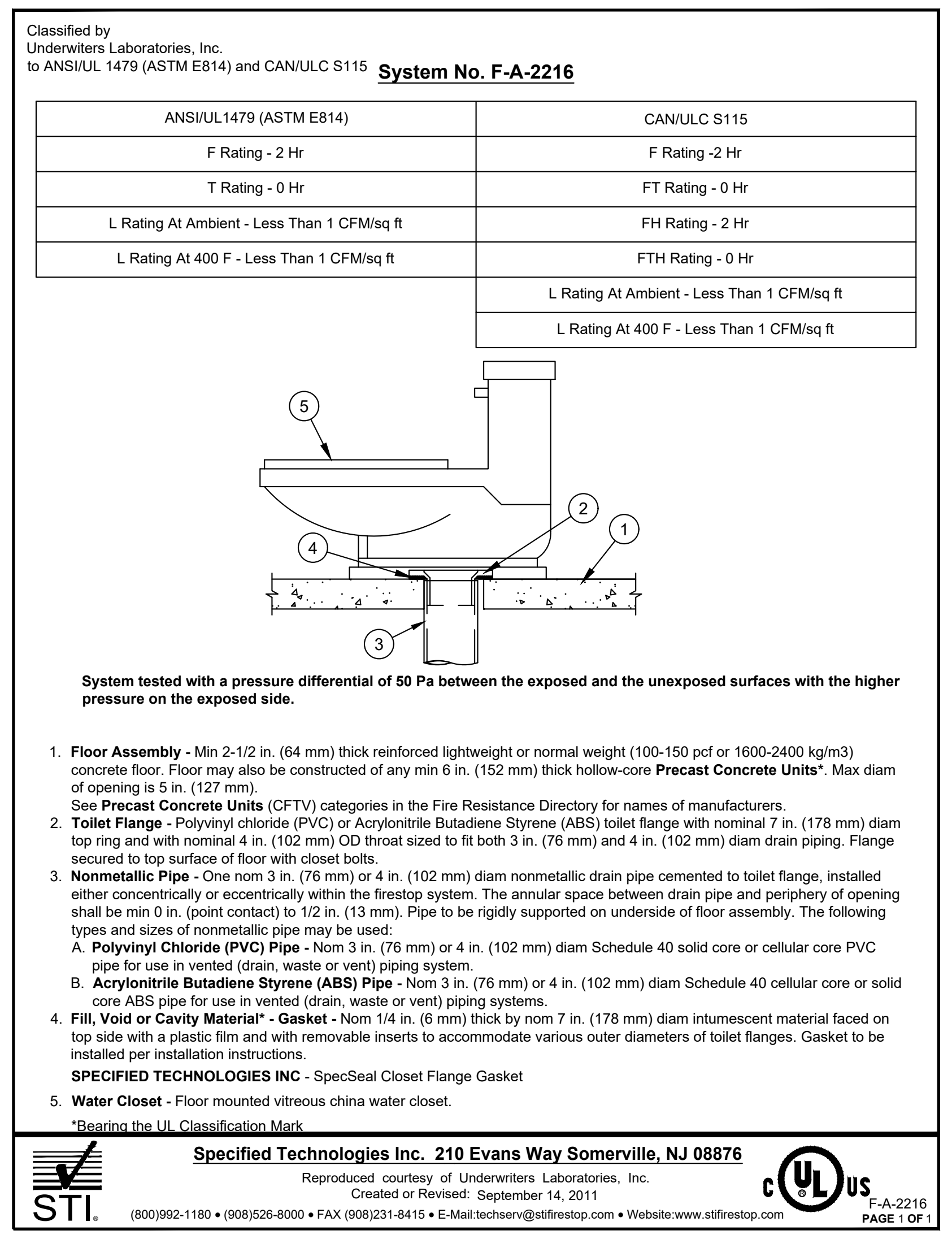

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. F-A-2216**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating -2 Hr
T Rating - 0 Hr	FT Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Rating - 2 Hr
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Rating - 0 Hr
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft

System tested with a pressure differential of 50 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

1. **Floor Assembly -** Min 2-1/2 in. (64 mm) 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 **Precast Concrete Units***. Max diam of opening is 5 in. (127 mm).
   See **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Toilet Flange -** Polyvinyl chloride (PVC) or Acrylonitrile Butadiene Styrene (ABS) toilet flange with nominal 7 in. (178 mm) diam 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.
3. **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.

*Bearing the UL Classification Mark

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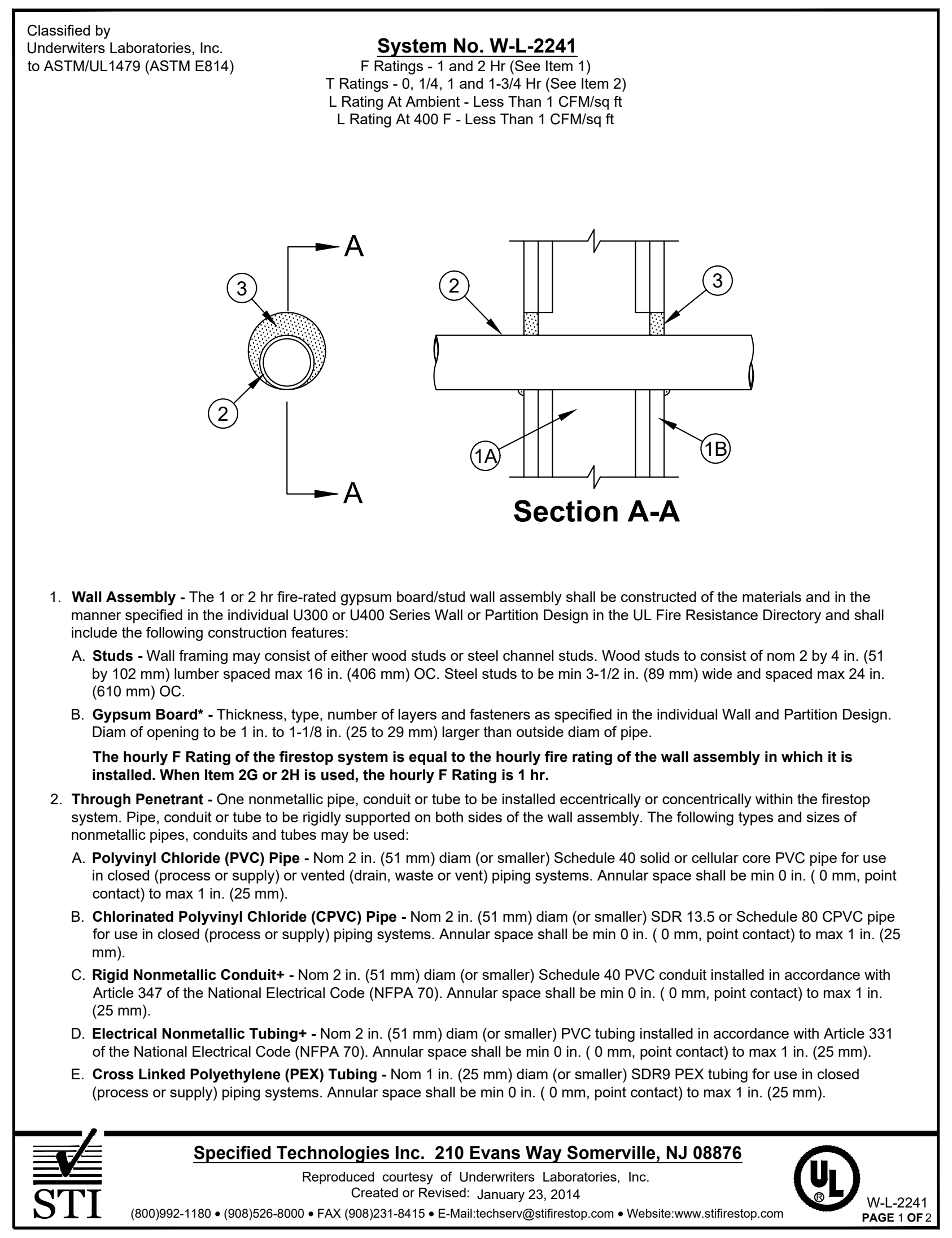

Classified by
Underwiters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. W-L-2241
F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 0, 1/4, 1 and 1-3/4 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 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. Diam of opening to be 1 in. to 1-1/8 in. (25 to 29 mm) larger than outside diam of pipe.
   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.
2. **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 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).
   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 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. (25 mm).
   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).

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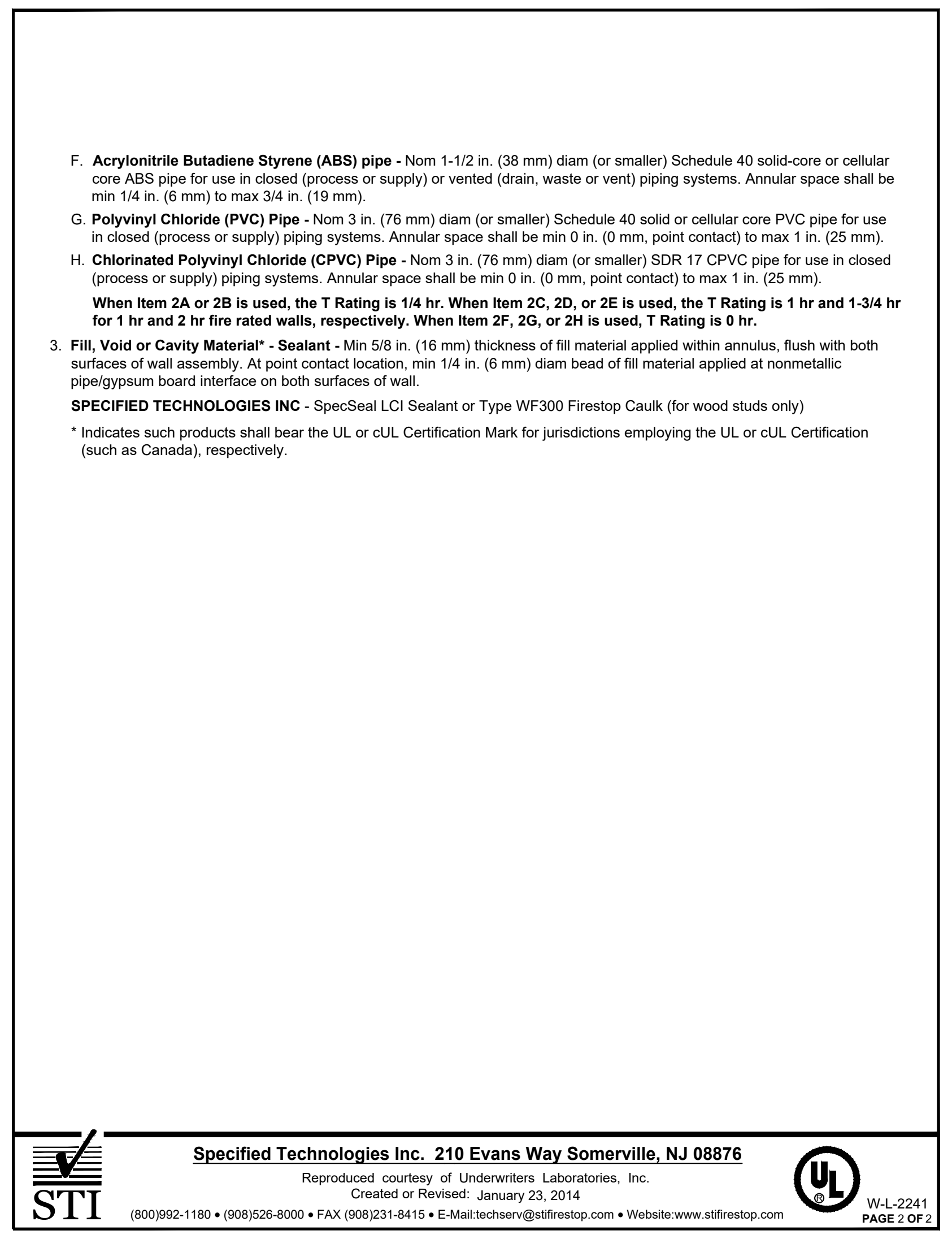

F. **Acrylonitrile Butadiene Styrene (ABS) pipe -** Nom 1-1/2 in. (38 mm) diam (or smaller) Schedule 40 solid-core or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Annular space shall be min 1/4 in. (6 mm) to max 3/4 in. (19 mm).
G. **Polyvinyl 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).
H. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) SDR 17 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 mm).
When Item 2A or 2B is used, the T Rating is 1/4 hr. When Item 2C, 2D, or 2E is used, the T Rating is 1 hr and 1-3/4 hr for 1 hr and 2 hr fire rated walls, respectively. When Item 2F, 2G, or 2H is used, T Rating is 0 hr.

3. **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 assembly. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at nonmetallic pipe/gypsum board interface on both surfaces of wall.
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant or Type WF300 Firestop Caulk (for wood studs only)

* 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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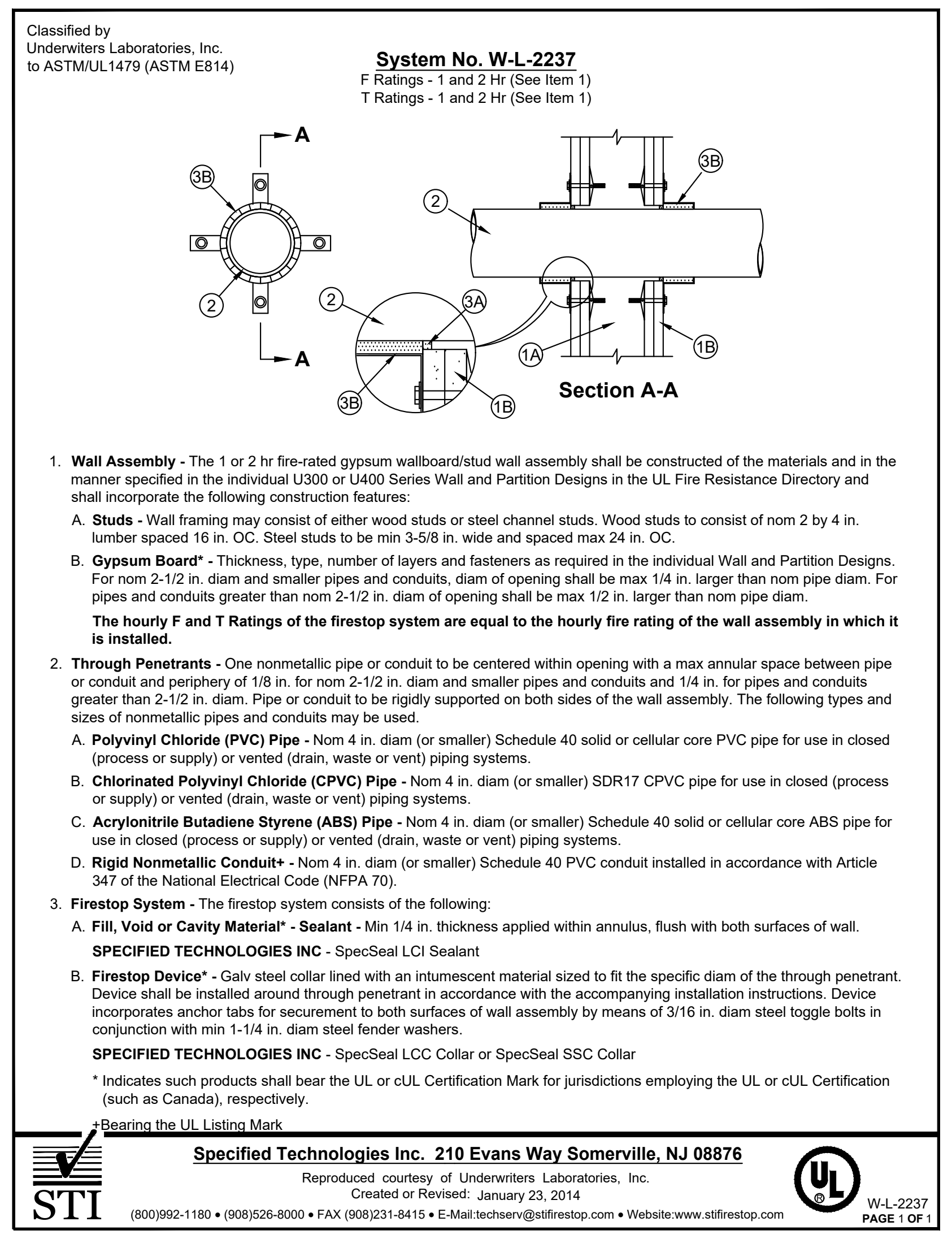

Classified by
Underwiters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. W-L-2237
F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall incorporate 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. lumber spaced 16 in. OC. Steel studs to be min 3-5/8 in. wide and spaced max 24 in. OC.
   B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Designs. For nom 2-1/2 in. diam and smaller pipes and conduits, diam of opening shall be max 1/4 in. larger than nom pipe diam. For pipes and conduits greater than nom 2-1/2 in. diam of opening shall be max 1/2 in. larger than nom pipe diam.
   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Through Penetrants -** One nonmetallic pipe or conduit to be centered within opening with a max annular space between pipe or conduit and periphery of 1/8 in. for nom 2-1/2 in. diam and smaller pipes and conduits and 1/4 in. for pipes and conduits greater than 2-1/2 in. diam. Pipe or conduit to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes and conduits may be used.
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 4 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 4 in. diam (or smaller) SDR17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   C. **Acrylonitrile Butadiene Styrene (ABS) Pipe -** Nom 4 in. diam (or smaller) Schedule 40 solid or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   D. **Rigid Nonmetallic Conduit+ -** Nom 4 in. 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 consists of the following:
   A. **Fill, Void or Cavity Material* - Sealant -** Min 1/4 in. thickness applied within annulus, flush with both surfaces of wall.
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant
   B. **Firestop Device* -** Galv steel collar lined with an intumescent material sized to fit the specific diam of the through penetrant. Device shall be installed around through penetrant in accordance with the accompanying installation instructions. Device incorporates anchor tabs for securement to both surfaces of wall assembly by means of 3/16 in. diam steel toggle bolts in conjunction with min 1-1/4 in. diam steel fender washers.
   SPECIFIED TECHNOLOGIES INC - 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.

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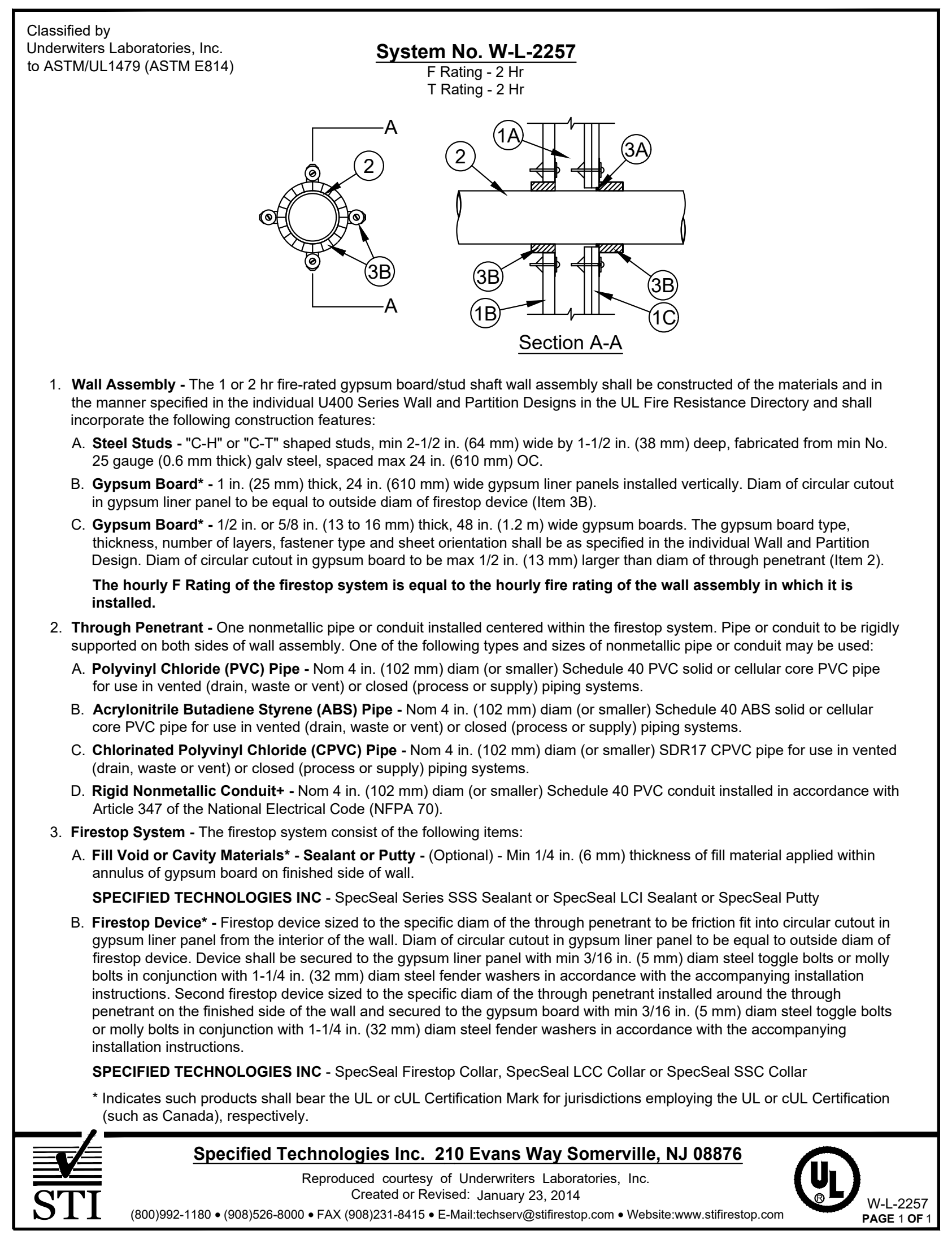

Classified by
Underwiters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. W-L-2257
F Rating - 2 Hr
T Rating - 2 Hr

1. **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 installed.
2. **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.
   SPECIFIED TECHNOLOGIES INC - SpecSeal Firestop Collar, SpecSeal LCC Collar or SpecSeal SSC Collar

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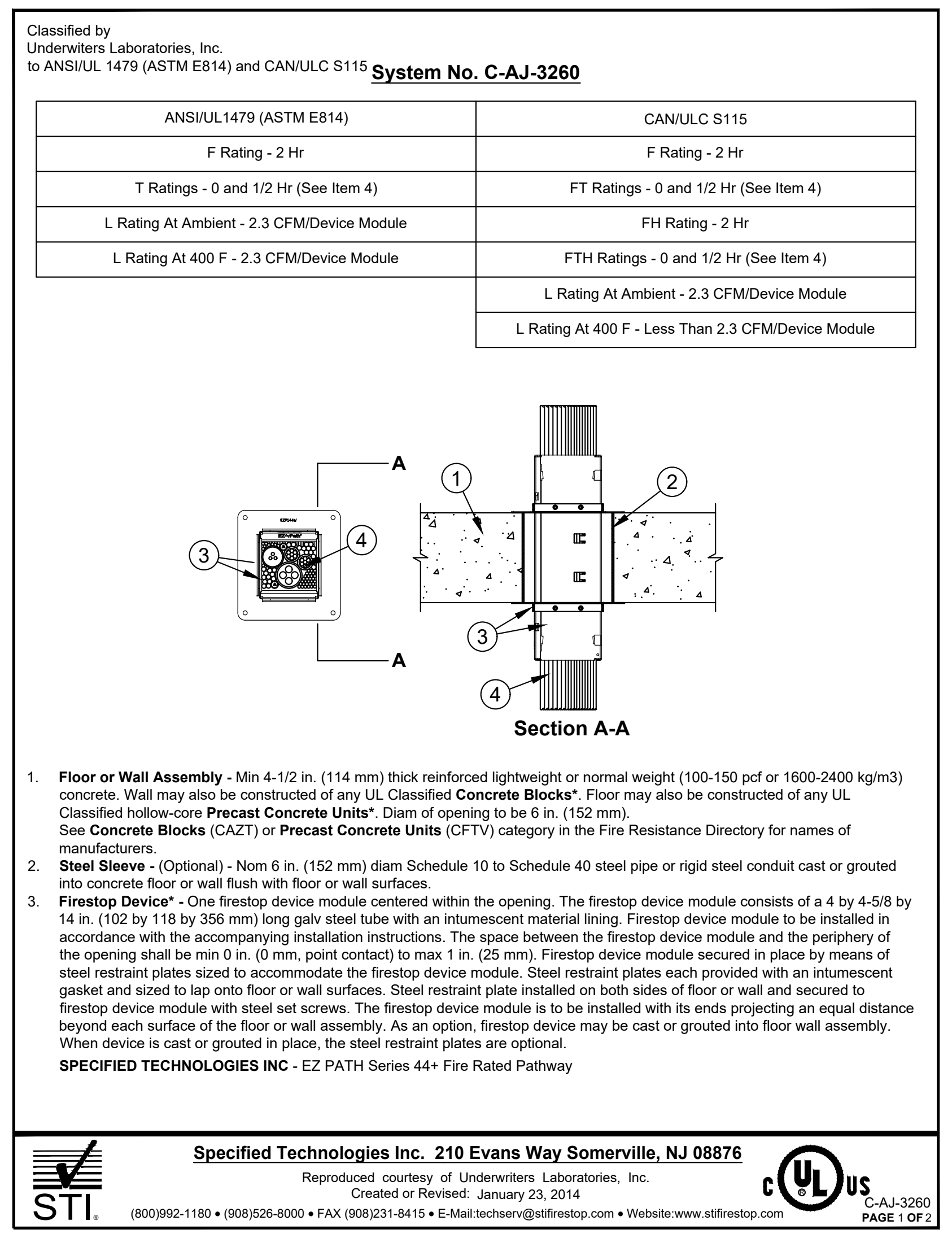

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. C-AJ-3260**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Ratings - 0 and 1/2 Hr (See Item 4)	FT Ratings - 0 and 1/2 Hr (See Item 4)
L Rating At Ambient - 2.3 CFM/Device Module	FH Rating - 2 Hr
L Rating At 400 F - 2.3 CFM/Device Module	FTH Ratings - 0 and 1/2 Hr (See Item 4)
	L Rating At Ambient - 2.3 CFM/Device Module
	L Rating At 400 F - Less Than 2.3 CFM/Device Module

1. **Floor or Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***. Floor may also be constructed of any UL Classified hollow-core **Precast Concrete Units***. Diam of opening to be 6 in. (152 mm).
   See **Concrete Blocks** (CAZT) or **Precast Concrete Units** (CFTV) category in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve -** (Optional) - Nom 6 in. (152 mm) diam Schedule 10 to Schedule 40 steel pipe or rigid steel conduit cast or grouted into concrete floor or wall flush with floor or wall surfaces.
3. **Firestop Device* -** One firestop device module centered within the opening. The firestop device module consists of a 4 by 4-5/8 by 14 in. (102 by 118 by 356 mm) long galv steel tube with an intumescent material lining. Firestop device module to be installed in accordance with the accompanying installation instructions. The space between the firestop device module and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm). Firestop device module secured in place by means of steel restraint plates sized to accommodate the firestop device module. Steel restraint plates each provided with an intumescent gasket and sized to lap onto floor or wall surfaces. Steel restraint plate installed on both sides of floor or wall and secured to 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. When device is cast or grouted in place, the steel restraint plates are optional.
   SPECIFIED TECHNOLOGIES INC - EZ PATH Series 44+ Fire Rated Pathway

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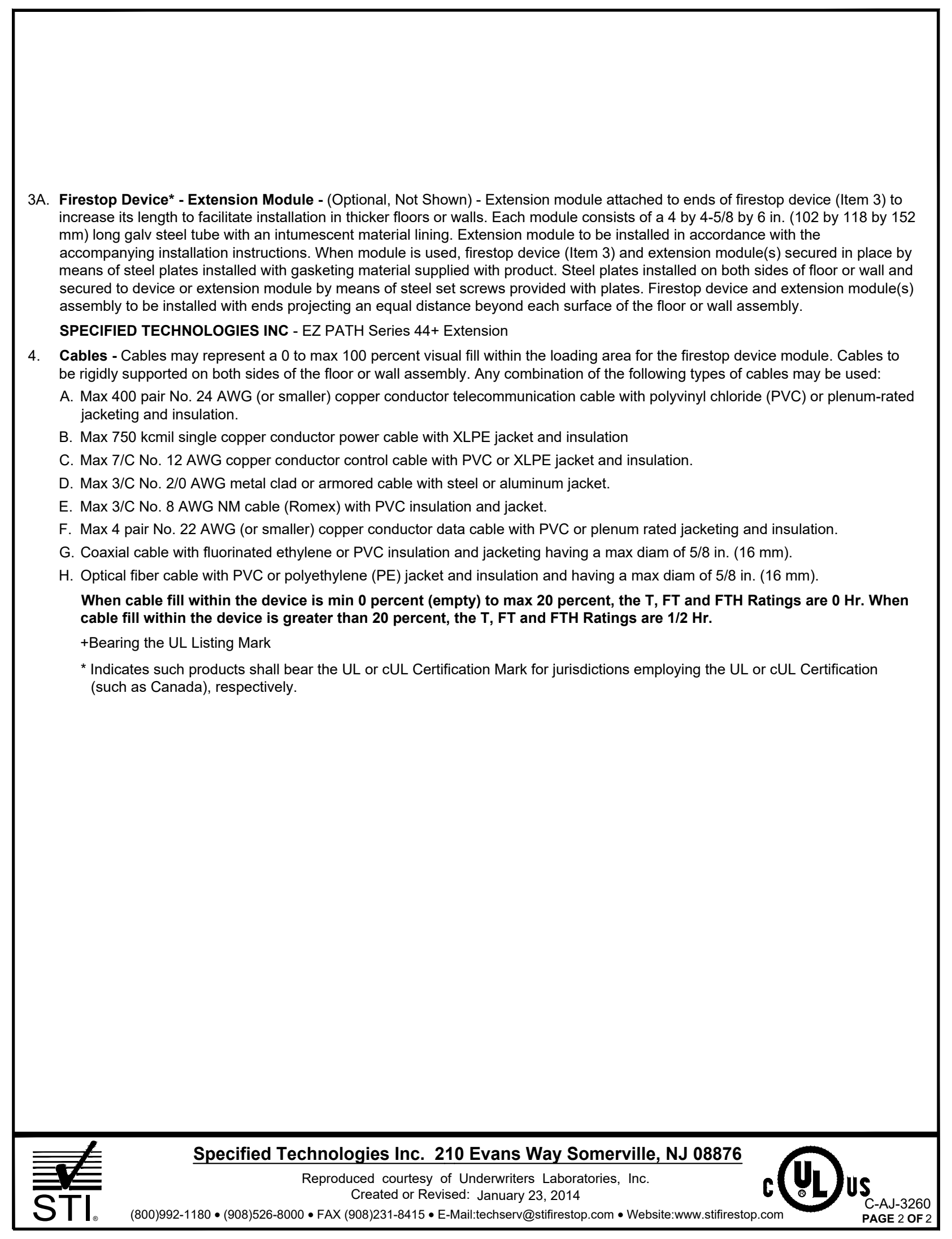

3A. **Firestop Device* - Extension Module -** (Optional, Not Shown) - Extension module attached to ends of firestop device (Item 3) to increase its length to facilitate installation in thicker floors or walls. Each module consists of a 4 by 4-5/8 by 6 in. (102 by 118 by 152 mm) long galv steel tube with 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

4. **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 jacketing and insulation.
   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.

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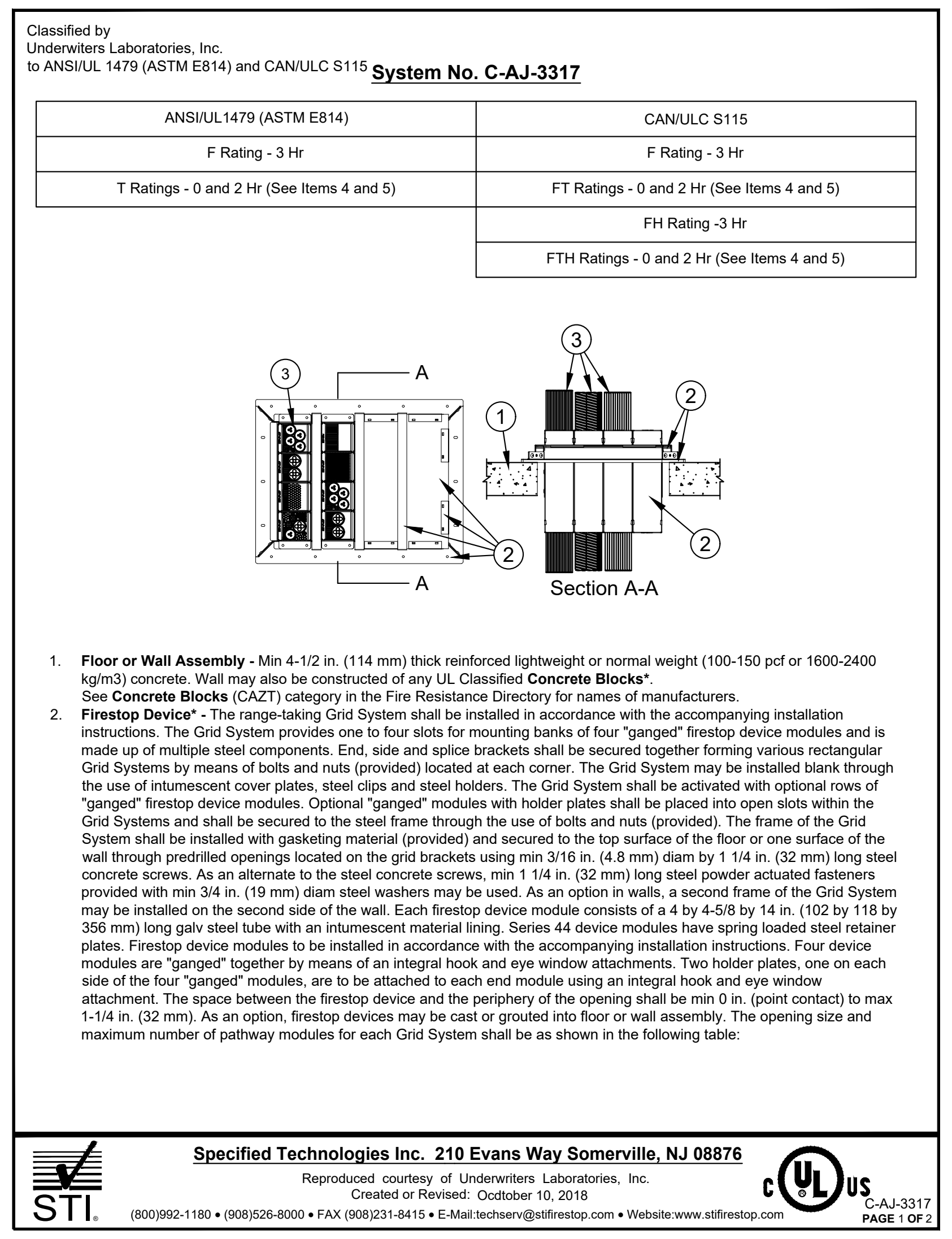

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. C-AJ-3317**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 3 Hr	F Rating - 3 Hr
T Ratings - 0 and 2 Hr (See Items 4 and 5)	FT Ratings - 0 and 2 Hr (See Items 4 and 5)
	FH Rating -3 Hr
	FTH Ratings - 0 and 2 Hr (See Items 4 and 5)

1. **Floor or Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***.
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. **Firestop Device* -** The range-taking Grid System shall be installed in accordance with the accompanying installation instructions. The Grid System provides one to four slots for mounting banks of four "ganged" firestop device modules and is made up of multiple steel components. End, side and splice brackets shall be secured together forming various rectangular Grid Systems by means of bolts and nuts (provided) located at each corner. The Grid System may be installed blank through the use of intumescent cover plates, steel clips and steel holders. The Grid System shall be activated with optional rows of "ganged" firestop device modules. Optional "ganged" modules with holder plates shall be placed into open slots within the Grid Systems and shall be secured to the steel frame through the use of bolts and nuts (provided). The frame of the Grid System shall be installed with gasketing material (provided) and secured to the top surface of the floor or one surface of the wall through predrilled openings located on the grid brackets using min 3/16 in. (4.8 mm) diam by 1 1/4 in. (32 mm) long steel concrete screws. As an alternate to the steel concrete screws, min 1 1/4 in. (32 mm) long steel powder actuated fasteners provided with min 3/4 in. (19 mm) diam steel washers may be used. As an option in walls, a second frame of the Grid System may be installed on the second side of the wall. Each firestop device module consists of a 4 by 4-5/8 by 14 in. (102 by 118 by 356 mm) long galv steel tube with an intumescent material lining. Series 44 device modules have spring loaded steel retainer plates. Firestop device modules to be installed in accordance with the accompanying installation instructions. Four device modules are "ganged" together by means of an integral hook and eye window attachments. Two holder plates, one on each side of the four "ganged" modules, are to be attached to each end module using an integral hook and eye window attachment. The space between the firestop device and the periphery of the opening shall be min 0 in. (point contact) to max 1-1/4 in. (32 mm). As an option, firestop devices may be cast or grouted into floor or wall assembly. The opening size and maximum number of pathway modules for each Grid System shall be as shown in the following table:

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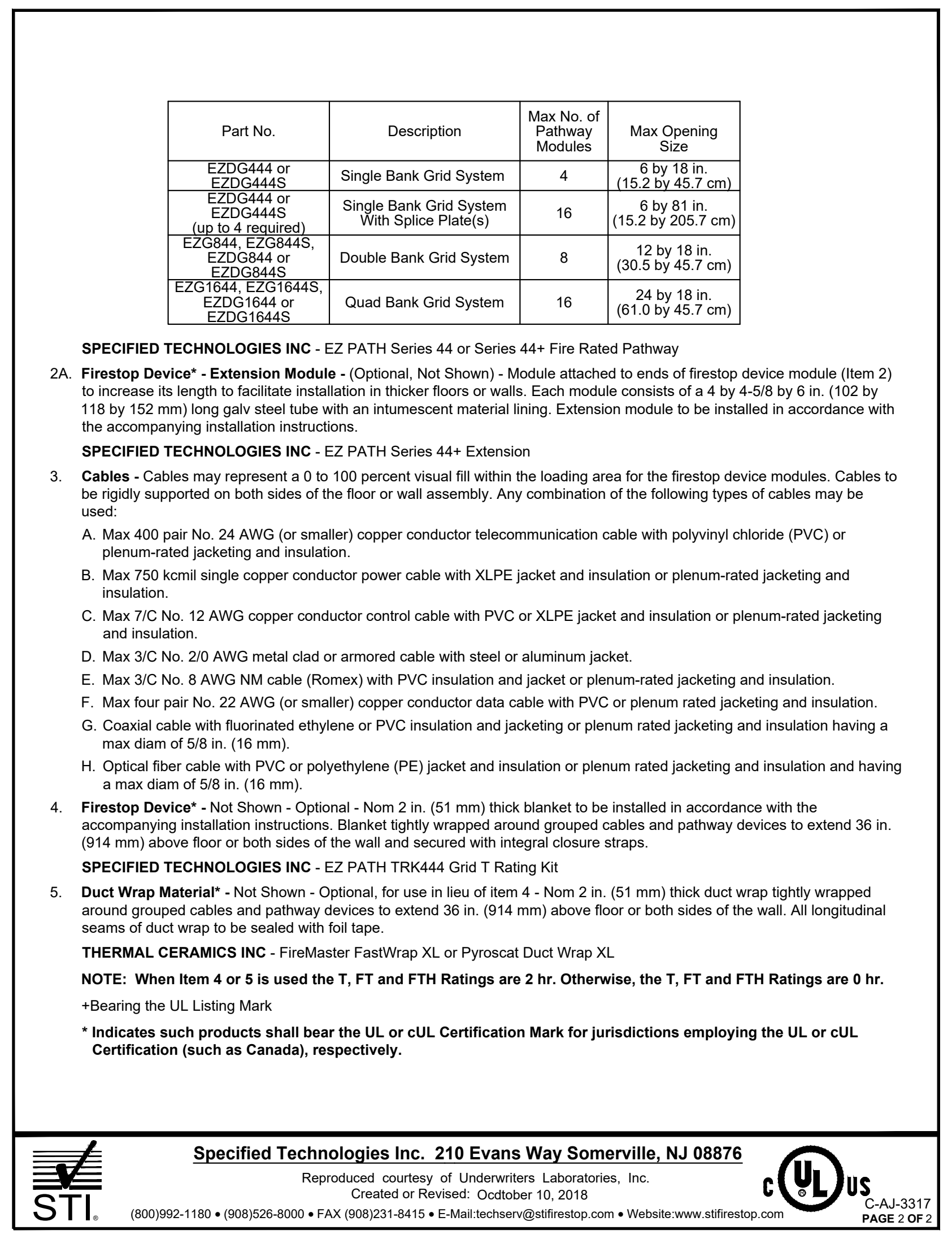

Part No.	Description	Max No. of Pathway Modules	Max Opening Size
EZDG444 or EZDG444S	Single Bank Grid System	4	6 by 18 in. (15.2 by 45.7 cm)
EZDG444 or EZDG444S (up to 4 required)	Single Bank Grid System With Splice Plate(s)	16	6 by 81 in. (15.2 by 205.7 cm)
EZG844, EZG844S, EZDG844 or EZDG844S	Double Bank Grid System	8	12 by 18 in. (30.5 by 45.7 cm)
EZG1644, EZG1644S, EZDG1644 or EZDG1644S	Quad Bank Grid System	16	24 by 18 in. (61.0 by 45.7 cm)

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

3. **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 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 or plenum-rated jacketing and insulation.
   C. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation or plenum-rated jacketing 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 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 max diam of 5/8 in. (16 mm).
   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).
4. **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.
   SPECIFIED TECHNOLOGIES INC - EZ PATH TRK444 Grid T Rating Kit
5. **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.

+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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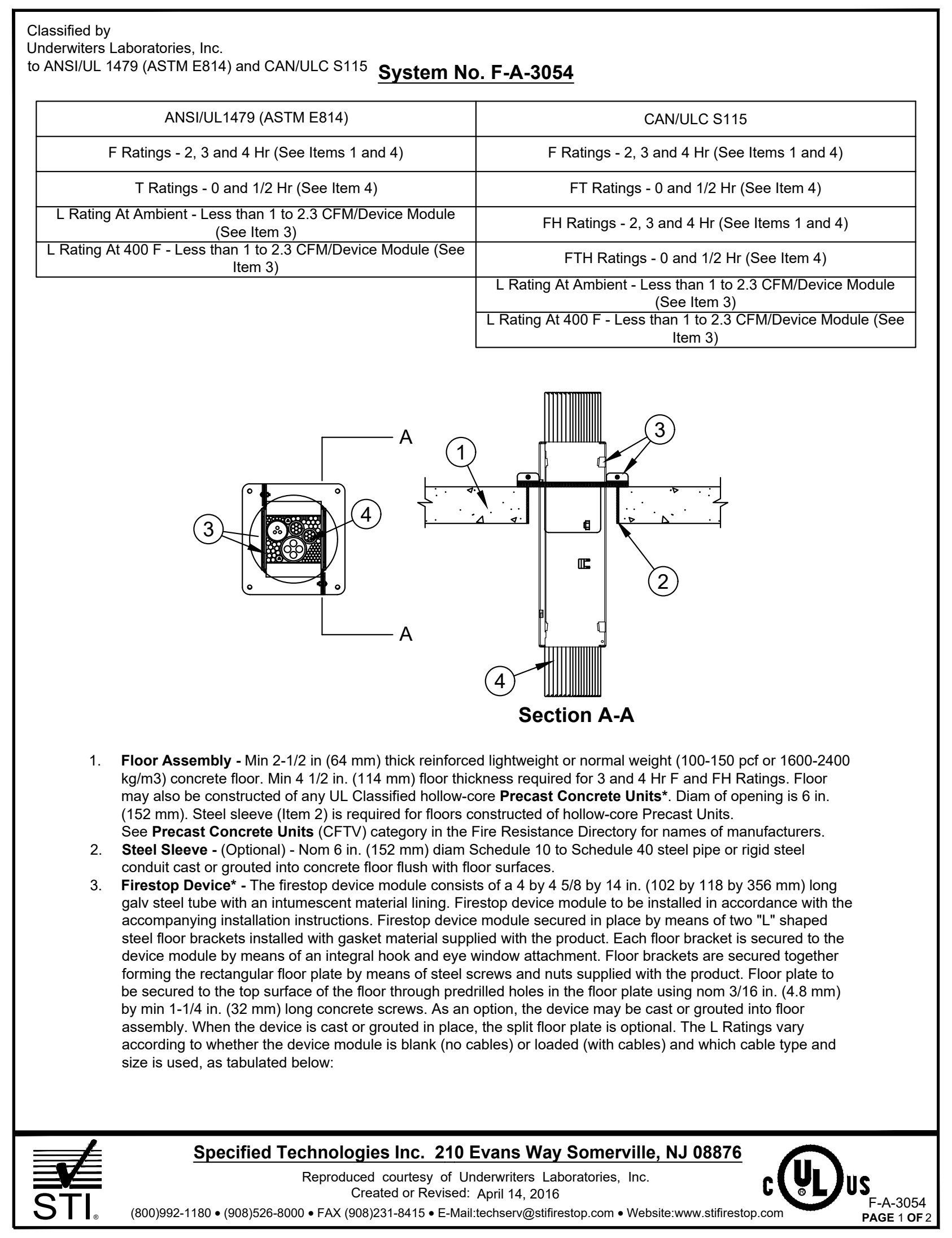

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. F-A-3054**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 2, 3 and 4 Hr (See Items 1 and 4)	F Ratings - 2, 3 and 4 Hr (See Items 1 and 4)
T Ratings - 0 and 1/2 Hr (See Item 4)	FT Ratings - 0 and 1/2 Hr (See Item 4)
L Rating At Ambient - Less than 1 to 2.3 CFM/Device Module (See Item 3)	FH Ratings - 2, 3 and 4 Hr (See Items 1 and 4)
L Rating At 400 F - Less than 1 to 2.3 CFM/Device Module (See Item 3)	FTH Ratings - 0 and 1/2 Hr (See Item 4)
	L Rating At Ambient - Less than 1 to 2.3 CFM/Device Module (See Item 3)
	L Rating At 400 F - Less than 1 to 2.3 CFM/Device Module (See Item 3)

1. **Floor Assembly -** Min 2-1/2 in (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor. Min 4 1/2 in. (114 mm) floor thickness required for 3 and 4 Hr F and FH Ratings. Floor may also be constructed of any UL Classified hollow-core **Precast Concrete Units***. Diam of opening is 6 in. (152 mm). Steel sleeve (Item 2) is required for floors constructed of hollow-core Precast Units.
   See **Precast Concrete Units** (CFTV) category in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve -** (Optional) - Nom 6 in. (152 mm) diam Schedule 10 to Schedule 40 steel pipe or rigid steel conduit cast or grouted into concrete floor flush with floor surfaces.
3. **Firestop Device* -** The firestop device module consists of a 4 by 4 5/8 by 14 in. (102 by 118 by 356 mm) long galv steel tube with an intumescent material lining. Firestop device module to be installed in accordance with the accompanying installation instructions. Firestop device module secured in place by means of two "L" shaped steel floor brackets installed with gasket material supplied with the product. Each floor bracket is secured to the device module by means of an integral hook and eye window attachment. Floor brackets are secured together forming the rectangular floor plate by means of steel screws and nuts supplied with the product. Floor plate to be secured to the top surface of the floor through predrilled holes in the floor plate using nom 3/16 in. (4.8 mm) by min 1-1/4 in. (32 mm) long concrete screws. As an option, the device may be cast or grouted into floor assembly. When the device is cast or grouted in place, the split floor plate is optional. The L Ratings vary according to whether the device module is blank (no cables) or loaded (with cables) and which cable type and size is used, as tabulated below:

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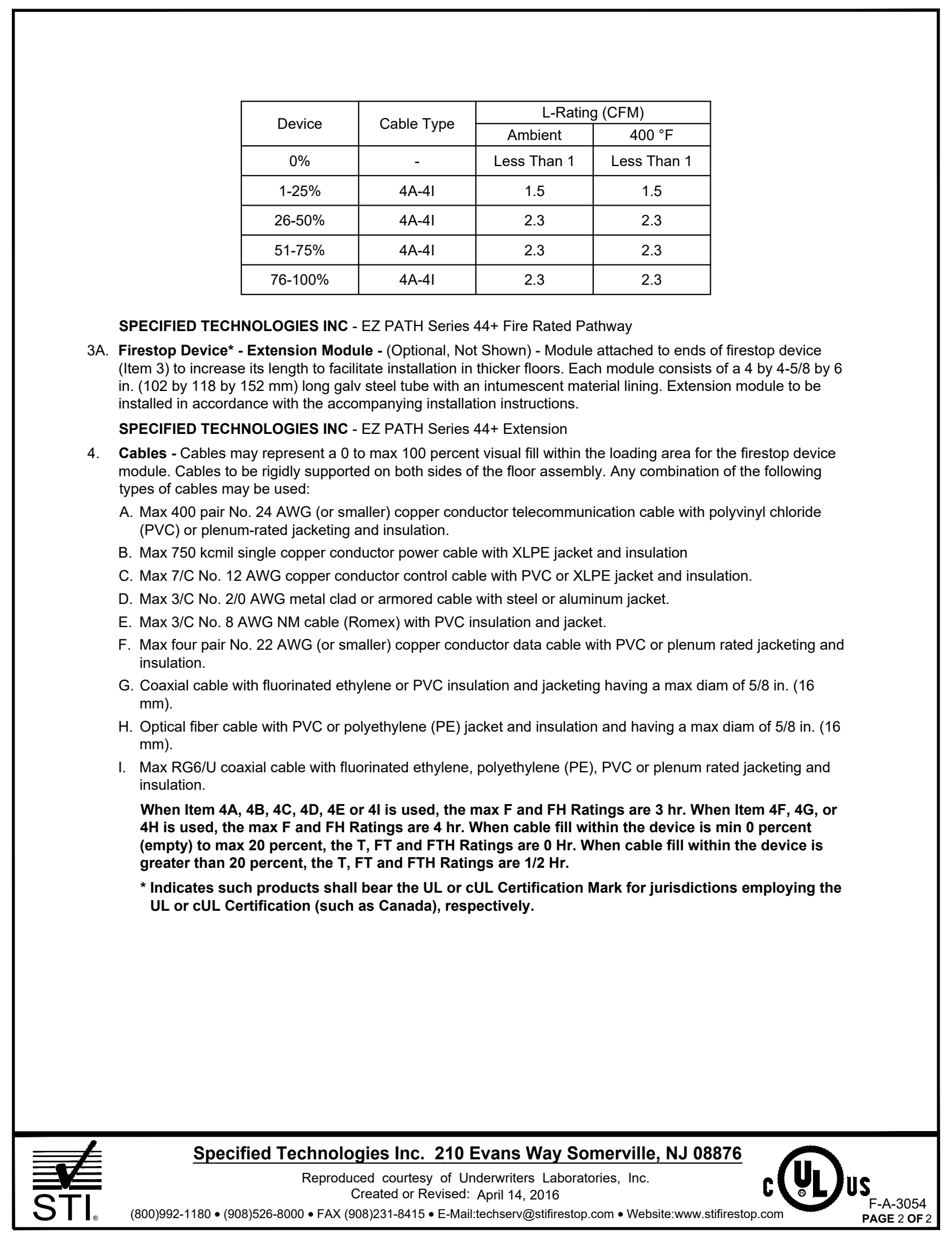

Device	Cable Type	L-Rating (CFM)	
		Ambient	400 °F
0%	-	Less Than 1	Less Than 1
1-25%	4A-4I	1.5	1.5
26-50%	4A-4I	2.3	2.3
51-75%	4A-4I	2.3	2.3
76-100%	4A-4I	2.3	2.3

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

3A. **Firestop Device* - Extension Module -** (Optional, Not Shown) - Module attached to ends of firestop device (Item 3) to increase its length to facilitate installation in thicker floors. 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

4. **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 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 jacketing and insulation.
   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 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 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).
   I. Max RG6/U coaxial cable with fluorinated ethylene, polyethylene (PE), PVC or plenum rated jacketing and insulation.
   When Item 4A, 4B, 4C, 4D, 4E or 4I is used, the max F and FH Ratings are 3 hr. When Item 4F, 4G, or 4H is used, the max F and FH Ratings are 4 hr. 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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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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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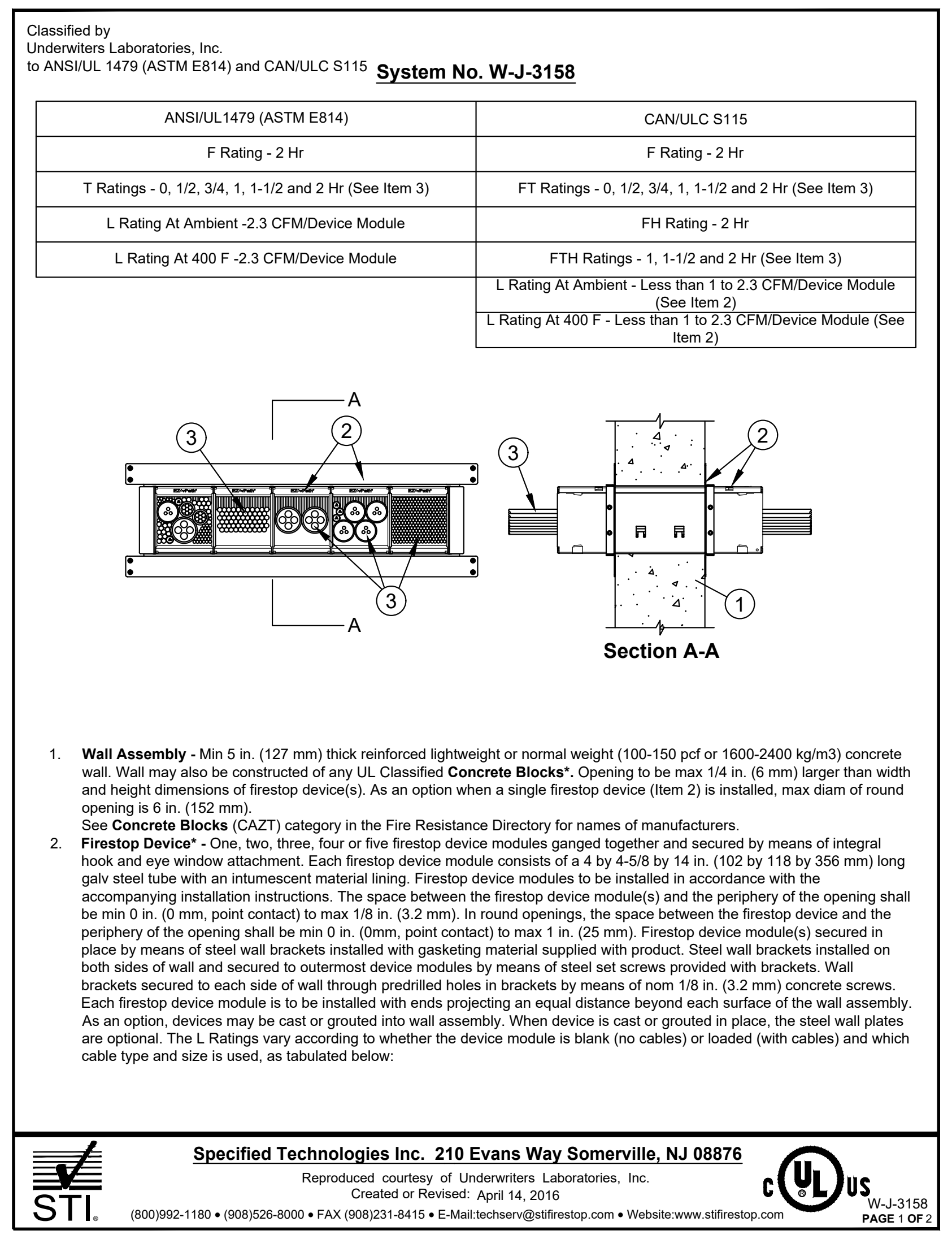

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-J-3158**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Ratings - 0, 1/2, 3/4, 1, 1-1/2 and 2 Hr (See Item 3)	FT Ratings - 0, 1/2, 3/4, 1, 1-1/2 and 2 Hr (See Item 3)
L Rating At Ambient -2.3 CFM/Device Module	FH Rating - 2 Hr
L Rating At 400 F -2.3 CFM/Device Module	FTH Ratings - 1, 1-1/2 and 2 Hr (See Item 3)
	L Rating At Ambient - Less than 1 to 2.3 CFM/Device Module (See Item 2)
	L Rating At 400 F - Less than 1 to 2.3 CFM/Device Module (See Item 2)

1. **Wall Assembly -** Min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete wall. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Opening to be max 1/4 in. (6 mm) larger than width and height dimensions of firestop device(s). As an option when a single firestop device (Item 2) is installed, max diam of round opening is 6 in. (152 mm).
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. **Firestop Device* -** One, two, three, four or five firestop device modules ganged together and secured by means of integral hook and eye window attachment. Each firestop device module consists of a 4 by 4-5/8 by 14 in. (102 by 118 by 356 mm) long galv steel tube with an intumescent material lining. Firestop device modules to be installed in accordance with the accompanying installation instructions. The space between the firestop device module(s) and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 1/8 in. (3.2 mm). In round openings, the space between the firestop device and the periphery of the opening shall be min 0 in. (0mm, point contact) to max 1 in. (25 mm). Firestop device module(s) secured in place by means of steel wall brackets installed with gasketing material supplied with product. Steel wall brackets installed on both sides of wall and secured to outermost device modules by means of steel set screws provided with brackets. Wall brackets secured to each side of wall through predrilled holes in brackets by means of nom 1/8 in. (3.2 mm) concrete screws. Each firestop device module is to be installed with ends projecting an equal distance beyond each surface of the wall assembly. As an option, devices may be cast or grouted into wall assembly. When device is cast or grouted in place, the steel wall plates are optional. The L Ratings vary according to whether the device module is blank (no cables) or loaded (with cables) and which cable type and size is used, as tabulated below:

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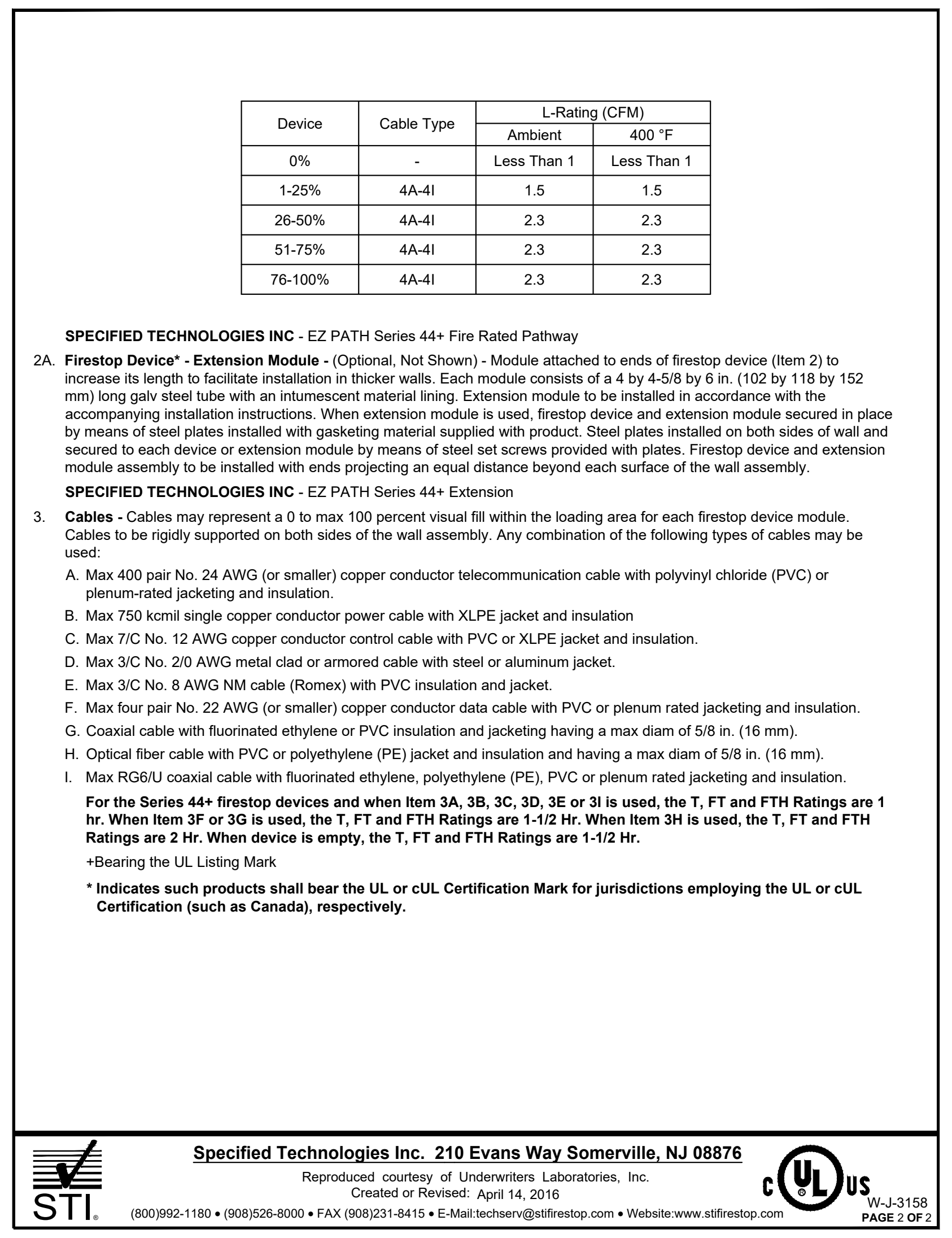

Device	Cable Type	L-Rating (CFM)	
		Ambient	400 °F
0%	-	Less Than 1	Less Than 1
1-25%	4A-4I	1.5	1.5
26-50%	4A-4I	2.3	2.3
51-75%	4A-4I	2.3	2.3
76-100%	4A-4I	2.3	2.3

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

2A. **Firestop Device* - Extension Module -** (Optional, Not Shown) - Module attached to ends of firestop device (Item 2) to increase its length to facilitate installation in thicker 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 extension module is used, firestop device and extension module secured in place by means of steel plates installed with gasketing material supplied with product. Steel plates installed on both sides of wall and secured to each device or extension module by means of steel set screws provided with plates. Firestop device and extension module assembly to be installed with ends projecting an equal distance beyond each surface of the wall assembly.

SPECIFIED TECHNOLOGIES INC - EZ PATH Series 44+ Extension

3. **Cables -** Cables may represent a 0 to max 100 percent visual fill within the loading area for each firestop device module. Cables to be rigidly supported on both sides of the 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 jacketing and insulation.
   - 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 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 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).
   - I. Max RG6/U coaxial cable with fluorinated ethylene, polyethylene (PE), PVC or plenum rated jacketing and insulation.

For the Series 44+ firestop devices and when Item 3A, 3B, 3C, 3D, 3E or 3I is used, the T, FT and FTH Ratings are 1 hr. When Item 3F or 3G is used, the T, FT and FTH Ratings are 1-1/2 Hr. When Item 3H is used, the T, FT and FTH Ratings are 2 Hr. When device is empty, the T, FT and FTH Ratings are 1-1/2 Hr.

+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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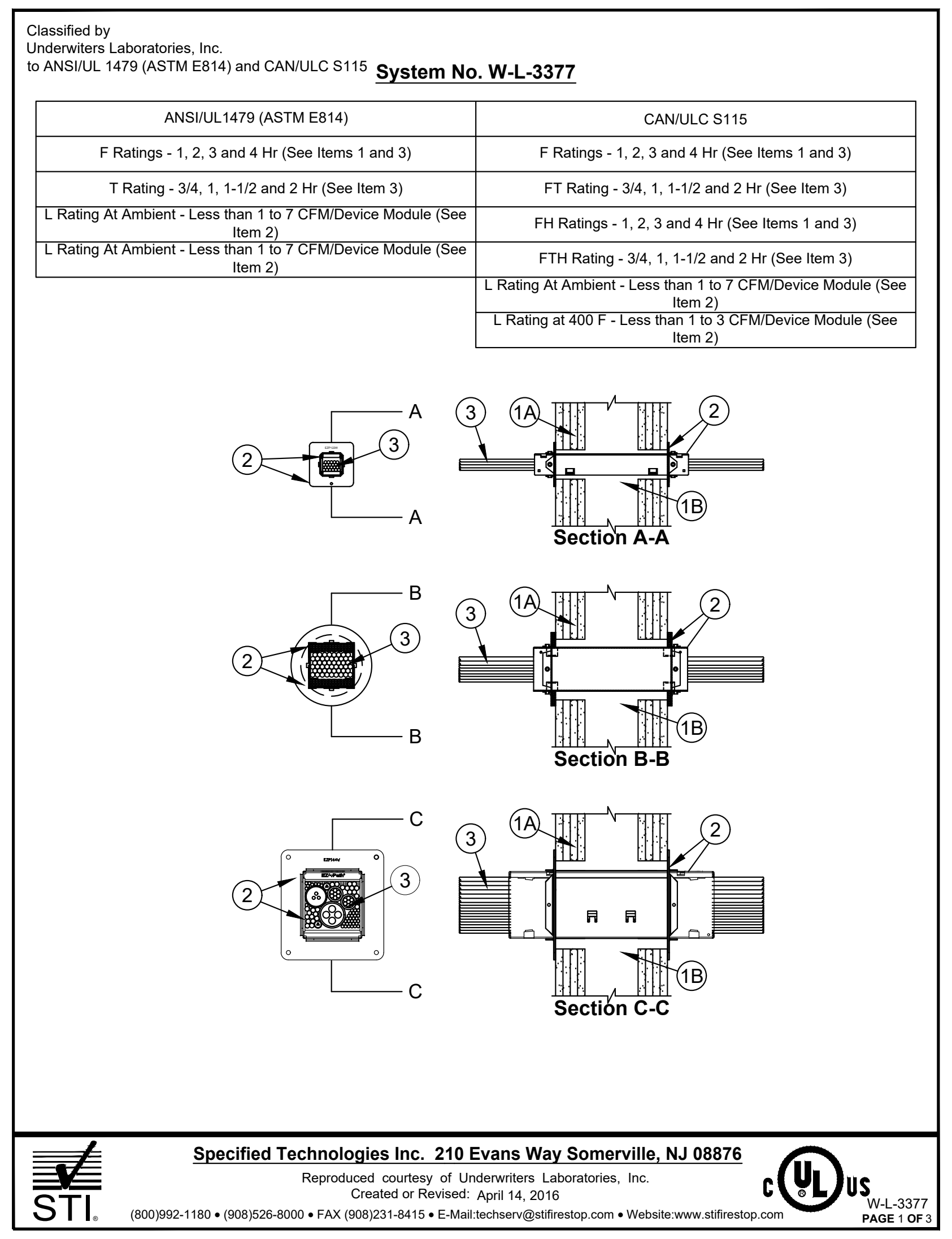

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-3377**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1, 2, 3 and 4 Hr (See Items 1 and 3)	F Ratings - 1, 2, 3 and 4 Hr (See Items 1 and 3)
T Rating - 3/4, 1, 1-1/2 and 2 Hr (See Item 3)	FT Rating - 3/4, 1, 1-1/2 and 2 Hr (See Item 3)
L Rating At Ambient - Less than 1 to 7 CFM/Device Module (See Item 2)	FH Ratings - 1, 2, 3 and 4 Hr (See Items 1 and 3)
L Rating At Ambient - Less than 1 to 7 CFM/Device Module (See Item 2)	FTH Rating - 3/4, 1, 1-1/2 and 2 Hr (See Item 3)
	L Rating At Ambient - Less than 1 to 7 CFM/Device Module (See Item 2)
	L Rating at 400 F - Less than 1 to 3 CFM/Device Module (See Item 2)

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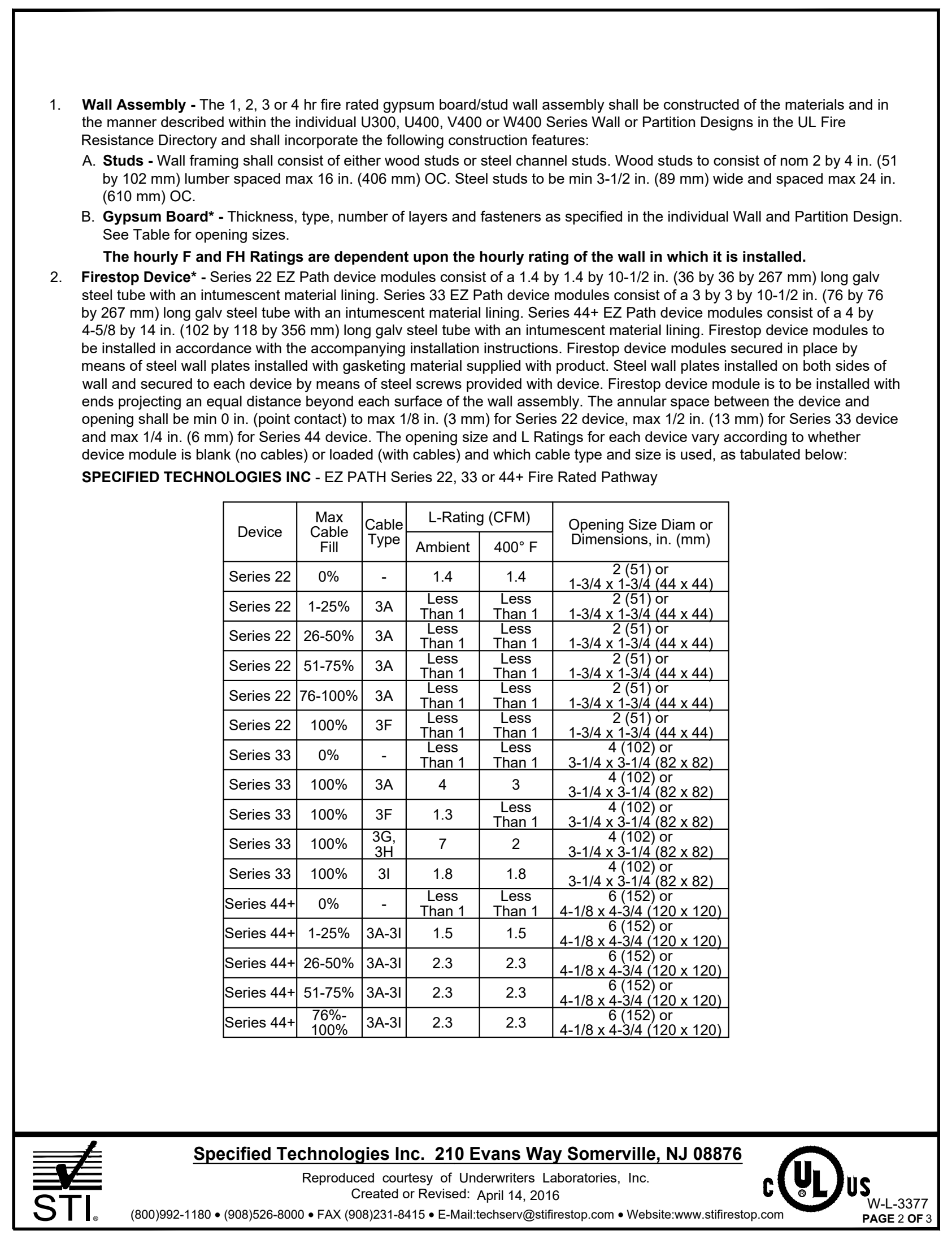

1. **Wall Assembly -** The 1, 2, 3 or 4 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, U400, V400 or W400 Series Wall or Partition Designs in the UL Fire Resistance Directory and shall incorporate the following construction features:
   - 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. (610 mm) OC.
   - B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. See Table for opening sizes.

   The hourly F and FH Ratings are dependent upon the hourly rating of the wall in which it is installed.
2. **Firestop Device* -** Series 22 EZ Path device modules consist of a 1.4 by 1.4 by 10-1/2 in. (36 by 36 by 267 mm) long galv steel tube with an intumescent material lining. Series 33 EZ Path device modules consist of a 3 by 3 by 10-1/2 in. (76 by 76 by 267 mm) long galv steel tube with an intumescent material lining. Series 44+ EZ Path device modules consist of a 4 by 4-5/8 by 14 in. (102 by 118 by 356 mm) long galv steel tube with an intumescent material lining. Firestop device modules to be installed in accordance with the accompanying installation instructions. Firestop device modules secured in place by means of steel wall plates installed with gasketing material supplied with product. Steel wall plates installed on both sides of wall and secured to each device by means of steel screws provided with device. Firestop device module is to be installed with ends projecting an equal distance beyond each surface of the wall assembly. The annular space between the device and opening shall be min 0 in. (point contact) to max 1/8 in. (3 mm) for Series 22 device, max 1/2 in. (13 mm) for Series 33 device and max 1/4 in. (6 mm) for Series 44 device. The opening size and L Ratings for each device vary according to whether device module is blank (no cables) or loaded (with cables) and which cable type and size is used, as tabulated below:

   SPECIFIED TECHNOLOGIES INC - EZ PATH Series 22, 33 or 44+ Fire Rated Pathway

Device	Max Cable Fill	Cable Type	L-Rating (CFM)		Opening Size Diam or Dimensions, in. (mm)
			Ambient	400° F	
Series 22	0%	-	1.4	1.4	2 (51) or 1-3/4 x 1-3/4 (44 x 44)
Series 22	1-25%	3A	Less Than 1	Less Than 1	2 (51) or 1-3/4 x 1-3/4 (44 x 44)
Series 22	26-50%	3A	Less Than 1	Less Than 1	2 (51) or 1-3/4 x 1-3/4 (44 x 44)
Series 22	51-75%	3A	Less Than 1	Less Than 1	2 (51) or 1-3/4 x 1-3/4 (44 x 44)
Series 22	76-100%	3A	Less Than 1	Less Than 1	2 (51) or 1-3/4 x 1-3/4 (44 x 44)
Series 22	100%	3F	Less Than 1	Less Than 1	2 (51) or 1-3/4 x 1-3/4 (44 x 44)
Series 33	0%	-	Less Than 1	Less Than 1	4 (102) or 3-1/4 x 3-1/4 (82 x 82)
Series 33	100%	3A	4	3	4 (102) or 3-1/4 x 3-1/4 (82 x 82)
Series 33	100%	3F	1.3	Less Than 1	4 (102) or 3-1/4 x 3-1/4 (82 x 82)
Series 33	100%	3G, 3H	7	2	4 (102) or 3-1/4 x 3-1/4 (82 x 82)
Series 33	100%	3I	1.8	1.8	4 (102) or 3-1/4 x 3-1/4 (82 x 82)
Series 44+	0%	-	Less Than 1	Less Than 1	6 (152) or 4-1/8 x 4-3/4 (120 x 120)
Series 44+	1-25%	3A-3I	1.5	1.5	6 (152) or 4-1/8 x 4-3/4 (120 x 120)
Series 44+	26-50%	3A-3I	2.3	2.3	6 (152) or 4-1/8 x 4-3/4 (120 x 120)
Series 44+	51-75%	3A-3I	2.3	2.3	6 (152) or 4-1/8 x 4-3/4 (120 x 120)
Series 44+	76%-100%	3A-3I	2.3	2.3	6 (152) or 4-1/8 x 4-3/4 (120 x 120)

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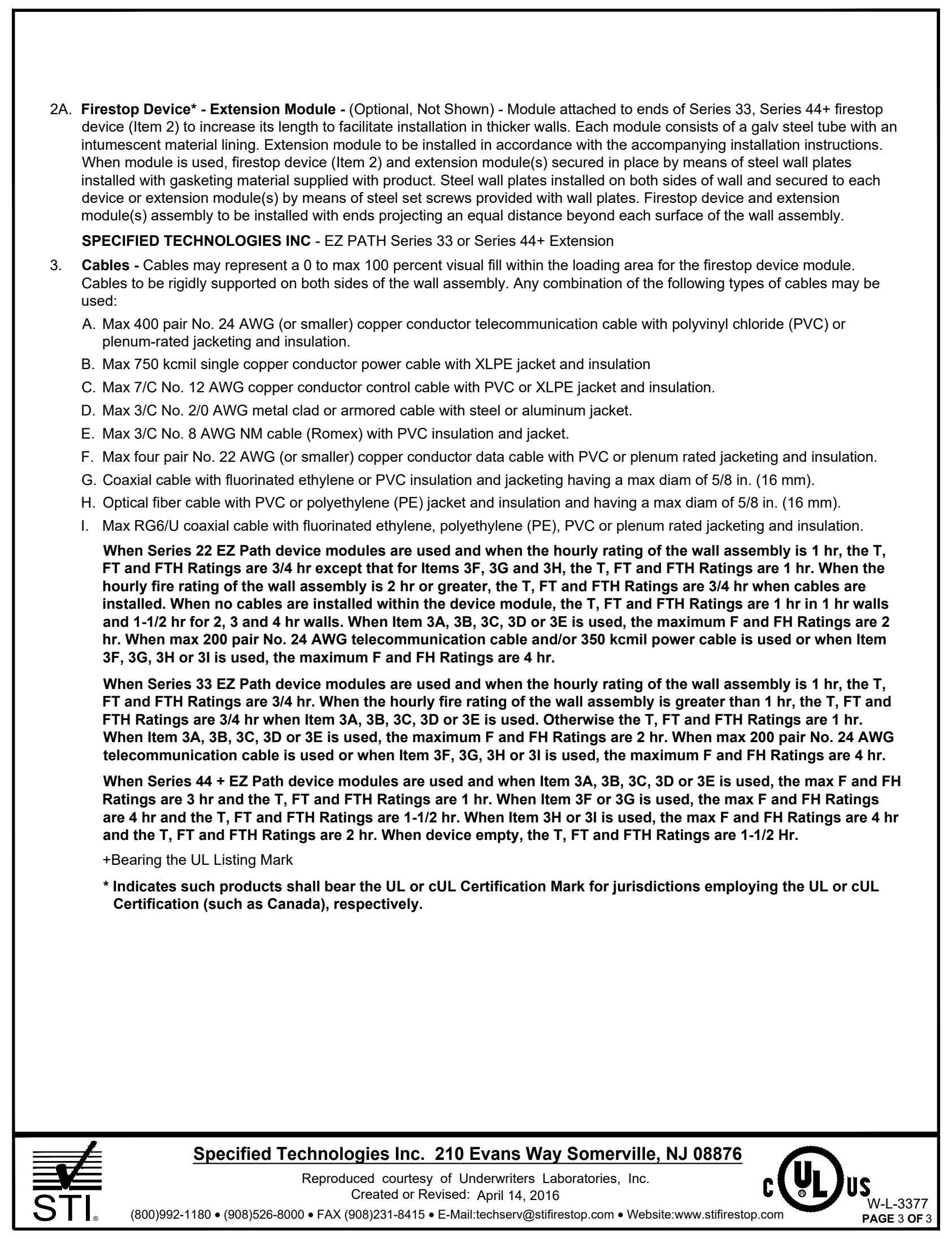

2A. **Firestop Device* - Extension Module -** (Optional, Not Shown) - Module attached to ends of Series 33, Series 44+ firestop device (Item 2) to increase its length to facilitate installation in thicker walls. Each module consists of a galv steel tube with an intumescent material lining. Extension module to be installed in accordance with the accompanying installation instructions. When module is used, firestop device (Item 2) and extension module(s) secured in place by means of steel wall plates installed with gasketing material supplied with product. Steel wall plates installed on both sides of wall and secured to each device or extension module(s) by means of steel set screws provided with wall plates. Firestop device and extension module(s) assembly to be installed with ends projecting an equal distance beyond each surface of the wall assembly.

SPECIFIED TECHNOLOGIES INC - EZ PATH Series 33 or Series 44+ Extension

3. **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 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 jacketing and insulation.
   - 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 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 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).
   - I. Max RG6/U coaxial cable with fluorinated ethylene, polyethylene (PE), PVC or plenum rated jacketing and insulation.

When Series 22 EZ Path device modules are used and when the hourly rating of the wall assembly is 1 hr, the T, FT and FTH Ratings are 3/4 hr except that for Items 3F, 3G and 3H, the T, FT and FTH Ratings are 1 hr. When the hourly fire rating of the wall assembly is 2 hr or greater, the T, FT and FTH Ratings are 3/4 hr when cables are installed. When no cables are installed within the device module, the T, FT and FTH Ratings are 1 hr in 1 hr walls and 1-1/2 hr for 2, 3 and 4 hr walls. When Item 3A, 3B, 3C, 3D or 3E is used, the maximum F and FH Ratings are 2 hr. When max 200 pair No. 24 AWG telecommunication cable and/or 350 kcmil power cable is used or when Item 3F, 3G, 3H or 3I is used, the maximum F and FH Ratings are 4 hr.

When Series 33 EZ Path device modules are used and when the hourly rating of the wall assembly is 1 hr, the T, FT and FTH Ratings are 3/4 hr. When the hourly fire rating of the wall assembly is greater than 1 hr, the T, FT and FTH Ratings are 3/4 hr when Item 3A, 3B, 3C, 3D or 3E is used. Otherwise the T, FT and FTH Ratings are 1 hr. When Item 3A, 3B, 3C, 3D or 3E is used, the maximum F and FH Ratings are 2 hr. When max 200 pair No. 24 AWG telecommunication cable is used or when Item 3F, 3G, 3H or 3I is used, the maximum F and FH Ratings are 4 hr.

When Series 44 + EZ Path device modules are used and when Item 3A, 3B, 3C, 3D or 3E is used, the max F and FH Ratings are 3 hr and the T, FT and FTH Ratings are 1 hr. When Item 3F or 3G is used, the max F and FH Ratings are 4 hr and the T, FT and FTH Ratings are 1-1/2 hr. When Item 3H or 3I is used, the max F and FH Ratings are 4 hr and the T, FT and FTH Ratings are 2 hr. When device empty, the T, FT and FTH Ratings are 1-1/2 Hr.

+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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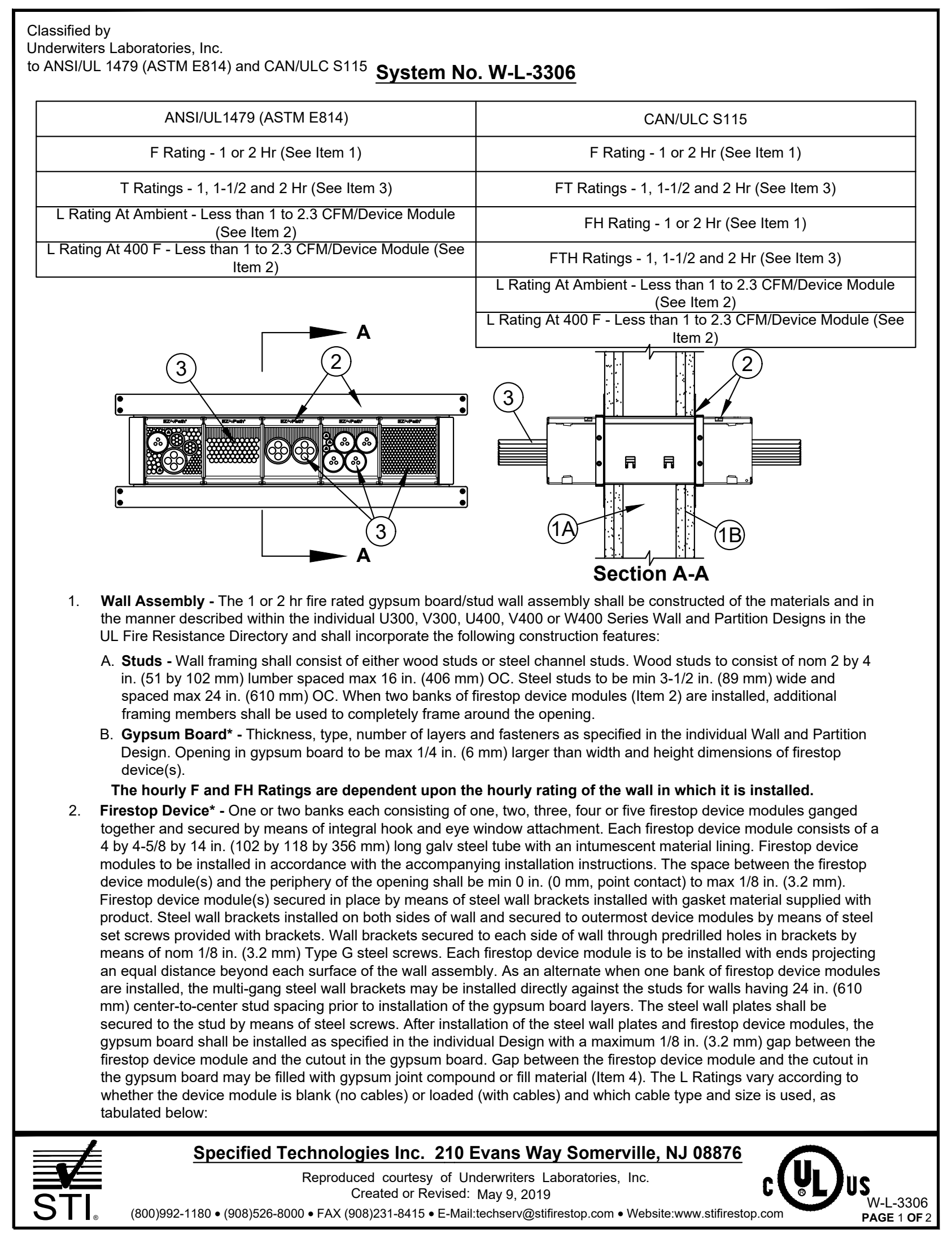

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-3306**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 1 or 2 Hr (See Item 1)	F Rating - 1 or 2 Hr (See Item 1)
T Ratings - 1, 1-1/2 and 2 Hr (See Item 3)	FT Ratings - 1, 1-1/2 and 2 Hr (See Item 3)
L Rating At Ambient - Less than 1 to 2.3 CFM/Device Module (See Item 2)	FH Rating - 1 or 2 Hr (See Item 1)
L Rating At 400 F - Less than 1 to 2.3 CFM/Device Module (See Item 2)	FTH Ratings - 1, 1-1/2 and 2 Hr (See Item 3)
	L Rating At Ambient - Less than 1 to 2.3 CFM/Device Module (See Item 2)
	L Rating At 400 F - Less than 1 to 2.3 CFM/Device Module (See Item 2)

1. **Wall Assembly -** The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, V300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall incorporate the following construction features:
   - 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. (610 mm) OC. When two banks of firestop device modules (Item 2) are installed, additional framing members shall be used to completely frame around the opening.
   - B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Opening in gypsum board to be max 1/4 in. (6 mm) larger than width and height dimensions of firestop device(s).

   The hourly F and FH Ratings are dependent upon the hourly rating of the wall in which it is installed.
2. **Firestop Device* -** One or two banks each consisting of one, two, three, four or five firestop device modules ganged together and secured by means of integral hook and eye window attachment. Each firestop device module consists of a 4 by 4-5/8 by 14 in. (102 by 118 by 356 mm) long galv steel tube with an intumescent material lining. Firestop device modules to be installed in accordance with the accompanying installation instructions. The space between the firestop device module(s) and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 1/8 in. (3.2 mm). Firestop device module(s) secured in place by means of steel wall brackets installed with gasket material supplied with product. Steel wall brackets installed on both sides of wall and secured to outermost device modules by means of steel set screws provided with brackets. Wall brackets secured to each side of wall through predrilled holes in brackets by means of nom 1/8 in. (3.2 mm) Type G steel screws. Each firestop device module is to be installed with ends projecting an equal distance beyond each surface of the wall assembly. As an alternate when one bank of firestop device modules are installed, the multi-gang steel wall brackets may be installed directly against the studs for walls having 24 in. (610 mm) center-to-center stud spacing prior to installation of the gypsum board layers. The steel wall plates shall be secured to the stud by means of steel screws. After installation of the steel wall plates and firestop device modules, the gypsum board shall be installed as specified in the individual Design with a maximum 1/8 in. (3.2 mm) gap between the firestop device module and the cutout in the gypsum board. Gap between the firestop device module and the cutout in the gypsum board may be filled with gypsum joint compound or fill material (Item 4). The L Ratings vary according to whether the device module is blank (no cables) or loaded (with cables) and which cable type and size is used, as tabulated below:

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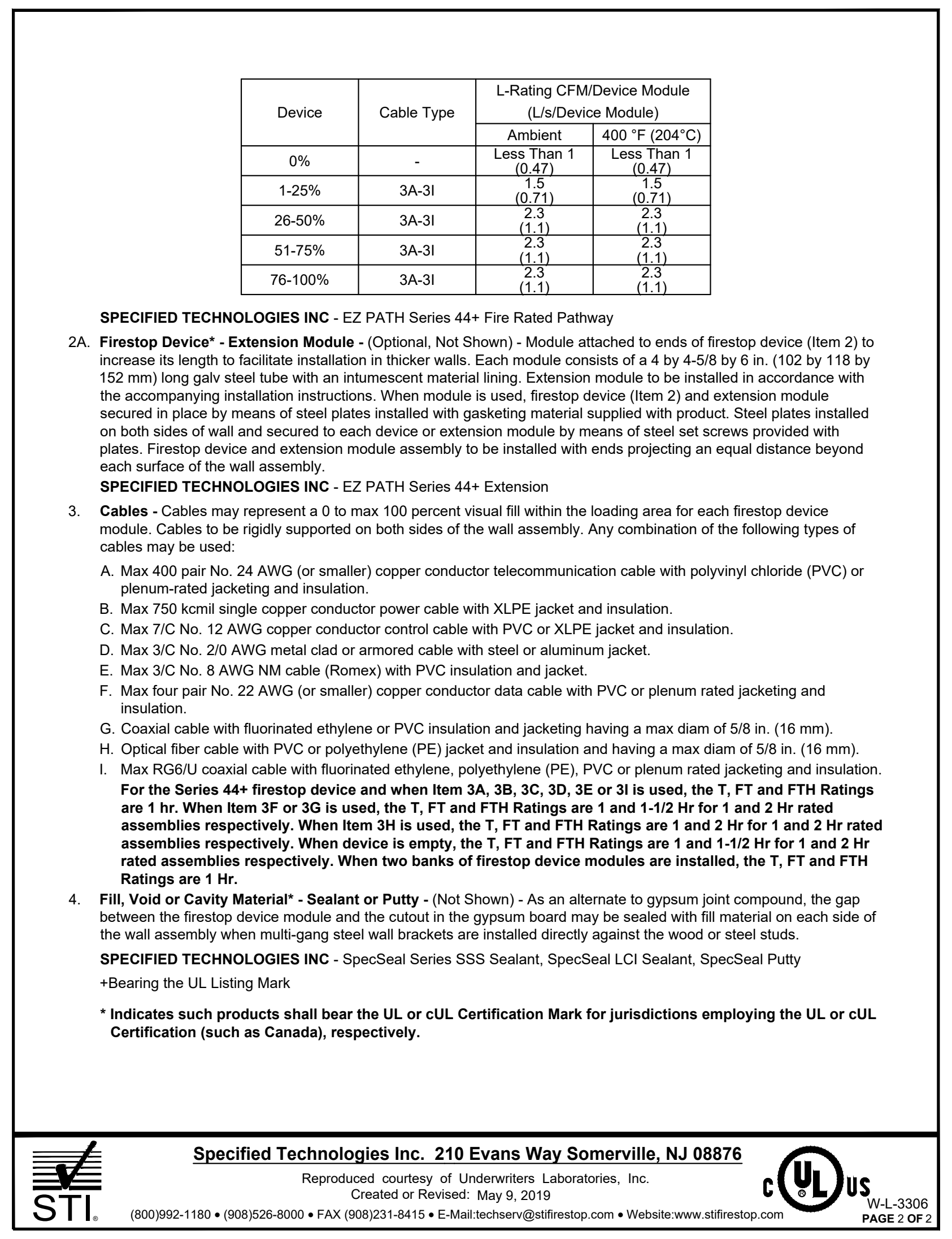

Device	Cable Type	L-Rating CFM/Device Module (L/s/Device Module)	
		Ambient	400 °F (204°C)
0%	-	Less Than 1 (0.47)	Less Than 1 (0.47)
1-25%	3A-3I	1.5 (0.71)	1.5 (0.71)
26-50%	3A-3I	2.3 (1.1)	2.3 (1.1)
51-75%	3A-3I	2.3 (1.1)	2.3 (1.1)
76-100%	3A-3I	2.3 (1.1)	2.3 (1.1)

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

2A. **Firestop Device* - Extension Module -** (Optional, Not Shown) - Module attached to ends of firestop device (Item 2) to increase its length to facilitate installation in thicker 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 2) and extension module secured in place by means of steel plates installed with gasketing material supplied with product. Steel plates installed on both sides of wall and secured to each device or extension module by means of steel set screws provided with plates. Firestop device and extension module assembly to be installed with ends projecting an equal distance beyond each surface of the wall assembly.

SPECIFIED TECHNOLOGIES INC - EZ PATH Series 44+ Extension

3. **Cables -** Cables may represent a 0 to max 100 percent visual fill within the loading area for each firestop device module. Cables to be rigidly supported on both sides of the 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 jacketing and insulation.
   - 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 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 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).
   - I. Max RG6/U coaxial cable with fluorinated ethylene, polyethylene (PE), PVC or plenum rated jacketing and insulation.

   For the Series 44+ firestop device and when Item 3A, 3B, 3C, 3D, 3E or 3I is used, the T, FT and FTH Ratings are 1 hr. When Item 3F or 3G is used, the T, FT and FTH Ratings are 1 and 1-1/2 Hr for 1 and 2 Hr rated assemblies respectively. When Item 3H is used, the T, FT and FTH Ratings are 1 and 2 Hr for 1 and 2 Hr rated assemblies respectively. When device is empty, the T, FT and FTH Ratings are 1 and 1-1/2 Hr for 1 and 2 Hr rated assemblies respectively. When two banks of firestop device modules are installed, the T, FT and FTH Ratings are 1 Hr.
4. **Fill, Void or Cavity Material* - Sealant or Putty -** (Not Shown) - As an alternate to gypsum joint compound, the gap between the firestop device module and the cutout in the gypsum board may be sealed with fill material on each side of the wall assembly when multi-gang steel wall brackets are installed directly against the wood or steel studs.

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

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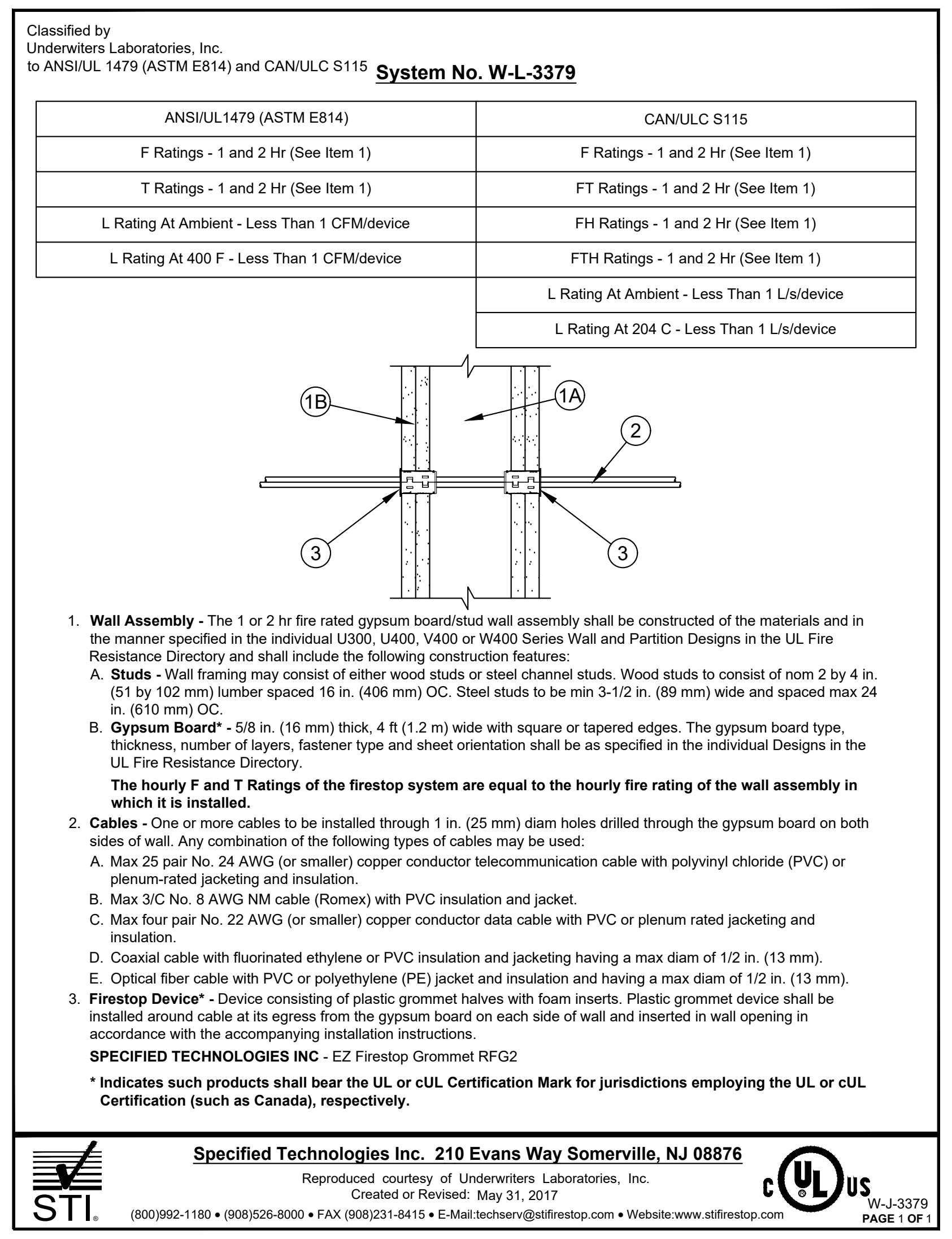

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-3379**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)	FT Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/device	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/device	FTH Ratings - 1 and 2 Hr (See Item 1)
	L Rating At Ambient - Less Than 1 L/s/device
	L Rating At 204 C - Less Than 1 L/s/device

1. **Wall Assembly -** The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   - A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 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.
   - B. **Gypsum Board* -** 5/8 in. (16 mm) thick, 4 ft (1.2 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Designs in the UL Fire Resistance Directory.

   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Cables -** One or more cables to be installed through 1 in. (25 mm) diam holes drilled through the gypsum board on both sides of wall. Any combination of the following types of cables may be used:
   - A. Max 25 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) or plenum-rated jacketing and insulation.
   - B. Max 3/C No. 8 AWG NM cable (Romex) with PVC insulation and jacket.
   - C. Max four pair No. 22 AWG (or smaller) copper conductor data cable with PVC or plenum rated jacketing and insulation.
   - D. Coaxial cable with fluorinated ethylene or PVC insulation and jacketing having a max diam of 1/2 in. (13 mm).
   - E. Optical fiber cable with PVC or polyethylene (PE) jacket and insulation and having a max diam of 1/2 in. (13 mm).
3. **Firestop Device* -** Device consisting of plastic grommet halves with foam inserts. Plastic grommet device shall be installed around cable at its egress from the gypsum board on each side of wall and inserted in wall opening in accordance with the accompanying installation instructions.

   SPECIFIED TECHNOLOGIES INC - EZ Firestop Grommet RFG2

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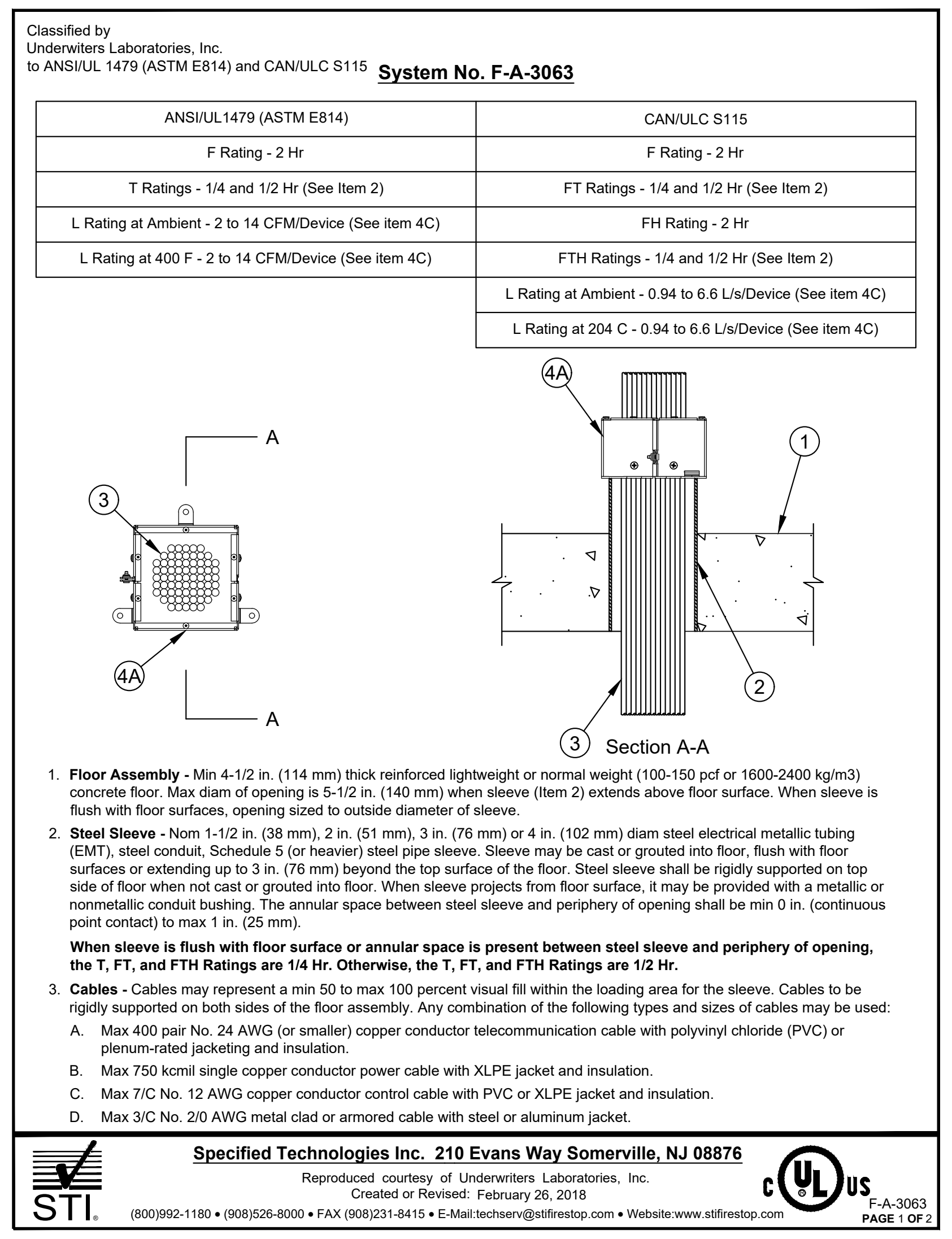

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. F-A-3063**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Ratings - 1/4 and 1/2 Hr (See Item 2)	FT Ratings - 1/4 and 1/2 Hr (See Item 2)
L Rating at Ambient - 2 to 14 CFM/Device (See item 4C)	FH Rating - 2 Hr
L Rating at 400 F - 2 to 14 CFM/Device (See item 4C)	FTH Ratings - 1/4 and 1/2 Hr (See Item 2)
	L Rating at Ambient - 0.94 to 6.6 L/s/Device (See item 4C)
	L Rating at 204 C - 0.94 to 6.6 L/s/Device (See item 4C)

1. **Floor Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor. Max diam of opening is 5-1/2 in. (140 mm) when sleeve (Item 2) extends above floor surface. When sleeve is flush with floor surfaces, opening sized to outside diameter of sleeve.
2. **Steel Sleeve -** 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. Sleeve may be cast or grouted into floor, flush with floor surfaces or extending up to 3 in. (76 mm) beyond the top surface of the floor. Steel sleeve shall be rigidly supported on top side of floor when not cast or grouted into floor. When sleeve projects from floor surface, it may be provided with a metallic or nonmetallic conduit bushing. The annular space between steel sleeve and periphery of opening shall be min 0 in. (continuous point contact) to max 1 in. (25 mm).

   When sleeve is flush with floor surface or annular space is present between steel sleeve and periphery of opening, the T, FT, and FTH Ratings are 1/4 Hr. Otherwise, the T, FT, and FTH Ratings are 1/2 Hr.
3. **Cables -** Cables may represent a min 50 to max 100 percent visual fill within the loading area for the sleeve. Cables to be rigidly supported on both sides of the floor 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.
   - 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.

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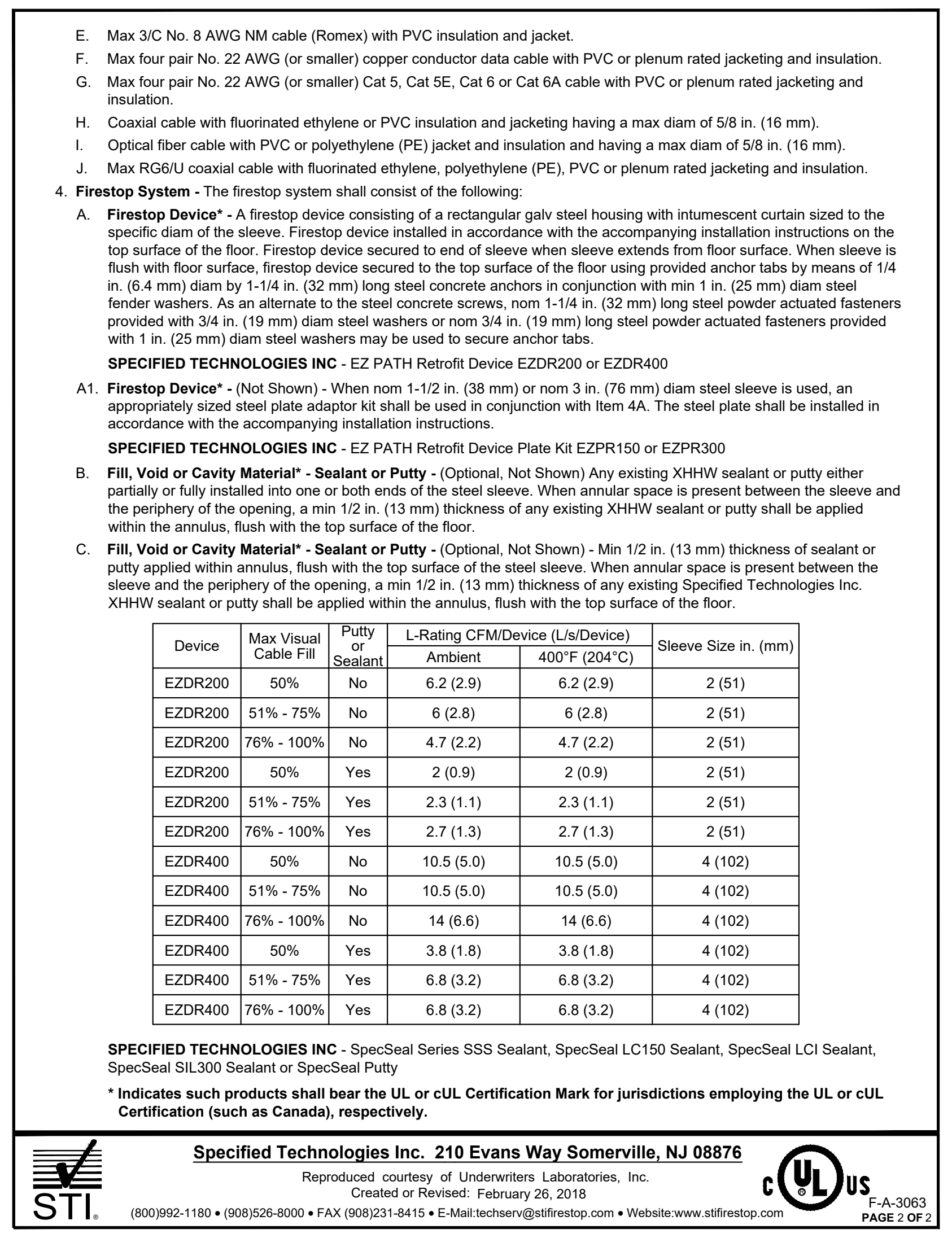

   - E. Max 3/C No. 8 AWG NM cable (Romex) with PVC insulation and jacket.
   - F. Max four pair No. 22 AWG (or smaller) copper conductor data cable with PVC or plenum rated jacketing and insulation.
   - G. Max four pair No. 22 AWG (or smaller) Cat 5, Cat 5E, Cat 6 or Cat 6A cable with PVC or plenum rated jacketing and insulation.
   - 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).
   - J. Max RG6/U coaxial cable with fluorinated ethylene, polyethylene (PE), PVC or plenum rated jacketing and insulation.
4. **Firestop System -** The firestop system shall consist of the following:
   - A. **Firestop Device* -** A firestop device consisting of a rectangular galv steel housing with intumescent curtain sized to the specific diam of the sleeve. Firestop device installed in accordance with the accompanying installation instructions on the top surface of the floor. Firestop device secured to end of sleeve when sleeve extends from floor surface. When sleeve is flush with floor surface, firestop device secured to the top surface of the floor using provided anchor tabs by means of 1/4 in. (6.4 mm) diam by 1-1/4 in. (32 mm) long steel concrete anchors in conjunction with min 1 in. (25 mm) diam steel fender washers. As an alternate to the steel concrete screws, nom 1-1/4 in. (32 mm) long steel powder actuated fasteners provided with 3/4 in. (19 mm) diam steel washers or nom 3/4 in. (19 mm) long steel powder actuated fasteners provided with 1 in. (25 mm) diam steel washers may be used to secure anchor tabs.

     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
   - B. **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 1/2 in. (13 mm) thickness of any existing XHHW sealant or putty shall be applied within the annulus, flush with the top surface of the floor.
   - C. **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 the top surface of the steel sleeve. When annular space is present between the sleeve and the periphery of the opening, a min 1/2 in. (13 mm) thickness of any existing Specified Technologies Inc. XHHW sealant or putty shall be applied within the annulus, flush with the top surface of the floor.

Device	Max Visual Cable Fill	Putty or Sealant	L-Rating CFM/Device (L/s/Device)		Sleeve Size in. (mm)
			Ambient	400°F (204°C)	
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

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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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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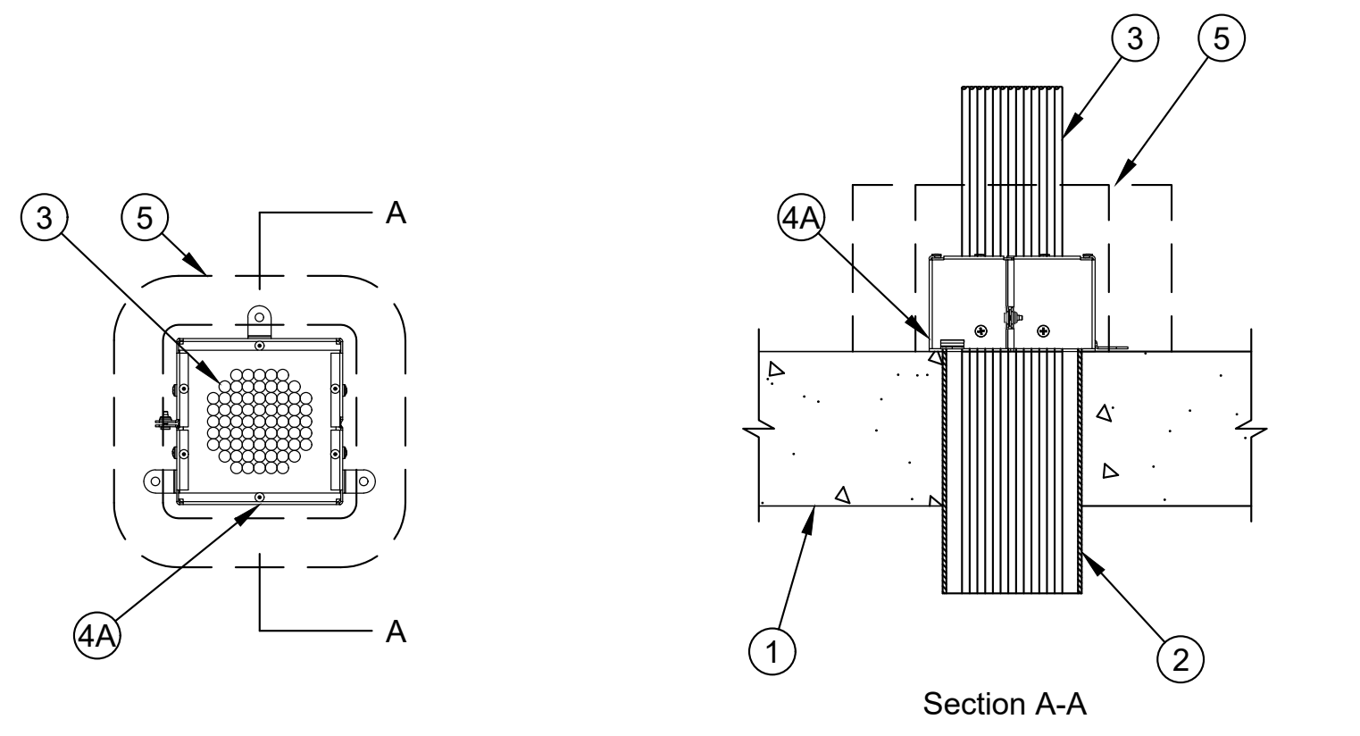
Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. F-A-3064

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Ratings - 1-1/4 and 2 Hr (See Item 5)	FT Ratings - 1-1/4 and 2 Hr (See Item 5)
L Rating at Ambient - 2 to 14 CFM/Device (See item 4C)	FH Rating - 2 Hr
L Rating at 400 F - 2 to 14 CFM/Device (See item 4C)	FTH Ratings - 1-1/4 and 2 Hr (See Item 5)
	L Rating at Ambient - 0.94 to 6.6 L/s/Device (See item 4C)
	L Rating at 204 C - 0.94 to 6.6 L/s/Device (See item 4C)



Section A-A

1. **Floor Assembly -** Min 4-1/2 in. (114 mm) 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 **Precast Concrete Units***. Max diam of opening is 4-1/2 in. (114 mm).
   See **Precast Concrete Units** (CFTV) category in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve -** Nom 1-1/2 (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. Sleeve shall be cast or grouted into floor, flush with floor surfaces or extending down to 3 in. (76 mm) beyond the bottom surface of the floor. When sleeve projects from floor surface, it may be provided with a metallic or nonmetallic conduit bushing.
3. **Cables -** Cables may represent a min 50 to max 100 percent visual fill within the loading area for the sleeve. Cables to be rigidly supported on both sides of the floor 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.
   - 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 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 insulation.
- 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).
- J. Max RG6/U coaxial cable with fluorinated ethylene, polyethylene (PE), PVC or plenum rated jacketing and insulation.

4. **Firestop System -** The firestop system shall consist of the following:
   - A. **Firestop Device* -** A firestop device consisting of a rectangular galv steel housing with intumescent curtain sized to the specific diam of the sleeve. Firestop device installed in accordance with the accompanying installation instructions on the top surface of the floor. Firestop device secured to the top surface of the floor using provided anchor tabs by means of 1/4 in. (6.4 mm) diam by 1-1/4 in. (32 mm) long steel concrete anchors in conjunction with min 1 in. (25 mm) diam steel fender washers. As an alternate to the steel concrete screws, nom 1-1/4 in. (32 mm) long steel powder actuated fasteners provided with 3/4 in. (19 mm) diam steel washers or nom 3/4 in. (19 mm) long steel powder actuated fasteners provided with 1 in. (25 mm) diam steel washers may be used to secure anchor tabs.
     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
   - B. **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.
   - C. **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 the top surface of the steel sleeve.

Device	Max Visual Cable Fill	Putty or Sealant	L-Rating CFM/Device (L/s/Device)		Sleeve Size in. (mm)
			Ambient	400°F (204°C)	
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.

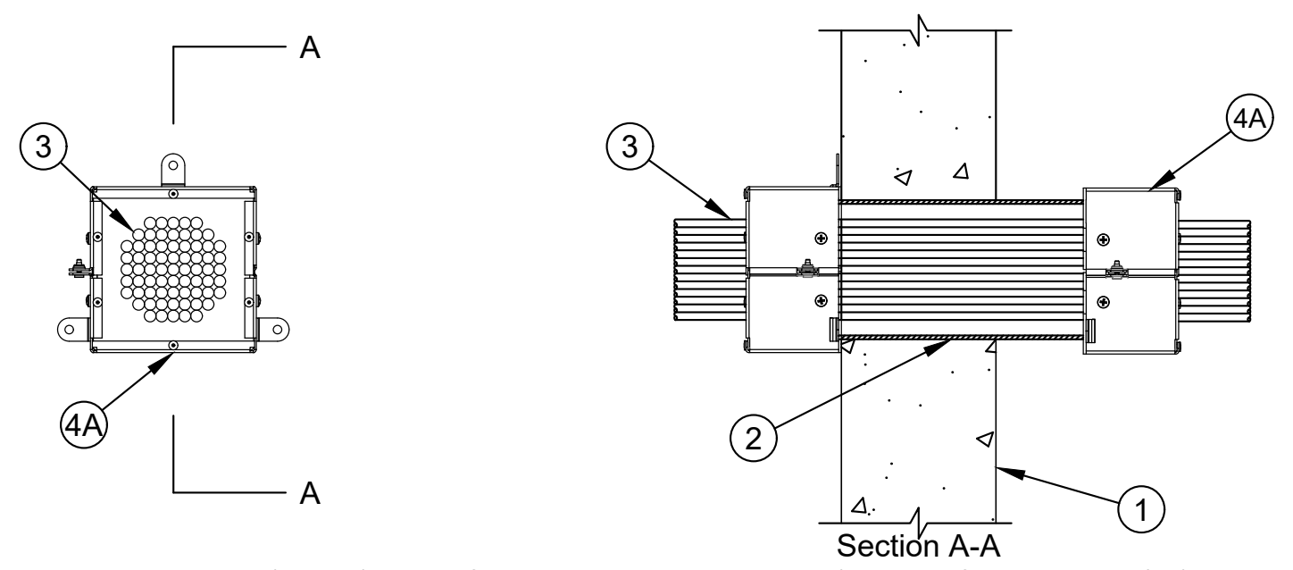
   When Item 5 is used at a min height of 18 in. (457 mm) the T, FT and FTH Ratings are 1-1/4 Hr. When Item 5 is used at a min height of 36 in. (914 mm), the T, FT and FTH Ratings are 2 Hr.

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

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-J-3240

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Ratings - 0 and 1/2 Hr (See Item 2)	FT Ratings - 0 and 1/2 Hr (See Item 2)
L Rating at Ambient - Less than 1 to 10.7 CFM/Device (See item 4C)	FH Rating - 2 Hr
L Rating at 400 F - Less than 1 to 10.7 CFM/Device (See item 4C)	FTH Ratings - 0 and 1/2 Hr (See Item 2)
	L Rating at Ambient - Less than 0.47 to 5.05 L/s/Device (See item 4C)
	L Rating at 204 C- Less than 0.47 to 5.05 L/s/Device (See item 4C)



Section A-A

1. **Wall Assembly -** Min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall assembly may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening is 5-1/2 in. (140 mm) when sleeve (Item 2) extends from wall surface. When sleeve is flush with wall surface, opening sized to outside diameter of sleeve. Max diam of opening is 4 in. (102 mm) when sleeve is not used.
   See **Concrete Blocks** (CAZT) in the Fire Resistance Directory for names of manufacturers.
2. **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) galv 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. Sleeve may be cast or grouted into wall assembly. 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 extending from the wall surfaces.

   When sleeve is flush with wall surface, the T, FT, and FTH Ratings are 1/2 Hr. Otherwise, the T, FT, and FTH Ratings are 0 Hr.
3. **Cables -** Cables may represent a min 50 to max 100 percent visual fill within the loading area for the sleeve, a nominal 2 in. (51 mm) opening or a nominal 4 in. (102 mm) 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.
   - 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 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 insulation.
- 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).
- J. Max RG6/U coaxial cable with fluorinated ethylene, polyethylene (PE), PVC or plenum rated jacketing and insulation.

4. **Firestop System -** The firestop system shall consist of the following:
   - A. **Firestop Device* -** A firestop device consisting of a rectangular galv 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 1/4 in. (6.4 mm) diam by 1-1/4 in. (32 mm) long steel concrete anchors in conjunction with min 1 in. (25 mm) diam steel fender washers. As an alternate to the steel concrete screws, nom 1-1/4 in. (32 mm) long steel powder actuated fasteners provided with 3/4 in. (19 mm) diam steel washers or nom 3/4 in. (19 mm) long steel powder actuated fasteners provided with 1 in. (25 mm) diam steel washers may be used to secure anchor tabs.
     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
   - B. **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 1/2 in. (13 mm) thickness of any existing XHHW sealant or putty shall be applied within the annulus, flush with both surfaces of wall.
   - C. **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.

Device	Max Visual Cable Fill	Putty or Sealant	L-Rating (CFM)		Sleeve Size in. (mm)
			Ambient	400°F	
EZDR200	50%	No	3.3	3.3	2 (51)
EZDR200	51% - 75%	No	3.7	3.7	2 (51)
EZDR200	76% - 100%	No	4	4	2 (51)
EZDR200	50%	Yes	Less Than 1	Less Than 1	2 (51)
EZDR200	51% - 75%	Yes	1.5	1.5	2 (51)
EZDR200	76% - 100%	Yes	1.8	1.8	2 (51)
EZDR400	50%	No	7.8	7.8	4 (102)
EZDR400	51% - 75%	No	8	8	4 (102)
EZDR400	76% - 100%	No	10.7	10.7	4 (102)
EZDR400	50%	Yes	1.3	1.3	4 (102)
EZDR400	51% - 75%	Yes	3.7	3.7	4 (102)
EZDR400	76% - 100%	Yes	5.2	5.2	4 (102)

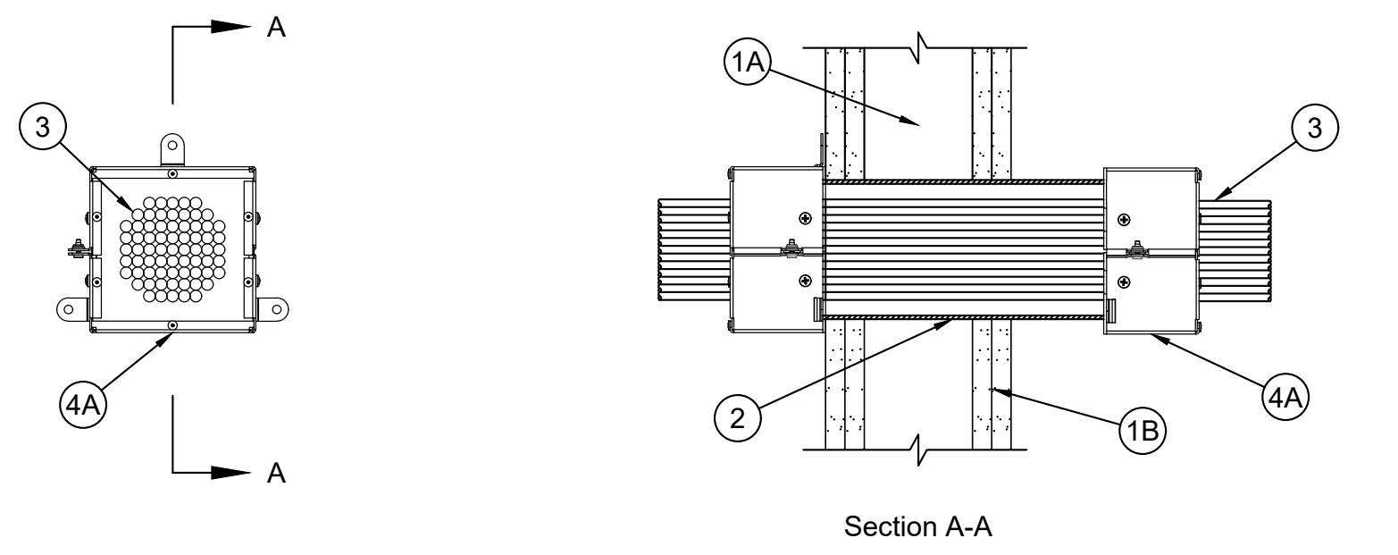
SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LC150 Sealant, SpecSeal LCI Sealant, SpecSeal SIL300 Sealant or SpecSeal Putty

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

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-3435

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 0 and 1/2 Hr (See Item 2)	FT Ratings - 0 and 1/2 Hr (See Item 2)
L Rating at Ambient - Less than 1 to 10.7 CFM/Device (See item 4C)	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating at 400 F - Less than 1 to 10.7 CFM/Device (See item 4C)	FTH Ratings - 0 and 1/2 Hr (See Item 2)
	L Rating at Ambient - Less than 0.47 to 5.05 L/s/Device (See item 4C)
	L Rating at 204 C- Less than 0.47 to 5.05 L/s/Device (See item 4C)



Section A-A

1. **Wall Assembly -** The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, V300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   - A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 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.
   - B. **Gypsum Board* -** Thickness, type, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, V300, U400 , V400 or W400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 5-1/2 in. (140 mm) when sleeve (Item 2) extends from wall surface. When sleeve is flush with wall surface, opening sized to outside diameter of sleeve. Max diam of opening is 4 in. (102 mm) when sleeve is not used.
     The F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall in which it is installed.

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2. **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) galv 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 extending from the wall surfaces.

   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.
3. **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.
   - 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 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 insulation.
   - 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).
   - J. Max RG6/U coaxial cable with fluorinated ethylene, polyethylene (PE), PVC or plenum rated jacketing and insulation.
4. **Firestop System* -** The firestop system shall consist of the following:
   - A. **Firestop Device -** A firestop device consisting of a rectangular galv 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
   - B. **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.
   - C. **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.

Device	Max Visual Cable Fill	Putty or Sealant	L-Rating (CFM)		Sleeve Size in. (mm)
			Ambient	400°F	
EZDR200	50%	No	3.3	3.3	2 (51)
EZDR200	51% - 75%	No	3.7	3.7	2 (51)
EZDR200	76% - 100%	No	4	4	2 (51)
EZDR200	50%	Yes	Less Than 1	Less Than 1	2 (51)
EZDR200	51% - 75%	Yes	1.5	1.5	2 (51)
EZDR200	76% - 100%	Yes	1.8	1.8	2 (51)
EZDR400	50%	No	7.8	7.8	4 (102)
EZDR400	51% - 75%	No	8	8	4 (102)
EZDR400	76% - 100%	No	10.7	10.7	4 (102)
EZDR400	50%	Yes	1.3	1.3	4 (102)
EZDR400	51% - 75%	Yes	3.7	3.7	4 (102)
EZDR400	76% - 100%	Yes	5.2	5.2	4 (102)

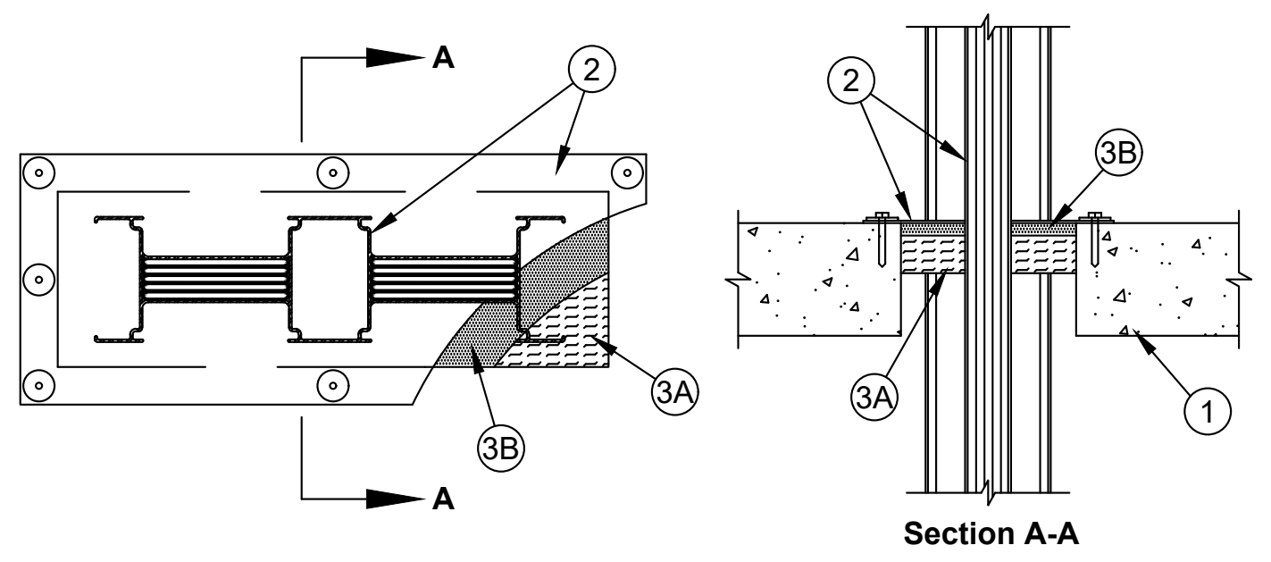
SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LC150 Sealant, SpecSeal LCI Sealant, SpecSeal SIL300 Sealant or SpecSeal Putty

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

Classified by
Underwriters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. C-AJ-6008

F Rating - 3 Hr
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft



Section A-A

1. **Floor or Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***. Opening shall be 2 in. (51 mm) to 4 in. (102 mm) greater than length and width dimensions of busway (Item 2).

   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. **Busway+ -** Max 19 in. (483 mm) wide by max 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. One busway to be installed within the opening. The 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 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 mm) long concrete anchors in accordance with busway manufacturer's installation instructions. Steel cover plate is optional when min 4 in. (102 mm) thickness of packing material (Item 3A) is used.
3. **Firestop System -** The firestop system shall consist of the following:
   - 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 opening as a permanent form. Packing material to be recessed from top surface of floor and from both surfaces of wall as required to accommodate the required thickness of fill material.
   - B. **Fill, Void or Cavity Material* - Caulk -** Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of floor and both surfaces of wall.

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

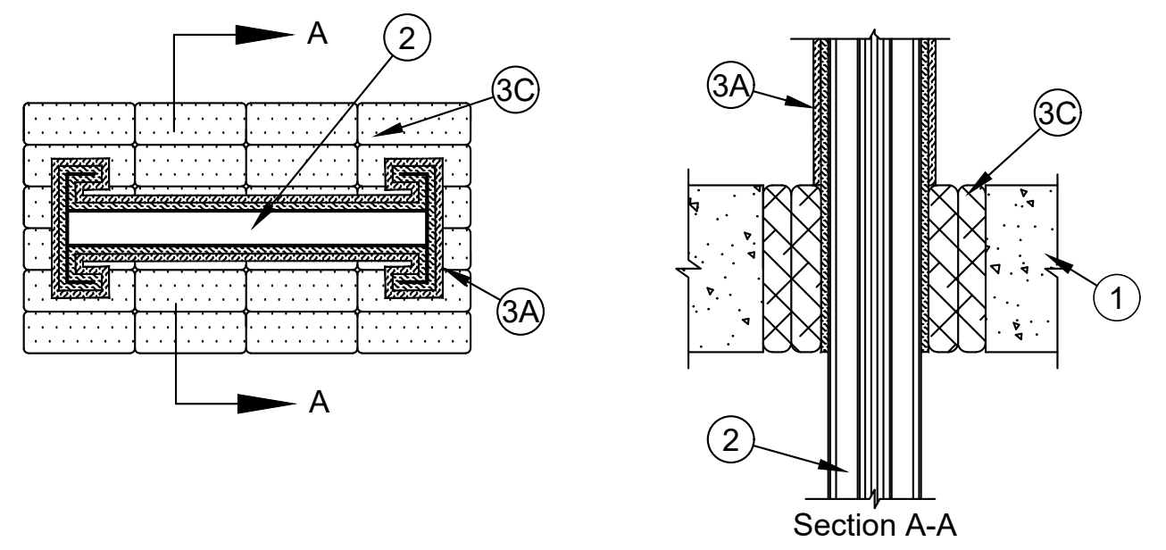
     *Bearing the UL Classification Marking

     +Bearing the UL Listing Mark

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. C-BK-6001

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 3 Hr	F Rating - 3 Hr
T Rating - 2-1/4 Hr	FT Rating - 2-1/4 Hr
L Rating At Ambient - 5.5 CFM/ft2	FH Rating - 3 Hr
L Rating At 400°F - 5.5 CFM/ft2	FTH Rating - 2-1/4 Hr
	L Rating At Ambient - 27.9 L/s/m2
	L Rating At 204°C - 27.9 L/s/m2



Section A-A

1. **Floor or Wall Assembly -** Min 9 in. (229 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***. Max area of opening is 312 sq in. (2013 cm2) with max dimension of 29-3/4 in. (756 mm).

   See **Concrete Blocks** (CAZT) in the Fire Resistance Directory for names of manufacturers.
2. **Busway+ -** Nom 26 in. (660 mm) wide (or smaller) by 6 in. (152 mm) deep "I" shaped aluminum enclosure containing factory-mounted aluminum bars rated for 600 V, 4000 A. One busway to be installed within the opening. The annular space between the busway and the periphery of the opening shall be a min 1 in. (25.4 mm) to a max 3-1/2 in. (88.9 mm). 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 the National Electrical Code, NFPA 70.

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3. **Firestop System -** The firestop system shall consist of the following:
   - A. **Fill, Void or Cavity Material* - Wrap -** Nom 0.4 in. (10 mm) flexible sheet material. A min of two layers of wrap material are required. In floors the first layer of wrap material shall be positioned flush with the bottom plane of the floor and project a min 25 in. (635 mm) above the top surface of the floor. The second layer of wrap material shall be positioned flush with the top surface of the floor and project a min 12 in. (305 mm) above the top surface of the floor. In walls the first layer of wrap material shall be continuous within the wall and project a min 25 in. (635 mm) beyond each surface of the wall and the second layer of wrap material shall project a min 12 in. (305 mm) beyond each surface of the wall. Individual layers of wrap material shall be installed with each layer of wrap material installed by cutting to size and wrapping around the busway and itself such that a min 1-1/2 in. (38.1 mm) overlap is present along the longitudinal seam and with adjacent lengths of wrap material in each layer to be installed with tightly-butted ends seams. Successive layers of wrap material installed in same manner with butted end seams offset min 1-1/2 in. (38.1 mm) from butted end seams of preceding layer. Wrap material folded to maintain contact with all sides of busway. Cut edges and seams of wrap material covered with one layer of aluminum foil tape. Wrap material layers secured in place with steel tie wire (Item 3B) on outermost layer.
     SPECIFIED TECHNOLOGIES INC - Thermal Barrier Wrap
   - B. **Steel Tie Wire -** (Not shown) - Min No. 16 Gauge (1.5 mm) galvanized steel tie wire. Tie wire used to secure outside layers of wrap material and spaced max 8 in. (203 mm) OC and max 1 in. (25.4 mm) from floor or wall surfaces and on each side of transition location where second layer of wrap material terminates.
   - C. **Fill, Void or Cavity Material* - Pillows -** Nom 9 in. (229 mm) long by 4 to 6 in. (102 to 152 mm) wide by 1 to 3 in. (25.4 to 76.2 mm) thick plastic covered intumescent pillows. In floors, pillows to be installed lengthwise into the opening and positioned flush with the bottom plane of the floor. In walls, pillows to be installed lengthwise through the opening and positioned to extend equally in both directions from the approximate centerline of the wall. Pillows tightly packed into opening to fill the annular space between busway and periphery of opening.
     SPECIFIED TECHNOLOGIES INC - SpecSeal Firestop Pillows
   - D. **Fill Void or Cavity Material* - Putty or Sealant -** (Not Shown) - After installation of pillows (Item 3C), min 1/2 in. (12.7 mm) thickness of putty or sealant applied to seal any voids between the busway and the pillows on both sides of the floor or wall assembly.
     SPECIFIED TECHNOLOGIES INC - SpecSeal Putty, SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

     +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.**

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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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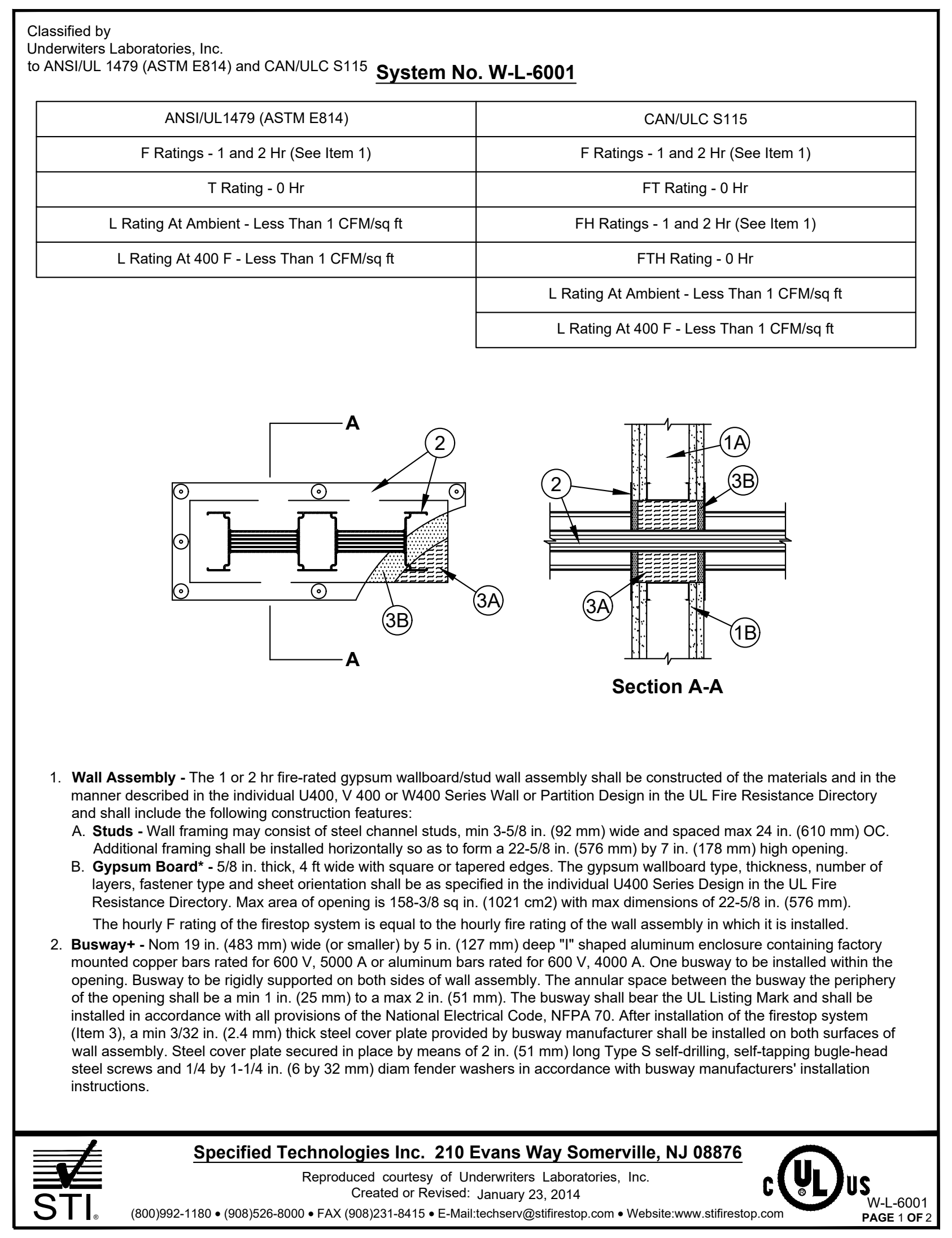
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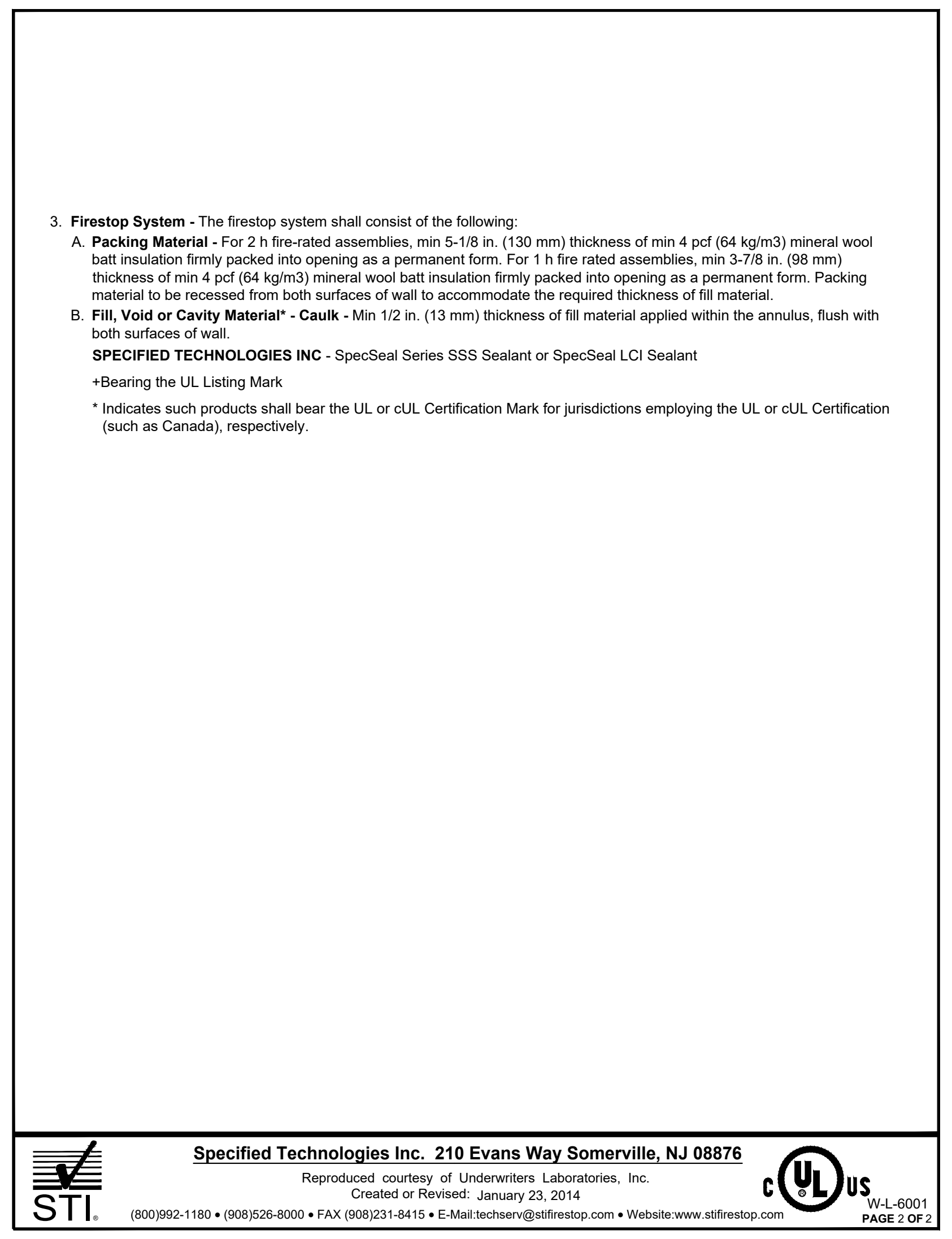
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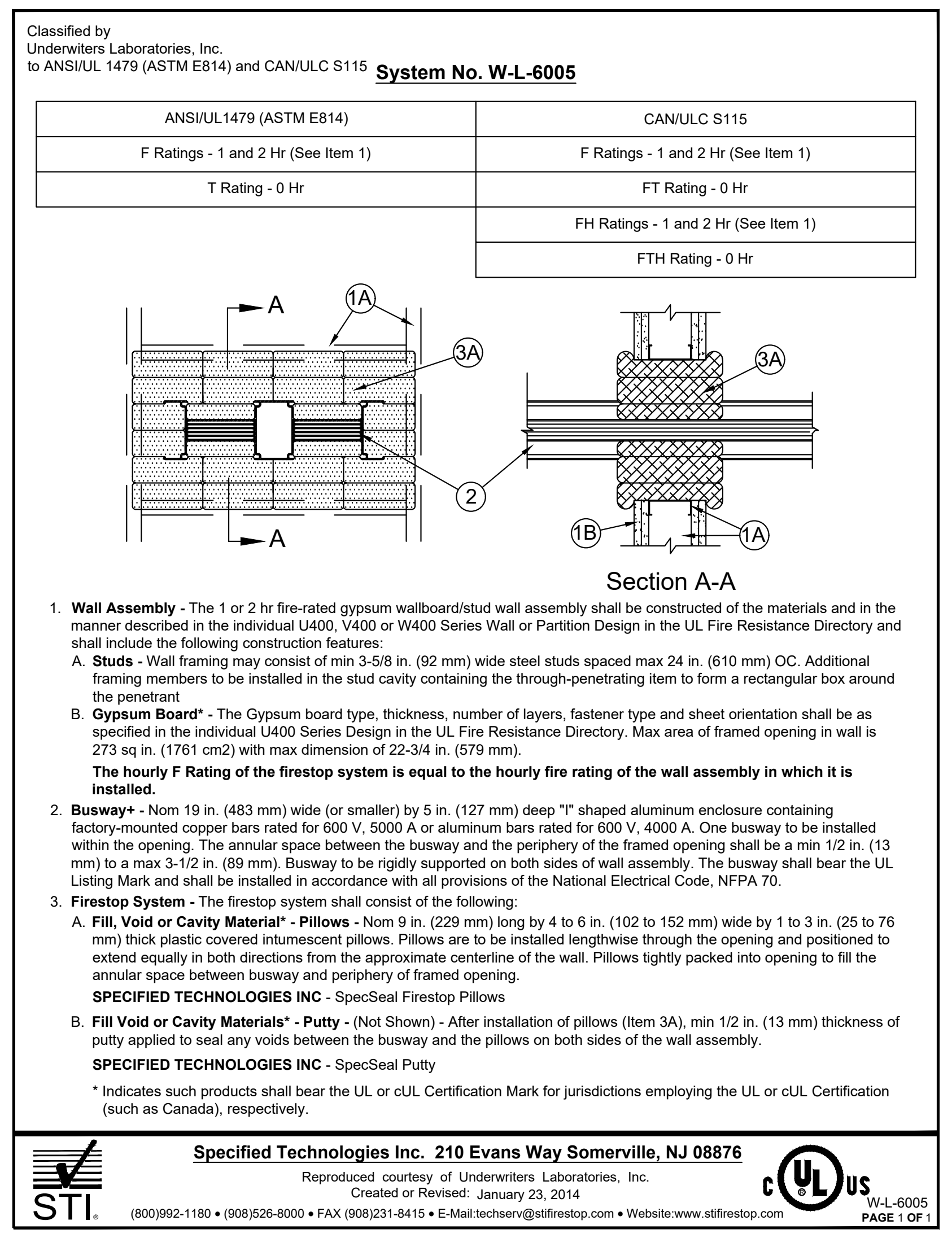
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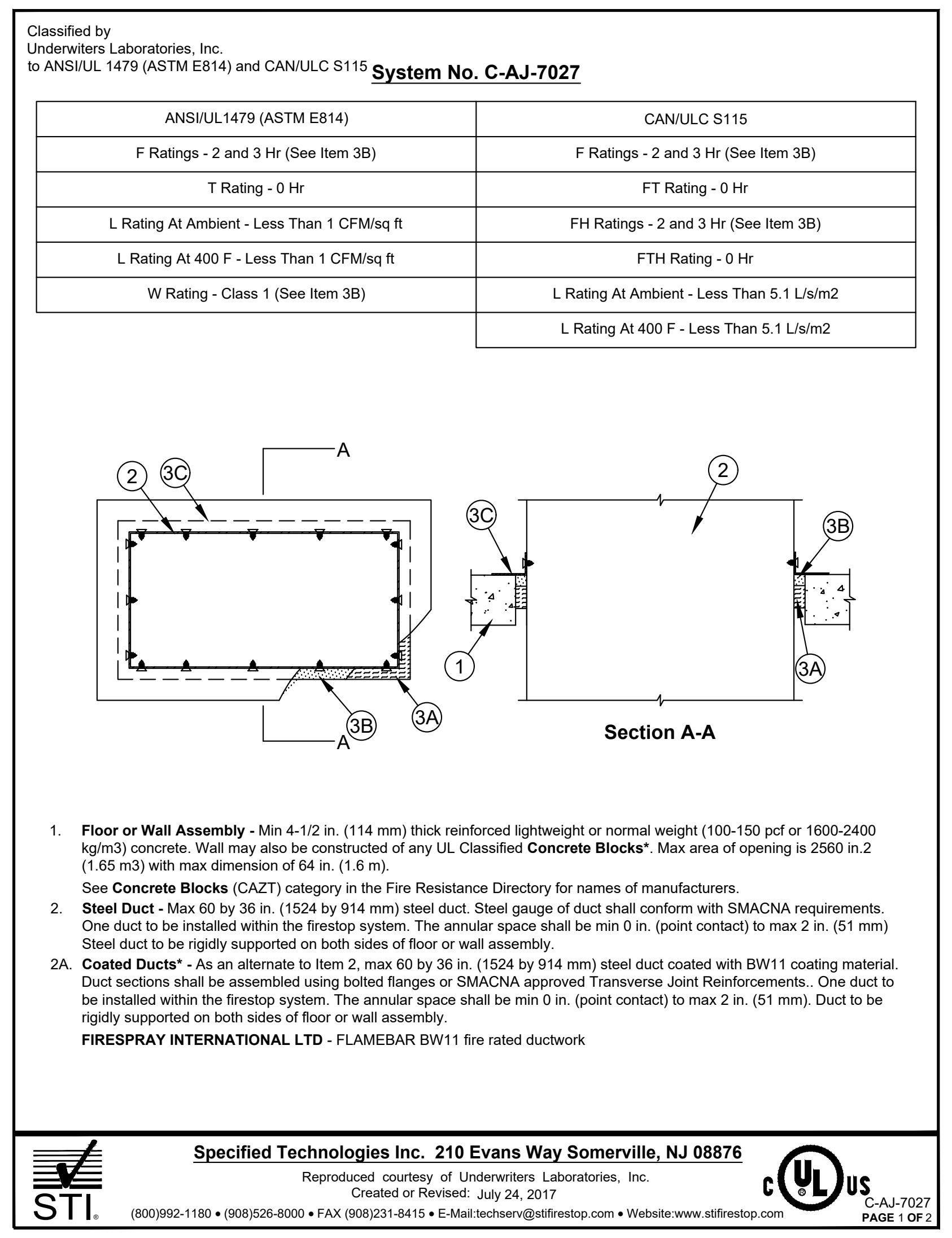
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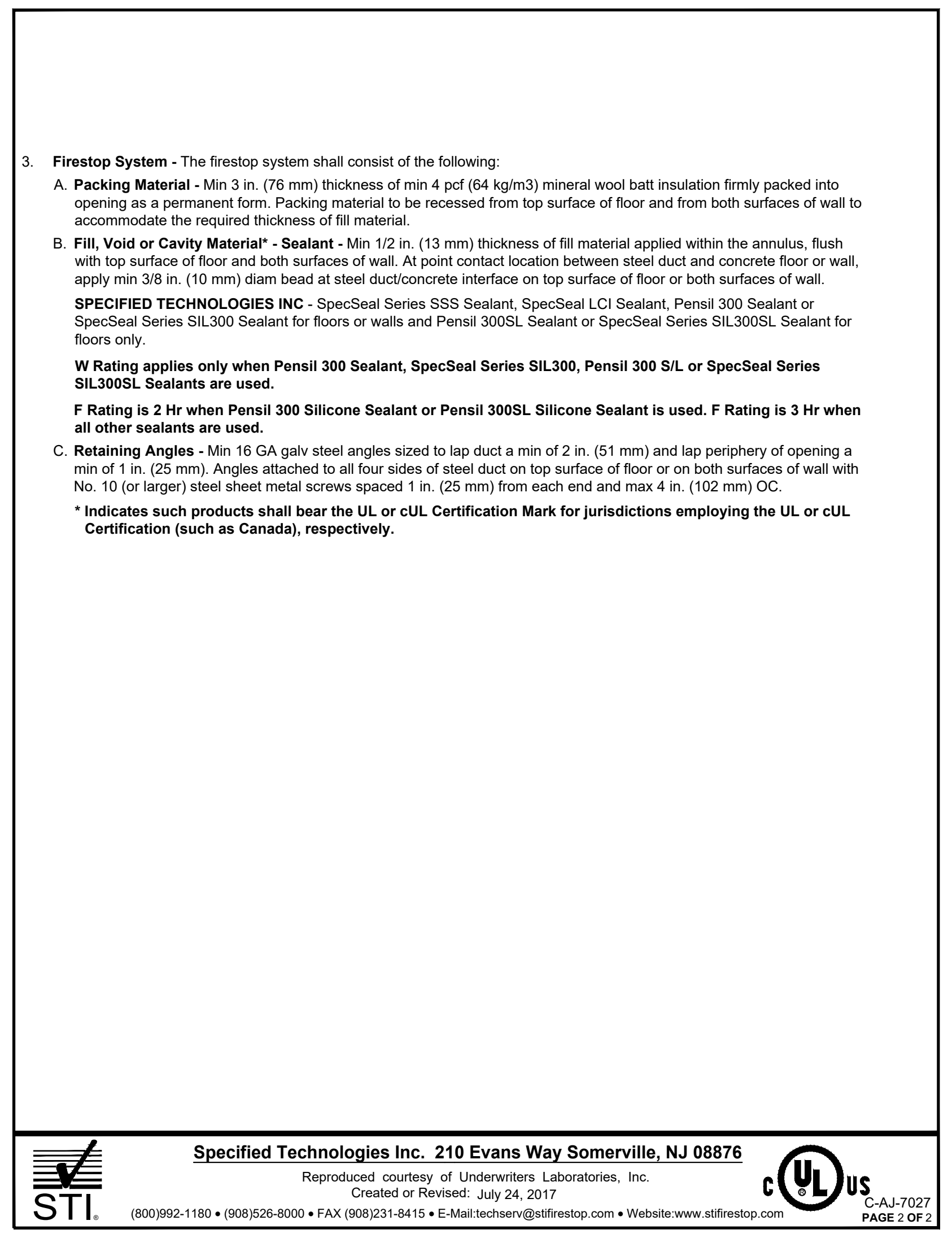
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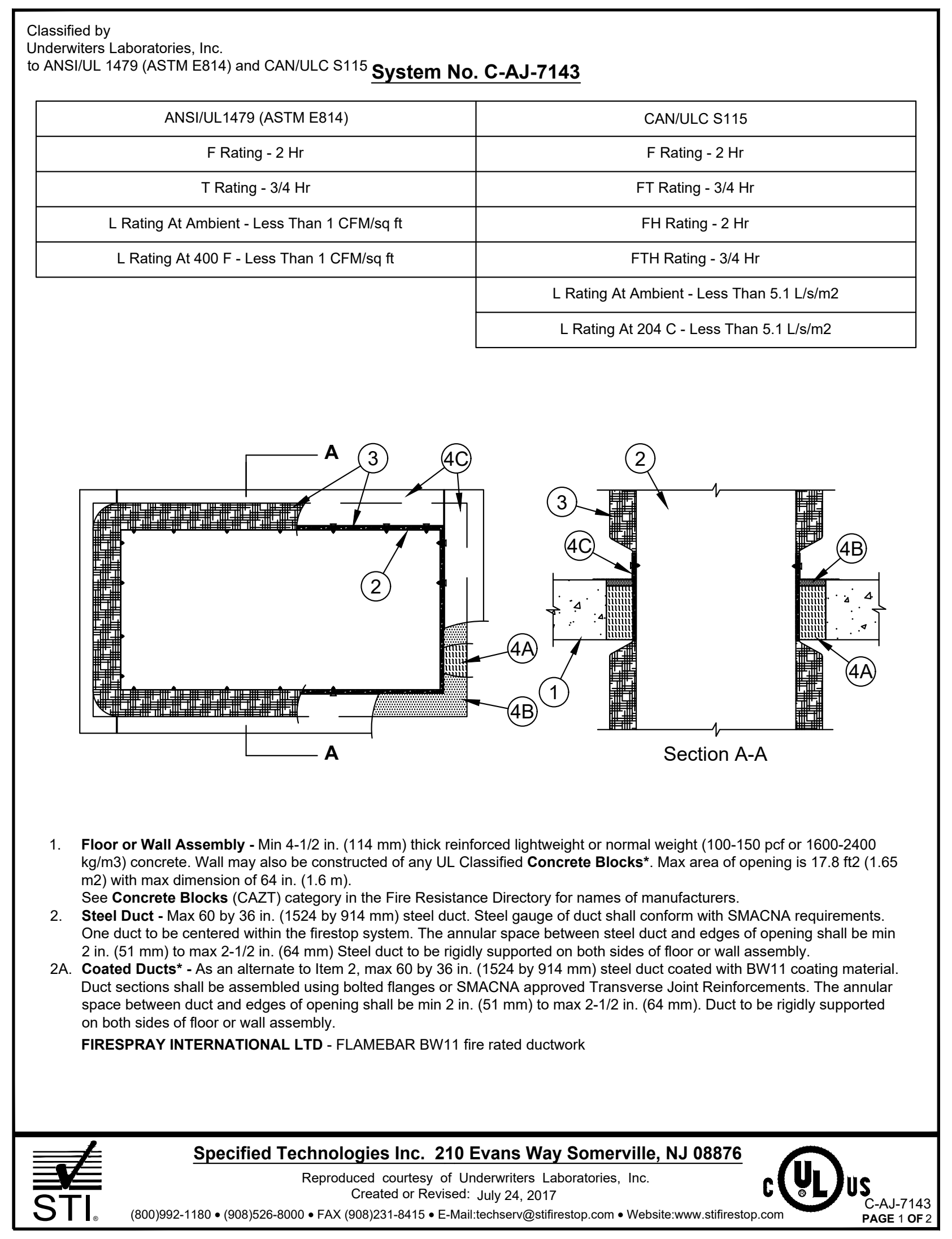
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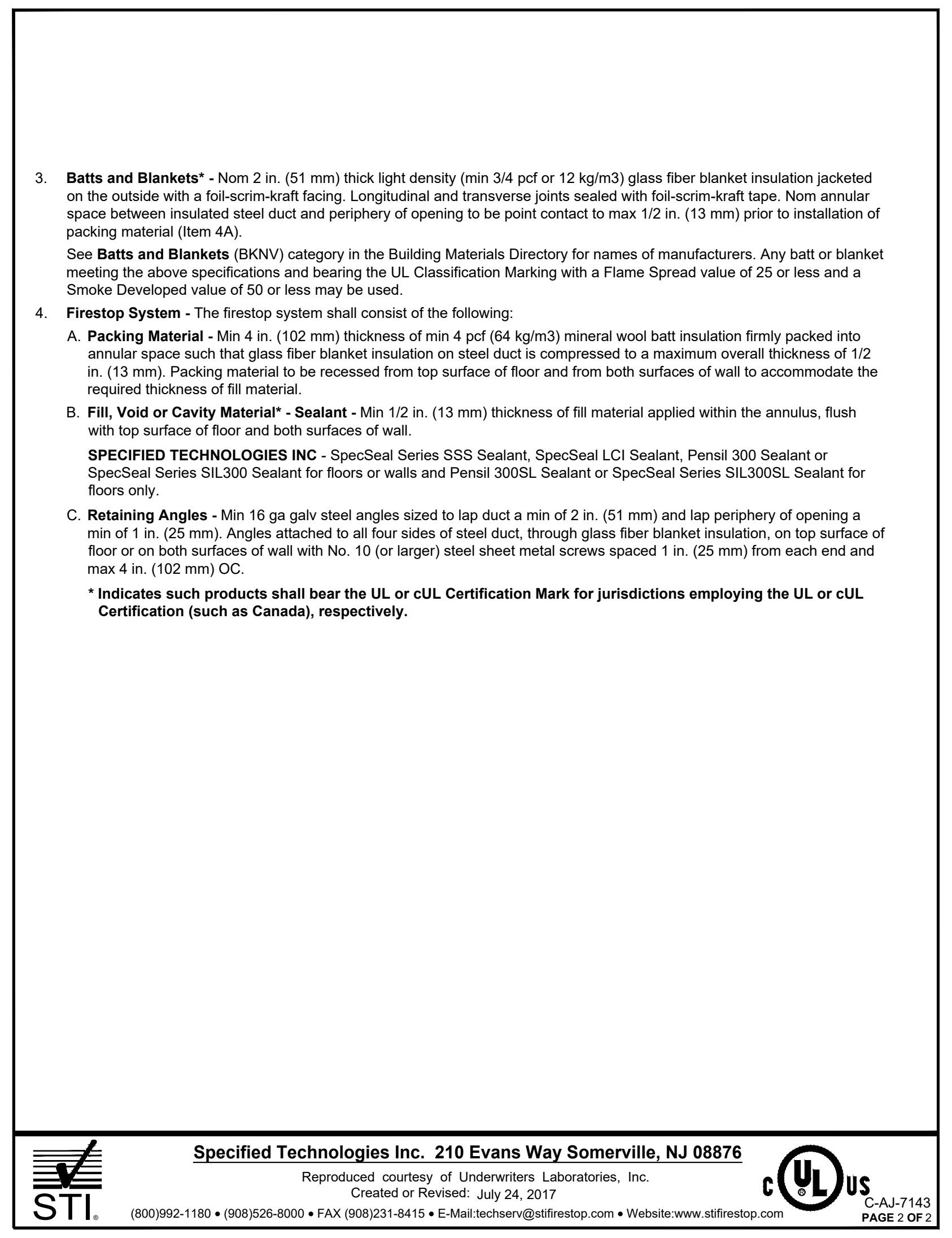
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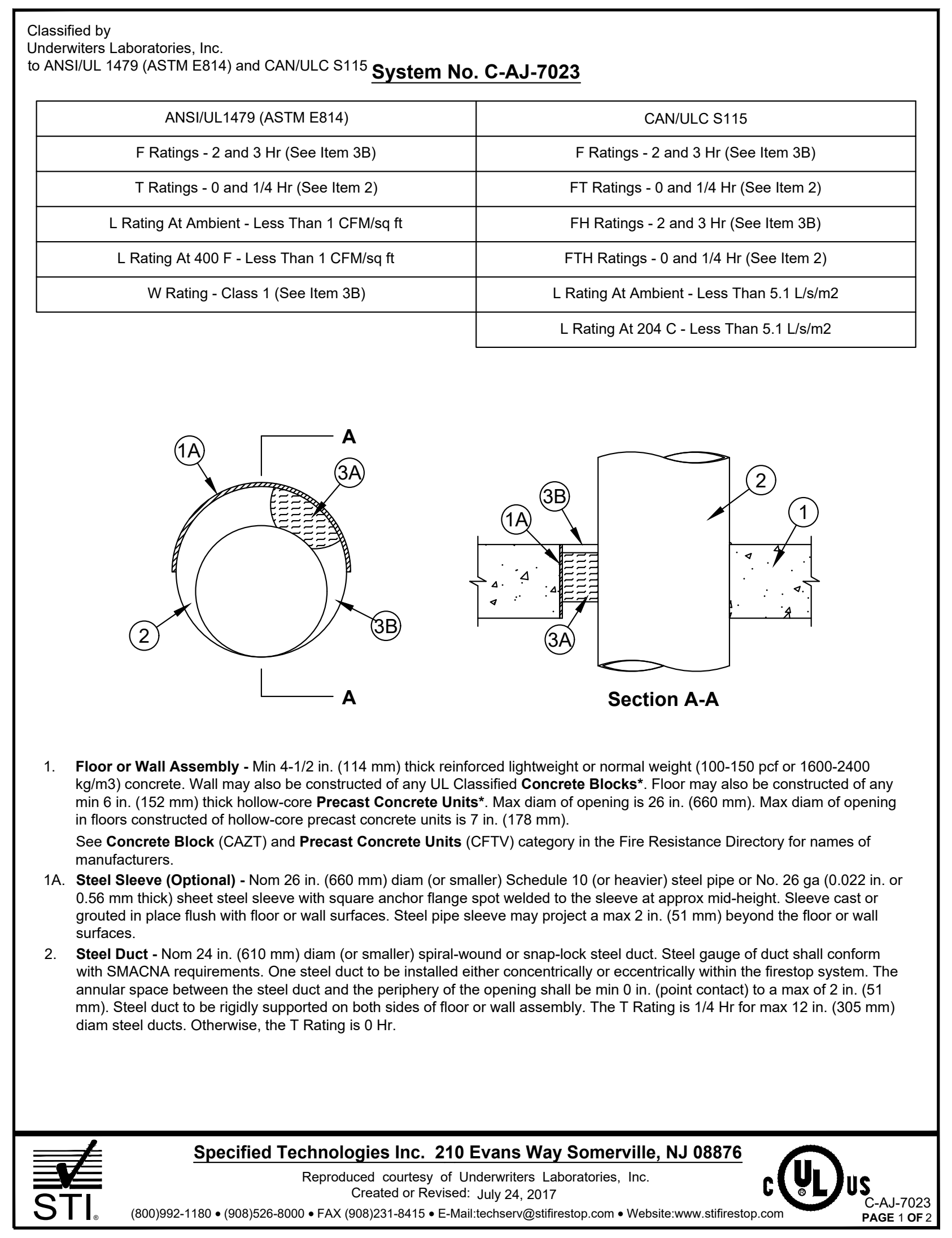
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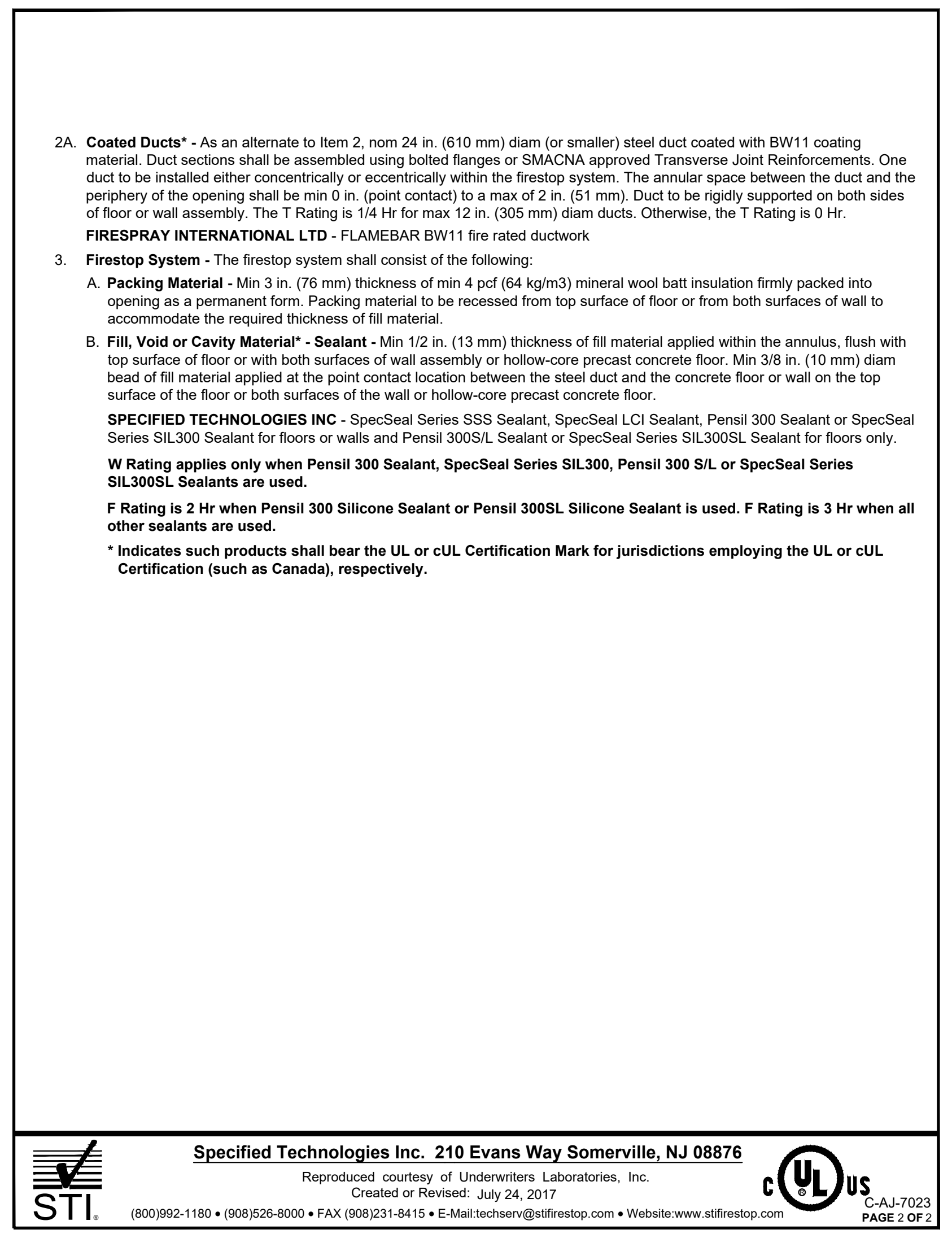
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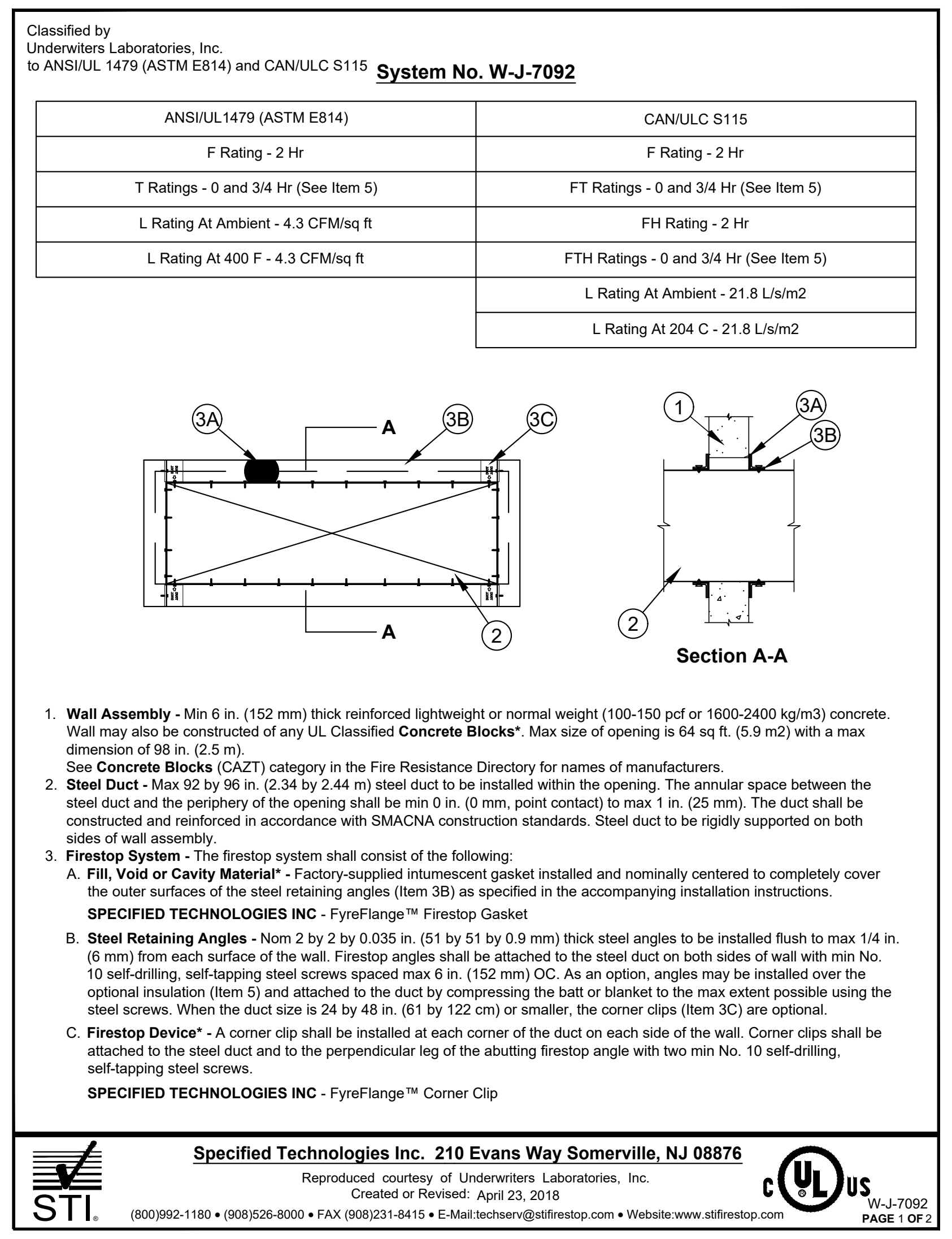
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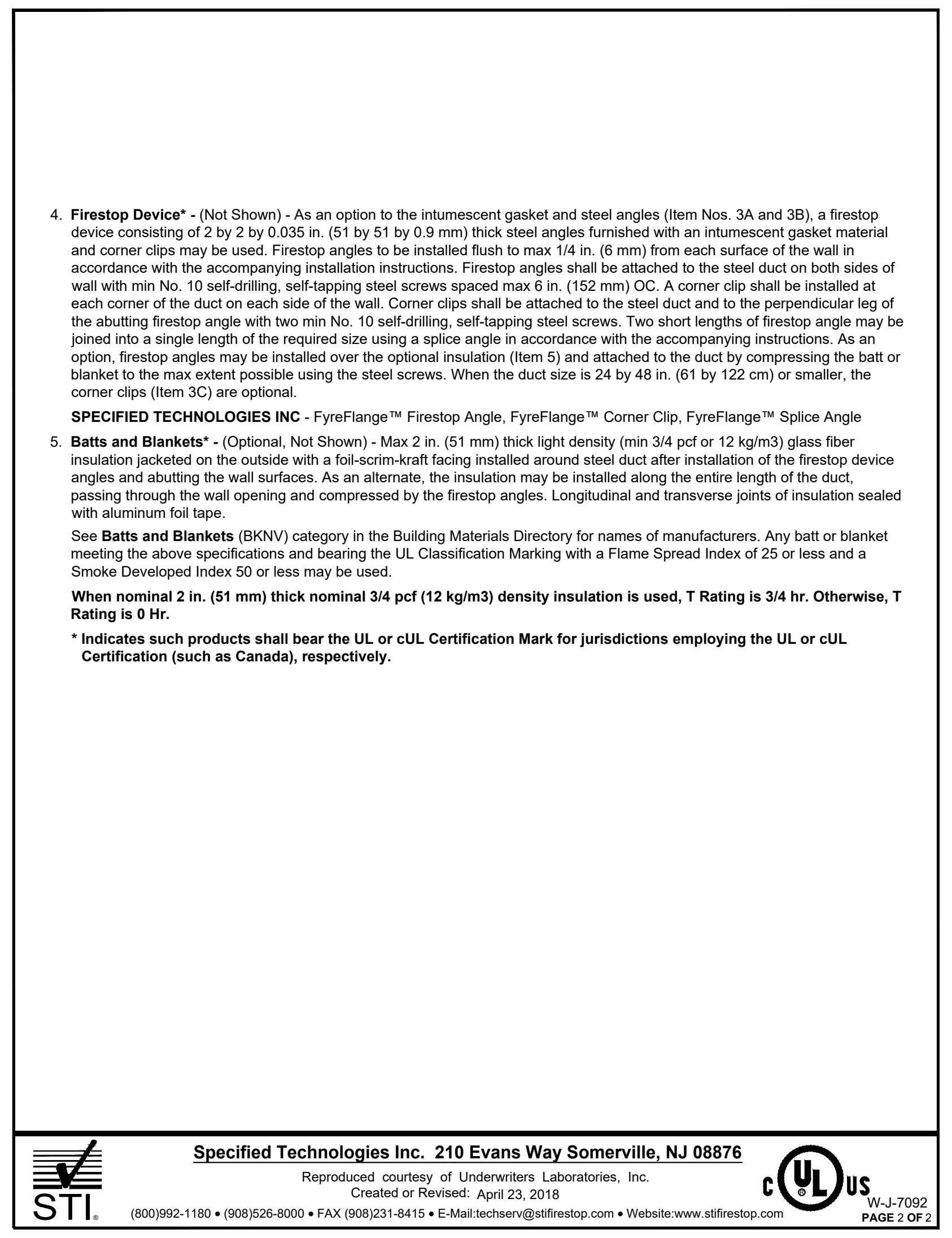
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GENERAL NOTES:

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.

DIVISION 4: Masonry
DIVISION 7: Thermal & Moisture Protection
DIVISION 9: Finishes
DIVISION 22: Plumbing
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PROJECT NAME:
PROJECT_NAME:

PROJECT LOCATION:
PROJECT_LOCATION:

ARCHITECT/CONSULTANT:
ARCHITECT/CONSULTANT:

TITLE:
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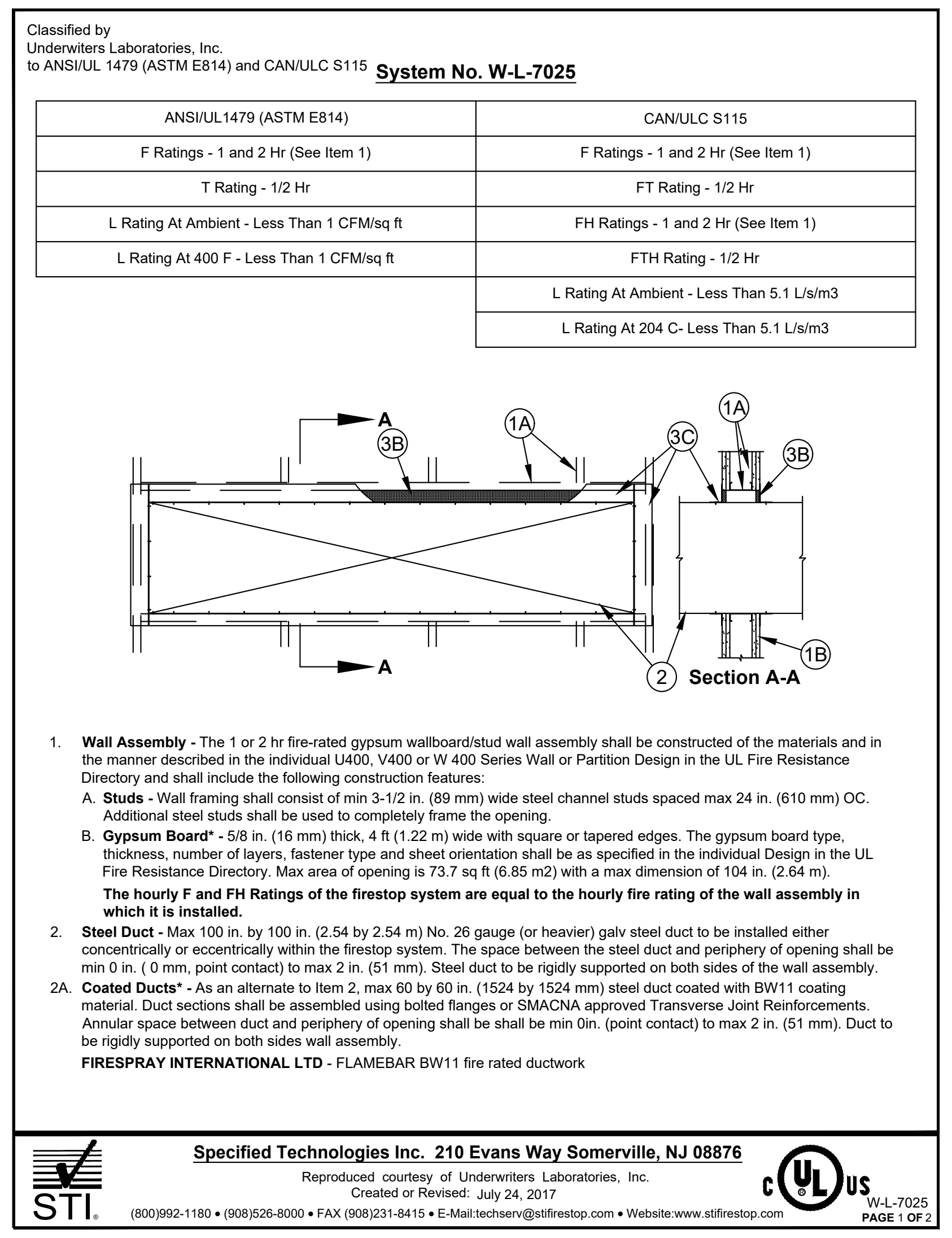

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-7025**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 1/2 Hr	FT Rating - 1/2 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Rating - 1/2 Hr
	L Rating At Ambient - Less Than 5.1 L/s/m3
	L Rating At 204 C- Less Than 5.1 L/s/m3

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W 400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing shall consist of min 3-1/2 in. (89 mm) wide steel channel studs spaced max 24 in. (610 mm) OC. Additional steel studs shall be used to completely frame the opening.
   B. **Gypsum Board* -** 5/8 in. (16 mm) thick, 4 ft (1.22 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Design in the UL Fire Resistance Directory. Max area of opening is 73.7 sq ft (6.85 m2) with a max dimension of 104 in. (2.64 m).

   The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Steel Duct -** Max 100 in. by 100 in. (2.54 by 2.54 m) No. 26 gauge (or heavier) galv steel duct to be installed either concentrically or eccentrically within the firestop system. The space between the steel duct and periphery of opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Steel duct to be rigidly supported on both sides of the wall assembly.

2A. **Coated Ducts* -** As an alternate to Item 2, max 60 by 60 in. (1524 by 1524 mm) steel duct coated with BW11 coating material. Duct sections shall be assembled using bolted flanges or SMACNA approved Transverse Joint Reinforcements. Annular space between duct and periphery of opening shall be shall be min 0in. (point contact) to max 2 in. (51 mm). Duct to be rigidly supported on both sides wall assembly.

FIRESPRAY INTERNATIONAL LTD - FLAMEBAR BW11 fire rated ductwork

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W-L-7025
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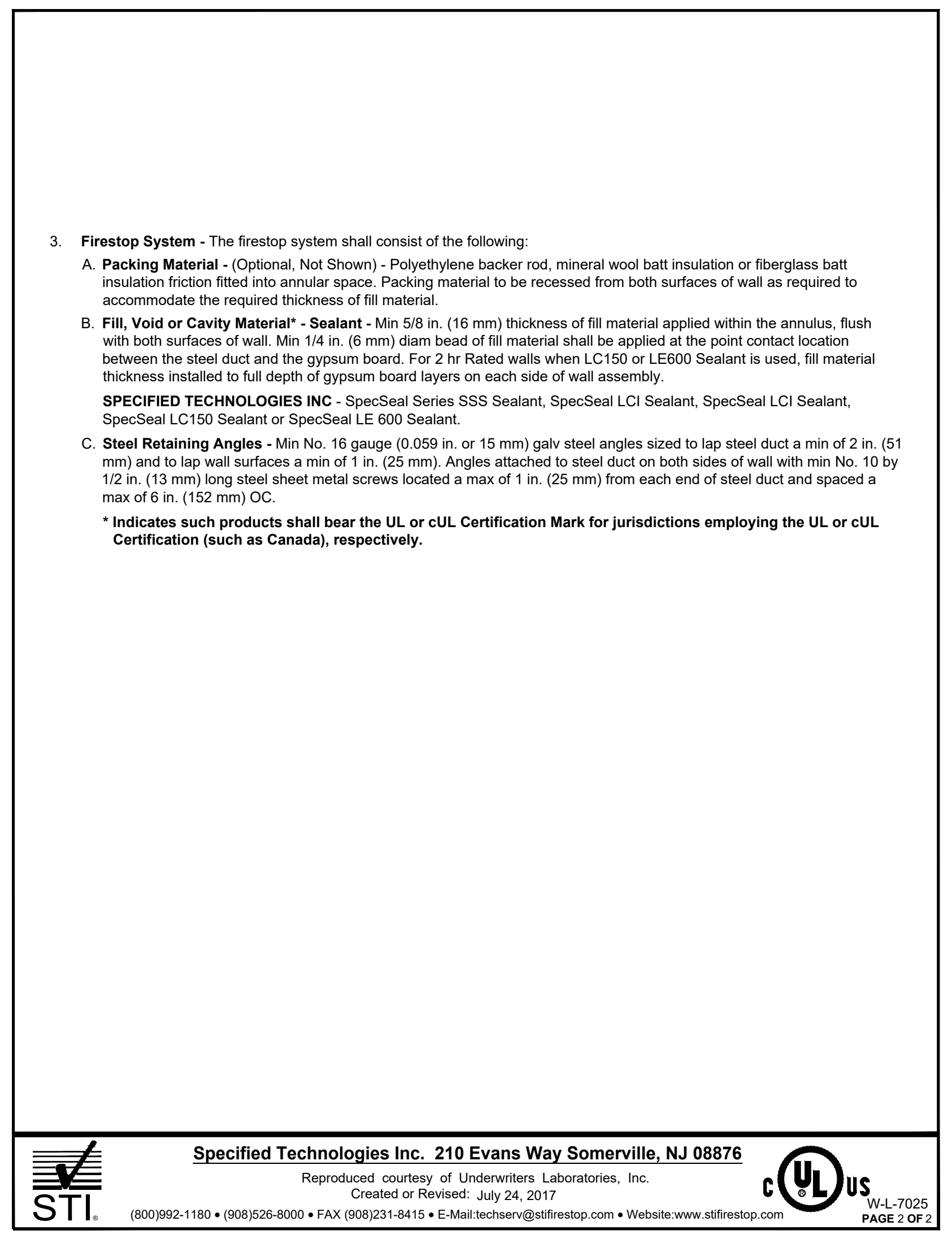

3. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** (Optional, Not Shown) - Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction fitted into annular space. Packing material to be recessed from both surfaces of wall as required to accommodate the required thickness of fill material.
   B. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. Min 1/4 in. (6 mm) diam bead of fill material shall be applied at the point contact location between the steel duct and the gypsum board. For 2 hr Rated walls when LC150 or LE600 Sealant is used, fill material thickness installed to full depth of gypsum board layers on each side of wall assembly.

   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, SpecSeal LCI Sealant, SpecSeal LC150 Sealant or SpecSeal LE 600 Sealant.

   C. **Steel Retaining Angles -** Min No. 16 gauge (0.059 in. or 15 mm) galv steel angles sized to lap steel duct a min of 2 in. (51 mm) and to lap wall surfaces a min of 1 in. (25 mm). Angles attached to steel duct on both sides of wall with min No. 10 by 1/2 in. (13 mm) long steel sheet metal screws located a max of 1 in. (25 mm) from each end of steel duct and spaced a max of 6 in. (152 mm) OC.

   *** 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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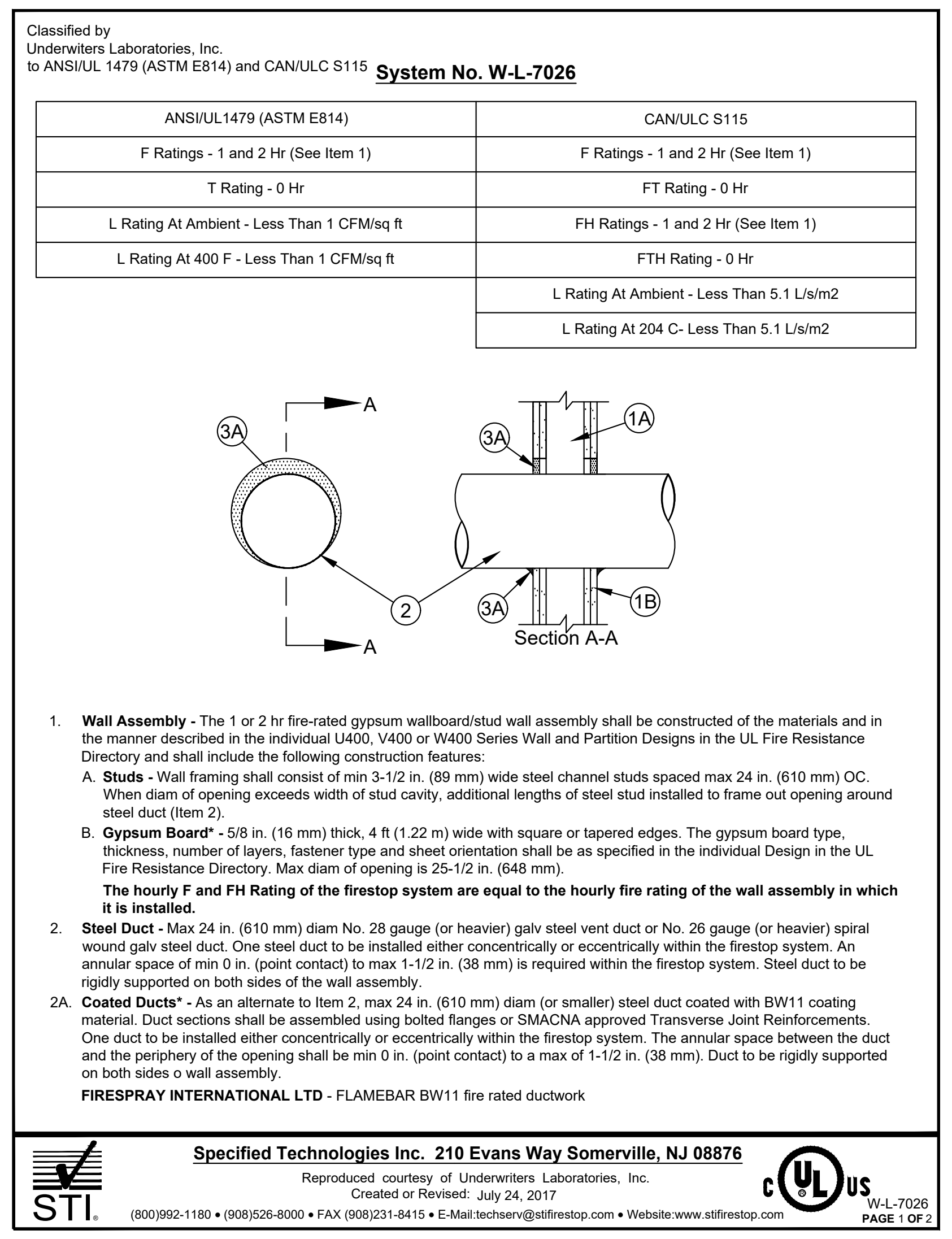

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-7026**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr	FT Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Rating - 0 Hr
	L Rating At Ambient - Less Than 5.1 L/s/m2
	L Rating At 204 C- Less Than 5.1 L/s/m2

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing shall consist of min 3-1/2 in. (89 mm) wide steel channel studs spaced max 24 in. (610 mm) OC. When diam of opening exceeds width of stud cavity, additional lengths of steel stud installed to frame out opening around steel duct (Item 2).
   B. **Gypsum Board* -** 5/8 in. (16 mm) thick, 4 ft (1.22 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Design in the UL Fire Resistance Directory. Max diam of opening is 25-1/2 in. (648 mm).

   The hourly F and FH Rating of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Steel Duct -** Max 24 in. (610 mm) diam No. 28 gauge (or heavier) galv steel vent duct or No. 26 gauge (or heavier) spiral wound galv steel duct. One steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (point contact) to max 1-1/2 in. (38 mm) is required within the firestop system. Steel duct to be rigidly supported on both sides of the wall assembly.

2A. **Coated Ducts* -** As an alternate to Item 2, max 24 in. (610 mm) diam (or smaller) steel duct coated with BW11 coating material. Duct sections shall be assembled using bolted flanges or SMACNA approved Transverse Joint Reinforcements. One duct to be installed either concentrically or eccentrically within the firestop system. The annular space between the duct and the periphery of the opening shall be min 0 in. (point contact) to a max of 1-1/2 in. (38 mm). Duct to be rigidly supported on both sides o wall assembly.

FIRESPRAY INTERNATIONAL LTD - FLAMEBAR BW11 fire rated ductwork

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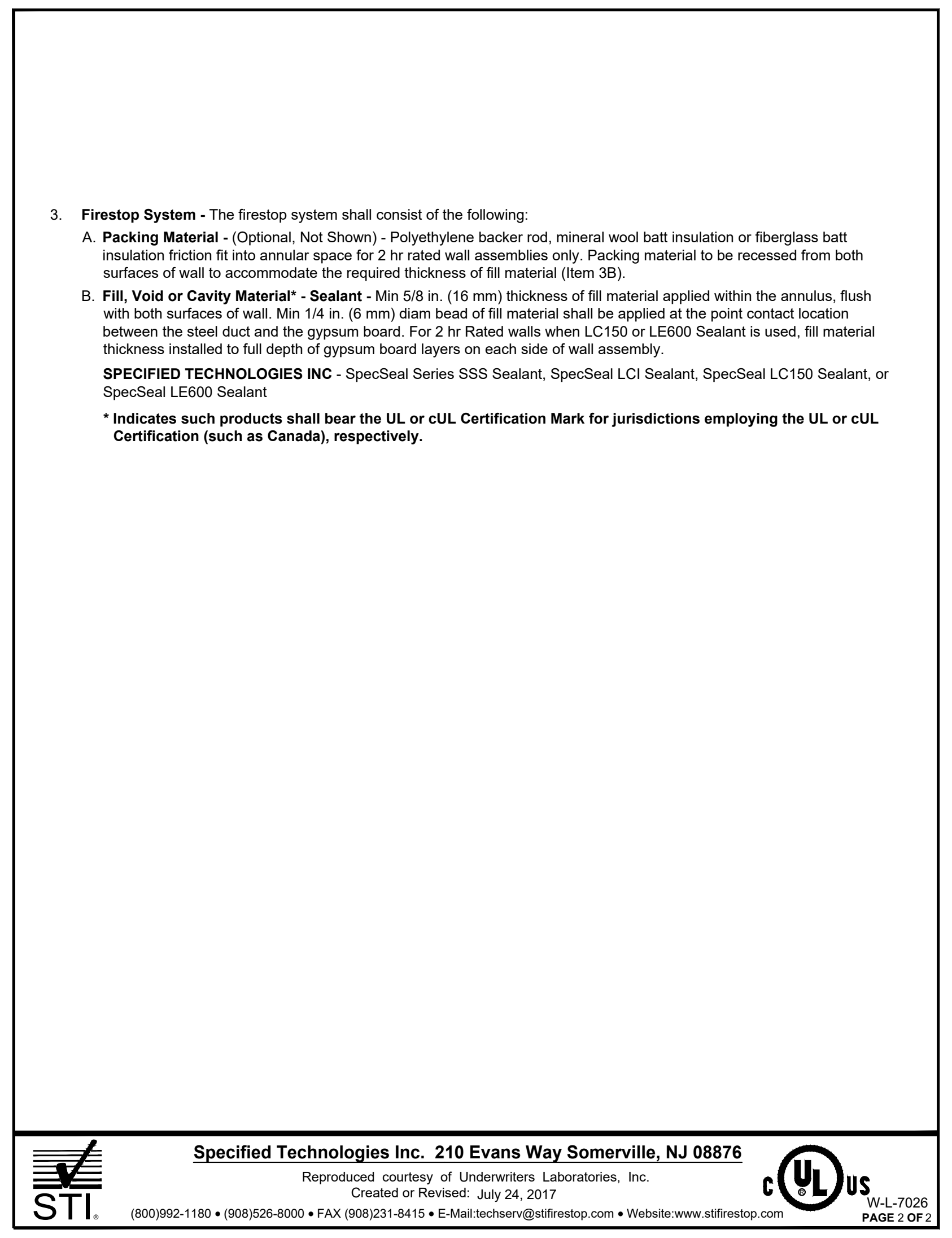

3. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** (Optional, Not Shown) - Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction fit into annular space for 2 hr rated wall assemblies only. Packing material to be recessed from both surfaces of wall to accommodate the required thickness of fill material (Item 3B).
   B. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. Min 1/4 in. (6 mm) diam bead of fill material shall be applied at the point contact location between the steel duct and the gypsum board. For 2 hr Rated walls when LC150 or LE600 Sealant is used, fill material thickness installed to full depth of gypsum board layers on each side of wall assembly.

   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, SpecSeal LC150 Sealant, or SpecSeal LE600 Sealant

   *** 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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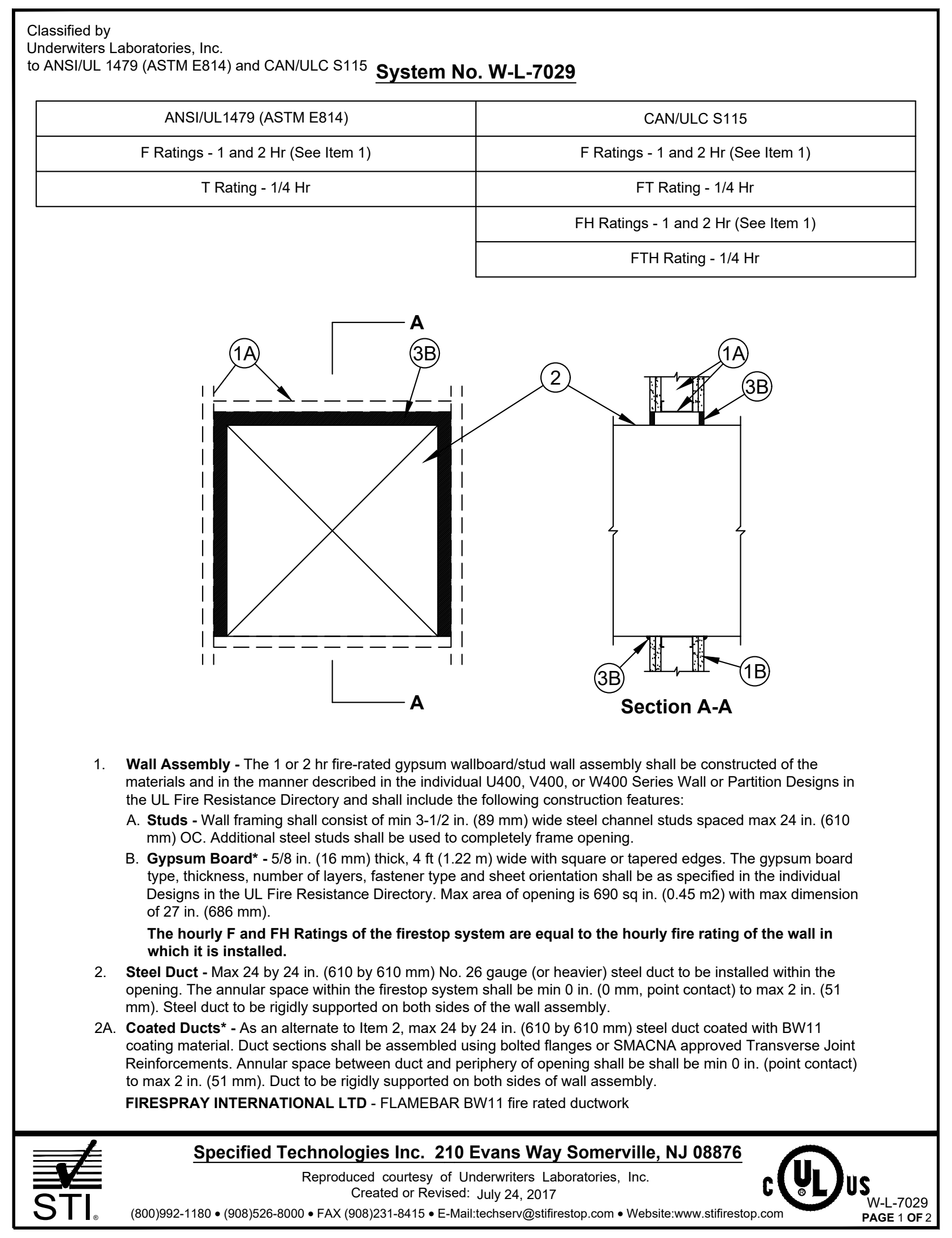

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-7029**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 1/4 Hr	FT Rating - 1/4 Hr
	FH Ratings - 1 and 2 Hr (See Item 1)
	FTH Rating - 1/4 Hr

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400, or W400 Series Wall or Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing shall consist of min 3-1/2 in. (89 mm) wide steel channel studs spaced max 24 in. (610 mm) OC. Additional steel studs shall be used to completely frame opening.
   B. **Gypsum Board* -** 5/8 in. (16 mm) thick, 4 ft (1.22 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Designs in the UL Fire Resistance Directory. Max area of opening is 690 sq in. (0.45 m2) with max dimension of 27 in. (686 mm).

   The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall in which it is installed.
2. **Steel Duct -** Max 24 by 24 in. (610 by 610 mm) No. 26 gauge (or heavier) steel duct to be installed within the opening. The annular space within the firestop system shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Steel duct to be rigidly supported on both sides of the wall assembly.

2A. **Coated Ducts* -** As an alternate to Item 2, max 24 by 24 in. (610 by 610 mm) steel duct coated with BW11 coating material. Duct sections shall be assembled using bolted flanges or SMACNA approved Transverse Joint Reinforcements. Annular space between duct and periphery of opening shall be shall be min 0 in. (point contact) to max 2 in. (51 mm). Duct to be rigidly supported on both sides of wall assembly.

FIRESPRAY INTERNATIONAL LTD - FLAMEBAR BW11 fire rated ductwork

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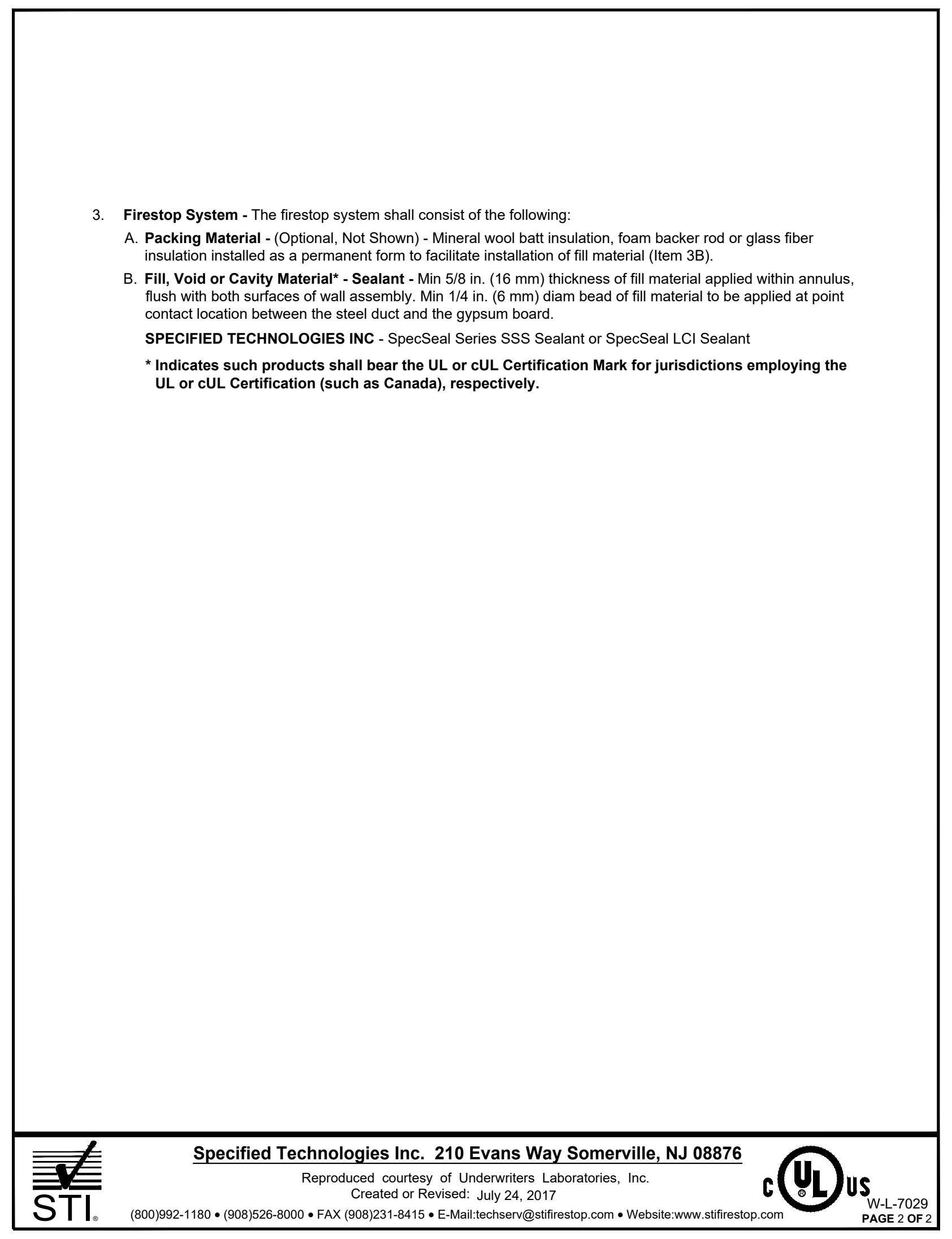

3. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** (Optional, Not Shown) - Mineral wool batt insulation, foam backer rod or glass fiber insulation installed as a permanent form to facilitate installation of fill material (Item 3B).
   B. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. Min 1/4 in. (6 mm) diam bead of fill material to be applied at point contact location between the steel duct and the gypsum board.

   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.**

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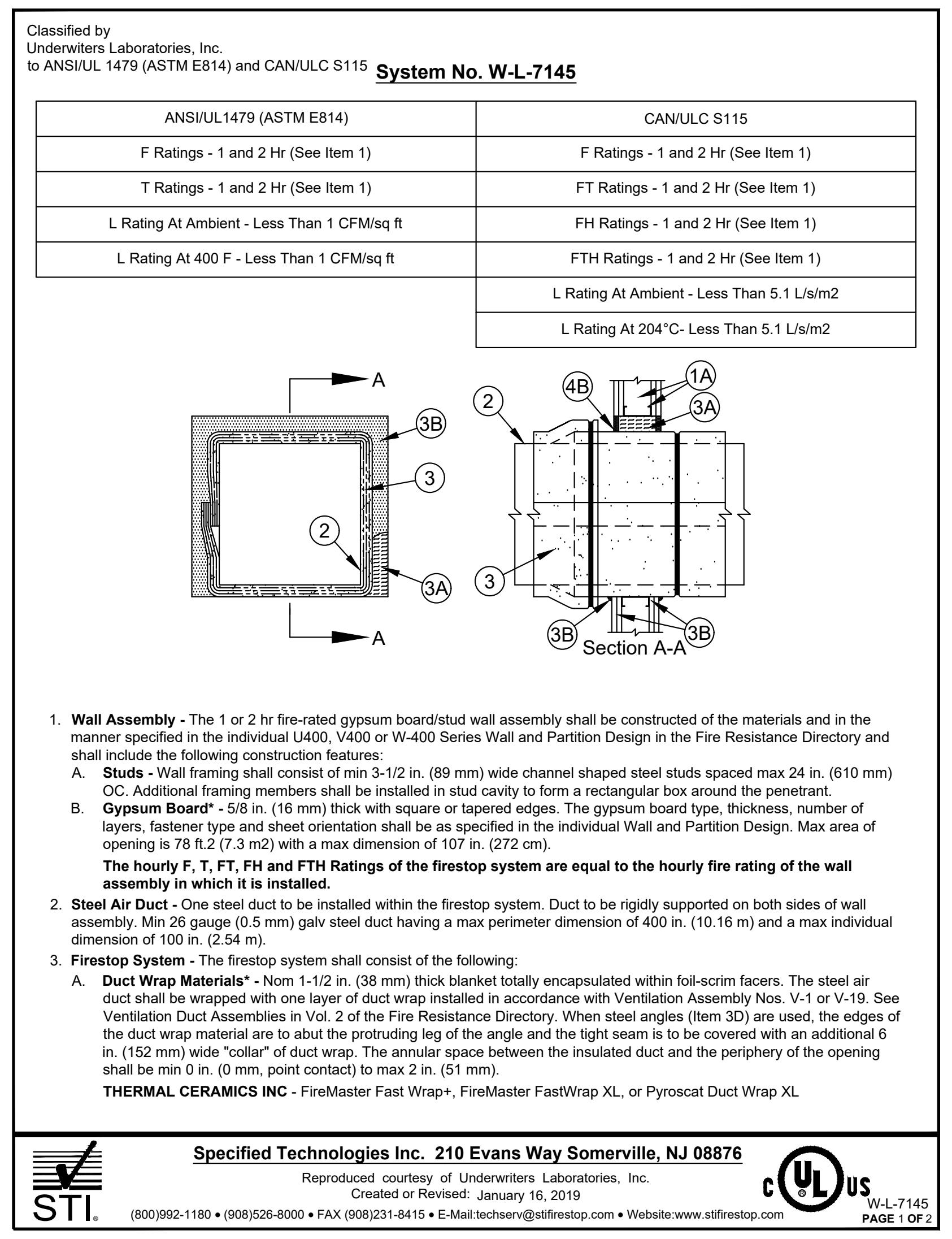

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-7145**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)	FT Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 1 and 2 Hr (See Item 1)
	L Rating At Ambient - Less Than 5.1 L/s/m2
	L Rating At 204°C- Less Than 5.1 L/s/m2

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400, V400 or W-400 Series Wall and Partition Design in the Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing shall consist of min 3-1/2 in. (89 mm) wide channel shaped steel studs spaced max 24 in. (610 mm) OC. Additional framing members shall be installed in stud cavity to form a rectangular box around the penetrant.
   B. **Gypsum Board* -** 5/8 in. (16 mm) thick with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max area of opening is 78 ft.2 (7.3 m2) with a max dimension of 107 in. (272 cm).

   The hourly F, T, FT, FH and FTH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Steel Air Duct -** One steel duct to be installed within the firestop system. Duct to be rigidly supported on both sides of wall assembly. Min 26 gauge (0.5 mm) galv steel duct having a max perimeter dimension of 400 in. (10.16 m) and a max individual dimension of 100 in. (2.54 m).
3. **Firestop System -** The firestop system shall consist of the following:
   A. **Duct Wrap Materials* -** Nom 1-1/2 in. (38 mm) thick blanket totally encapsulated within foil-scrim facers. The steel air duct shall be wrapped with one layer of duct wrap installed in accordance with Ventilation Assembly Nos. V-1 or V-19. See Ventilation Duct Assemblies in Vol. 2 of the Fire Resistance Directory. When steel angles (Item 3D) are used, the edges of the duct wrap material are to abut the protruding leg of the angle and the tight seam is to be covered with an additional 6 in. (152 mm) wide "collar" of duct wrap. The annular space between the insulated duct and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm).

   THERMAL CERAMICS INC - FireMaster Fast Wrap+, FireMaster FastWrap XL, or Pyroscat Duct Wrap XL

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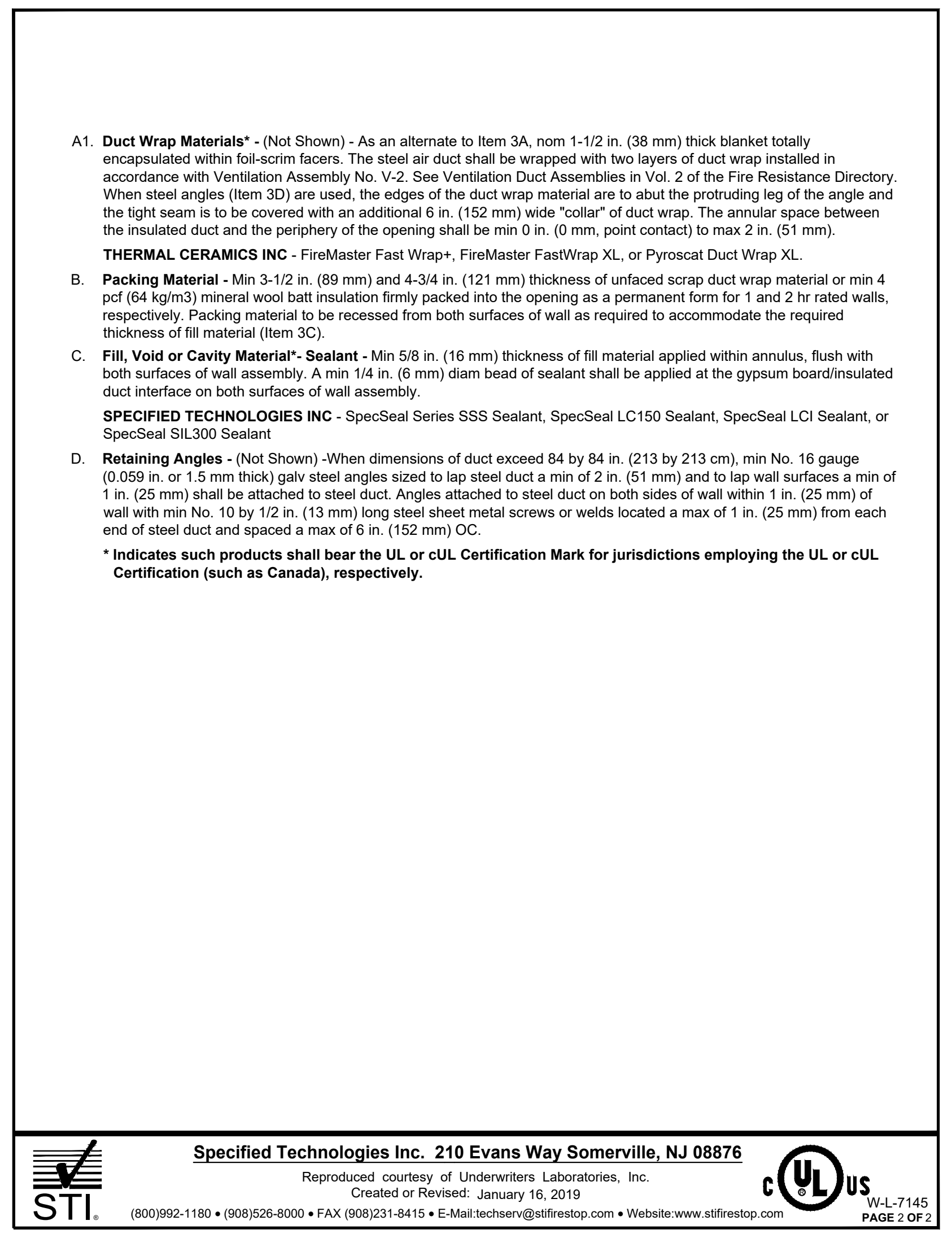

A1. **Duct Wrap Materials* -** (Not Shown) - As an alternate to Item 3A, nom 1-1/2 in. (38 mm) thick blanket totally encapsulated within foil-scrim facers. The steel air duct shall be wrapped with two layers of duct wrap installed in accordance with Ventilation Assembly No. V-2. See Ventilation Duct Assemblies in Vol. 2 of the Fire Resistance Directory. When steel angles (Item 3D) are used, the edges of the duct wrap material are to abut the protruding leg of the angle and the tight seam is to be covered with an additional 6 in. (152 mm) wide "collar" of duct wrap. The annular space between the insulated duct and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm).

THERMAL CERAMICS INC - FireMaster Fast Wrap+, FireMaster FastWrap XL, or Pyroscat Duct Wrap XL.

B. **Packing Material -** Min 3-1/2 in. (89 mm) and 4-3/4 in. (121 mm) thickness of unfaced scrap duct wrap material or min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into the opening as a permanent form for 1 and 2 hr rated walls, respectively. Packing material to be recessed from both surfaces of wall as required to accommodate the required thickness of fill material (Item 3C).

C. **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 assembly. A min 1/4 in. (6 mm) diam bead of sealant shall be applied at the gypsum board/insulated duct interface on both surfaces of wall assembly.

SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LC150 Sealant, SpecSeal LCI Sealant, or SpecSeal SIL300 Sealant

D. **Retaining Angles -** (Not Shown) -When dimensions of duct exceed 84 by 84 in. (213 by 213 cm), min No. 16 gauge (0.059 in. or 1.5 mm thick) galv steel angles sized to lap steel duct a min of 2 in. (51 mm) and to lap wall surfaces a min of 1 in. (25 mm) shall be attached to steel duct. Angles attached to steel duct on both sides of wall within 1 in. (25 mm) of wall with min No. 10 by 1/2 in. (13 mm) long steel sheet metal screws or welds located a max of 1 in. (25 mm) from each end of steel duct and spaced a max of 6 in. (152 mm) OC.

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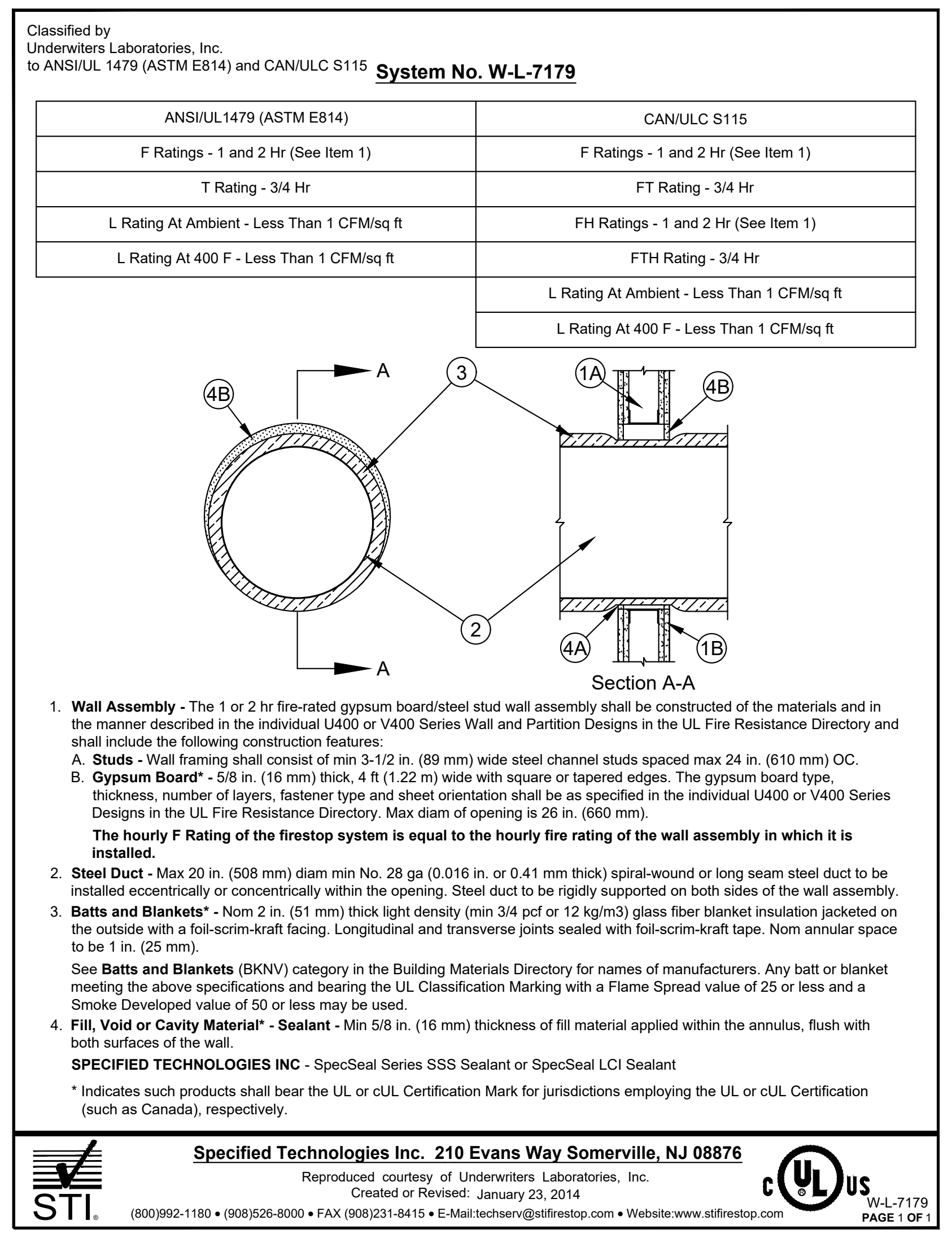

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-7179**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 3/4 Hr	FT Rating - 3/4 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Rating - 3/4 Hr
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing shall consist of min 3-1/2 in. (89 mm) wide steel channel studs spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board* -** 5/8 in. (16 mm) thick, 4 ft (1.22 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U400 or V400 Series Designs in the UL Fire Resistance Directory. Max diam of opening is 26 in. (660 mm).

   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Steel Duct -** Max 20 in. (508 mm) diam min No. 28 ga (0.016 in. or 0.41 mm thick) spiral-wound or long seam steel duct to be installed eccentrically or concentrically within the opening. Steel duct to be rigidly supported on both sides of the wall assembly.
3. **Batts and Blankets* -** Nom 2 in. (51 mm) thick light density (min 3/4 pcf or 12 kg/m3) glass fiber blanket insulation jacketed on the outside with a foil-scrim-kraft facing. Longitudinal and transverse joints sealed with foil-scrim-kraft tape. Nom annular space to be 1 in. (25 mm).

   See **Batts and Blankets** (BKNV) category in the Building Materials Directory for names of manufacturers. Any batt or blanket meeting the above specifications and bearing the UL Classification Marking with a Flame Spread value of 25 or less and a Smoke Developed value of 50 or less may be used.
4. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with 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.

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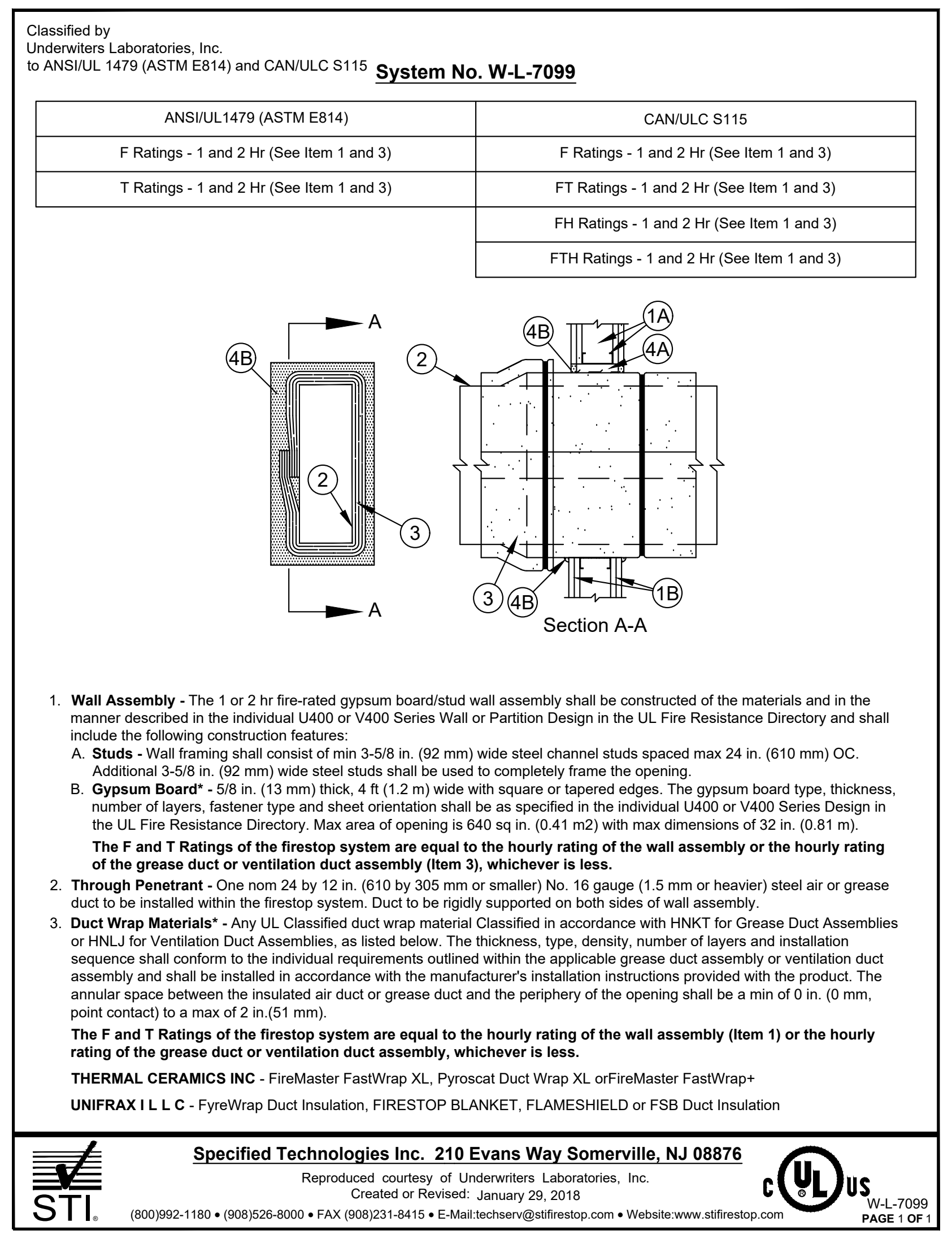

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-7099**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1 and 3)	F Ratings - 1 and 2 Hr (See Item 1 and 3)
T Ratings - 1 and 2 Hr (See Item 1 and 3)	FT Ratings - 1 and 2 Hr (See Item 1 and 3)
	FH Ratings - 1 and 2 Hr (See Item 1 and 3)
	FTH Ratings - 1 and 2 Hr (See Item 1 and 3)

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing shall consist of min 3-5/8 in. (92 mm) wide steel channel studs spaced max 24 in. (610 mm) OC. Additional 3-5/8 in. (92 mm) wide steel studs shall be used to completely frame the opening.
   B. **Gypsum Board* -** 5/8 in. (13 mm) thick, 4 ft (1.2 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U400 or V400 Series Design in the UL Fire Resistance Directory. Max area of opening is 640 sq in. (0.41 m2) with max dimensions of 32 in. (0.81 m).

   The F and T Ratings of the firestop system are equal to the hourly rating of the wall assembly or the hourly rating of the grease duct or ventilation duct assembly (Item 3), whichever is less.
2. **Through Penetrant -** One nom 24 by 12 in. (610 by 305 mm or smaller) No. 16 gauge (1.5 mm or heavier) steel air or grease duct to be installed within the firestop system. Duct to be rigidly supported on both sides of wall assembly.
3. **Duct Wrap Materials* -** Any UL Classified duct wrap material Classified in accordance with HNKT for Grease Duct Assemblies or HNLJ for Ventilation Duct Assemblies, as listed below. The thickness, type, density, number of layers and installation sequence shall conform to the individual requirements outlined within the applicable grease duct assembly or ventilation duct assembly and shall be installed in accordance with the manufacturer's installation instructions provided with the product. The annular space between the insulated air duct or grease duct and the periphery of the opening shall be a min of 0 in. (0 mm, point contact) to a max of 2 in.(51 mm).

   The F and T Ratings of the firestop system are equal to the hourly rating of the wall assembly (Item 1) or the hourly rating of the grease duct or ventilation duct assembly, whichever is less.

   THERMAL CERAMICS INC - FireMaster FastWrap XL, Pyroscat Duct Wrap XL orFireMaster FastWrap+

   UNIFRAX I L L C - FyreWrap Duct Insulation, FIRESTOP BLANKET, FLAMESHIELD or FSB Duct Insulation

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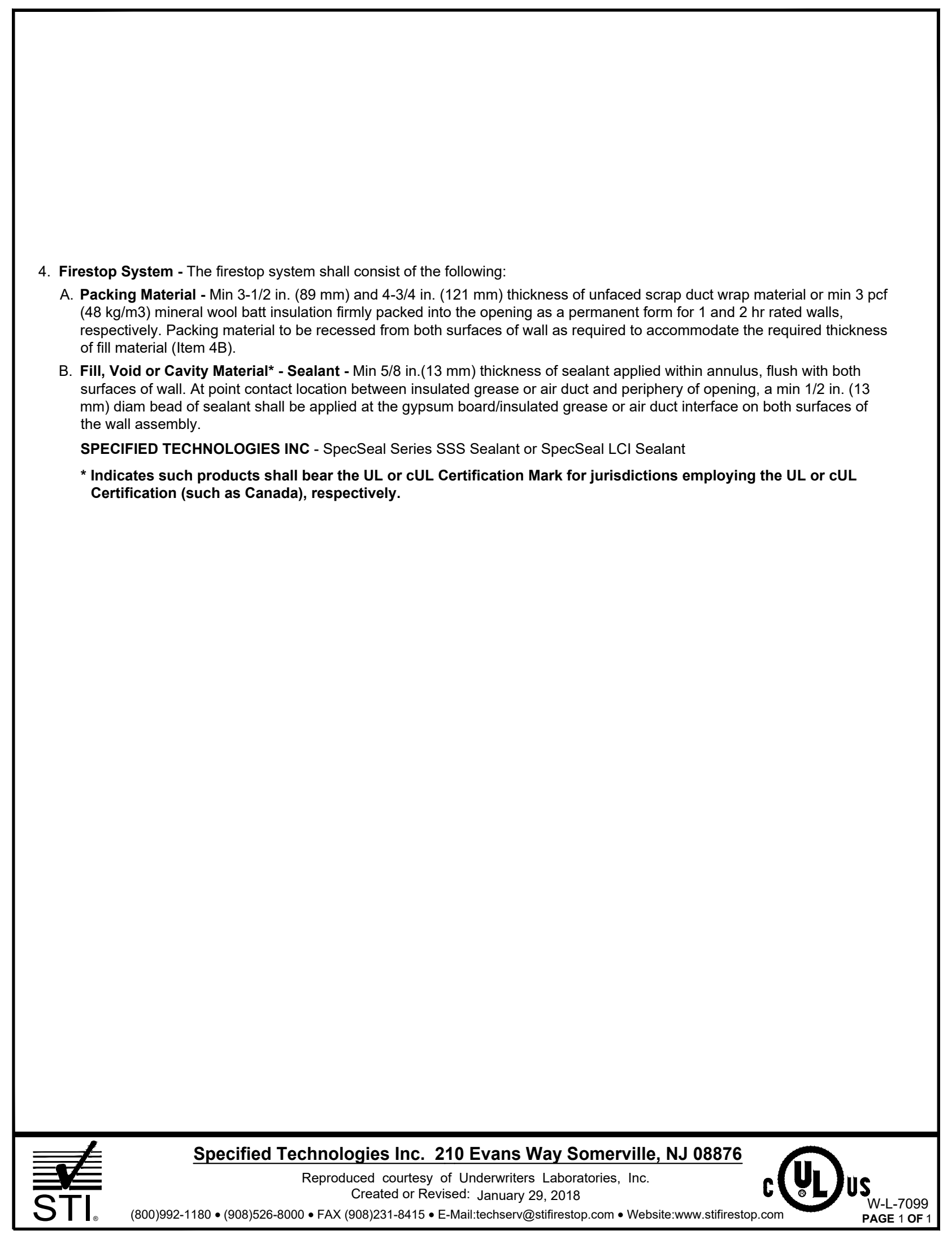

4. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** Min 3-1/2 in. (89 mm) and 4-3/4 in. (121 mm) thickness of unfaced scrap duct wrap material or min 3 pcf (48 kg/m3) mineral wool batt insulation firmly packed into the opening as a permanent form for 1 and 2 hr rated walls, respectively. Packing material to be recessed from both surfaces of wall as required to accommodate the required thickness of fill material (Item 4B).
   B. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in.(13 mm) thickness of sealant applied within annulus, flush with both surfaces of wall. At point contact location between insulated grease or air duct and periphery of opening, a min 1/2 in. (13 mm) diam bead of sealant shall be applied at the gypsum board/insulated grease or air duct interface on both surfaces of the wall assembly.

   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.**

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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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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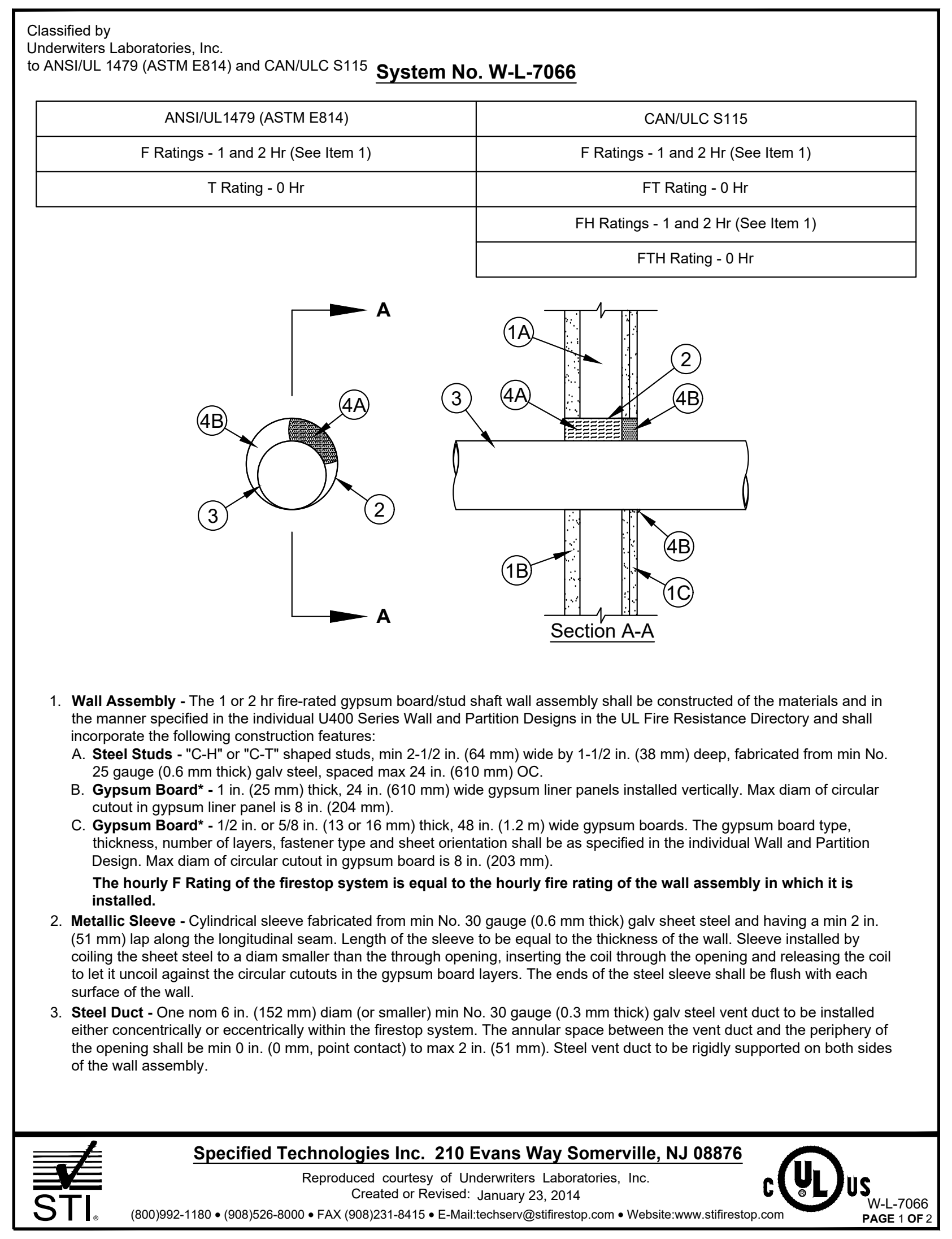

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-7066**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr	FT Rating - 0 Hr
	FH Ratings - 1 and 2 Hr (See Item 1)
	FTH Rating - 0 Hr

Section A-A

1. **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. Max diam of circular cutout in gypsum liner panel is 8 in. (204 mm).
   C. **Gypsum Board* -** 1/2 in. or 5/8 in. (13 or 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. Max diam of circular cutout in gypsum board is 8 in. (203 mm).

   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Metallic Sleeve -** Cylindrical sleeve fabricated from min No. 30 gauge (0.6 mm thick) galv sheet steel and having a min 2 in. (51 mm) lap along the longitudinal seam. Length of the sleeve to be equal to the thickness of the wall. Sleeve installed by coiling the sheet steel to a diam smaller than the through opening, inserting the coil through the opening and releasing the coil to let it uncoil against the circular cutouts in the gypsum board layers. The ends of the steel sleeve shall be flush with each surface of the wall.
3. **Steel Duct -** One nom 6 in. (152 mm) diam (or smaller) min No. 30 gauge (0.3 mm thick) galv steel vent duct to be installed either concentrically or eccentrically within the firestop system. The annular space between the vent duct and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Steel vent duct to be rigidly supported on both sides of the wall assembly.

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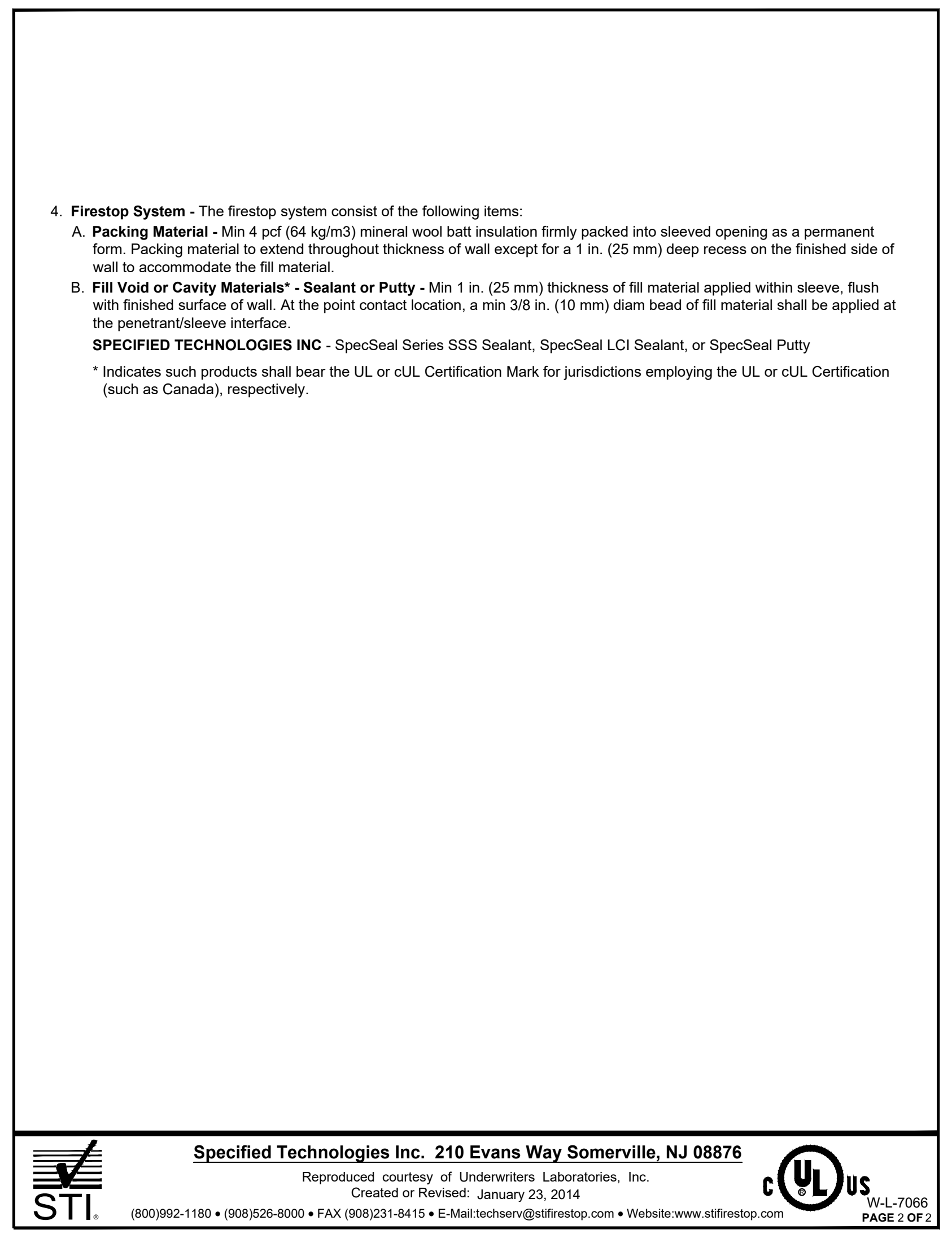

4. **Firestop System -** The firestop system consist of the following items:
   A. **Packing Material -** Min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into sleeved opening as a permanent form. Packing material to extend throughout thickness of wall except for a 1 in. (25 mm) deep recess on the finished side of wall to accommodate the fill material.
   B. **Fill Void or Cavity Materials* - Sealant or Putty -** Min 1 in. (25 mm) thickness of fill material applied within sleeve, flush with finished surface of wall. At the point contact location, a min 3/8 in. (10 mm) diam bead of fill material shall be applied at the penetrant/sleeve interface.

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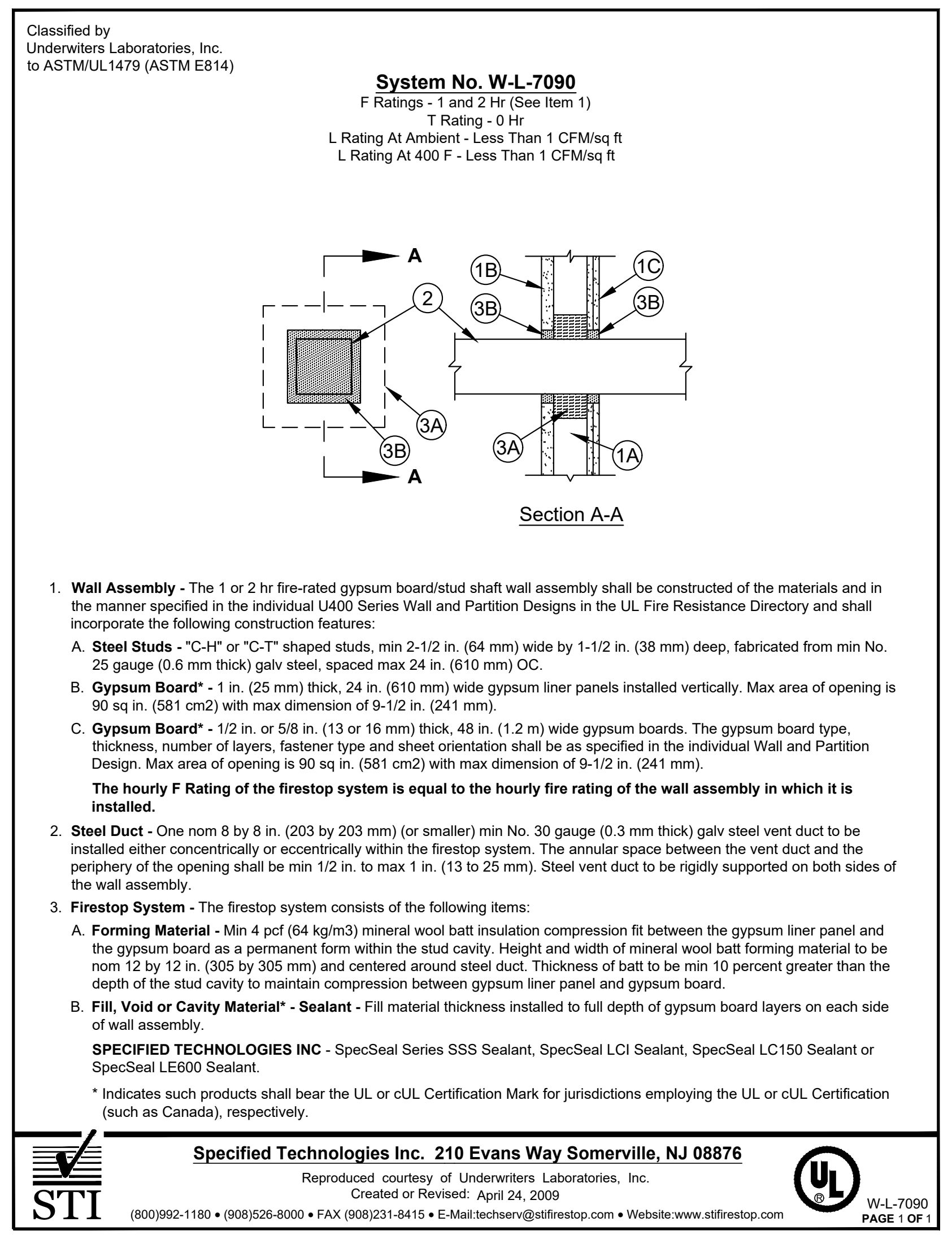

Classified by
Underwiters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. W-L-7090
F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft

Section A-A

1. **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. Max area of opening is 90 sq in. (581 cm2) with max dimension of 9-1/2 in. (241 mm).
   C. **Gypsum Board* -** 1/2 in. or 5/8 in. (13 or 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. Max area of opening is 90 sq in. (581 cm2) with max dimension of 9-1/2 in. (241 mm).

   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Steel Duct -** One nom 8 by 8 in. (203 by 203 mm) (or smaller) min No. 30 gauge (0.3 mm thick) galv steel vent duct to be installed either concentrically or eccentrically within the firestop system. The annular space between the vent duct and the periphery of the opening shall be min 1/2 in. to max 1 in. (13 to 25 mm). Steel vent duct to be rigidly supported on both sides of the wall assembly.
3. **Firestop System -** The firestop system consists of the following items:
   A. **Forming Material -** Min 4 pcf (64 kg/m3) mineral wool batt insulation compression fit between the gypsum liner panel and the gypsum board as a permanent form within the stud cavity. Height and width of mineral wool batt forming material to be nom 12 by 12 in. (305 by 305 mm) and centered around steel duct. Thickness of batt to be min 10 percent greater than the depth of the stud cavity to maintain compression between gypsum liner panel and gypsum board.
   B. **Fill, Void or Cavity Material* - Sealant -** Fill material thickness installed to full depth of gypsum board layers on each side of wall assembly.

   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, SpecSeal LC150 Sealant or SpecSeal LE600 Sealant.

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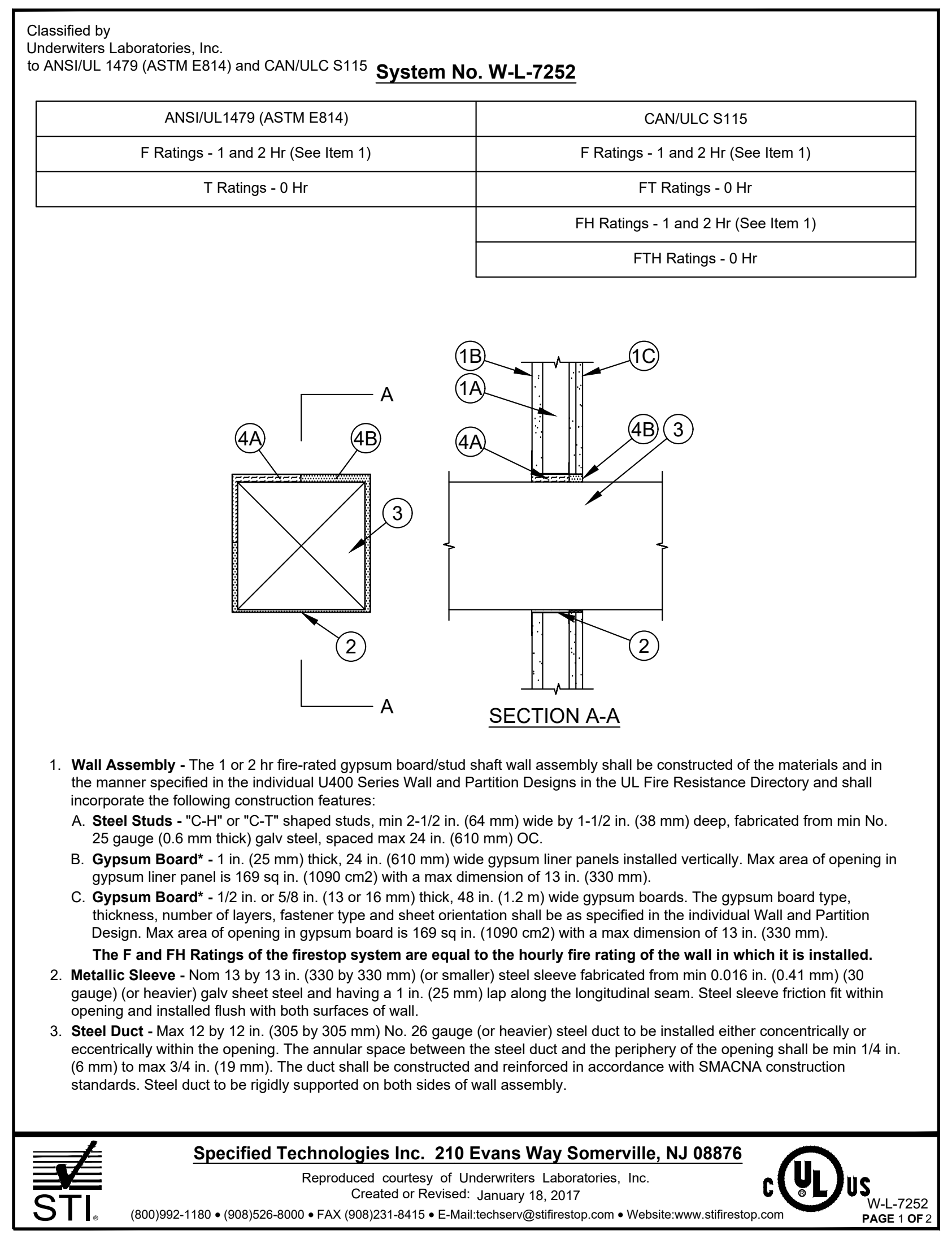

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-7252**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 0 Hr	FT Ratings - 0 Hr
	FH Ratings - 1 and 2 Hr (See Item 1)
	FTH Ratings - 0 Hr

SECTION A-A

1. **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. Max area of opening in gypsum liner panel is 169 sq in. (1090 cm2) with a max dimension of 13 in. (330 mm).
   C. **Gypsum Board* -** 1/2 in. or 5/8 in. (13 or 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. Max area of opening in gypsum board is 169 sq in. (1090 cm2) with a max dimension of 13 in. (330 mm).

   The F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall in which it is installed.
2. **Metallic Sleeve -** Nom 13 by 13 in. (330 by 330 mm) (or smaller) steel sleeve fabricated from min 0.016 in. (0.41 mm) (30 gauge) (or heavier) galv sheet steel and having a 1 in. (25 mm) lap along the longitudinal seam. Steel sleeve friction fit within opening and installed flush with both surfaces of wall.
3. **Steel Duct -** Max 12 by 12 in. (305 by 305 mm) No. 26 gauge (or heavier) steel duct to be installed either concentrically or eccentrically within the opening. The annular space between the steel duct and the periphery of the opening shall be min 1/4 in. (6 mm) to max 3/4 in. (19 mm). The duct shall be constructed and reinforced in accordance with SMACNA construction standards. Steel duct to be rigidly supported on both sides of wall assembly.

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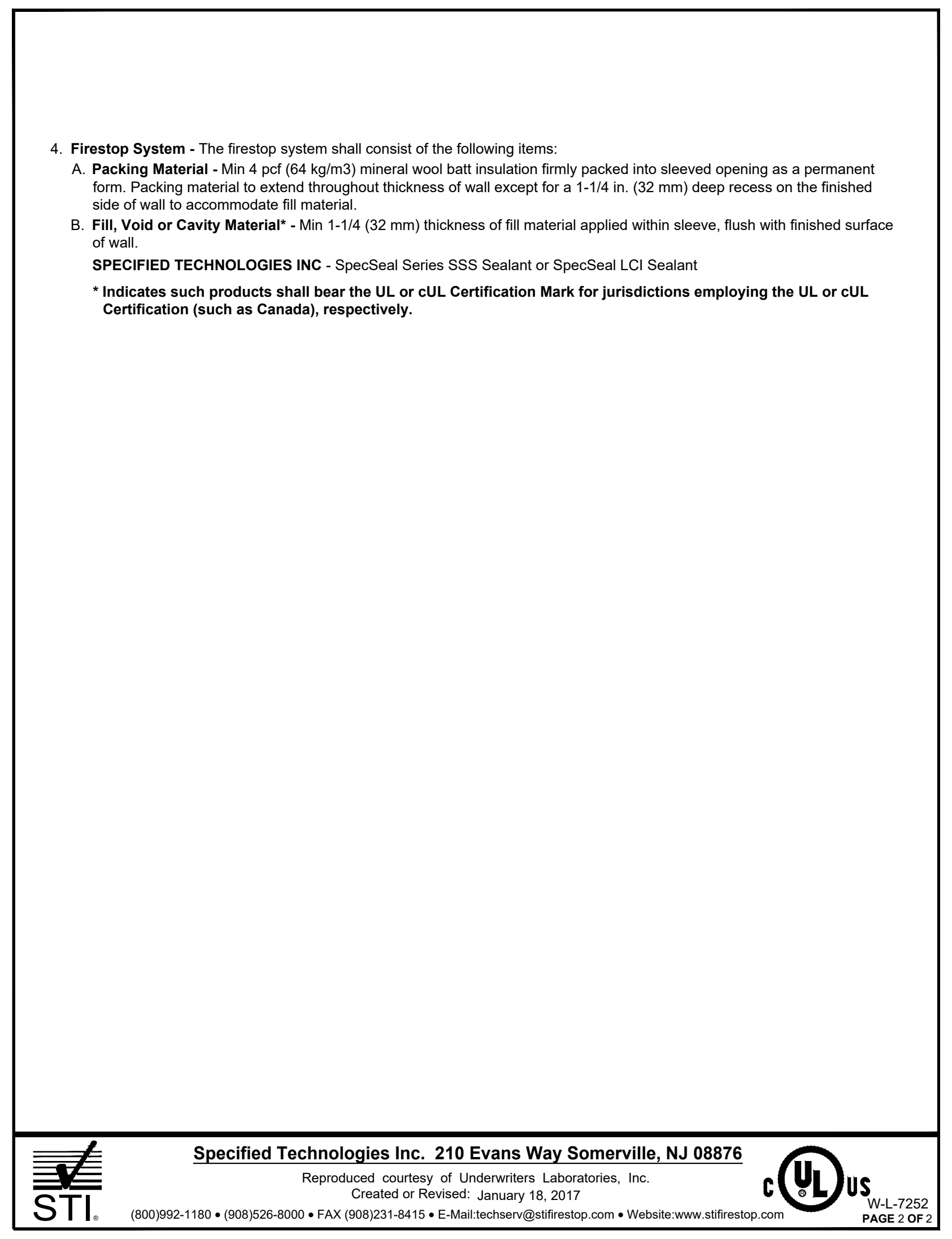

4. **Firestop System -** The firestop system shall consist of the following items:
   A. **Packing Material -** Min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into sleeved opening as a permanent form. Packing material to extend throughout thickness of wall except for a 1-1/4 in. (32 mm) deep recess on the finished side of wall to accommodate fill material.
   B. **Fill, Void or Cavity Material* -** Min 1-1/4 (32 mm) thickness of fill material applied within sleeve, flush with finished surface of wall.

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

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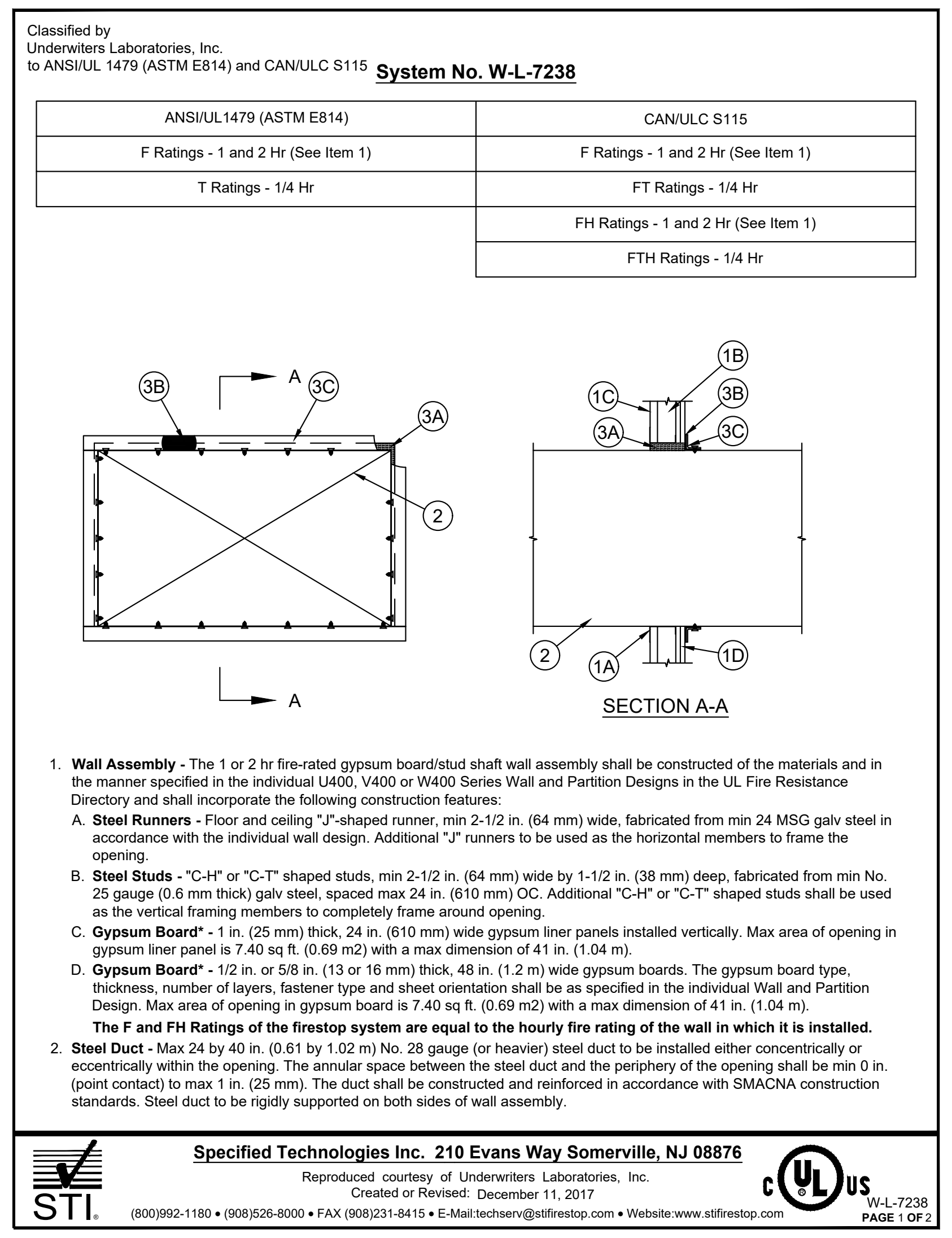

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-7238**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1/4 Hr	FT Ratings - 1/4 Hr
	FH Ratings - 1 and 2 Hr (See Item 1)
	FTH Ratings - 1/4 Hr

SECTION A-A

1. **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, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall incorporate the following construction features:
   A. **Steel Runners -** Floor and ceiling "J"-shaped runner, min 2-1/2 in. (64 mm) wide, fabricated from min 24 MSG galv steel in accordance with the individual wall design. Additional "J" runners to be used as the horizontal members to frame the opening.
   B. **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. Additional "C-H" or "C-T" shaped studs shall be used as the vertical framing members to completely frame around opening.
   C. **Gypsum Board* -** 1 in. (25 mm) thick, 24 in. (610 mm) wide gypsum liner panels installed vertically. Max area of opening in gypsum liner panel is 7.40 sq ft. (0.69 m2) with a max dimension of 41 in. (1.04 m).
   D. **Gypsum Board* -** 1/2 in. or 5/8 in. (13 or 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. Max area of opening in gypsum board is 7.40 sq ft. (0.69 m2) with a max dimension of 41 in. (1.04 m).

   The F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall in which it is installed.
2. **Steel Duct -** Max 24 by 40 in. (0.61 by 1.02 m) No. 28 gauge (or heavier) steel duct to be installed either concentrically or eccentrically within the opening. The annular space between the steel duct and the periphery of the opening shall be min 0 in. (point contact) to max 1 in. (25 mm). The duct shall be constructed and reinforced in accordance with SMACNA construction standards. Steel duct to be rigidly supported on both sides of wall assembly.

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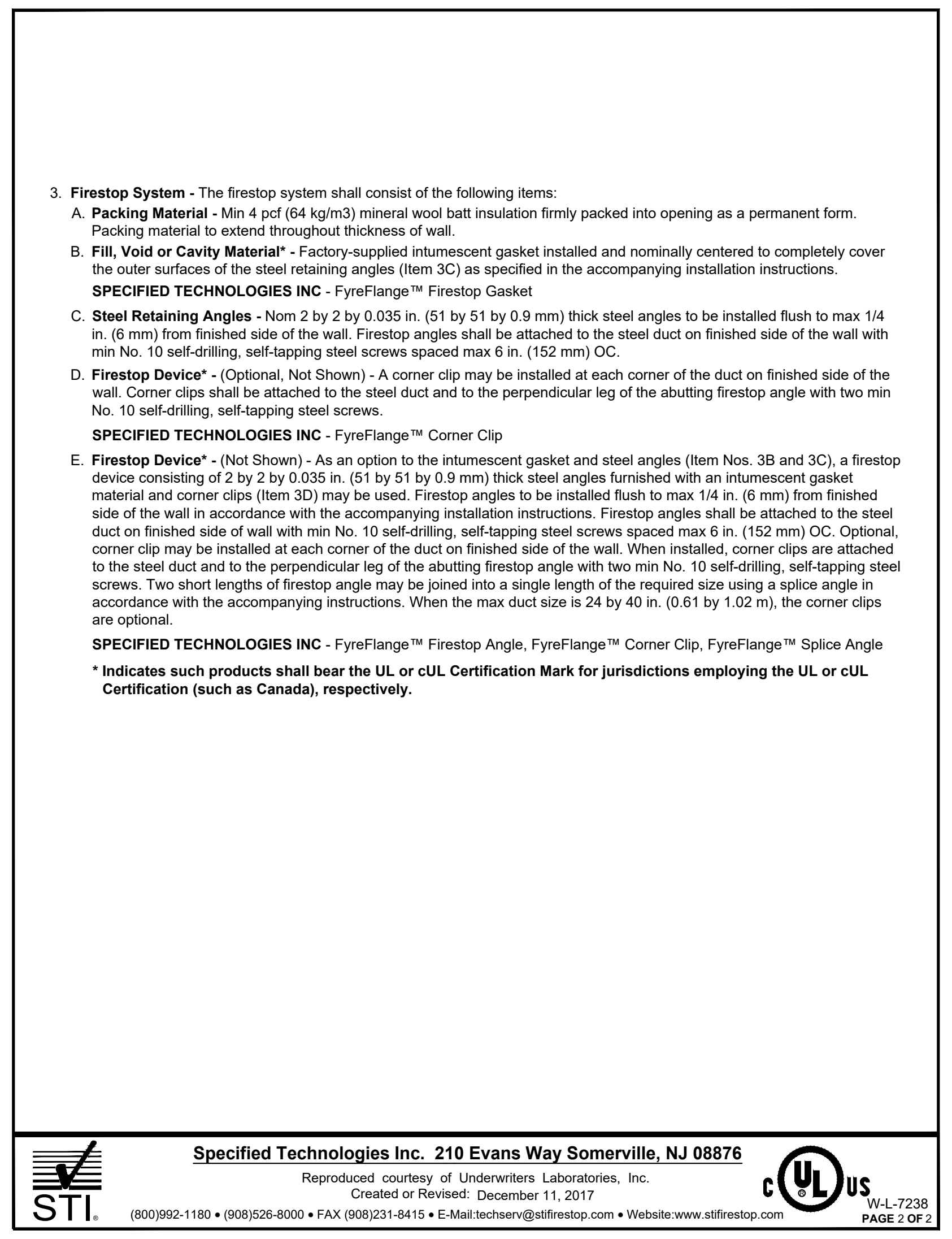

3. **Firestop System -** The firestop system shall consist of the following items:
   A. **Packing Material -** Min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to extend throughout thickness of wall.
   B. **Fill, Void or Cavity Material* -** Factory-supplied intumescent gasket installed and nominally centered to completely cover the outer surfaces of the steel retaining angles (Item 3C) as specified in the accompanying installation instructions.

   SPECIFIED TECHNOLOGIES INC - FyreFlange™ Firestop Gasket
   C. **Steel Retaining Angles -** Nom 2 by 2 by 0.035 in. (51 by 51 by 0.9 mm) thick steel angles to be installed flush to max 1/4 in. (6 mm) from finished side of the wall. Firestop angles shall be attached to the steel duct on finished side of the wall with min No. 10 self-drilling, self-tapping steel screws spaced max 6 in. (152 mm) OC.
   D. **Firestop Device* -** (Optional, Not Shown) - A corner clip may be installed at each corner of the duct on finished side of the wall. Corner clips shall be attached to the steel duct and to the perpendicular leg of the abutting firestop angle with two min No. 10 self-drilling, self-tapping steel screws.

   SPECIFIED TECHNOLOGIES INC - FyreFlange™ Corner Clip
   E. **Firestop Device* -** (Not Shown) - As an option to the intumescent gasket and steel angles (Item Nos. 3B and 3C), a firestop device consisting of 2 by 2 by 0.035 in. (51 by 51 by 0.9 mm) thick steel angles furnished with an intumescent gasket material and corner clips (Item 3D) may be used. Firestop angles to be installed flush to max 1/4 in. (6 mm) from finished side of the wall in accordance with the accompanying installation instructions. Firestop angles shall be attached to the steel duct on finished side of wall with min No. 10 self-drilling, self-tapping steel screws spaced max 6 in. (152 mm) OC. Optional, corner clip may be installed at each corner of the duct on finished side of the wall. When installed, corner clips are attached to the steel duct and to the perpendicular leg of the abutting firestop angle with two min No. 10 self-drilling, self-tapping steel screws. Two short lengths of firestop angle may be joined into a single length of the required size using a splice angle in accordance with the accompanying instructions. When the max duct size is 24 by 40 in. (0.61 by 1.02 m), the corner clips are optional.

   SPECIFIED TECHNOLOGIES INC - FyreFlange™ Firestop Angle, FyreFlange™ Corner Clip, FyreFlange™ Splice Angle

   *** 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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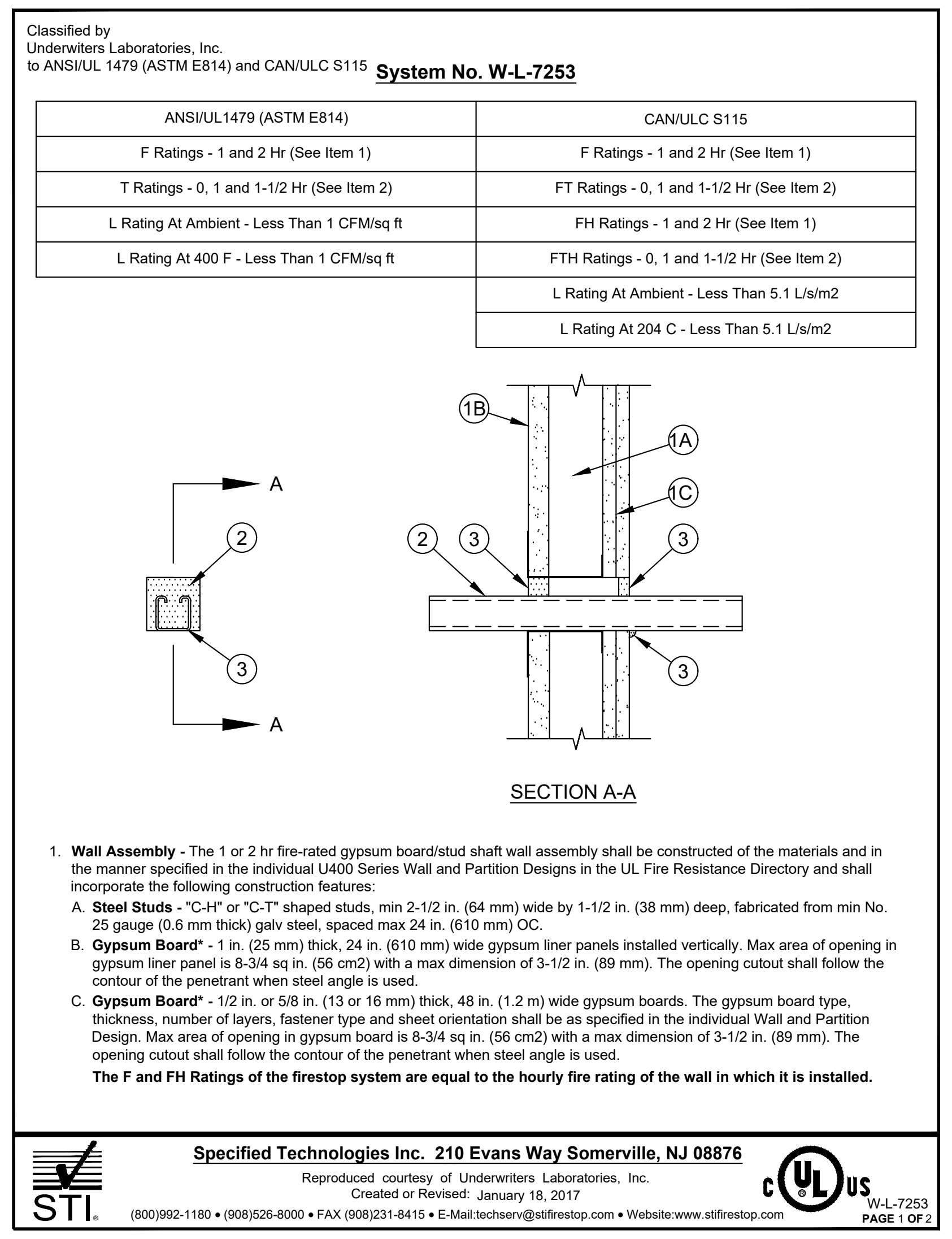

Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. W-L-7253**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 0, 1 and 1-1/2 Hr (See Item 2)	FT Ratings - 0, 1 and 1-1/2 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 0, 1 and 1-1/2 Hr (See Item 2)
	L Rating At Ambient - Less Than 5.1 L/s/m2
	L Rating At 204 C - Less Than 5.1 L/s/m2

SECTION A-A

1. **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. Max area of opening in gypsum liner panel is 8-3/4 sq in. (56 cm2) with a max dimension of 3-1/2 in. (89 mm). The opening cutout shall follow the contour of the penetrant when steel angle is used.
   C. **Gypsum Board* -** 1/2 in. or 5/8 in. (13 or 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. Max area of opening in gypsum board is 8-3/4 sq in. (56 cm2) with a max dimension of 3-1/2 in. (89 mm). The opening cutout shall follow the contour of the penetrant when steel angle is used.

   The F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall in which it is installed.

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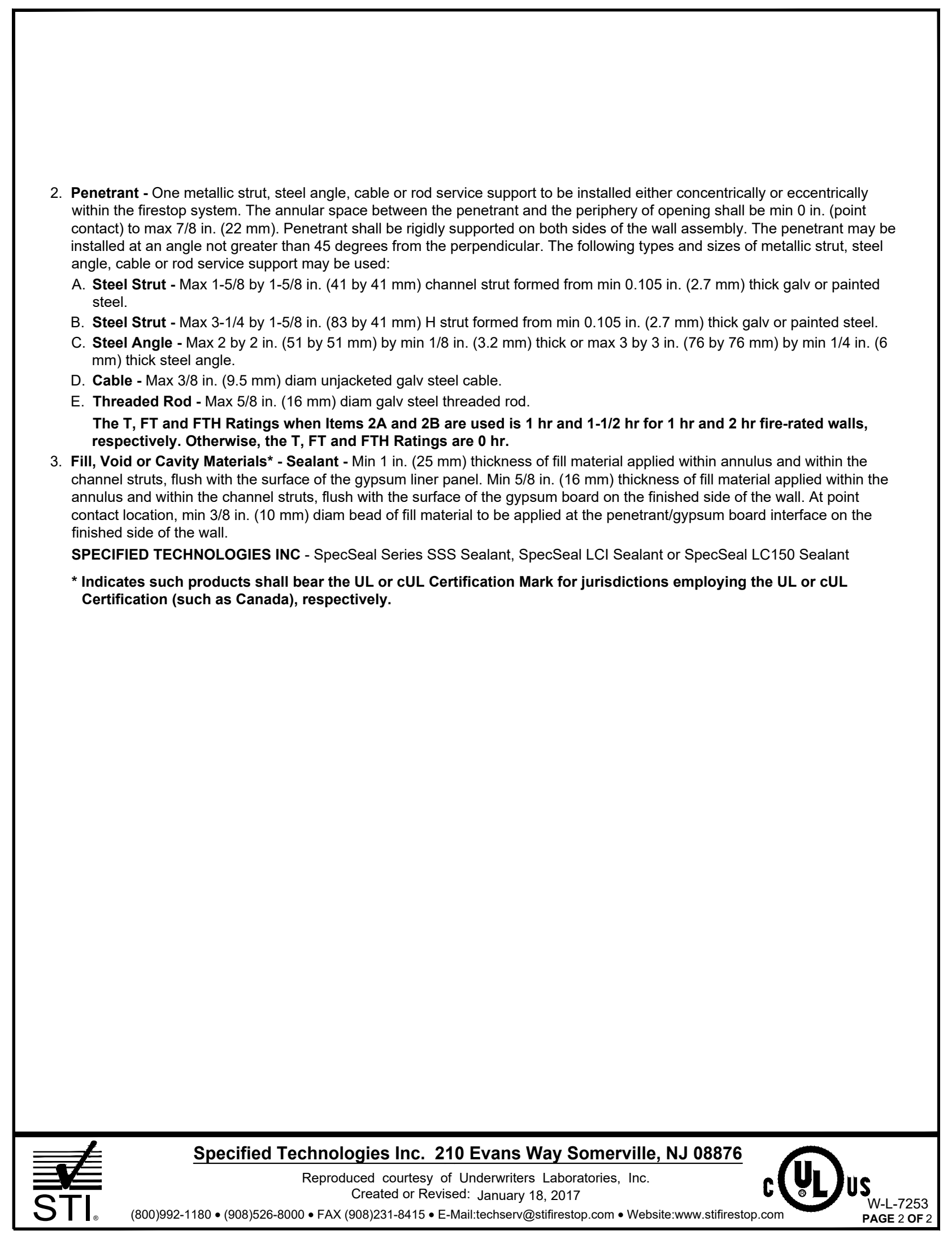

2. **Penetrant -** One metallic strut, steel angle, cable or rod service support to be installed either concentrically or eccentrically within the firestop system. The annular space between the penetrant and the periphery of opening shall be min 0 in. (point contact) to max 7/8 in. (22 mm). Penetrant shall be rigidly supported on both sides of the wall assembly. The penetrant may be installed at an angle not greater than 45 degrees from the perpendicular. The following types and sizes of metallic strut, steel angle, cable or rod service support may be used:
   A. **Steel Strut -** Max 1-5/8 by 1-5/8 in. (41 by 41 mm) channel strut formed from min 0.105 in. (2.7 mm) thick galv or painted steel.
   B. **Steel Strut -** Max 3-1/4 by 1-5/8 in. (83 by 41 mm) H strut formed from min 0.105 in. (2.7 mm) thick galv or painted steel.
   C. **Steel Angle -** Max 2 by 2 in. (51 by 51 mm) by min 1/8 in. (3.2 mm) thick or max 3 by 3 in. (76 by 76 mm) by min 1/4 in. (6 mm) thick steel angle.
   D. **Cable -** Max 3/8 in. (9.5 mm) diam unjacketed galv steel cable.
   E. **Threaded Rod -** Max 5/8 in. (16 mm) diam galv steel threaded rod.

   The T, FT and FTH Ratings when Items 2A and 2B are used is 1 hr and 1-1/2 hr for 1 hr and 2 hr fire-rated walls, respectively. Otherwise, the T, FT and FTH Ratings are 0 hr.
3. **Fill, Void or Cavity Materials* - Sealant -** Min 1 in. (25 mm) thickness of fill material applied within annulus and within the channel struts, flush with the surface of the gypsum liner panel. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus and within the channel struts, flush with the surface of the gypsum board on the finished side of the wall. At point contact location, min 3/8 in. (10 mm) diam bead of fill material to be applied at the penetrant/gypsum board interface on the finished side of the wall.

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

   *** 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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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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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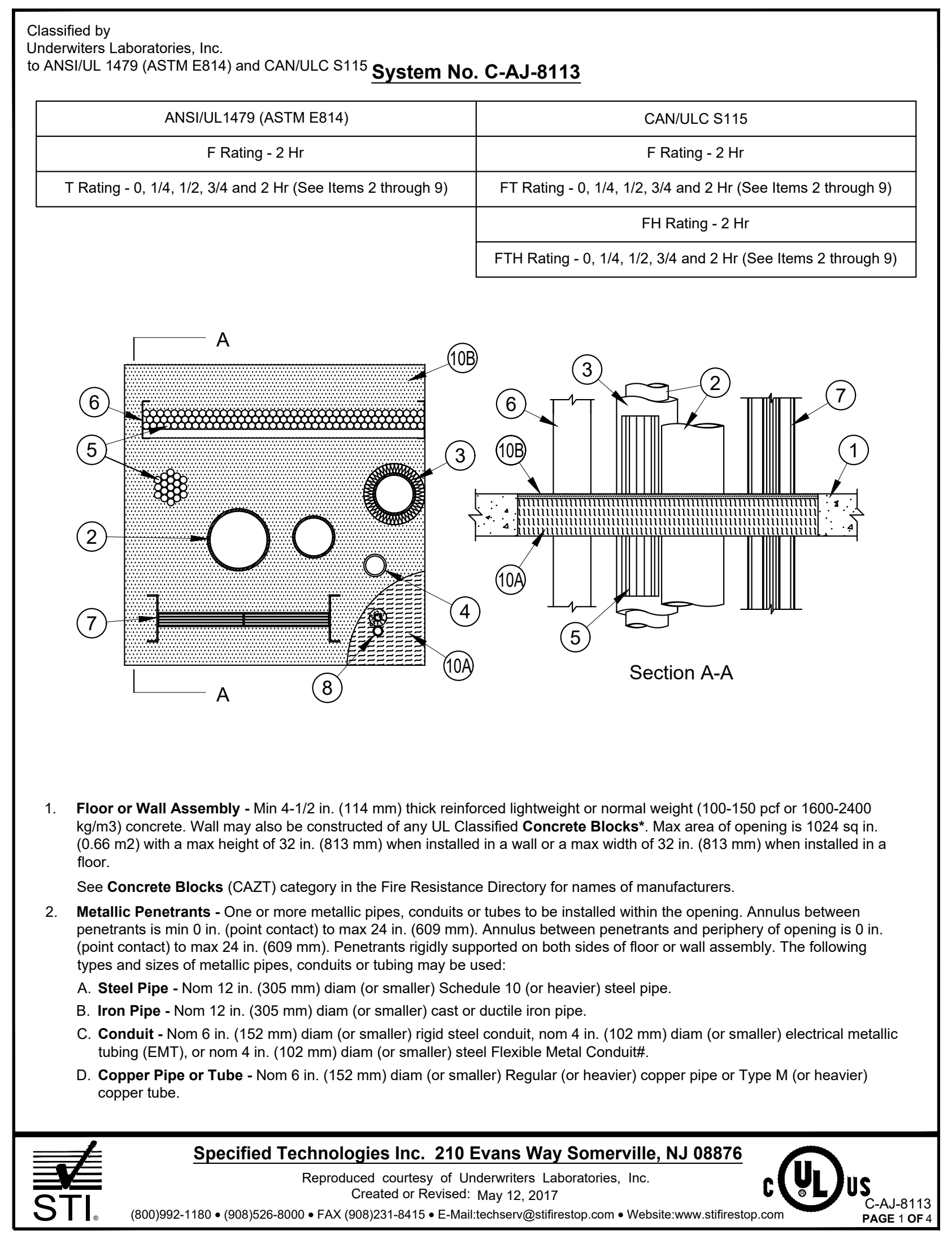


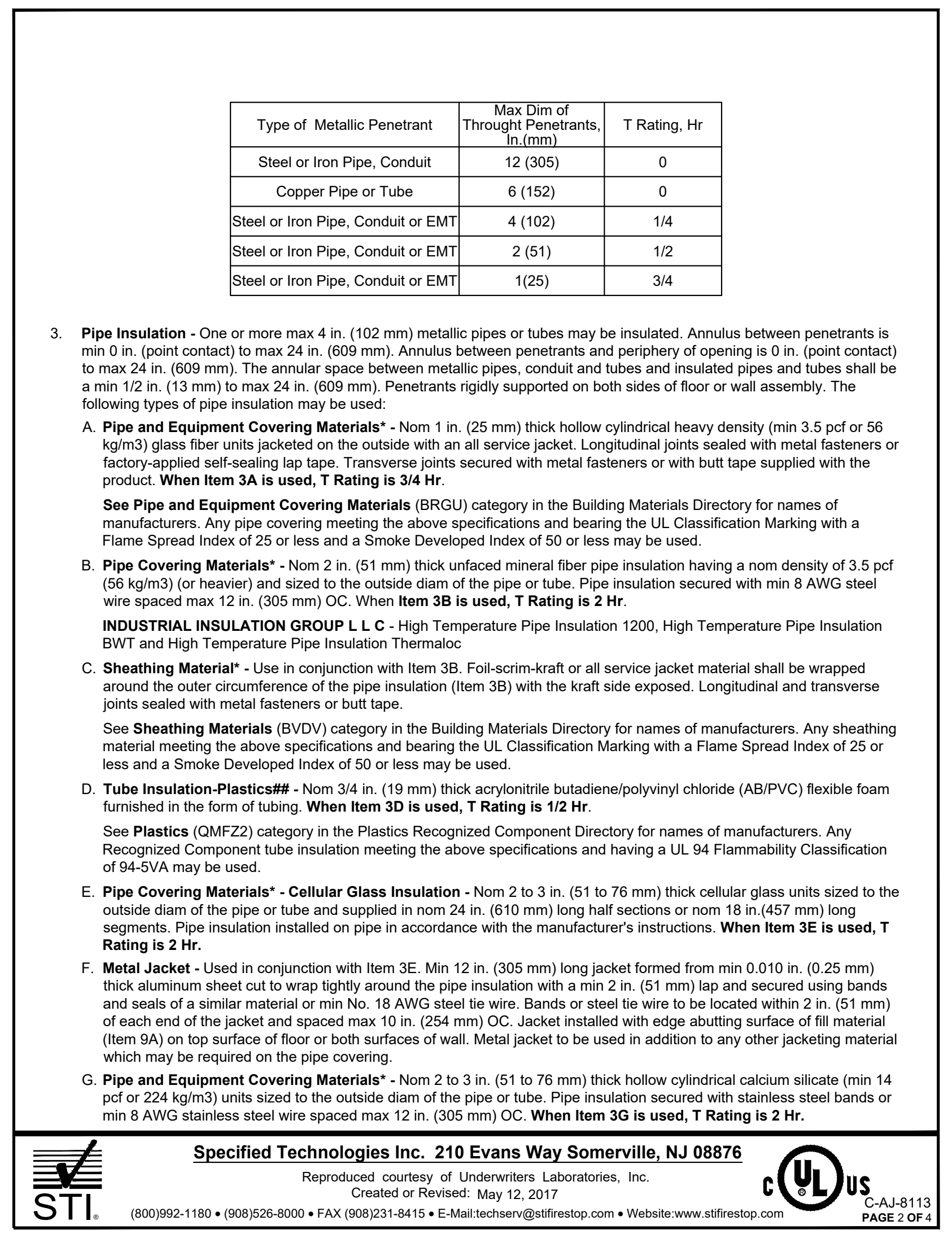
Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. C-AJ-8113**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Rating - 0, 1/4, 1/2, 3/4 and 2 Hr (See Items 2 through 9)	FT Rating - 0, 1/4, 1/2, 3/4 and 2 Hr (See Items 2 through 9)
	FH Rating - 2 Hr
	FTH Rating - 0, 1/4, 1/2, 3/4 and 2 Hr (See Items 2 through 9)

1. **Floor or Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max area of opening is 1024 sq in. (0.66 m2) with a max height of 32 in. (813 mm) when installed in a wall or a max width of 32 in. (813 mm) when installed in a floor.

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

2. **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 floor or 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 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 tube.



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

3. **Pipe Insulation -** 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 24 in. (609 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:
   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

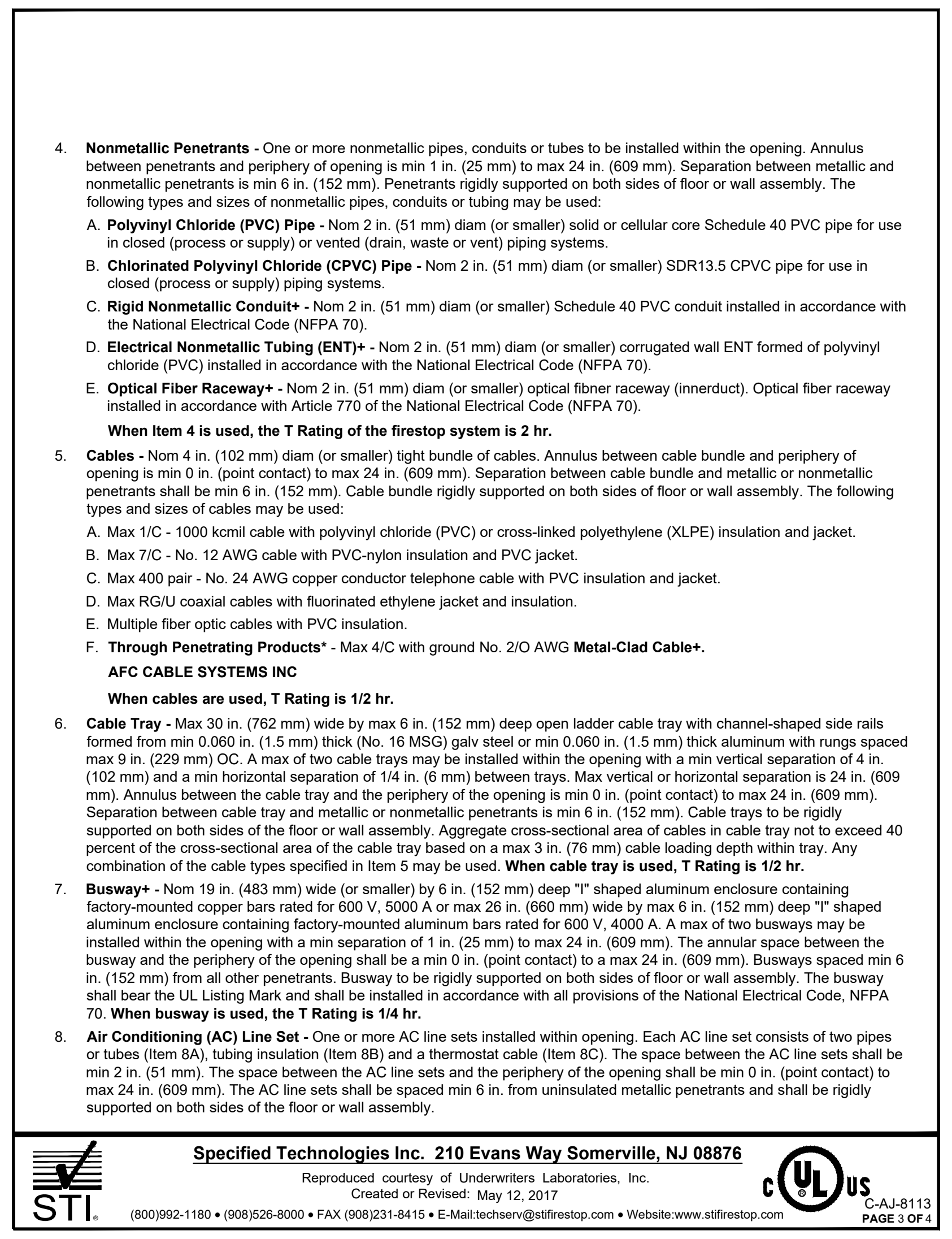
   C. **Sheathing Material* -** Use in conjunction with Item 3B. Foil-scrim-kraft or all service jacket material shall be wrapped around the outer circumference of the pipe insulation (Item 3B) with the kraft side exposed. Longitudinal and transverse joints sealed with metal fasteners or butt tape.

   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. **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.**
   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 top surface of floor or both 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.**



4. **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 floor or 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 fibner raceway (innerduct). Optical fiber raceway installed in accordance with Article 770 of the National Electrical Code (NFPA 70).

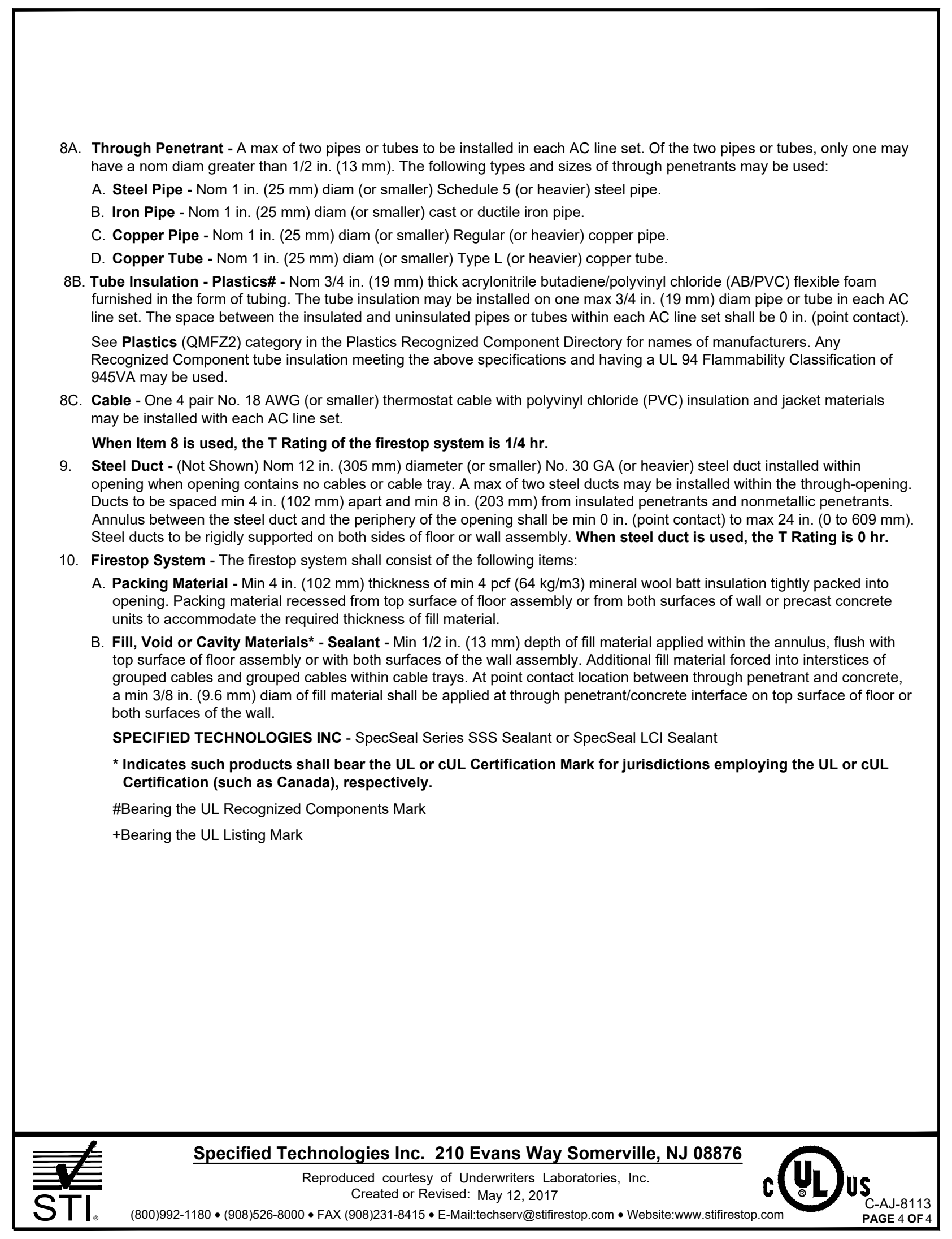
   When Item 4 is used, the T Rating of the firestop system is 2 hr.

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 floor or wall assembly. The following types and sizes of cables may be used:
   A. Max 1/C - 1000 kcmil cable with polyvinyl chloride (PVC) or cross-linked polyethylene (XLPE) insulation and jacket.
   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 PVC insulation and jacket.
   D. Max RG/U coaxial cables with fluorinated ethylene jacket and insulation.
   E. Multiple fiber optic cables with PVC insulation.
   F. **Through Penetrating Products*** - Max 4/C with ground No. 2/O AWG **Metal-Clad Cable+.**

   AFC CABLE SYSTEMS INC

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

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 floor or 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.**
7. **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 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 70. **When busway is used, the T Rating is 1/4 hr.**
8. **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 sides of the floor or wall assembly.



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 uninsulated 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 used.

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.

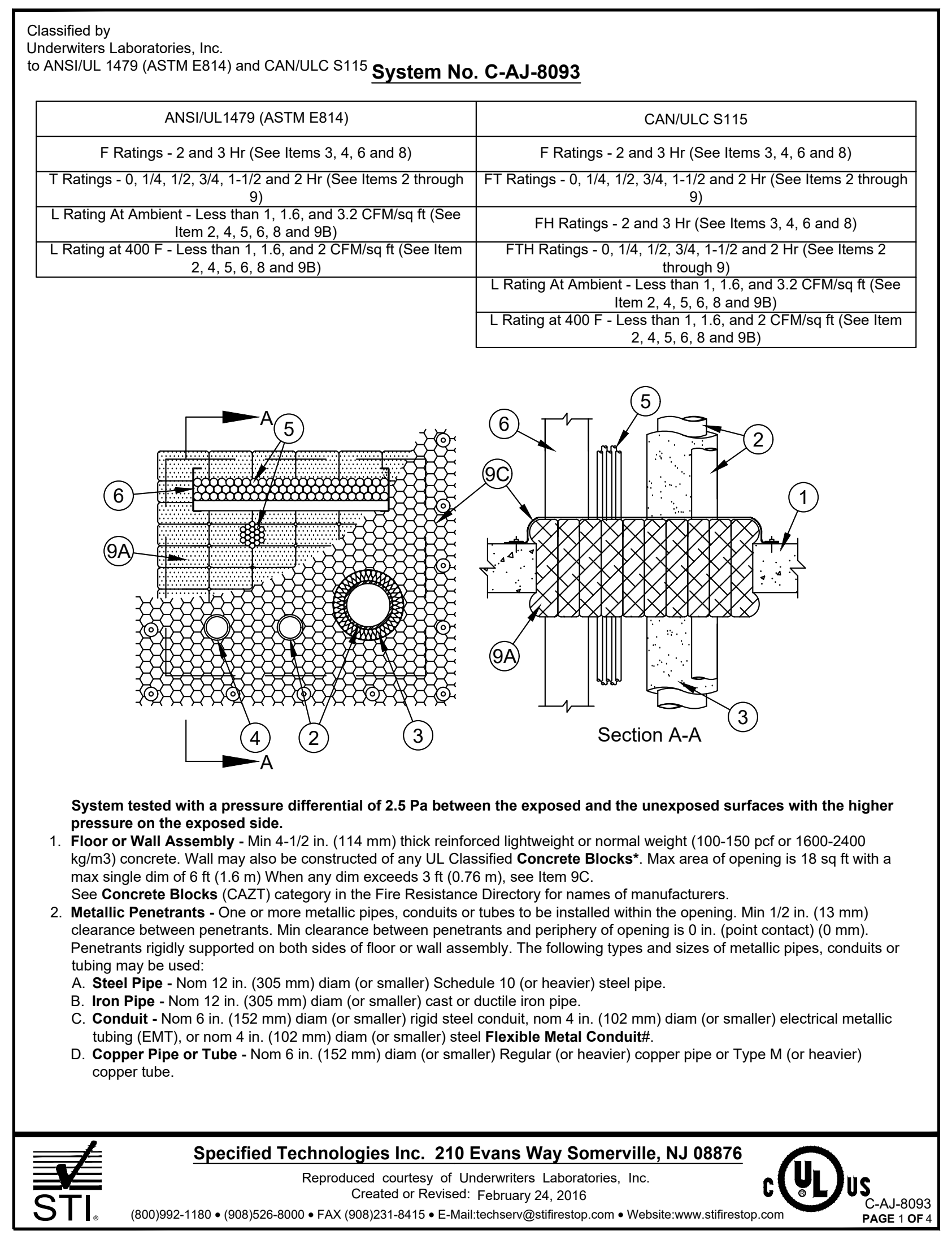
9. **Steel Duct -** (Not Shown) Nom 12 in. (305 mm) diameter (or smaller) No. 30 GA (or heavier) steel duct installed within opening when opening contains no cables or cable tray. A max of two steel ducts may be installed within the through-opening. Ducts to be spaced min 4 in. (102 mm) apart and min 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 floor or wall assembly. **When steel duct is used, the T Rating is 0 hr.**
10. **Firestop System -** The firestop system shall consist of the following items:
    A. **Packing Material -** Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation tightly packed into opening. Packing material recessed from top surface of floor assembly or from both surfaces of wall or precast concrete units 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 top surface of floor assembly or 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 concrete, a min 3/8 in. (9.6 mm) diam of fill material shall be applied at through penetrant/concrete interface on top surface of floor or 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

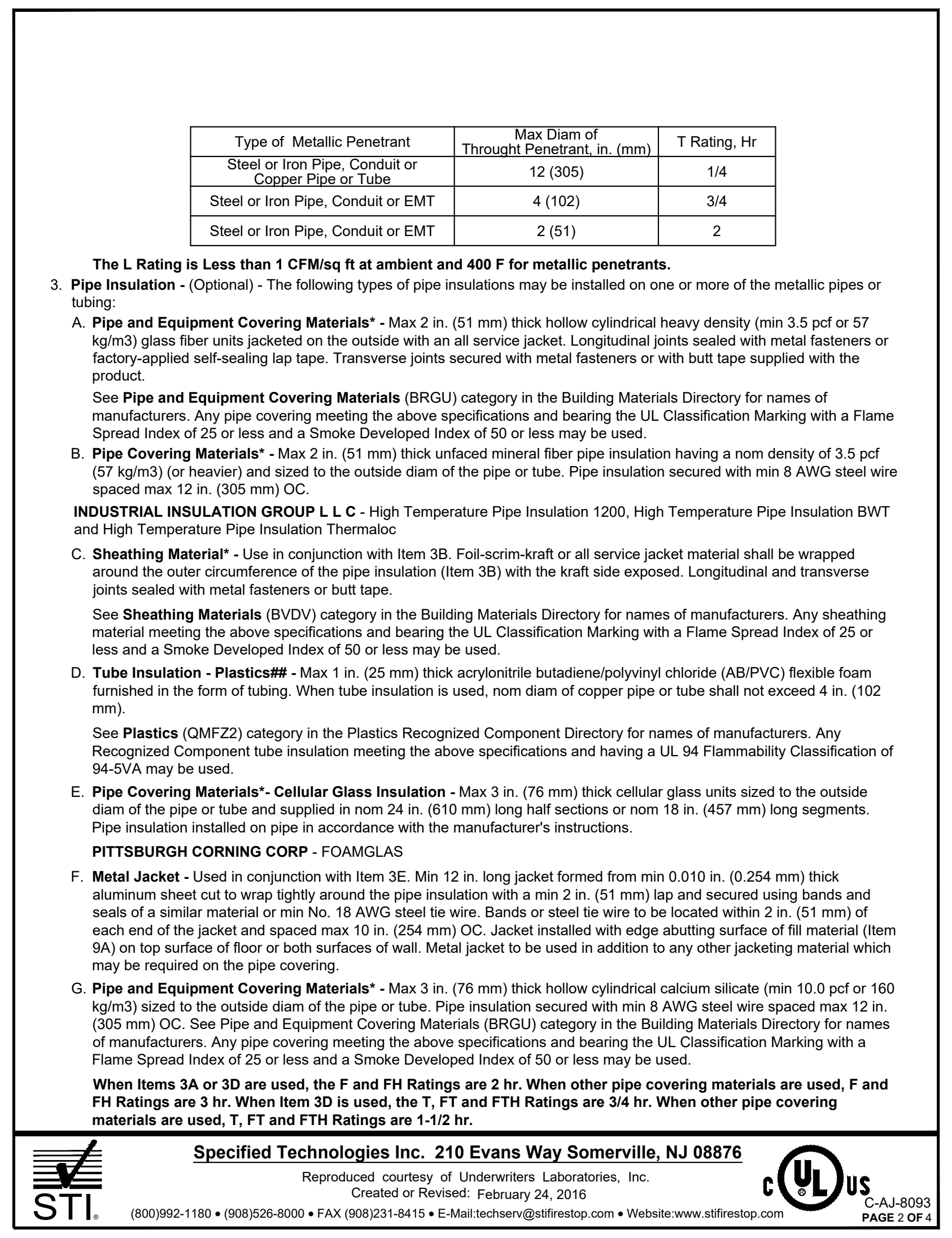


Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115 **System No. C-AJ-8093**

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 2 and 3 Hr (See Items 3, 4, 6 and 8)	F Ratings - 2 and 3 Hr (See Items 3, 4, 6 and 8)
T Ratings - 0, 1/4, 1/2, 3/4, 1-1/2 and 2 Hr (See Items 2 through 9)	FT Ratings - 0, 1/4, 1/2, 3/4, 1-1/2 and 2 Hr (See Items 2 through 9)
L Rating At Ambient - Less than 1, 1.6, and 3.2 CFM/sq ft (See Item 2, 4, 5, 6, 8 and 9B)	FH Ratings - 2 and 3 Hr (See Items 3, 4, 6 and 8)
L Rating at 400 F - Less than 1, 1.6, and 2 CFM/sq ft (See Item 2, 4, 5, 6, 8 and 9B)	FTH Ratings - 0, 1/4, 1/2, 3/4, 1-1/2 and 2 Hr (See Items 2 through 9)
	L Rating At Ambient - Less than 1, 1.6, and 3.2 CFM/sq ft (See Item 2, 4, 5, 6, 8 and 9B)
	L Rating at 400 F - Less than 1, 1.6, and 2 CFM/sq ft (See Item 2, 4, 5, 6, 8 and 9B)

System tested with a pressure differential of 2.5 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

1. **Floor or Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max area of opening is 18 sq ft with a max single dim of 6 ft (1.6 m) When any dim exceeds 3 ft (0.76 m), see Item 9C.
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. **Metallic Penetrants -** One or more metallic pipes, conduits or tubes to be installed within the opening. Min 1/2 in. (13 mm) clearance between penetrants. Min clearance between penetrants and periphery of opening is 0 in. (point contact) (0 mm). Penetrants rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
   A. **Steel Pipe -** Nom 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 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 tube.



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

The L Rating is Less than 1 CFM/sq ft at ambient and 400 F for metallic penetrants.

3. **Pipe Insulation -** (Optional) - The following types of pipe insulations may be installed on one or more of the metallic pipes or tubing:
   A. **Pipe and Equipment Covering Materials* -** Max 2 in. (51 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 57 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.

   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* -** Max 2 in. (51 mm) thick unfaced mineral fiber pipe insulation having a nom density of 3.5 pcf (57 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.

   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 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 mm).

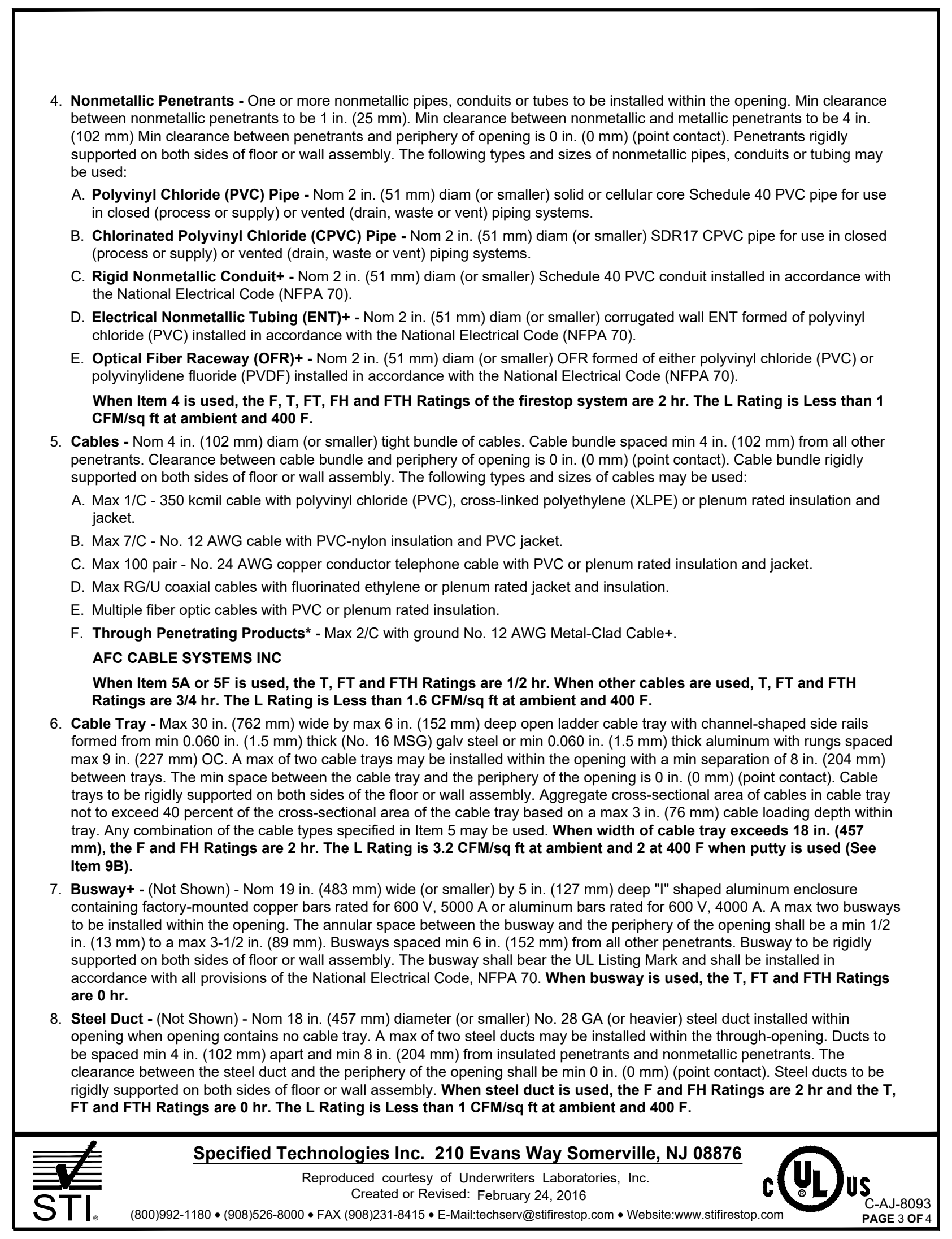
   See **Plastics** (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.

   E. **Pipe Covering Materials*- Cellular Glass Insulation -** 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 may be required on the pipe covering.
   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 FH Ratings are 3 hr. When Item 3D is used, the T, FT and FTH Ratings are 3/4 hr. When other pipe covering materials are used, T, FT and FTH Ratings are 1-1/2 hr.



4. **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. (102 mm) Min clearance between penetrants and periphery of opening is 0 in. (0 mm) (point contact). Penetrants rigidly supported on both sides of floor or 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) SDR17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) 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 (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).

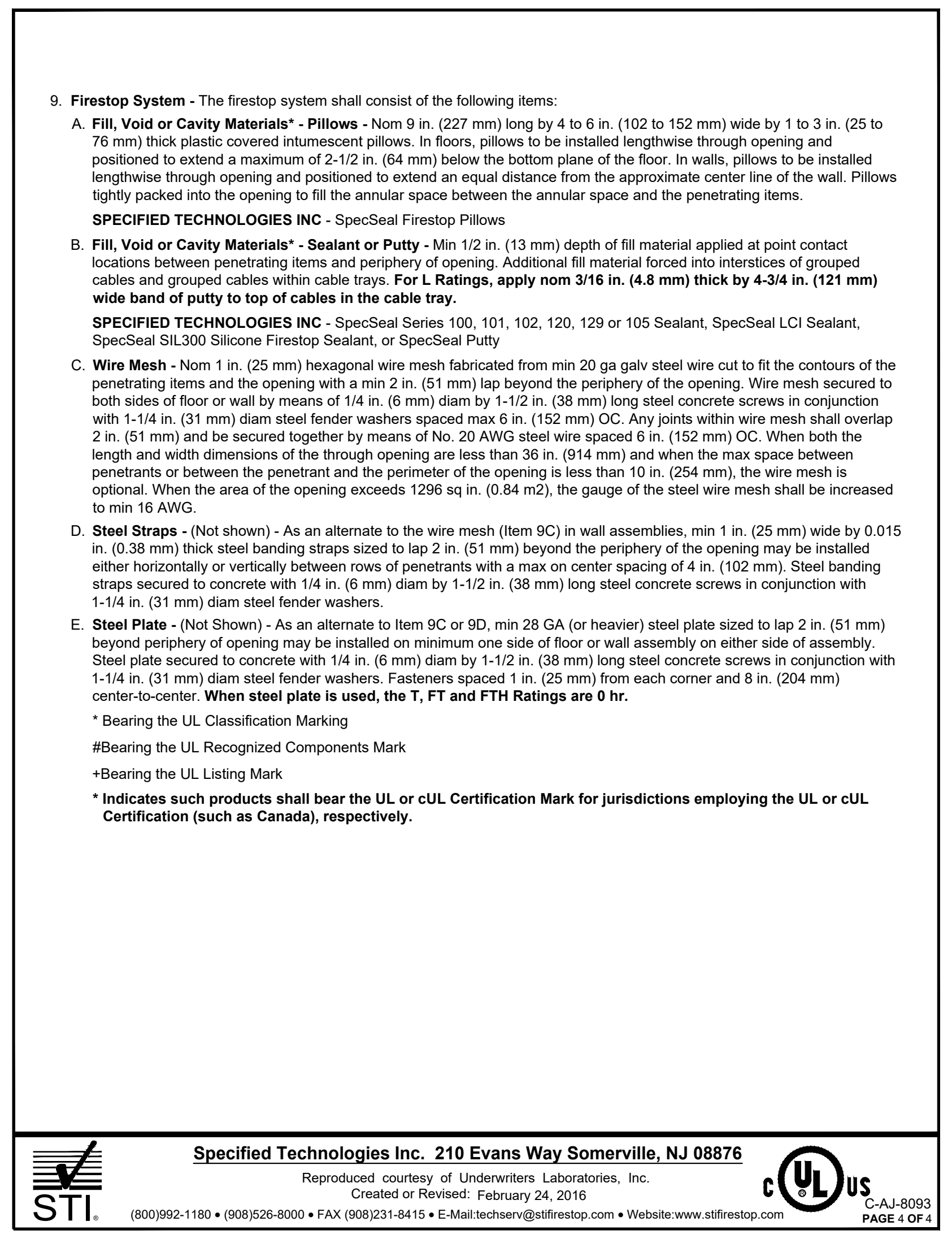
   When Item 4 is used, the F, T, FT, FH and FTH Ratings of the firestop system are 2 hr. The L Rating is Less than 1 CFM/sq ft at ambient and 400 F.

5. **Cables -** Nom 4 in. (102 mm) diam (or smaller) tight bundle of cables. Cable bundle spaced min 4 in. (102 mm) from all other penetrants. Clearance between cable bundle and periphery of opening is 0 in. (0 mm) (point contact). Cable bundle rigidly supported on both sides of floor or 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 jacket.
   C. Max 100 pair - No. 24 AWG copper conductor telephone cable with PVC or plenum rated insulation and jacket.
   D. Max RG/U coaxial cables with fluorinated ethylene or plenum rated jacket and insulation.
   E. Multiple fiber optic cables with PVC or plenum rated insulation.
   F. **Through Penetrating Products* -** Max 2/C with ground No. 12 AWG Metal-Clad Cable+.

   AFC CABLE SYSTEMS INC

   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 Less than 1.6 CFM/sq ft at ambient and 400 F.

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. (227 mm) OC. A max of two cable trays may be installed within the opening with a min separation of 8 in. (204 mm) between trays. The min space between the cable tray and the periphery of the opening is 0 in. (0 mm) (point contact). Cable trays to be rigidly supported on both sides of the floor or 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 width of cable tray exceeds 18 in. (457 mm), the F and FH Ratings are 2 hr. The L Rating is 3.2 CFM/sq ft at ambient and 2 at 400 F when putty is used (See Item 9B).**
7. **Busway+ -** (Not Shown) - 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. A max two busways to be installed within the opening. The annular space between the busway and the periphery of the opening shall be a min 1/2 in. (13 mm) to a max 3-1/2 in. (89 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 70. **When busway is used, the T, FT and FTH Ratings are 0 hr.**
8. **Steel Duct -** (Not Shown) - Nom 18 in. (457 mm) diameter (or smaller) No. 28 GA (or heavier) steel duct installed within opening when opening contains no 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. (204 mm) from insulated penetrants and nonmetallic penetrants. The clearance between the steel duct and the periphery of the opening shall be min 0 in. (0 mm) (point contact). Steel ducts to be rigidly supported on both sides of floor or wall assembly. **When steel duct is used, the F and FH Ratings are 2 hr and the T, FT and FTH Ratings are 0 hr. The L Rating is Less than 1 CFM/sq ft at ambient and 400 F.**



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 to min 16 AWG.
   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.**

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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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
Website:www.stifirestop.com

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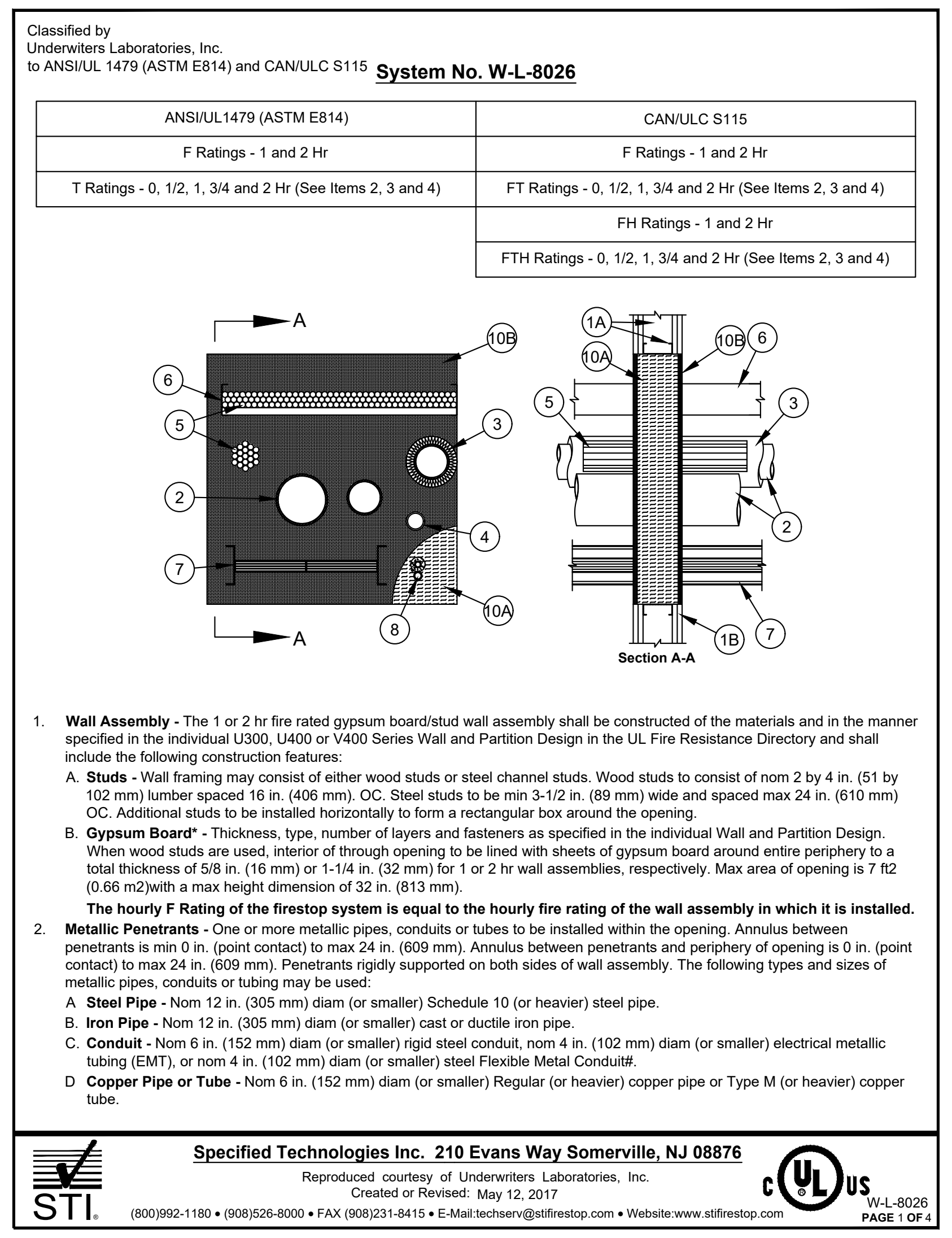

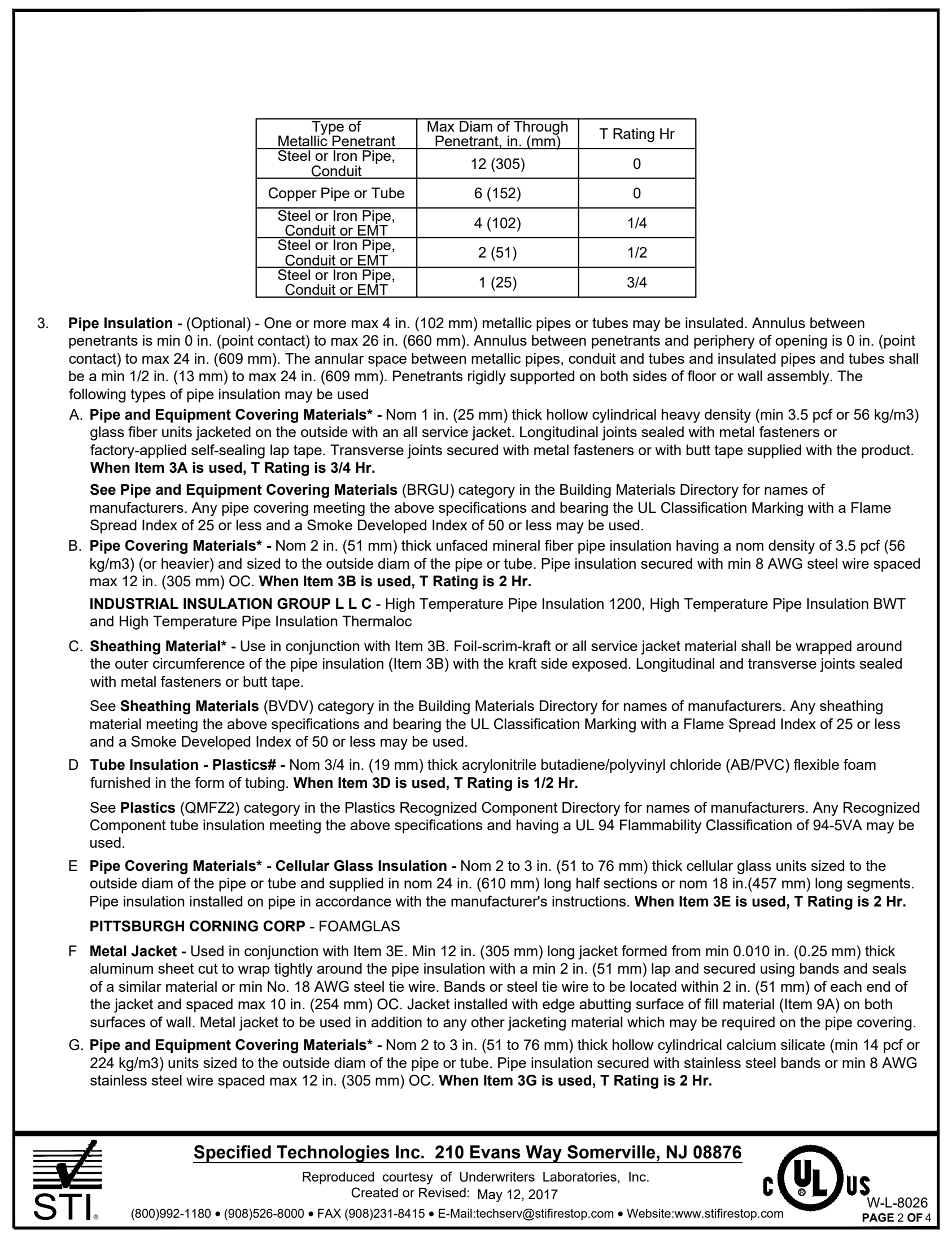

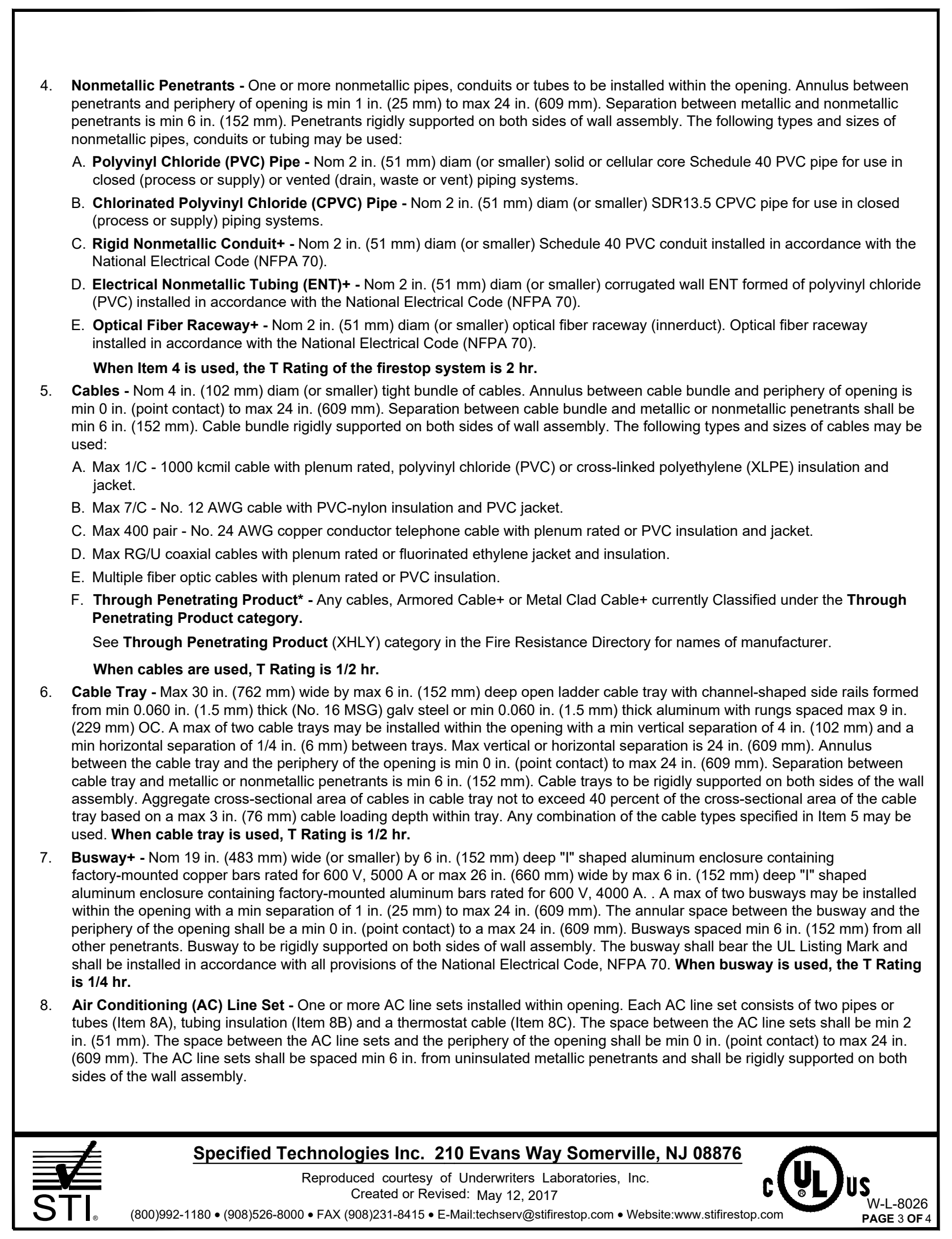

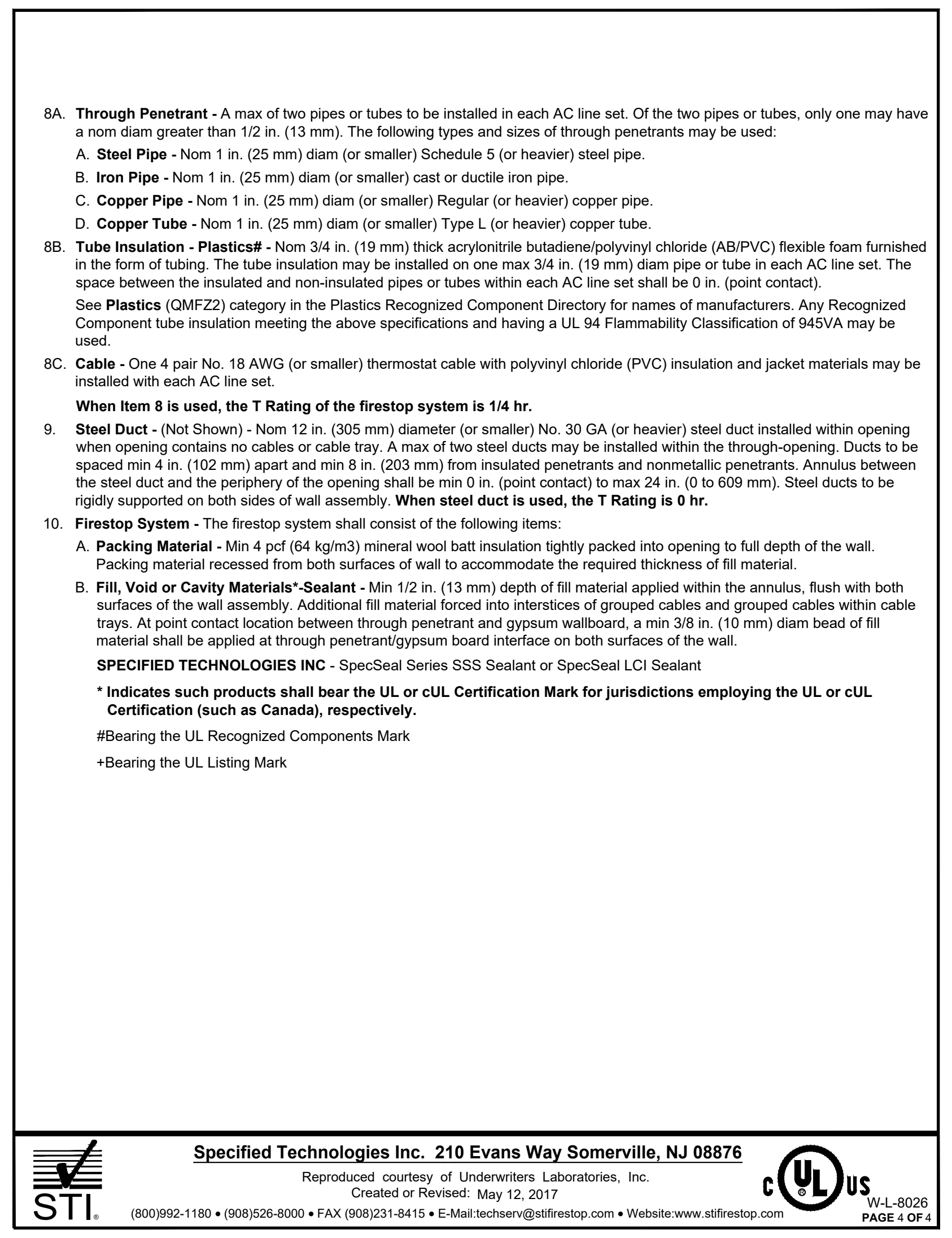

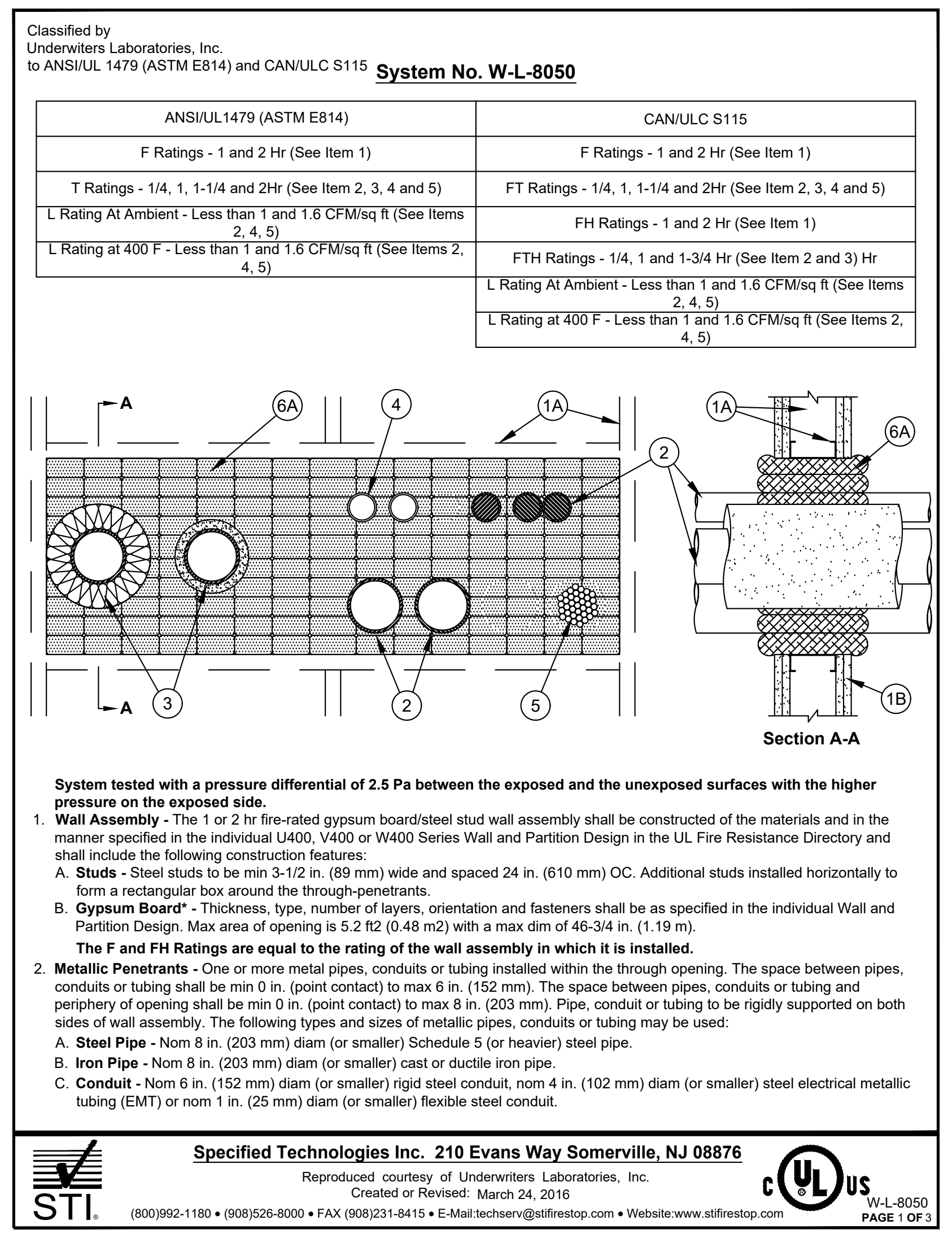

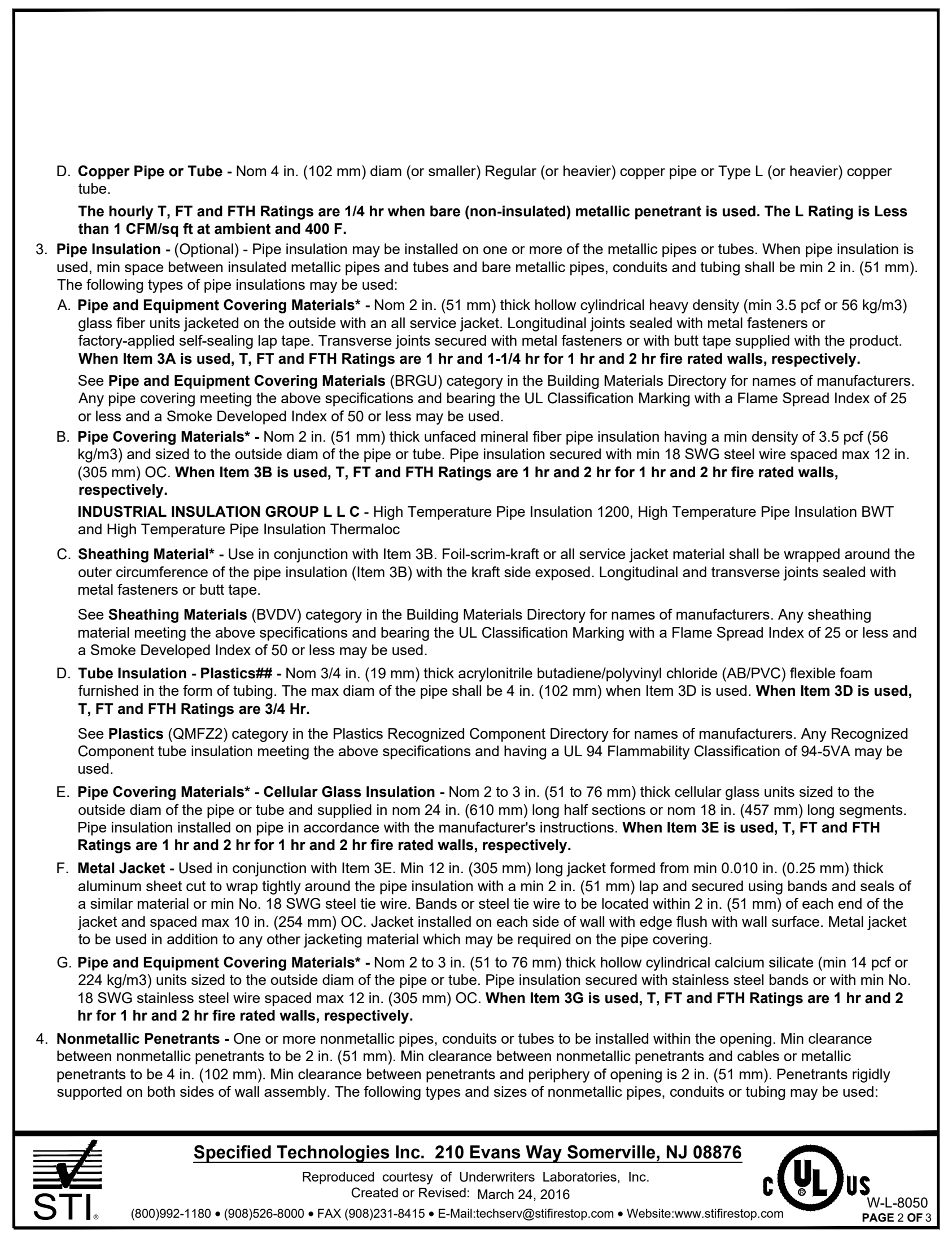

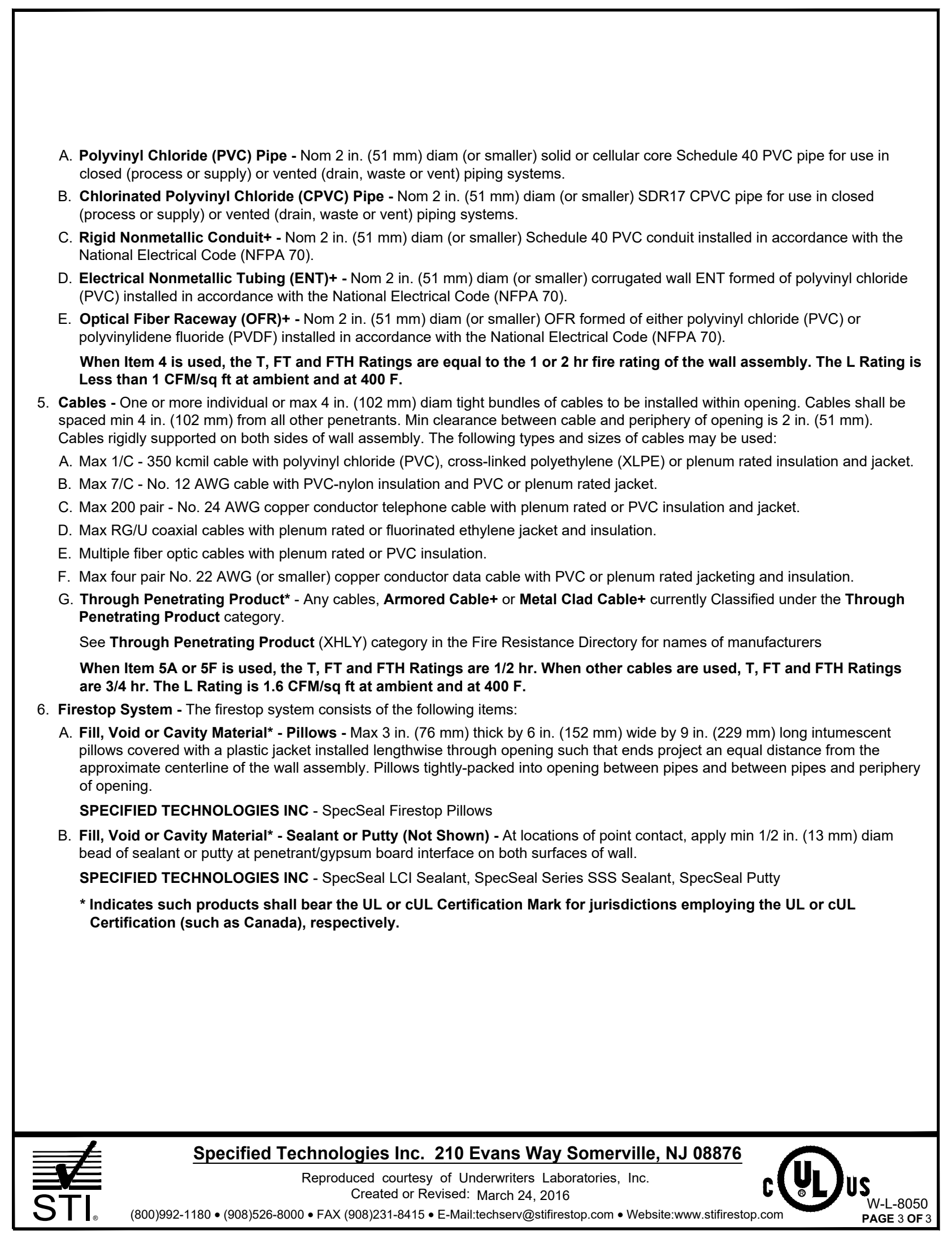

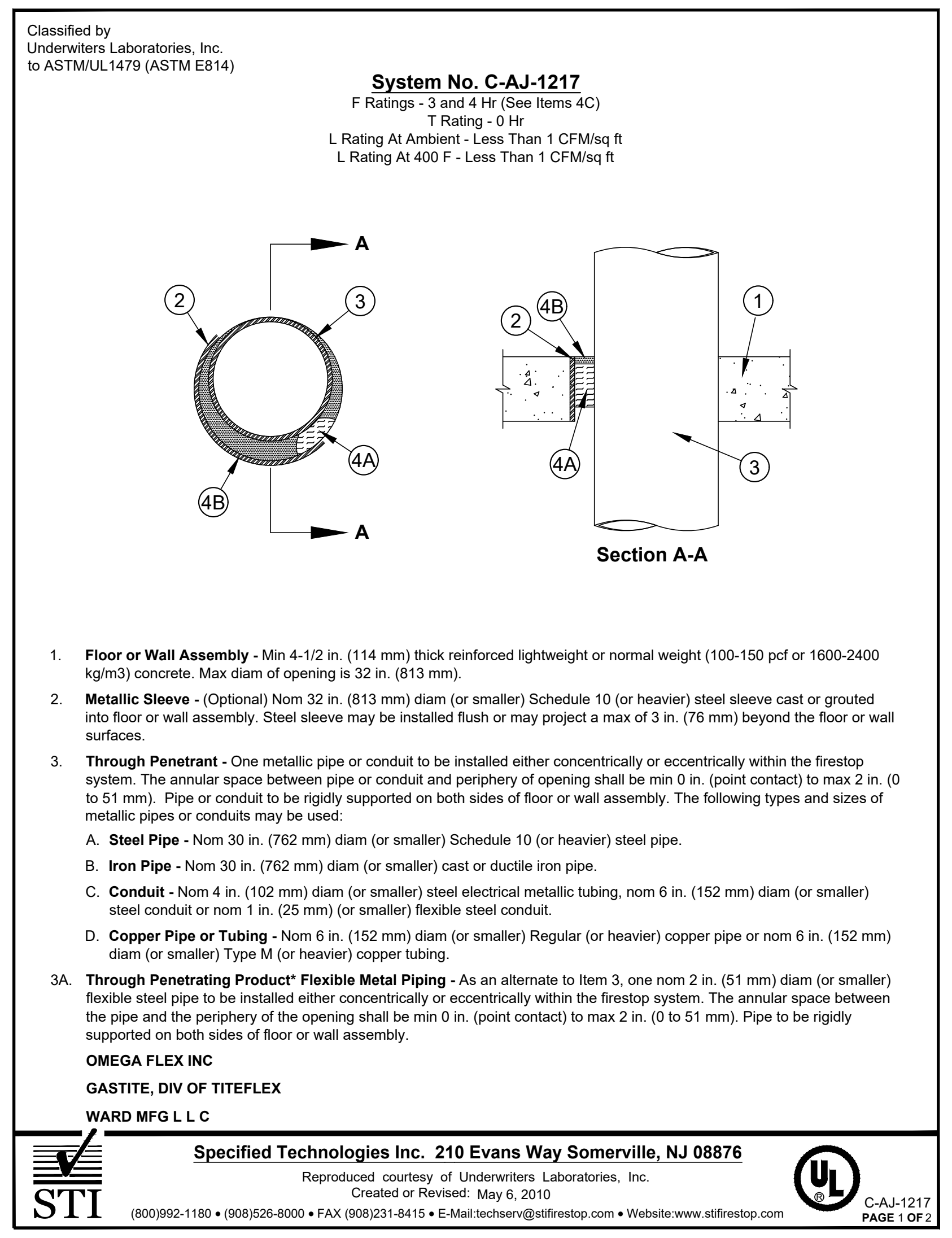

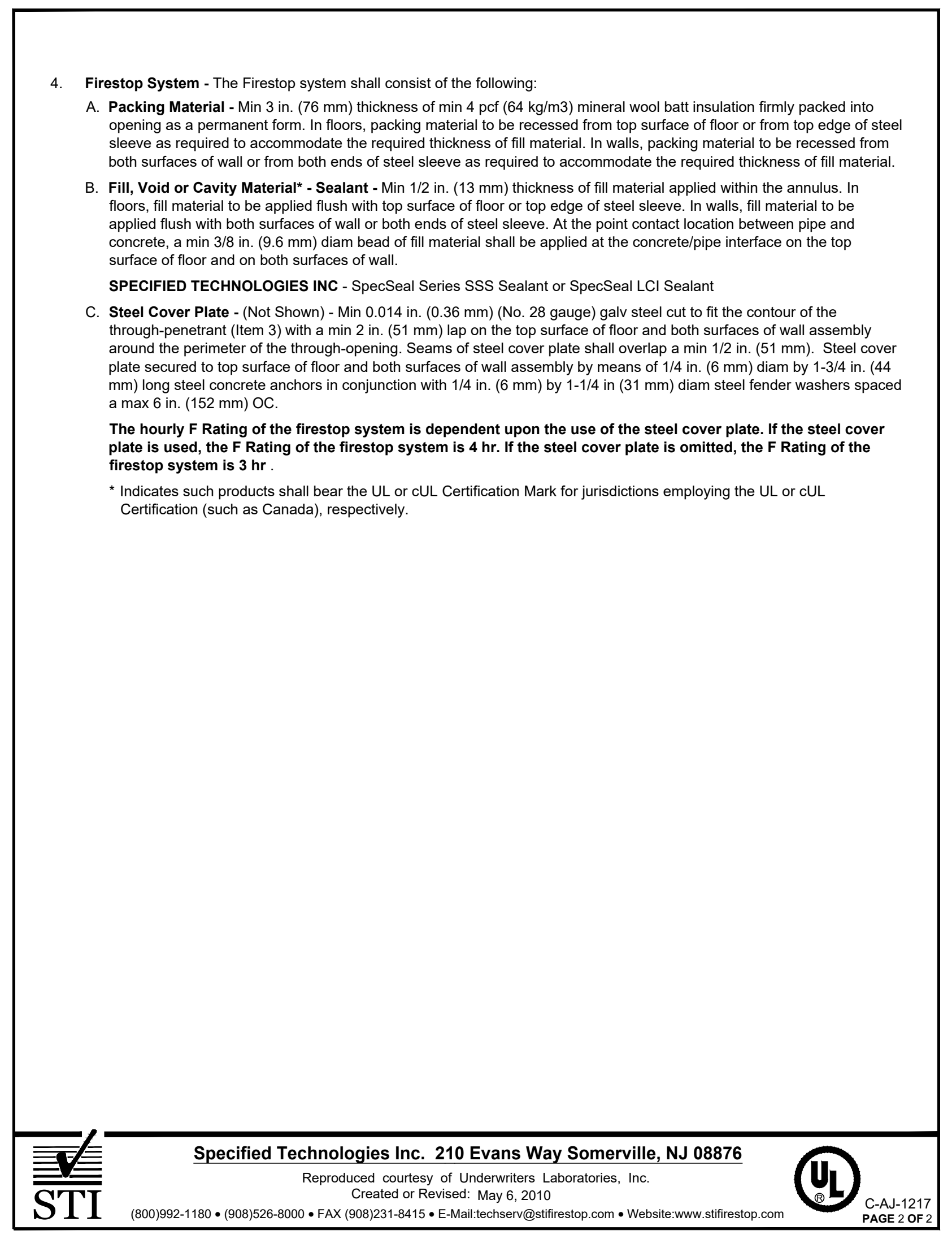

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3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
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   - All governing local and regional building codes
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Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814)
and ANSI/UL263 (ASTM E119)

CLIV.R14288

Wall-opening Protective Materials

SpecSeal Power Shield Box Inserts, for use with flush device UL Listed Metallic Outlet Boxes without internal clamps installed with steel mud rings in framed wall assemblies. When protective material is used in outlet boxes on both sides of the wall as directed, the horizontal separation between outlet boxes on opposite sides of the wall may be less than 24 in. (610 mm) provided that the boxes are not installed back-to-back. Installation shall comply with the National Electrical Code (NFPA 70). The max outlet box dimensions, hourly rating, type of stud, use of stud cavity insulation and type of faceplate are tabulated below. Additional general construction features shall comply as follows:

A. **Studs** - Unless otherwise specified, the minimum stud width is 3-1/2 in. (89 mm).

B. **Stud Cavity Insulation** - Where indicated in the table below, stud cavity insulation to consist of min 3-1/2 in. (89 mm) thick fiberglass (min 0.5 pcf or 8 kg/m3) or mineral fiber (min 4 pcf or 64 kg/m3). Unless indicated as required, stud cavity insulation is optional.

C. **Wall Design** - Stud composition is indicated in the table below. Wall construction shall comply with the individual U300, U400 or V400 Series Wall and Partition Design in the Fire Resistance Directory.

D. **Pad Dimensions** - The minimum dimensions of the insert pad are shown in the table below. Pads may be cut to achieve dimensions shown in table and partial insert pads may be utilized.

Product	Max Outlet Box Size, in. (mm)	Outlet Box Type	Outlet Box Mfr	Pad Size, in. (mm)	Rating, hr	Stud	Cavity Insulation	Face Plate Type	Putty Ball
EP 23	2 x 3 x 2-1/4 (51 x 76 x 57) deep	-	-	1-7/8 x 2-3/4 (48 x 70)	2	Steel	No	Steel	-
EP 23	2 x 3 x 2-1/4 (51 x 76 x 57) deep	-	-	1-7/8 x 2-3/4 (48 x 70)	2	Steel	Yes	Plastic	-
EP 23	2 x 3 x 2-1/4 (51 x 76 x 57) deep	-	-	1-7/8 x 2-3/4 (48 x 70)	1	Steel or Wood	Yes	Plastic or Steel	-
EP 24	2-1/8 x 4 x 2-1/8 (54 x 102 x 54) deep	-	-	1-7/8 x 3-3/4 (48 x 95)	2	Steel	No	Steel	-
EP 24	2-1/8 x 4 x 2-1/8 (54 x 102 x 54) deep	-	-	1-7/8 x 3-3/4 (48 x 95)	2	Steel	Yes	Plastic	-
EP 24	2-1/8 x 4 x 2-1/8 (54 x 102 x 54) deep	-	-	1-7/8 x 3-3/4 (48 x 95)	1	Steel or Wood	Yes	Plastic or Steel	-
EP 44	4 x 4 x 2-1/8 (102 x 102 x 54) deep	-	-	3-3/4 x 3-3/4 (95 x 95)	2	Steel	No	Steel	-
EP 44	4 x 4 x 2-1/8 (102 x 102 x 54) deep	-	-	3-3/4 x 3-3/4 (95 x 95)	2	Steel	Yes	Plastic	-
EP 44	4 x 4 x 2-1/8 (102 x 102 x 54) deep	-	-	3-3/4 x 3-3/4 (95 x 95)	1	Steel or Wood	Yes	Plastic or Steel	-
EP 45	4-11/16 x 4-11/16 x 2-1/8 (119 x 119 x 54) deep	-	-	4-1/2 x 4-1/2 (114 x 114)	1 or 2	Steel or Wood	Yes	Plastic or Steel	-
EP 45	4-1/2 x 5 x 2-3/8 (114 x 127 x 60) deep	-	-	4-1/2 x 4-1/2 (114 x 114)	1 or 2	Steel or Wood	Yes	Plastic or Steel	-
EP 45	4-1/2 x 14 x 2-1/2 (114 x 356 x 64) deep	-	-	4-1/2 x 13-3/4 (114 x 349)	1 or 2	Steel or Wood	Yes	Plastic or Steel	-

SpecSeal Putty Pads, for use with flush device UL Listed Metallic Outlet Boxes installed with steel mud rings or UL Listed Nonmetallic Outlet Boxes in framed wall assemblies. When protective material is used on outlet boxes on both sides of the wall as directed, the horizontal separation between outlet boxes on opposite sides of the wall may be less than 24 in. (610 mm) provided that the boxes are not installed back-to-back. Installation shall comply with the National Electrical Code (NFPA 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. When nonmetallic box is used with Type NM cable, a 3/16 in. (5 mm) thickness of putty shall be formed around the cable at its connection to the box and extending a min of 1 in. (25 mm). The box composition, max device dimensions, hourly rating, type of stud and type of faceplate are tabulated below. Additional general construction features shall comply as follows:

A. **Studs** - Unless otherwise specified, the minimum stud width is 3-1/2 in. (89 mm).

B. **Stud Cavity Insulation** - Unless indicated as required, stud cavity insulation is optional and may consist of min 3-1/2 in. (89 mm) thick fiberglass (min 0.5 pcf or 8 kg/m3) or mineral fiber (min 4 pcf or 64 kg/m3).

C. **Wall Design** - Stud composition is indicated in the table below. Wall construction shall comply with the individual U300, U400 or V400 Series Wall and Partition Design in the Fire Resistance Directory.

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D. **Metallic Outlet Boxes** - Except as indicated in the table below, when steel outlet boxes are used and the boxes are interconnected by means of electrical metallic tube or conduit, a ball of putty is to be installed to plug the open end of each electrical metallic tube (EMT) or conduit within the outlet box. When MC cable is used and/or when the outlet boxes are not interconnected, the ball of putty is not required.

E. **Nonmetallic Outlet Boxes** - The box manufacturer is indicated in the table below. Boxes shall bear a 2 hr rating under the "Outlet Boxes and Fittings Classified for Fire Resistance" category in the Fire Resistance Directory.

Model	Max Outlet Box in. (mm)	Outlet Box Type	Outlet Box Mfr	Pad Size in. (mm)	Rating, hr	Stud	Cavity Insulation	Face Plate Type	Putty Ball
-	4 x 4 x 2-1/8 (102 x 102 x 54) deep	Steel	N.A.	-	1	Steel or Wood	-	Steel	No
-	4 x 4 x 2-1/8 (102 x 102 x 54) deep	Steel	N.A.	-	1	Steel or Wood	-	Plastic	Yes
-	4-11/16 x 4-11/16 x 2-1/8 (119 x 119 x 54) deep	Steel	N.A.	-	1 or 2	Steel or Wood	-	Steel	Yes
-	4-1/2 x 5 x 2-3/8 (114 x 127 x 60) deep	Steel	N.A.	-	1 or 2	Steel or Wood	-	Steel	Yes
-	4-1/2 x 14 x 2-1/2 (114 x 127 x 60) deep	Steel	N.A.	-	1 or 2	Steel or Wood	-	Steel	Yes
-	3-3/4 x 4 x 3 (95 x 102 x 76) deep	Polyvinyl Chloride	Lamson & Sessions or Carlon	-	1 or 2	Wood	-	Plastic or Steel	N.A.
-	3-3/4 x 4 x 3 (95 x 102 x 76) deep	Phenolic	Allied Moulded Prods	-	1 or 2	Wood	-	Plastic or Steel	N.A.
-	3-3/4 x 4 x 3 (95 x 102 x 76) deep	Polycarbonate	Thomas & Betts	-	1 or 2	Wood	-	Plastic or Steel	N.A.
-	3-3/4 x 4 x 3 (95 x 102 x 76) deep	Phenolic	Thomas & Betts	-	1 or 2	Wood	-	Plastic or Steel	N.A.
-	2-1/4 x 3-3/4 x 2-3/4 (57 x 95 x 70) deep	Polyvinyl Chloride	Pass & Seymour	-	1 or 2	Wood	-	Plastic or Steel	N.A.

SpecSeal Putty Pads , for use with maximum 4 by 4 by 2-1/8 in. (102 by 102 by 54 mm) deep flush device UL Listed Metallic Outlet Boxes installed with steel mud rings and with steel faceplates in 1 hr or 2 hr fire rated gypsum board wall assemblies constructed with min 5-1/2 in. (140 mm) wide wood or steel studs and with stud cavities filled with fiberglass (nom 0.5 pcf or 8 kg/m3) or mineral fiber (nom 4 pcf or 64 kg/m3) insulation. When protective material is used on outlet boxes on both sides of the wall as directed, the boxes may be installed back-to-back provided that the boxes on opposite sides of the wall are not interconnected with conduit or, when interconnected, the open end of the conduit within the outlet box is filled with a ball of putty. Installation shall comply with the National Electrical Code (NFPA 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.

SpecSeal EP23, EP24 and EP44 Power Shield Box Inserts and SpecSeal Putty Pads, for use with maximum 4 by 4 by 1-1/2 or 2-1/8 in. (102 by 102 by 38 or 54 mm) deep flush device UL Listed **Metallic Outlet Boxes** installed with steel mud rings and with steel or plastic faceplates in 1 hr or 2 hr fire rated gypsum board wall assemblies constructed with min 3-1/2 in. (89 mm) wide wood or steel studs. When both protective materials are used with outlet boxes on both sides of the wall as directed, the boxes may be installed back-to-back provided that the backs of the boxes are minimum 1/2 in. (13 mm) apart and provided that the boxes are not interconnected. Installation shall comply with the National Electrical Code (NFPA 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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SpecSeal Putty Pads, for use with max 5 by 5 by 2 7/8 in. (127 by 127 by 73 mm) deep flush device UL Listed Metallic Outlet Boxes or UL Listed Communications-Circuit Accessories manufactured by Randl Industries Inc for use in 1 hr or 2 hr fire rated gypsum board wall assemblies framed with min 3-5/8 in. (92 mm) wide wood or steel studs and constructed as specified in the individual U300, U400, or V400 or W400 Series Wall and Partition Designs in the Fire Resistance Directory. Metallic outlet boxes to be provided with UL Listed Signal Appliance with steel cover plate manufactured by Cooper Wheelock Inc. Moldable putty pads are to be installed to completely cover the exterior surfaces of the outlet box (except for the side of the outlet box against the stud unless otherwise noted) including nailing tabs and to completely seal against the stud within the stud cavity. Multiple moldable putty pads may be installed on an outlet box to attain the required minimum thickness of putty material. Additional putty material used to seal around each conduit and/or cable fitting on the exterior of each box. A min 3/16 in. (4.8 mm) thickness of putty material is required on the exterior surfaces of flush device boxes in 1 and 2 hr fire rated Wall and Partition Designs. When the moldable putty pad outlet box protective material is used on boxes on both sides of wall as directed, the horizontal separation between outlet boxes on opposite sides of the wall may be less than 24 in. (610 mm) provided that the outlet boxes are not installed back to back, except as noted.

SpecSeal EP55 Power Shield Box Inserts, for use with max 5 by 5 by 2 7/8 in. (127 by 127 by 73 mm) deep flush device UL Listed Metallic Outlet Boxes or UL Listed Communications-Circuit Accessories manufactured by Randl Industries Inc for use in 1 hr or 2 hr fire rated gypsum board wall assemblies framed with min 3-5/8 in. (92 mm) wide wood or steel studs and constructed as specified in the individual U300, U400, or V400 or W400 Series Wall and Partition Designs in the Fire Resistance Directory. Metallic outlet boxes to be provided with UL Listed Signal Appliance with steel cover plate manufactured by Cooper Wheelock Inc. Power Shield Box Insert is to be applied to the back surface of the box and may be slit to accommodate communications-circuit accessories. When the Power Shield Box Insert is used on boxes on both sides of wall as directed, the horizontal separation between outlet boxes on opposite sides of the wall may be less than 24 in. (610 mm) provided that the outlet boxes are not installed back to back, except as noted.

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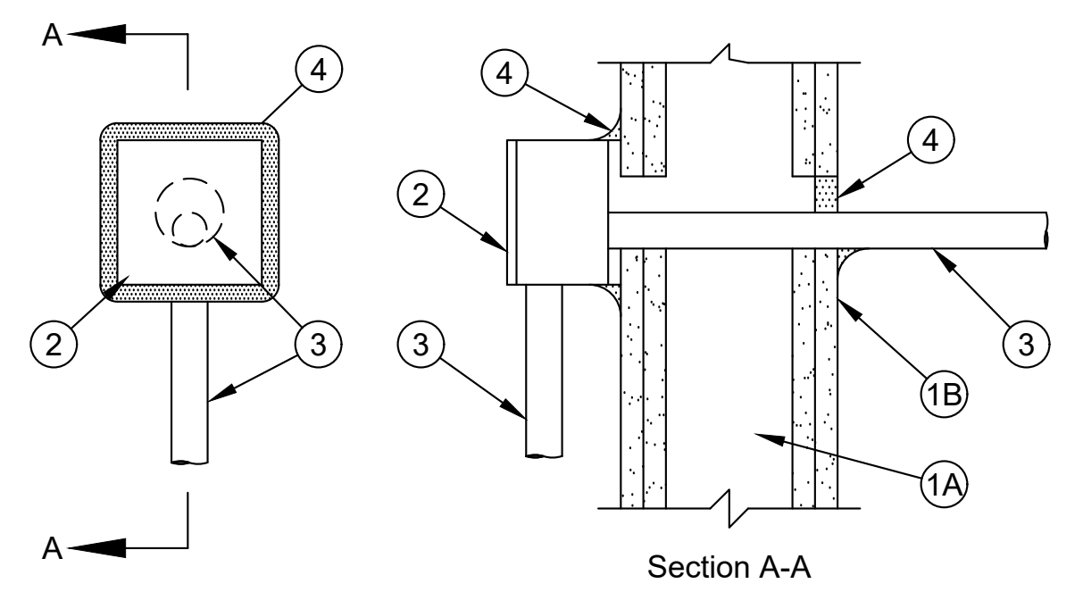
Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-1448

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr	FT Rating - 0 Hr
	FH Ratings - 1 and 2 Hr (See Item 1)
	FTH Rating - 0 Hr



1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of 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.
   B. **Gypsum Board* -** 5/8 in. (16 mm) thick, 4 ft (1.2 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Diam of opening to be 1/2 in. (13 mm) to 1 in. (25 mm) larger than outside diam of through penetrant. Max diam of opening is 2-1/4 in. (57 mm).

   The F Rating of the firestop system is equal to the fire rating of the wall assembly.
2. **Pull or Junction Box+ -** Min 16 ga steel pull or junction box mounted flush with or max 1/4 in. (6 mm) from surface of wall.

   See **Junction and Pull Boxes** (BGUZ) category in the Electrical Construction Material Directory for names of manufacturers.
3. **Conduit -** One nom 1 in. (25 mm) diam (or smaller) steel conduit or steel electrical metallic tubing to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 0 in. (point contact) to max 1 in. (25 mm). Conduit or EMT to be secured to back surface of pull or junction box with steel connector and rigidly supported on both sides of wall assembly.

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4. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with surface of wall opposite the pull or junction box. A min 1/2 in. (13 mm) diam bead of fill material shall be applied at the point contact location between the conduit and wall. A min 1/2 in. (13 mm) diam bead of fill material shall be applied around the entire perimeter of the pull or junction box at its interface with the wall surface. The fill material shall lap min 1/2 in. (13 mm) onto both the wall and the sides of the pull or junction box.

   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, SpecSeal LC150 Sealant, or SpecSeal LE600 Sealant

   +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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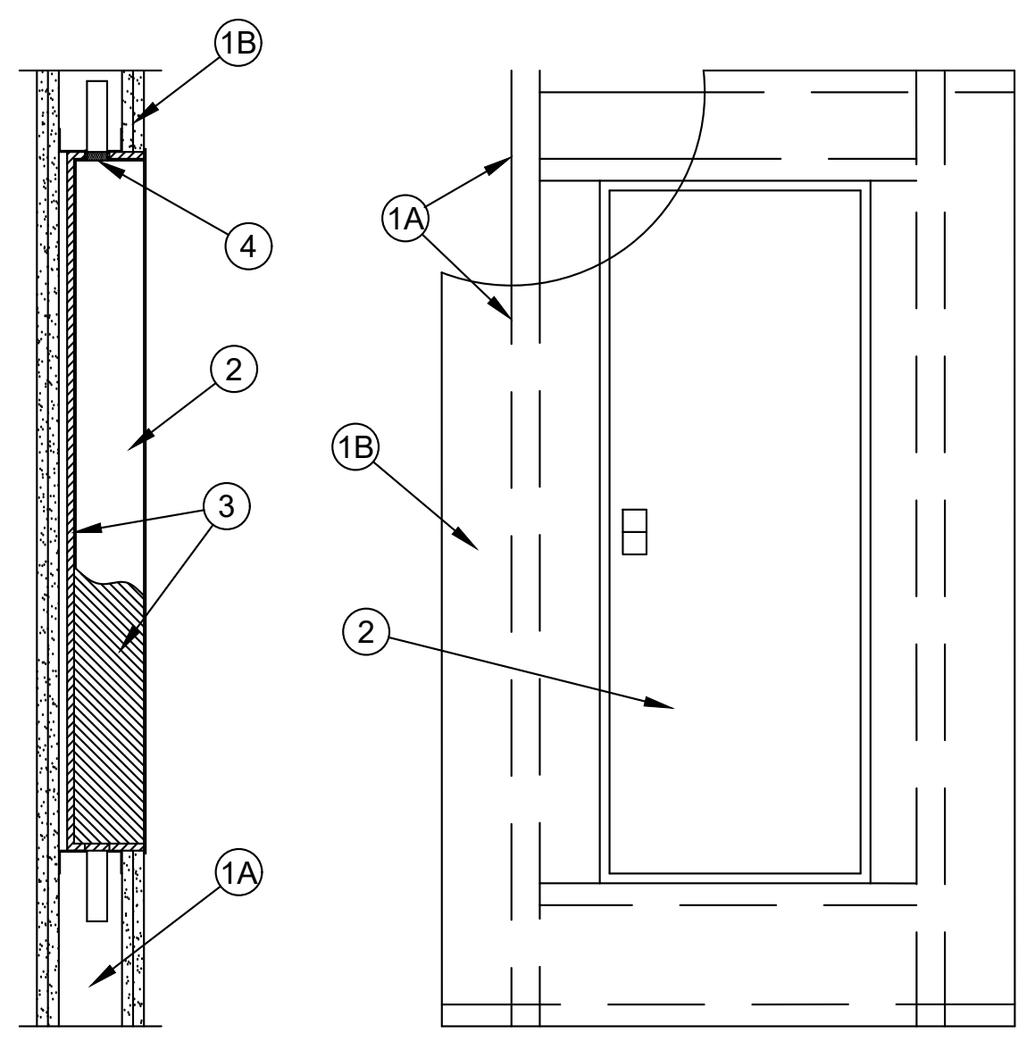
Classified by
Underwiters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-7307

AN SI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)	FT Ratings - 1 and 2 Hr (See Item 1)
	FH Ratings - 1 and 2 Hr (See Item 1)
	FTH Ratings - 1 and 2 Hr (See Item 1)



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1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 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. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional studs installed horizontally at the top and bottom of the steel box. Additional studs installed vertically as required for steel box attachment.
   B. **Gypsum Board* -** Gypsum board type, thickness, number of layers, and orientation shall be as specified in the individual Wall and Partition Design. Size of cutout made to accommodate steel box (Item 2) and wrap material (Item 3).

   The hourly Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Steel Box -** Max 14-1/8 in. (359 mm) wide by 39-3/8 in. (1000 mm) by max 3-7/8 (98 mm) steel electrical panel box, steel utility box, or steel med-gas valve box with hinged steel door and mounting flange. Steel box attached to wall framing using steel screws after application of wrap material (Item 3). Sides of steel box may be penetrated by min two min 1/2" (13 mm) diam steel pipe, iron pipe, copper pipe or tube, steel conduit or EMT. Steel conduit connectors may be used at interface with steel box. Open ends of pipes, tubes or conduits which terminate inside the box to be plugged with sealant or putty (Item 4).
3. **E-Wrap Endothermic Wrap* -** Wrap - Nom 0.5 in. (13 mm) thick flexible sheet material. One layer sized to cover back and four sides of steel box. At corners of steel box, wrap cut horizontally or vertically, extending from corner of steel box to edge of wrap material. Circular openings made in wrap material to accommodate pipes, tubes or conduits sized max 1/2 in. (13 mm) larger than the outside diameter of the pipe, tube, or conduit. Wrap material folded to maintain contact with back and four sides of steel box. At the corners of the box, trim the overhanging material on the top and bottom sides so that it is flush with the wrap on the sides. Seal the corners with aluminum foil tape. As an option, the overhanging material can be folded onto the sides and secured with aluminum foil tape. Prior to application of wrap material, a bead of construction adhesive to be applied to the back and side of steel box at edge.

   SPECIFIED TECHNOLOGIES INC - E-Wrap Endothermic Wrap.
4. **Fill, Void or Cavity Materials* - Putty or Sealant -** Min 1/2 in. (13 mm) thickness of sealant or putty applied into ends of pipes, tubes or conduits that terminate inside box. Additional putty or sealant to fill circular cutouts made to accommodate pipes, tubes or conduits. A min 1/4 in. (6 mm) diam bead or sealant applied to exposed edge of wrap material.

   SPECIFIED TECHNOLOGIES INC - SpecSeal Putty, SpecSeal 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.**

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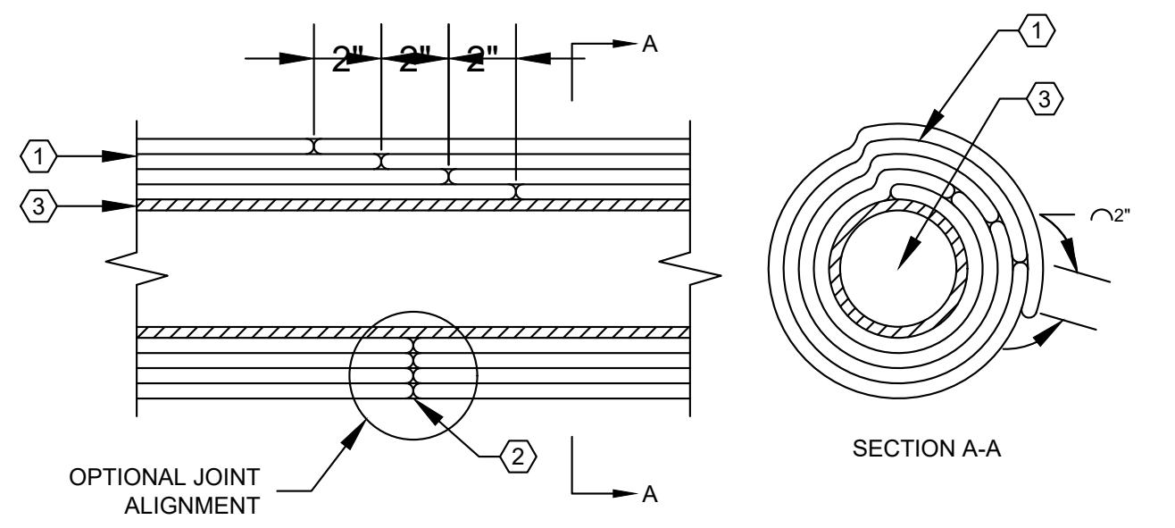
Specified Technologies, Inc.
Design No. STI/AF 120-01

Applied Fireproofing
STI E-Wrap
ASTM E1725
Ratings:
Min. 1 in. Tubing, 3 Layers of STI E-Wrap: 1 Hour
Min. 1 in. Tubing, 4 Layers of STI E-Wrap: 1-3/4 Hour
Min. 1 in. Tubing, 5 Layers of STI E-Wrap: 2 Hour
Min. 4 in. Tubing, 4 Layers of STI E-Wrap: 2 Hour



1. **CERTIFIED MANUFACTURER:** Specified Technologies, Inc.
   CERTIFIED PRODUCT: Applied Fireproofing
   CERTIFIED MODEL: STI E-Wrap Endothermic Wrap

   Install STI E-Wrap layers to achieve the desired fire resistance rating.

   LAYER 1 - Wrap STI E-Wrap onto the tubing (Item 3) by attaching the edge to the tubing using 1/2 in. wide filament tape or 2 in. wide aluminum foil tape, and wrapping tightly around the tubing and overlapping 2 in. at the longitudinal seam. 3 in. wide aluminum foil tape is applied centered on, and parallel with the longitudinal seam for the full length of the seam. Additional wrap sections are added to insulate all straight runs of tubing. The radial seams are butted end-to-end without overlap. 3 in. wide aluminum foil tape is applied over the seam and overlaps 2 in. back onto itself.

   The elbows are each fitted with a gore segment cut to accommodate the elbow radius that occurs as the STI E-Wrap is wrapped radially around the elbow. The gore segment is wrapped onto the tubing (Item 3) by attaching the edge to the tubing using 1/2 in. wide filament tape or 2 in. wide aluminum foil tape,and wrapping tightly around the tubing and overlapping 2 in. at the longitudinal seam. The longitudinal seam is located at the long radius of the elbow. 2 in. wide aluminum foil tape is applied centered on, and parallel with the longitudinal seam for the full length of the seam. The radial seam butted between the gore end segment and adjoining straight section is filled with STI LCI Intumescent Firestop Sealant (Item 2). 3 in. wide aluminum foil tape is applied over the seams and overlaps 2 in. back onto itself.

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LAYER 2 - Wrap a second layer of STI E-Wrap in the same manner as Layer 1. The start of Layer 2 begins at the longitudinal seam of Layer 1, secured with 2 in. wide aluminum foil tape covering the full length of the seam. Offset the Layer 2 radial seam 2 in. from the radial seam of Layer 1. Tightly wrap Layer 2 over Layer 1 and overlap the longitudinal seam by 2 in. Cover the full length of the longitudinal and radial seam with 3 in. wide aluminum foil tape. Alternatively, Layer 2 and subsequent layers can be aligned such that the radial seams are not offset or have an offset less than 2 in. When this is done, apply a 1/8 in. thickness of STI LCI Intumescent Sealant (Item 2) over the entire edge of the STI E-Wrap prior to installing the adjacent section.

The elbows are each fitted with a gore segment cut to accommodate the elbow radius that occurs as the STI E-Wrap is wrapped radially around the elbow in the same manner as Layer 1. The gore segment is attached to Layer 1 with 2 in. wide aluminum foil tape and wrapped tightly around Layer 1, overlapping 2 in. at the longitudinal seam. The longitudinal seam of Layer 2 is located at the short radius of the elbow. 2 in. wide aluminum foil tape is applied centered on, and parallel with the longitudinal seam for the full length of the seam. The radial seam butted between the gore end segment and adjoining straight Layer 2 section is filled with STI LCI Intumescent Sealant. The elbow and straight section butt joints of Layer 1 and Layer 2 are in alignment and not offset. 3 in. wide aluminum foil tape is applied over the seams and overlaps 2 in. back onto itself.

LAYER 3 AND LAYER 4 - Wrap a third and fourth layer of STI E-Wrap in the same manner as Layer 2.
The elbow longitudinal seam for Layer 3 is located at the middle radius of the elbow, rotated 90 degrees from the longitudinal seam of Layer 2. The elbow longitudinal seam for Layer 4 is located at the middle radius of the elbow, rotated 180 degrees from the longitudinal seam of Layer 3.

GENERAL - For each layer, all aluminum foil tape is pressed with a squeegee.
The outer layer is further secured with steel tie wire or 1/2 in. wide stainless steel banding located 1 in. from each radial seam. Space the steel tie wire 6 in. on center (oc) between the seams or the 1/2 in. wide stainless steel banding 12 in. oc. At the elbows, space the steel wire 2 in. oc or the stainless steel banding 12 in. oc, both at the short interior radius.

2. **CERTIFIED MANUFACTURER:** Specified Technologies, Inc.
   CERTIFIED PRODUCT: Caulk or Sealant
   CERTIFIED MODEL: STI LCI Intumescent Firestop Sealant

   Install STI LCI Intumescent Firestop Sealant at seams of elbow gore segments and for any gap greater than 1/8 in. at a butted seam. Use only STI LCI Intumescent Firestop Sealant bearing an Intertek Certified Label.

3. **TUBING:** Use min. 1 in. diameter electrical metal tubing (EMT), intermediate metal conduit (IMC), or rigid metal conduit (RMC).

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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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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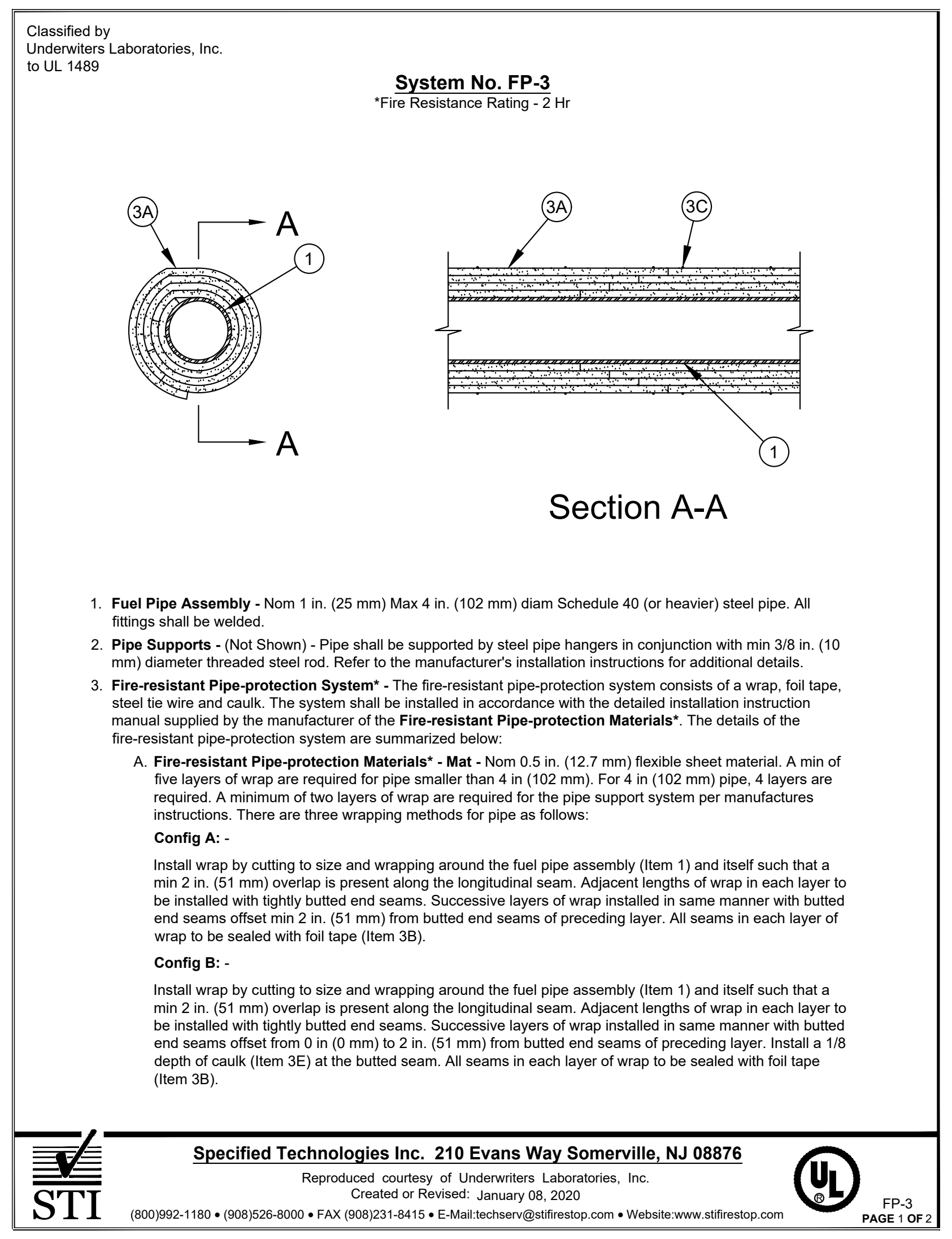

Classified by
Underwiters Laboratories, Inc.
to UL 1489

System No. FP-3
*Fire Resistance Rating - 2 Hr

Section A-A

1. **Fuel Pipe Assembly -** Nom 1 in. (25 mm) Max 4 in. (102 mm) diam Schedule 40 (or heavier) steel pipe. All fittings shall be welded.
2. **Pipe Supports -** (Not Shown) - Pipe shall be supported by steel pipe hangers in conjunction with min 3/8 in. (10 mm) diameter threaded steel rod. Refer to the manufacturer's installation instructions for additional details.
3. **Fire-resistant Pipe-protection System* -** The fire-resistant pipe-protection system consists of a wrap, foil tape, steel tie wire and caulk. The system shall be installed in accordance with the detailed installation instruction manual supplied by the manufacturer of the **Fire-resistant Pipe-protection Materials***. The details of the fire-resistant pipe-protection system are summarized below:
   A. **Fire-resistant Pipe-protection Materials* - Mat -** Nom 0.5 in. (12.7 mm) flexible sheet material. A min of five layers of wrap are required for pipe smaller than 4 in (102 mm). For 4 in (102 mm) pipe, 4 layers are required. A minimum of two layers of wrap are required for the pipe support system per manufactures instructions. There are three wrapping methods for pipe as follows:

   Config A: -

   Install wrap by cutting to size and wrapping around the fuel pipe assembly (Item 1) and itself such that a min 2 in. (51 mm) overlap is present along the longitudinal seam. Adjacent lengths of wrap in each layer to be installed with tightly butted end seams. Successive layers of wrap installed in same manner with butted end seams offset min 2 in. (51 mm) from butted end seams of preceding layer. All seams in each layer of wrap to be sealed with foil tape (Item 3B).

   Config B: -

   Install wrap by cutting to size and wrapping around the fuel pipe assembly (Item 1) and itself such that a min 2 in. (51 mm) overlap is present along the longitudinal seam. Adjacent lengths of wrap in each layer to be installed with tightly butted end seams. Successive layers of wrap installed in same manner with butted end seams offset from 0 in (0 mm) to 2 in. (51 mm) from butted end seams of preceding layer. Install a 1/8 depth of caulk (Item 3E) at the butted seam. All seams in each layer of wrap to be sealed with foil tape (Item 3B).

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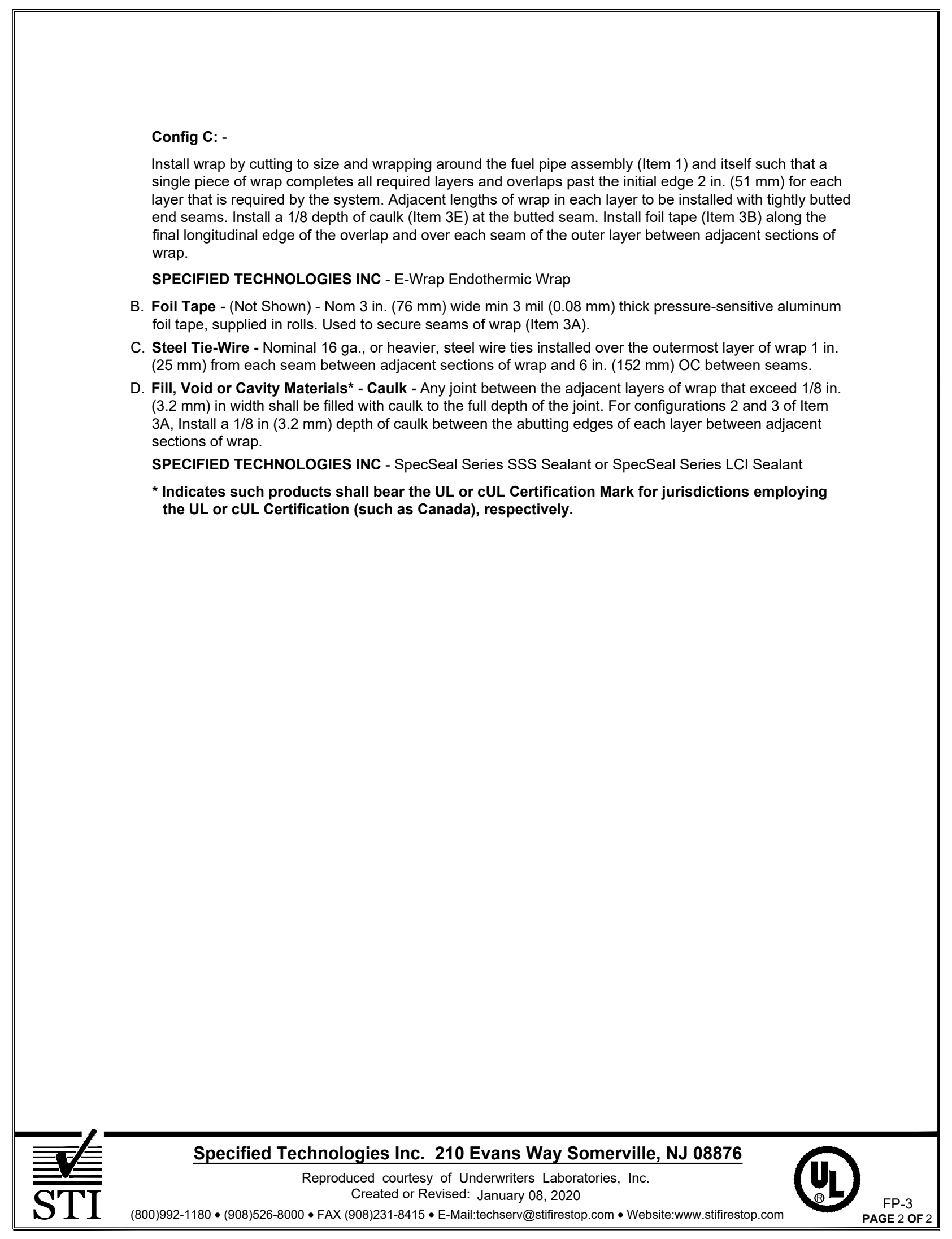

Config C: -

Install wrap by cutting to size and wrapping around the fuel pipe assembly (Item 1) and itself such that a single piece of wrap completes all required layers and overlaps past the initial edge 2 in. (51 mm) for each layer that is required by the system. Adjacent lengths of wrap in each layer to be installed with tightly butted end seams. Install a 1/8 depth of caulk (Item 3E) at the butted seam. Install foil tape (Item 3B) along the final longitudinal edge of the overlap and over each seam of the outer layer between adjacent sections of wrap.

SPECIFIED TECHNOLOGIES INC - E-Wrap Endothermic Wrap

B. **Foil Tape -** (Not Shown) - Nom 3 in. (76 mm) wide min 3 mil (0.08 mm) thick pressure-sensitive aluminum foil tape, supplied in rolls. Used to secure seams of wrap (Item 3A).
C. **Steel Tie-Wire -** Nominal 16 ga., or heavier, steel wire ties installed over the outermost layer of wrap 1 in. (25 mm) from each seam between adjacent sections of wrap and 6 in. (152 mm) OC between seams.
D. **Fill, Void or Cavity Materials* - Caulk -** Any joint between the adjacent layers of wrap that exceed 1/8 in. (3.2 mm) in width shall be filled with caulk to the full depth of the joint. For configurations 2 and 3 of Item 3A, Install a 1/8 in (3.2 mm) depth of caulk between the abutting edges of each layer between adjacent sections of wrap.

SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal Series 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.**

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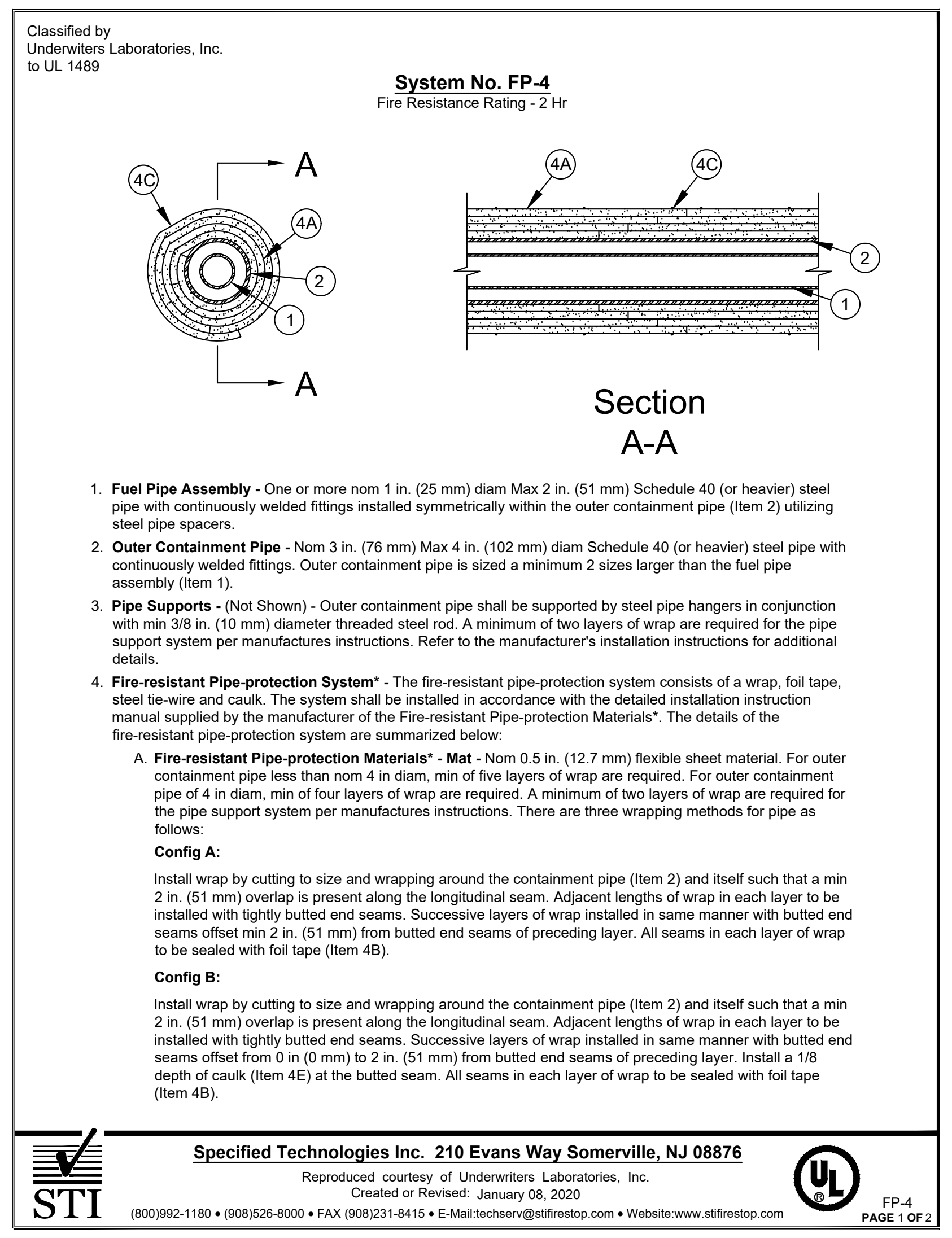

Classified by
Underwiters Laboratories, Inc.
to UL 1489

System No. FP-4
Fire Resistance Rating - 2 Hr

Section
A-A

1. **Fuel Pipe Assembly -** One or more nom 1 in. (25 mm) diam Max 2 in. (51 mm) Schedule 40 (or heavier) steel pipe with continuously welded fittings installed symmetrically within the outer containment pipe (Item 2) utilizing steel pipe spacers.
2. **Outer Containment Pipe -** Nom 3 in. (76 mm) Max 4 in. (102 mm) diam Schedule 40 (or heavier) steel pipe with continuously welded fittings. Outer containment pipe is sized a minimum 2 sizes larger than the fuel pipe assembly (Item 1).
3. **Pipe Supports -** (Not Shown) - Outer containment pipe shall be supported by steel pipe hangers in conjunction with min 3/8 in. (10 mm) diameter threaded steel rod. A minimum of two layers of wrap are required for the pipe support system per manufactures instructions. Refer to the manufacturer's installation instructions for additional details.
4. **Fire-resistant Pipe-protection System* -** The fire-resistant pipe-protection system consists of a wrap, foil tape, steel tie-wire and caulk. The system shall be installed in accordance with the detailed installation instruction manual supplied by the manufacturer of the Fire-resistant Pipe-protection Materials*. The details of the fire-resistant pipe-protection system are summarized below:
   A. **Fire-resistant Pipe-protection Materials* - Mat -** Nom 0.5 in. (12.7 mm) flexible sheet material. For outer containment pipe less than nom 4 in diam, min of five layers of wrap are required. For outer containment pipe of 4 in diam, min of four layers of wrap are required. A minimum of two layers of wrap are required for the pipe support system per manufactures instructions. There are three wrapping methods for pipe as follows:

   Config A:

   Install wrap by cutting to size and wrapping around the containment pipe (Item 2) and itself such that a min 2 in. (51 mm) overlap is present along the longitudinal seam. Adjacent lengths of wrap in each layer to be installed with tightly butted end seams. Successive layers of wrap installed in same manner with butted end seams offset min 2 in. (51 mm) from butted end seams of preceding layer. All seams in each layer of wrap to be sealed with foil tape (Item 4B).

   Config B:

   Install wrap by cutting to size and wrapping around the containment pipe (Item 2) and itself such that a min 2 in. (51 mm) overlap is present along the longitudinal seam. Adjacent lengths of wrap in each layer to be installed with tightly butted end seams. Successive layers of wrap installed in same manner with butted end seams offset from 0 in (0 mm) to 2 in. (51 mm) from butted end seams of preceding layer. Install a 1/8 depth of caulk (Item 4E) at the butted seam. All seams in each layer of wrap to be sealed with foil tape (Item 4B).

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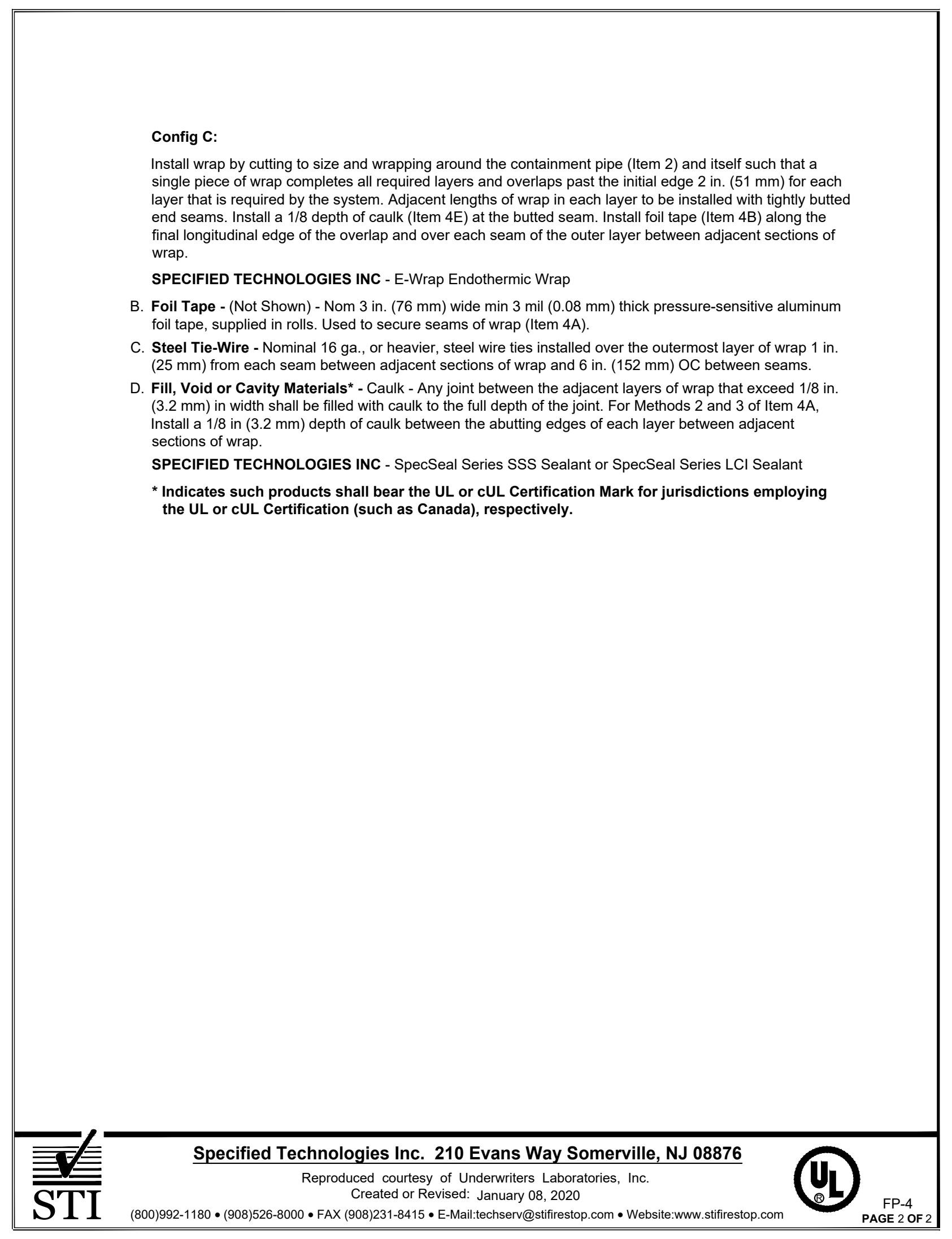

Config C:

Install wrap by cutting to size and wrapping around the containment pipe (Item 2) and itself such that a single piece of wrap completes all required layers and overlaps past the initial edge 2 in. (51 mm) for each layer that is required by the system. Adjacent lengths of wrap in each layer to be installed with tightly butted end seams. Install a 1/8 depth of caulk (Item 4E) at the butted seam. Install foil tape (Item 4B) along the final longitudinal edge of the overlap and over each seam of the outer layer between adjacent sections of wrap.

SPECIFIED TECHNOLOGIES INC - E-Wrap Endothermic Wrap

B. **Foil Tape -** (Not Shown) - Nom 3 in. (76 mm) wide min 3 mil (0.08 mm) thick pressure-sensitive aluminum foil tape, supplied in rolls. Used to secure seams of wrap (Item 4A).
C. **Steel Tie-Wire -** Nominal 16 ga., or heavier, steel wire ties installed over the outermost layer of wrap 1 in. (25 mm) from each seam between adjacent sections of wrap and 6 in. (152 mm) OC between seams.
D. **Fill, Void or Cavity Materials* -** Caulk - Any joint between the adjacent layers of wrap that exceed 1/8 in. (3.2 mm) in width shall be filled with caulk to the full depth of the joint. For Methods 2 and 3 of Item 4A, Install a 1/8 in (3.2 mm) depth of caulk between the abutting edges of each layer between adjacent sections of wrap.

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

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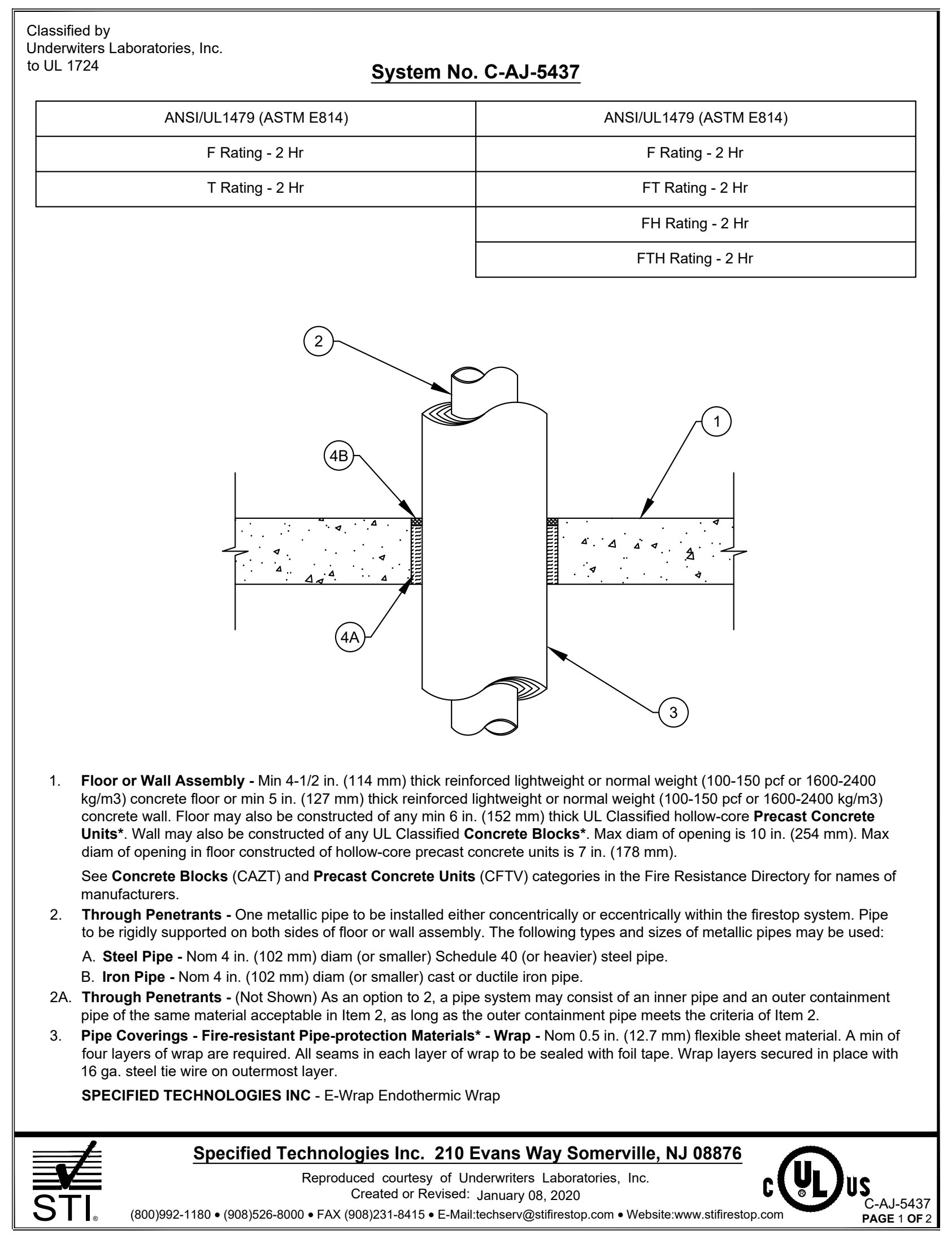

Classified by
Underwiters Laboratories, Inc.
to UL 1724

System No. C-AJ-5437

ANSI/UL1479 (ASTM E814)	ANSI/UL1479 (ASTM E814)
F Rating - 2 Hr	F Rating - 2 Hr
T Rating - 2 Hr	FT Rating - 2 Hr
	FH Rating - 2 Hr
	FTH Rating - 2 Hr

1. **Floor or Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor or min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete wall. Floor may also be constructed of any min 6 in. (152 mm) thick UL Classified hollow-core **Precast Concrete Units***. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening is 10 in. (254 mm). Max diam of opening in floor constructed of hollow-core precast concrete units is 7 in. (178 mm).

   See **Concrete Blocks** (CAZT) and **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Through Penetrants -** One metallic pipe to be installed either concentrically or eccentrically within the firestop system. Pipe to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes may be used:
   A. **Steel Pipe -** Nom 4 in. (102 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.
   B. **Iron Pipe -** Nom 4 in. (102 mm) diam (or smaller) cast or ductile iron pipe.

2A. **Through Penetrants -** (Not Shown) As an option to 2, a pipe system may consist of an inner pipe and an outer containment pipe of the same material acceptable in Item 2, as long as the outer containment pipe meets the criteria of Item 2.

3. **Pipe Coverings - Fire-resistant Pipe-protection Materials* - Wrap -** Nom 0.5 in. (12.7 mm) flexible sheet material. A min of four layers of wrap are required. All seams in each layer of wrap to be sealed with foil tape. Wrap layers secured in place with 16 ga. steel tie wire on outermost layer.

   SPECIFIED TECHNOLOGIES INC - E-Wrap Endothermic Wrap

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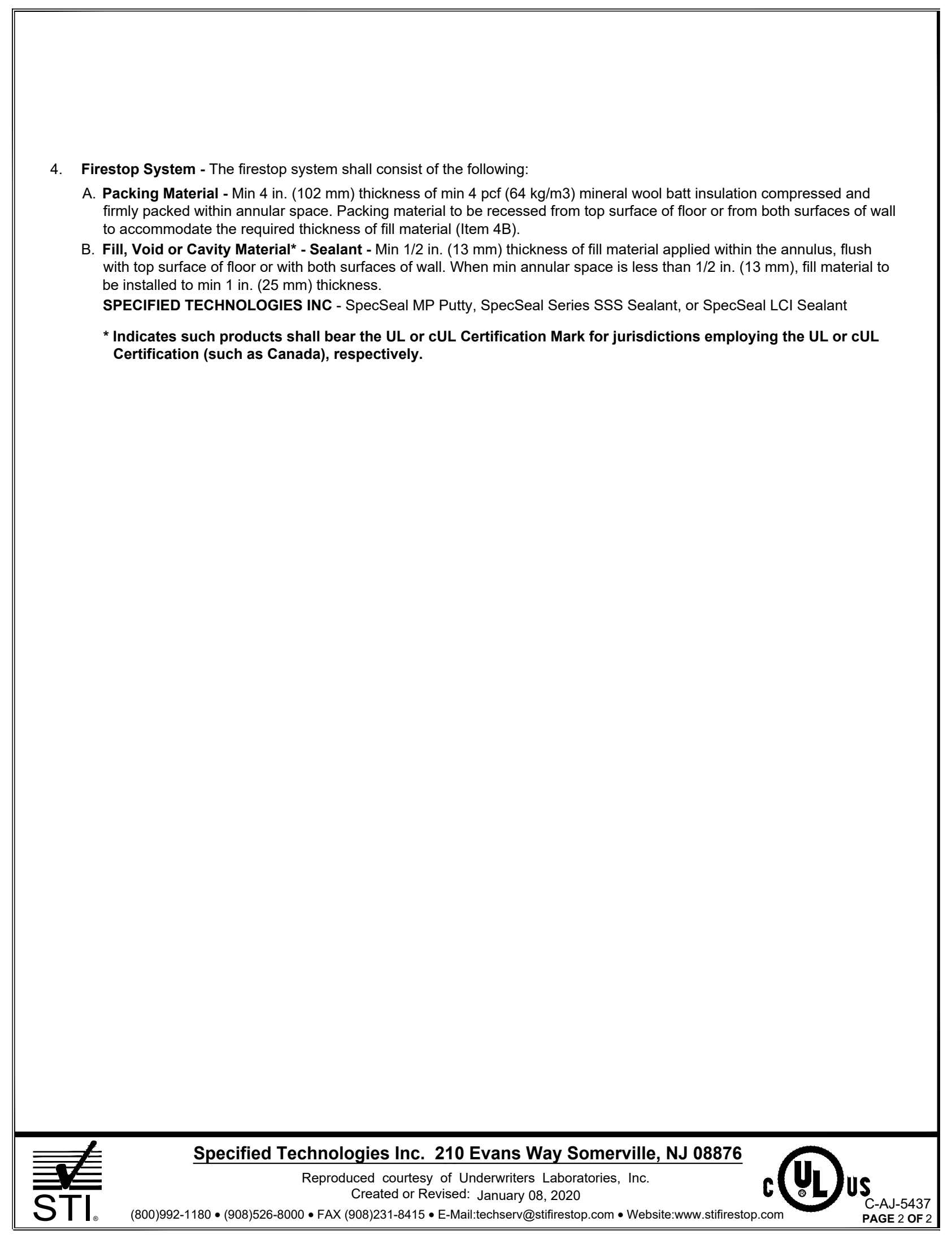

4. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation compressed and firmly packed within annular space. Packing material to be recessed from top surface of floor or from both surfaces of wall to accommodate the required thickness of fill material (Item 4B).
   B. **Fill, Void or Cavity Material* - Sealant -** Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall. When min annular space is less than 1/2 in. (13 mm), fill material to be installed to min 1 in. (25 mm) thickness.

   SPECIFIED TECHNOLOGIES INC - SpecSeal MP Putty, SpecSeal Series SSS Sealant, or SpecSeal LCI Sealant

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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:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

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