FIRESTOP SUBMITTAL PACKAGE

PROJECT:

DATE:

SUBMITTED BY:

Specified Technologies Inc.

SpecSeal FIRESTOP PRODUCTS

200 Evans Way • Somerville, NJ 08876 • (800) 992-1180 • (908) 526-8000 • Fax (908) 526-9623

#	UL SYSTEM	DESCRIPTION	PRODUCT(S)
1	CAJ1079	Max 24" steel or iron pipe or max 6" copper pipe or tube	SSS Intumescent Sealant
2	CAJ1353	Max 12" steel or iron pipe, max 4" copper pipe or tube, max 2" flexible steel pipe. Caulk and backing. 3 Hr.	LCI Intumescent Sealant
3	CAJ2166	Max 2" rigid PVC conduit	RED Wrap Strip
4	CAJ2166	Max 2" rigid PVC conduit	RED Wrap Strip
5	CAJ2290	Max 2" PVC or CPVC pipe	LCI Intumescent Sealant
6	CAJ2291	Max 1" PVC, CPVC or PEX	LCI Intumescent Sealant
7	CAJ2298	Max 4" PVC, CPVC or ABS Pipe	LCC Collar
8	CAJ2298	Max 4" PVC, CPVC or ABS Pipe	LCC Collar
9	CAJ5138	Max 6" Steel,Iron,Copper or Copper Tubing	LCI Intumescent Sealant
10	CAJ5154	Max 6" Steel or Iron Pipe, max 4" Copper Pipe or Tube	LCI Intumescent Sealant
11	CAJ5155	Max. 4" steel or iron or 2" copper with 1/2" to 3/4" thick AB/PVC	LCI Intumescent Sealant
12	CAJ7040	Max 8" steel duct	LCI Intumescent Sealant
13	CAJ7041	Max 24 by 12" Steel Duct	LCI Intumescent Sealant
14	CAJ8083	Max 4" steel, iron or copper, 2" fiberglass, mineral fiber or 1/2" AB/PVC	LCI Intumescent Sealant
15	CAJ8084	Max 3/4" Steel or Iron or 3/4" Copper Pipe or Tube	LCI Intumescent Sealant
16	WJ1099	Max 12" Steel or Iron pipe, Max 4" Copper pipe or tube, max 2" flexible steel pipe	LCI Intumescent Sealant
17	WJ2076	2" PVC, CPVC or 1-1/2" ABS (vented or closed), 1" PEX (closed only)	LCI Intumescent Sealant
18	WJ2077	Max 1" PVC CPVC, PEX or ENT	LCI Intumescent Sealant
19	WJ5054	Max 6" Steel, Iron ,Copper or Copper Tubing	LCI Intumescent Sealant
20	WJ5055	Max 4" Steel or Iron Pipe, Max 2" Copper Pipe or Tube, Max 3/4" AB/PVC Insulation	LCI Intumescent Sealant
21	WJ5056	Max. 6-in. steel or iron or 4-in. copper with 3-in. cellular glass.	LCI Intumescent Sealant
22	WJ7031	Max 24 by 30" Duct. 26-Gauge.	LCI Intumescent Sealant
23	WJ8011	Max 1" Steel or Iron Insulated pipe or Max 1" Copper Insulated pipe or tube	LCI Intumescent Sealant
24	WL1222	Max 8" Steel ,Iron ,Copper or Copper tubing or 1 1/4" Flex Pipe. Angled Penetrant.	LCI Intumescent Sealant
25	WL1223	Max 8" Steel or Iron Pipe, max 4" Copper Pipe or Tubing	LCI Intumescent Sealant
26	WL2237	Max 4" PVC, CPVC, ABS	LCC Collar
27	WL2241	Max 2" PVC or CPVC, max 1-1/2 ABS or max 1" PEX	LCI Intumescent Sealant
28	WL2242	Max 1" PVC, CPVC or PEX (closed systems only)	LCI Intumescent Sealant
29	WL5121	Max 6" steel, iron, max 4" copper, max 2" fiberglass	LCI Intumescent Sealant
30	WL5122	Max 4" Steel or Iron Pipe Or Max 2" Copper Pipe or Copper Tubing	LCI Intumescent Sealant
31	WL5123	Max 6" steel, iron, max 4" copper, max 3" foamglas	LCI Intumescent Sealant
32	WL7060	Max 24" by 30" Steel duct. 26-Gauge.	LCI Intumescent Sealant
33	WL7061	Max 8" diam duct	LCI Intumescent Sealant

34	WL7062	Max. 8 by 8-in. steel duct. Caulk only. No angles.	LCI Intumescent Sealant
35	WL8025	AC Line Set. Caulk only.	LCI Intumescent Sealant

GENERAL CERTIFICATE OF COMPLIANCE

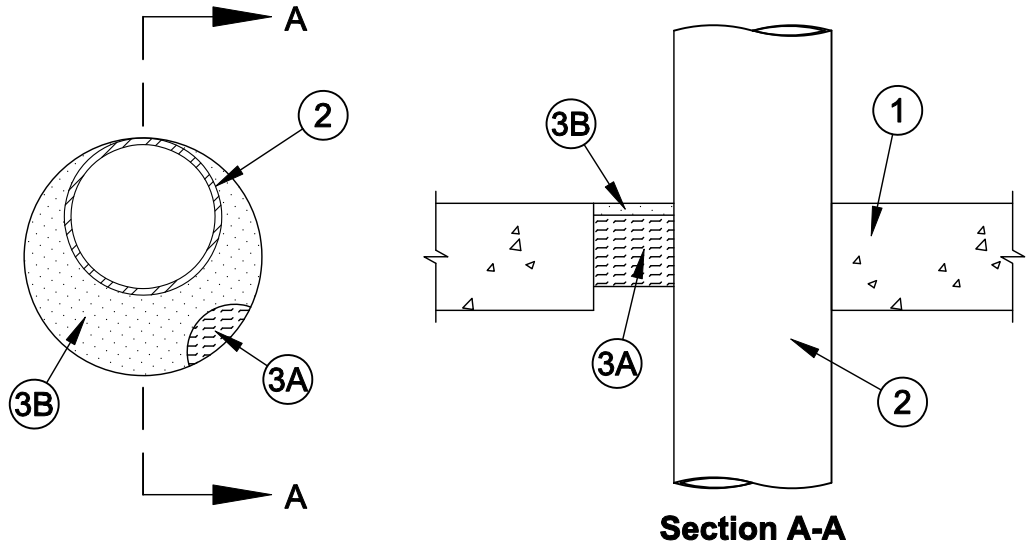
PRODUCT DATA SHEETS
1 LCI Intumescent Sealant
2 SSWRED Intumescent Wrap Strip
3 SSS Intumescent Sealant

MATERIAL SAFETY DATA SHEETS
1 LCI Intumescent Sealant
2 SSWRED Intumescent Wrap Strip
3 SSS Intumescent Sealant

IMPORTANT NOTICE:
This submittal is comprised of user selected documents that have been assembled using an automatic printing and archiving system. Use of the products or designs referenced herein are at the sole discretion of the installer, specifier, or other designated project decision maker. Specified Technologies Inc (STI) makes no guarantees nor recommendations regarding the applicability of the products or designs contained in this document to the referenced project.

System No. C-AJ-1079

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 3 and 4 Hr (See Item 3C)	F Ratings - 3 and 4 Hr (See Item 3C)
T Ratings - 0, 1/4, 1/2 and 3/4 Hr (See Item 2)	FT Ratings - 0, 1/4, 1/2 and 3/4 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 3 and 4 Hr (See Item 3C)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 0, 1/4, 1/2 and 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



Section A-A

1. **Floor or Wall Assembly -** Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Floor may also be constructed of any min 6 in. thick UL Classified hollow-core **Precast Concrete Units*.** Wall may also be constructed of any UL Classified **Concrete Blocks*** . Max diam of opening is 28 in. Max diam of opening in floor constructed of hollow-core precast concrete units is 7 in.

   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, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe, conduit or tubing and the periphery of the opening shall be min 0 in. (point contact) to a max 4 in. Pipe, conduit 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 24 in diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. **Iron Pipe -** Nom 24 in. diam (or smaller) cast or ductile iron pipe.
   C. **Conduit -** Nom 4 in. diam (or smaller) electrical metallic tubing or nom 6 in. diam (or smaller) steel conduit or nom 1 in. diam (or smaller) flexible steel conduit.
   D. **Copper Tubing -** Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.

E. **Copper Pipe -** Nom 6 in. diam (or smaller) Regular or heavier copper pipe.

Type of Metallic Penetrant	Max Diam of Metallic Penetrant in.	T Rating Hr
Steel or Iron Pipe, Conduit	24	0
Copper Pipe or Tube	6	0
Steel or Iron Pipe, Conduit or EMT	4	1/4
Steel or Iron Pipe, Conduit or EMT	2	1/2
Steel or Iron Pipe, Conduit or EMT	1	3/4

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

A. **Packing Material -** Min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of fill material. When floor is constructed of hollow-core precast concrete units, packing material is to be recessed from both surfaces of floor to accommodate the required thickness of fill material.

The thickness of the packing material is dependent upon the type and diam of the through penetrant (Item 2) as tabulated below:

Thought Penetrant	Max Throught-Penetrant Diam In.	Min Mineral Wool Insulation Thkns In.
Steel Pipe, Conduit Or Iron Pipe	6	1-1/2++
Steel Pipe, Conduit Or Iron Pipe	24	3
Copper Tube Or Copper Pipe	6	3

++When annular space exceeds 2 in., packing material thickness to be min 3 in.

B. **Fill, Void or Cavity Material* - Caulk -** Min 1/2 in. thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall. When floor is constructed of hollow-core precast concrete units, fill material is to be installed symmetrically on both sides of floor, flush with floor surfaces. At the point contact location between penetrating item and concrete, a min 3/8 in. thick bead of fill material shall be applied at the concrete penetrating item interface on top surface of floor and both surfaces of wall or hollow-core precast concrete floor.

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

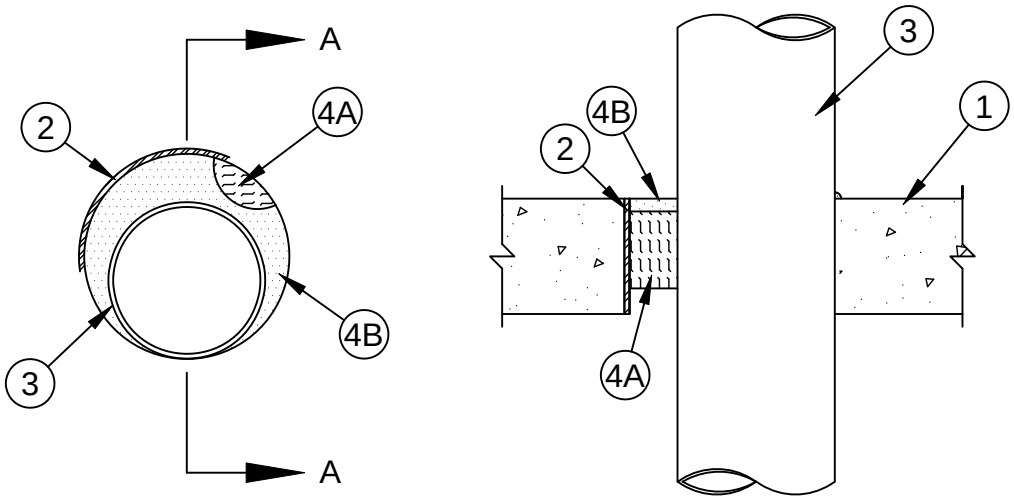
C. **Steel Cover Plate -** (Not Shown) - Min 0.014 in. (No. 28 gauge) galv steel cut to fit the contour of the through-penetrant (Item 2) with a min 2 in. lap on the top surface of floor and both surfaces of wall assembly around the perimeter of the through-opening. Seams of steel cover plate shall overlap a min 1/2 in. Steel cover plate secured to top surface of floor and both surfaces of wall assembly by means of 1/4 in. diam by 1-3/4 in. long steel concrete anchors in conjunction with 1/4 in. by 1-1/4 in. diam steel fender washers spaced a max 6 in. OC.

The hourly F Rating of the firestop system is dependent upon the use of the steel cover plate. If the steel cover plate is used , the F Rating of the firestop system is 4 hr. If the steel cover plate is omitted, the F Rating of the firestop system is 3 hr.

*Bearing the UL Classification Mark

System No. C-AJ-1353

F Rating - 3 Hr
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Lin Ft
L Rating At 400°F - Less Than 1 CFM/Lin 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.

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

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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:

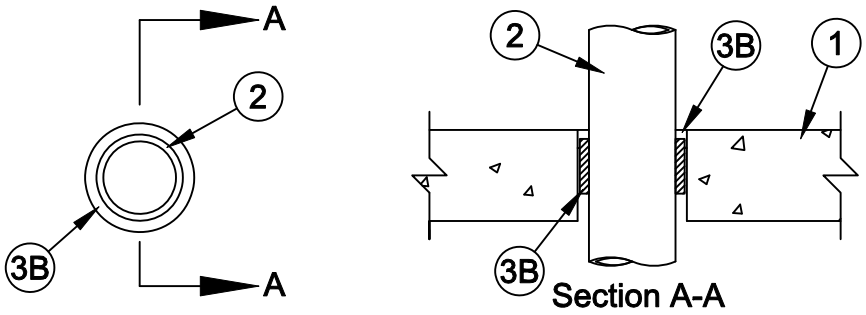
Min Concrete Thickness in. (mm)	Steel Sleeve	Max Annular Space, in. (mm)	Packing Material	Min Fill Material Thickness in. (mm)	F Rating
2-1/2 (64)	Optional	2 (51)	Required	1/4 (6)	3 hr
4-1/2 (114)	Optional	1 (25)	Optional	1/2 (13)	2 hr

SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

*Bearing the UL Classification Mark

System No. C-AJ-2166

F Rating - 2 Hr
T Ratings - 0 and 1 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
W Rating - Class 1 (See Item 3B)



1. **Floor or Wall Assembly -** Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor or 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 3 in. (76 mm).

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

2. **Through Penetrants -** One nonmetallic pipe, conduit or tubing to be centered within the firestop system. A nom annular space of 5/16 in. (8 mm) is required within the firestop system. The pipe, conduit or tubing to be rigidly supported on both sides of floor or wall. The following types and sizes of pipes, conduits or tubing may be used:

   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste, or vent) piping systems.

   B. **Rigid Nonmetallic Conduit (RNC)+ -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code, (NFPA No. 70.)

   C. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 2 in. (51 mm) diam (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

   D. **Acrylonitrile Butadiene Styrene (ABS) Pipe -** Nom 2 in. (51 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.

   The T Rating of the firestop system is dependent upon the type of through penetrant used. If a PVC pipe, RNC or CPVC pipe is used, the T Rating is 1 Hr. If an ABS pipe is used, the T Rating is 0 Hr.

3. **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 1/4 in. (6 mm) thick intumescent material faced on both sides with a plastic film, supplied in 1-1/2 in. (38 mm) wide strips. One layer of wrap strip installed around outer circumference of the through penetrant with ends butted and held in place with masking tape. The wrap strip shall be recessed a nom 3/4 in. (19 mm) from the bottom surface of the concrete floor. In walls having a nom thickness of 3-1/4 in. (83 mm) or less, the wrap strip shall be centered within the wall. In walls having a nom thickness equal to or greater than 3-1/4 in. (83 mm), the wrap strip shall be installed on both surfaces of the wall such that the exposed edges of the wrap strip are recessed a max 1/4 in. (6 mm) from each side of the wall. When floor is constructed of hollow-core precast concrete unit, wrap strip shall be installed on both surfaces of floor such that the exposed edges of the wrap strip are recessed a max 1/4 in. (6 mm) from each side of the floor.

      SPECIFIED TECHNOLOGIES INC - Speceal RED or RED2 Wrap Strip

   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 assembly. In floors, bottom edge of fill material shall be recessed a nom 1/4 in. (6 mm) below the top edge of wrap strip. When floor is constructed of hollow-core precast concrete unit, sealant to be installed symmetrically on both sides of floor, flush with floor surfaces.

      SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, Pensil 300 Sealant or SpecSeal Series SIL300 Sealant for floors or walls and Pensil 300SL Sealant or SpecSeal Series SIL300SL Sealant for floors only.)

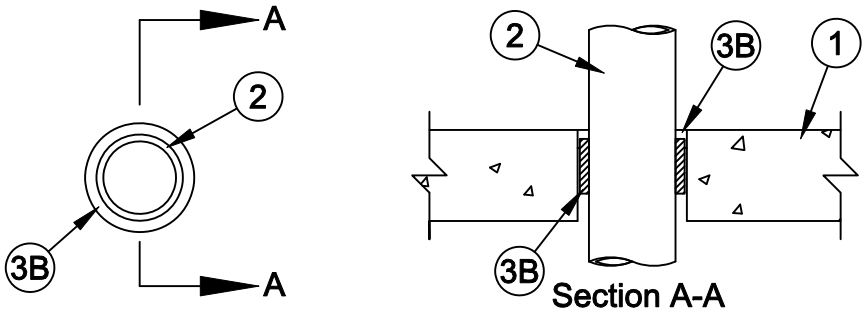
      W Ratings apply when Pensil 300. SpecSeal Series SIL300, Pensil 300SL or SpecSeal Series SIL300SL Sealants are used.

      +Bearing the UL Listing Mark

      *Bearing the UL Classification Marking

System No. C-AJ-2166

F Rating - 2 Hr
T Ratings - 0 and 1 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
W Rating - Class 1 (See Item 3B)



1. **Floor or Wall Assembly -** Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor or 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 3 in. (76 mm).

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

2. **Through Penetrants -** One nonmetallic pipe, conduit or tubing to be centered within the firestop system. A nom annular space of 5/16 in. (8 mm) is required within the firestop system. The pipe, conduit or tubing to be rigidly supported on both sides of floor or wall. The following types and sizes of pipes, conduits or tubing may be used:

   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste, or vent) piping systems.

   B. **Rigid Nonmetallic Conduit (RNC)+ -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code, (NFPA No. 70.)

   C. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 2 in. (51 mm) diam (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

   D. **Acrylonitrile Butadiene Styrene (ABS) Pipe -** Nom 2 in. (51 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.

   The T Rating of the firestop system is dependent upon the type of through penetrant used. If a PVC pipe, RNC or CPVC pipe is used, the T Rating is 1 Hr. If an ABS pipe is used, the T Rating is 0 Hr.

3. **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 1/4 in. (6 mm) thick intumescent material faced on both sides with a plastic film, supplied in 1-1/2 in. (38 mm) wide strips. One layer of wrap strip installed around outer circumference of the through penetrant with ends butted and held in place with masking tape. The wrap strip shall be recessed a nom 3/4 in. (19 mm) from the bottom surface of the concrete floor. In walls having a nom thickness of 3-1/4 in. (83 mm) or less, the wrap strip shall be centered within the wall. In walls having a nom thickness equal to or greater than 3-1/4 in. (83 mm), the wrap strip shall be installed on both surfaces of the wall such that the exposed edges of the wrap strip are recessed a max 1/4 in. (6 mm) from each side of the wall. When floor is constructed of hollow-core precast concrete unit, wrap strip shall be installed on both surfaces of floor such that the exposed edges of the wrap strip are recessed a max 1/4 in. (6 mm) from each side of the floor.

      SPECIFIED TECHNOLOGIES INC - Speceal RED or RED2 Wrap Strip

   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 assembly. In floors, bottom edge of fill material shall be recessed a nom 1/4 in. (6 mm) below the top edge of wrap strip. When floor is constructed of hollow-core precast concrete unit, sealant to be installed symmetrically on both sides of floor, flush with floor surfaces.

      SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, Pensil 300 Sealant or SpecSeal Series SIL300 Sealant for floors or walls and Pensil 300SL Sealant or SpecSeal Series SIL300SL Sealant for floors only.)

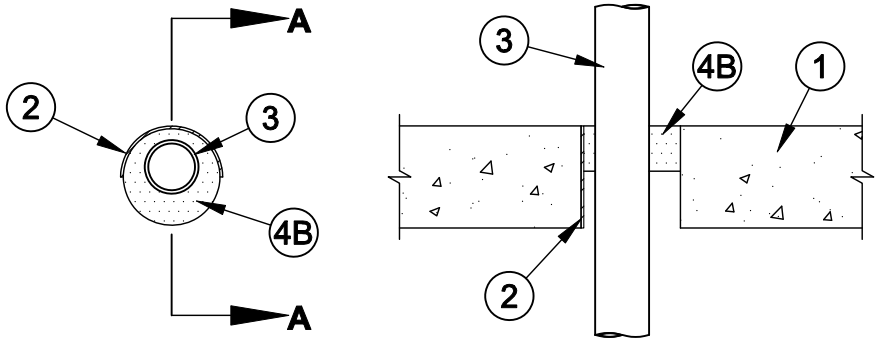
      W Ratings apply when Pensil 300. SpecSeal Series SIL300, Pensil 300SL or SpecSeal Series SIL300SL Sealants are used.

      +Bearing the UL Listing Mark

      *Bearing the UL Classification Marking

System No. C-AJ-2290

F Rating - 2 Hr
T Rating - 0 Hr



Section A-A

1. **Floor or Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor. 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 4 in. (102 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 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. **Through Penetrant -** One nonmetallic 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 nom 1/2 in. (13 mm) to max 1-1/8 in. (29 mm) . Pipe, conduit or tube 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 2 in. (51 mm) diam (or smaller) 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 2 in. (51 mm) diam (or smaller) SDR13.5 chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.

   C. **Rigid Nonmetallic Conduit+ -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70).

   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).

   E. **Optical Fiber Raceway (OFR)+ -** Nom 2 in. (51 mm) diam (or smaller) optical fiber raceway formed from either polyvinylidene (PVDF) or polyvinyl chloride (PVC). Raceway to be installed in accordance with Article 770 of the National Electrical Code (NFPA 70). Multiple 62.5/48 micron fiber optical cables with PE or PVC jacket to be installed within each raceway.

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

   A. **Packing Material -** (Optional, Not Shown) - Polyethylene backer rod, mineral wool batt insulation or glass fiber batt insulation friction fit into opening as a permanent form to facilitate installation of fill material (Item 4B).

   B. **Fill, Void or Cavity Material* - Sealant -** Min 2 in. (51 mm) thickness of fill material installed within annulus, flush with top surface of floor or both surfaces of wall assembly. In floors constructed of precast hollow core units, fill material installed to min 1 in. (25 mm) depth, flush with each surface of the floor.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

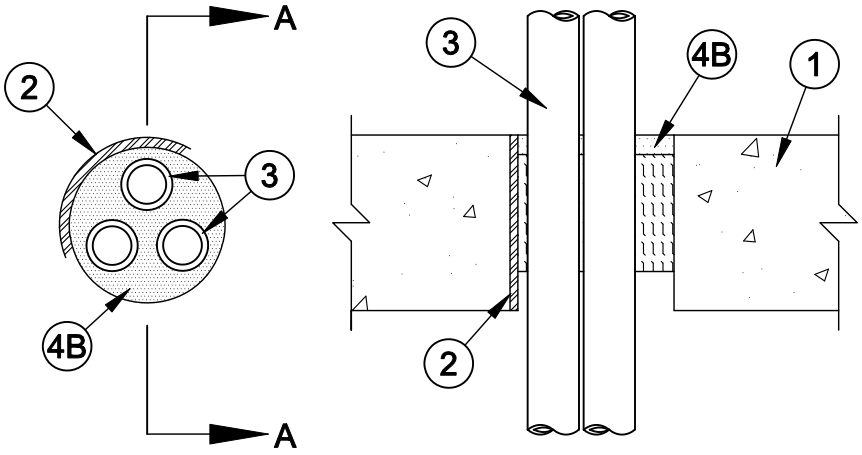
   *Bearing the UL Classification Mark

   +Bearing the UL Listing Mark

System No. C-AJ-2291

F Rating - 2 Hr

T Rating - 1 Hr



Section A-A

1. **Floor or Wall Assembly -** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor. 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 4 in. (102 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 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. **Through Penetrant -** One or more nonmetallic pipes, conduits or tubes 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 1/4 in. (6 mm) to max 1-1/8 in. (29 mm). The space between the pipes, conduits or tubes shall be min 1/4 in. (6 mm). Pipes, conduits or tubing 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 1 in. (25 mm) diam (or smaller) Schedule 40 polyvinyl chloride (PVC) pipe for use in closed (process or supply) piping systems.

   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) SDR17 chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.

   C. **Rigid Nonmetallic Conduit+ -** Nom 1 in. (25 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70).

   D. **Electrical Nonmetallic Tubing+ -** Nom 1 in. (25 mm) diam (or smaller) PVC tubing installed in accordance with Article 331 of the National Electrical Code (NFPA 70).

   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.

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

   A. **Packing Material -** Min 3 in. (76 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation compressed and tightly packed into opening. Packing material recessed from top surface of floor or both surfaces of wall or precast concrete units.

   B. **Fill, Void or Cavity Material* - Sealant -** Min 1/2 in. (13 mm) thickness of fill material installed within annulus, flush with top surface of floor or both surfaces of wall assembly. In floors constructed of precast hollow core units, fill material installed symmetrically on both sides of floor, flush with each surface of the floor.

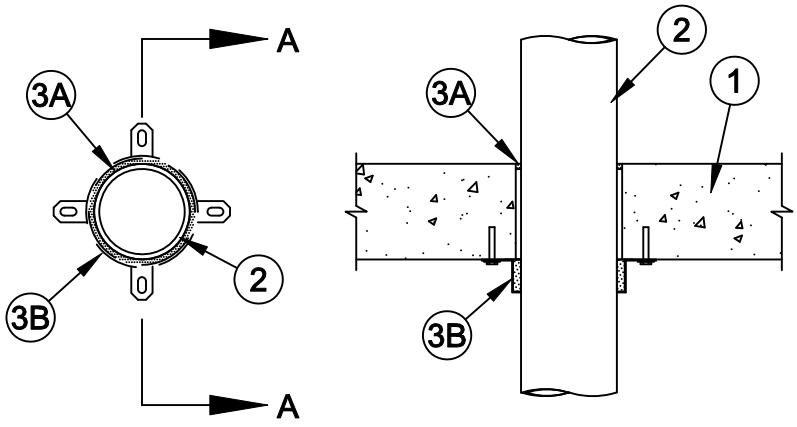
      SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

      *Bearing the UL Classification Mark

      +Bearing the UL Listing Mark

System No. C-AJ-2298

F Ratings - 2 Hr
T Ratings - 2 Hr



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***. 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.

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

2. **Through Penetrants -** One nonmetallic pipe or conduit to be centered within opening with a max 1/8 in. annular space for nom 2-1/2 in. diam and smaller pipes and conduits and a max 1/4 in. annular space for pipes and conduits greater than 2-1/2 in. diam. Pipe or conduit to be rigidly supported on both sides of the floor or 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) SDR13.5 CPVC pipe for use in closed (process or supply) 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 top surface of floor or 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 attachment to bottom surface of floor or both surfaces of wall assembly by means of 1/4 in. diam by min 1-1/4 in. long steel concrete screws in conjunction with min 1 in. diam steel fender washers.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCC Collar or SpecSeal SSC Collar

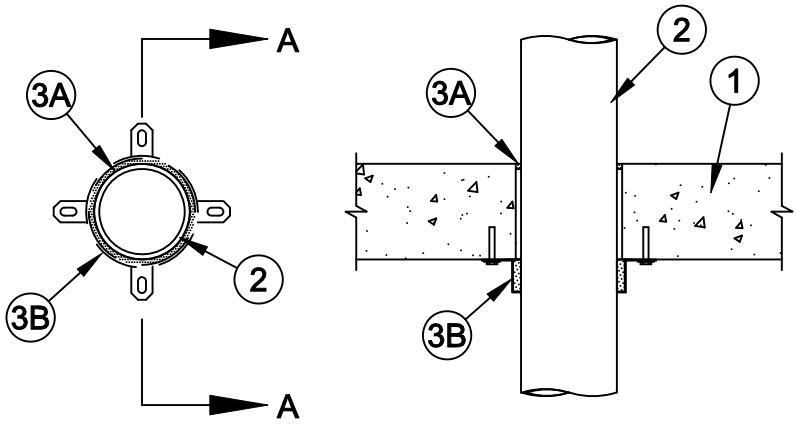
   * Bearing the UL Classification Marking

   +Bearing the UL Listing Mark

   *Bearing the UL Classification Mark

System No. C-AJ-2298

F Ratings - 2 Hr
T Ratings - 2 Hr



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***. 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.

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

2. **Through Penetrants -** One nonmetallic pipe or conduit to be centered within opening with a max 1/8 in. annular space for nom 2-1/2 in. diam and smaller pipes and conduits and a max 1/4 in. annular space for pipes and conduits greater than 2-1/2 in. diam. Pipe or conduit to be rigidly supported on both sides of the floor or 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) SDR13.5 CPVC pipe for use in closed (process or supply) 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 top surface of floor or 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 attachment to bottom surface of floor or both surfaces of wall assembly by means of 1/4 in. diam by min 1-1/4 in. long steel concrete screws in conjunction with min 1 in. diam steel fender washers.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCC Collar or SpecSeal SSC Collar

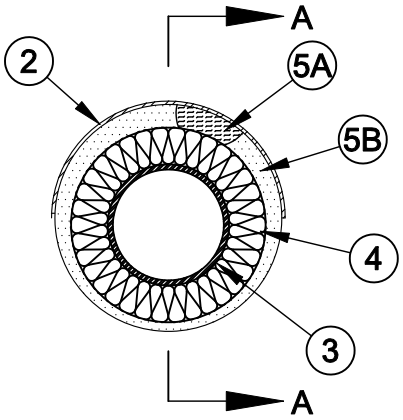
   * Bearing the UL Classification Marking

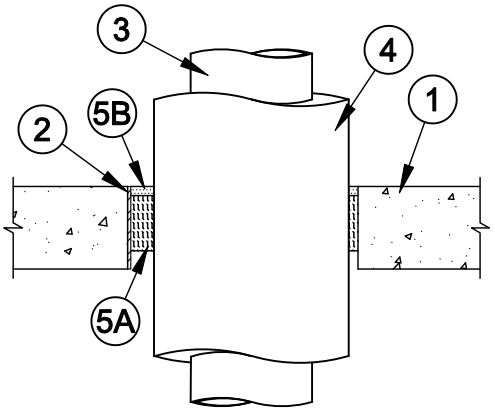
   +Bearing the UL Listing Mark

   *Bearing the UL Classification Mark

System No. C-AJ-5138

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Ratings - 3/4 and 1 Hr (See Item 2)	FT Ratings - 3/4 and 1 Hr (See Item 2)
	FH Rating - 2 Hr
	FTH Ratings - 3/4 and 1 Hr (See Item 2)





Section A-A

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 12 in. Max diam of opening in floors constructed of hollow-core precast concrete units is 7 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 12 in. diam (or smaller) Schedule 10 (or heavier) steel pipe cast or grouted into floor or wall assembly. Steel sleeve may be installed flush or may project a max 2 in. beyond the floor or wall surfaces. **When steel sleeve is used, the T Rating is 3/4 hr. When steel sleeve is omitted in min 4-1/2 in. thick concrete , the T Rating is 1 hr.**
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 6 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. **Iron Pipe -** Nom 6 in. diam (or smaller) cast or ductile iron pipe.
   C. **Copper Pipe -** Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe.
   D. **Copper Tube -** Nom 4 in. diam (or smaller) Regular L (or heavier) copper tube.
4. **Pipe Coverings -** One of the following types of pipe coverings shall be used:
   A. **Pipe and Equipment Covering Materials* -** Nom 2 in. thick hollow cylindrical heavy density (min 3.5 pcf) 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 butt tape supplied with the product.

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

B. **Pipe Covering Materials* -** Nom 2 in. thick unfaced mineral fiber pipe insulation having a nom density of 3.5 pcf (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. OC.

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

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 mineral wool batt insulation compressed and tightly packed into opening as a permanent form . 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 (Item 5B). 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. Packing material depth is dependent upon several variables, as shown in the table under Item 5B.

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, fill material applied within annulus 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. Fill material depth is dependent upon several variables, as shown in the following table:

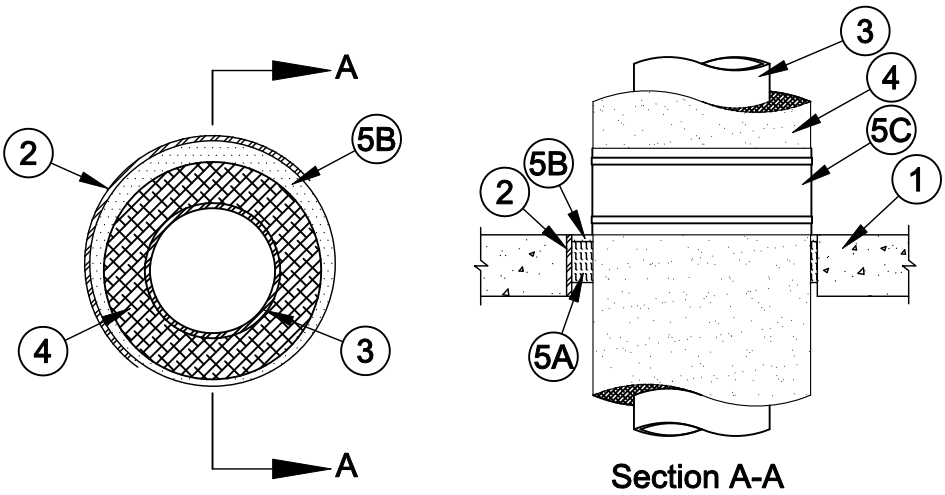
Min Floor or Wall thickness, in.	Annular Space, in.	Min Packing Material Depth, in.	Min Fill Material Depth, in.
2-1/2	1/4 to 5/8	1-1/2	1
4-1/2	1/4 to 1-5/8	3	1/2

SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

*Bearing the UL Classification Mark

System No. C-AJ-5154

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Ratings - 3/4 and 1 Hr (See Item 2)	FT Ratings - 3/4 and 1 Hr (See Item 2)
	FH Rating - 2 Hr
	FTH Ratings - 3/4 and 1 Hr (See Item 2)



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. 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 precast concrete units 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 cast or grouted into floor or wall assembly. Steel sleeve may be installed flush or may project a max 2 in. (51 mm) beyond the floor or wall surfaces. **When steel sleeve is used, the T Rating is 3/4 hr. When steel sleeve is omitted, the T Rating is 1 hr.**
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 6 in. (152 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. **Iron Pipe -** Nom 6 in. (152 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 L (or heavier) copper tube.
4. **Pipe Covering Materials* - Cellular Glass Insulation -** Nom 3 in. (76 mm) thick cellular glass units sized to the outside diam of the through-penetrant 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. Annular space shall be min 1/2 in. (13 mm) to max 1-5/8 in. (41 mm).

   PITTSBURGH CORNING CORP - FOAMGLAS
5. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** Min 4 pcf (64 kg/m3) mineral wool batt insulation compressed and tightly packed to min 3 in. (76 mm) thickness. 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 (Item 5B). 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 1/2 in. (13 mm) thickness of fill material applied within annulus, flush with top surface of floor assembly or top edge of steel sleeve. In walls, min 1/2 in. (13 mm) thickness of fill material applied within annulus 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.

SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

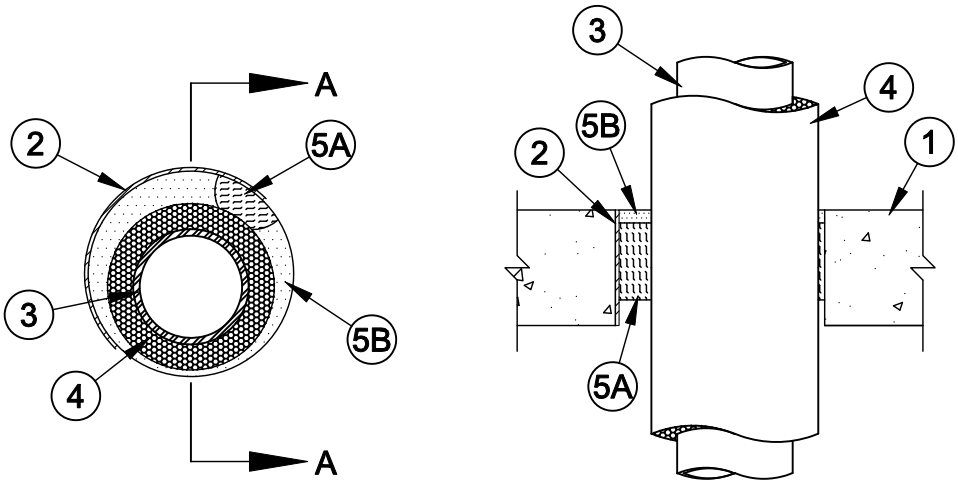
C. **Metal Jacket -** Min 12 in. (305 mm) long jacket formed of min 0.010 in. (0.25 mm) thick aluminum sheet cut to wrap tightly around the pipe insulation with a min 2 in. (51 mm) lap and secured using bands and seals of similar material or min No. 18 AWG steel tie wire. Bands or tie wire to be located within 2 in. (51 mm) of each end of the jacket and spaced max 10 in. (254 mm) OC. Jacket to be installed with edge abutting surface of fill material (Item 5B) 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.

*Bearing the UL Classification Mark

System No. C-AJ-5155

F Rating - 2 Hr

T Rating - 3/4 Hr



Section A-A

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.

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

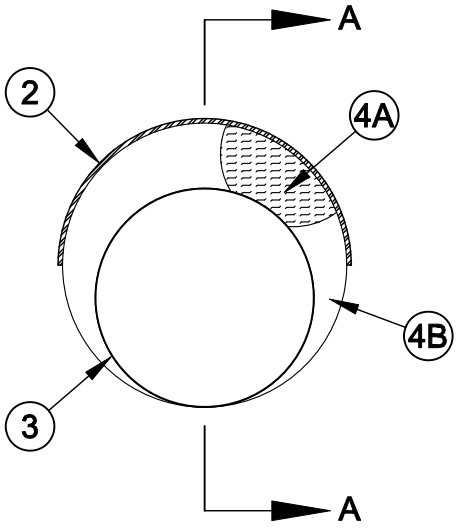
SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

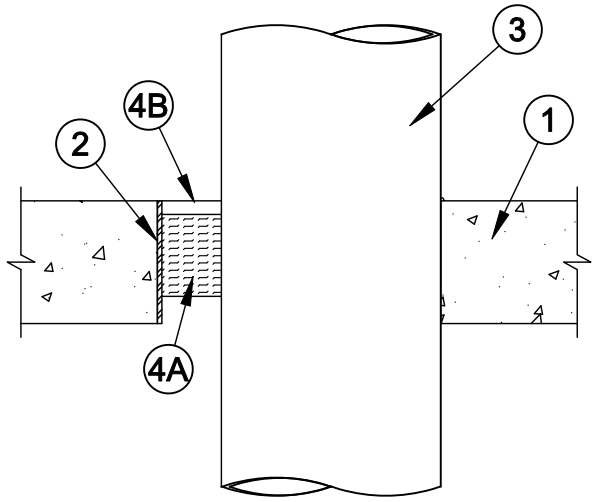
*Bearing the UL Classification Mark

#Bearing the UL Recognized Component Mark

System No. C-AJ-7040

F Rating - 2 Hr
T Rating - 1/4 Hr





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***. 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 floors constructed of hollow-core concrete is 7 in. (178 mm).

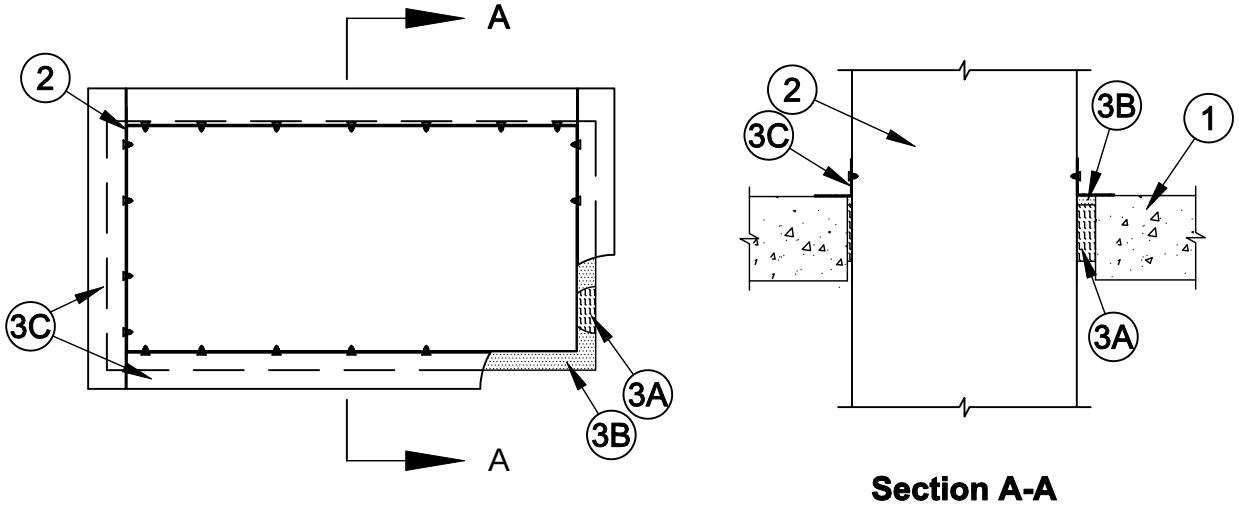
   See **Concrete Blocks** (CAZT) or **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve -** (Optional) - Nom 14 in. (356 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe cast or grouted into floor or wall assembly. Steel sleeve may be installed flush or may project a max of 2 in. (51 mm) beyond the floor or wall surfaces.
3. **Steel Duct -** One nom 12 in. (305 mm) diam (or smaller) galv steel duct. Steel gauge of duct shall conform with SMACNA requirements. Steel duct to be installed eccentrically or concentrically within the firestop system. The annular space between the steel duct and the periphery of the opening shall be min 0 in. (point contact) to max 2 in. (51 mm). Steel duct to be rigidly supported on both sides of the floor or wall assembly.
4. **Firestop System -** The firestop system shall consist of the following:
   A. **Packing Material -** Min 3 in. (76 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation compressed and tightly packed into opening. Packing material recessed from top surface of floor or both surfaces of wall or precast concrete units to accommodate the required thickness of fill material. 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 1/2 in. (13 mm) thickness of fill material applied within annulus, flush with top surface of floor assembly or top edge of steel sleeve. In walls, min 1/2 in. (13 mm) 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 sides of floor. At point contact location, min 1/4 in. (6 mm) diam bead of fill material installed at steel duct/concrete or steel duct/steel sleeve interface on top surface of floor or both surfaces of wall or precast concrete units.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

   *Bearing the UL Classification Mark

System No. C-AJ-7041

F Rating - 2 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 floor. When LC150 or LE600 Sealant (Item 3B) is used, the min wall thickness is 5 in. (127 mm). Wall may also be constructed of any UL Classified **Concrete Blocks*** Max area of opening is 1024 sq in. (0.66 m3) with a max dimension of 32 in. (81 cm).

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

2. **Steel Duct -** Nom 30 by 30 in. (76 by 76 cm) (or smaller) No. 24 ga (or heavier) galv steel duct installed eccentrically or concentrically within opening. Steel gauge of duct shall conform with SMACNA requirements. Annular space between duct and periphery of opening to be min 1/4 in. to max 1-3/4 in. Duct to be rigidly supported on both sides of the floor or wall assembly.

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

   A. **Packing Material -** Min 4 pcf (64 kg/m3) mineral wool batt insulation compressed and tightly packed to min 3 in. (76 mm) thickness. Packing material recessed from top surface of floor or both surfaces of wall as required to accommodate fill material (Item 3B).

   B. **Fill Void or Cavity Materials* - Sealant -** Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of floor assembly or both surfaces of wall assembly. When LC150 or LE600 Sealant is used, the min sealant thickness is 1 in. (25 mm).

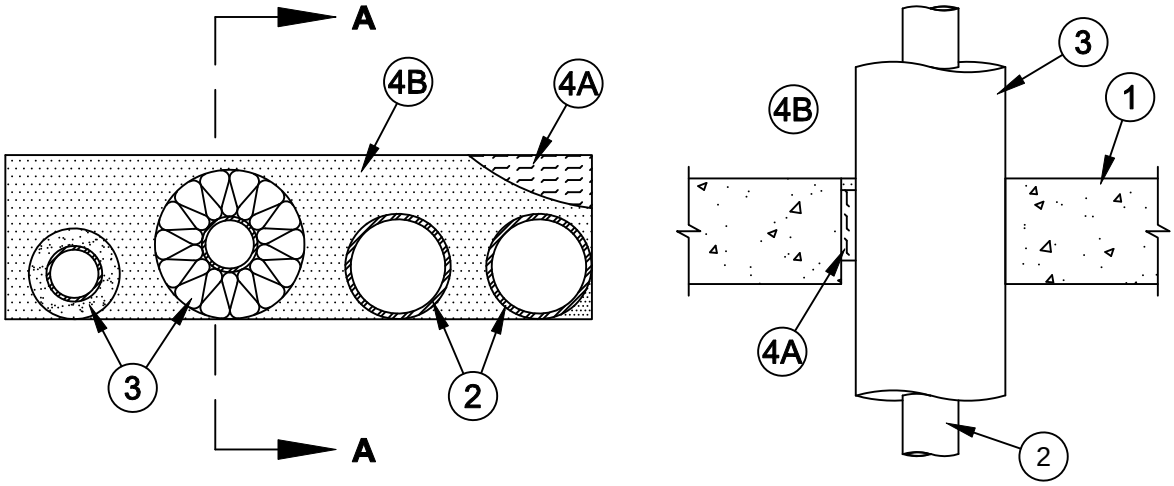
      SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant, SpecSeal LC150 Sealant, or SpecSeal LE600 Sealant.

   C. **Retaining Angles -** Min 16 GA (0.059 in. or 1.5 mm) galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap periphery of opening a min of 1 in. (25 mm). Angles attached to all four sides of steel duct on top surface of floor or both surfaces of wall with No. 10 (or larger) steel sheet metal screws spaced 1 in. (25 mm) from each end and max 4 in. (102 mm) OC.

      *Bearing the UL Classification Mark

System No. C-AJ-8083

F Rating - 2 Hr
T Rating - 0, 1/4, 3/4 and 1-1/2 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 floor. 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 area of opening is 192 sq in. (0.12 m2) with a max dim of 24 in. (610 mm). Max area of opening in floors constructed of hollow-core concrete is 49 sq in. (316 cm2) with a max dim of 7 in. (178 mm). As an alternate, the opening may be round and have a max diam of 8 in. (204 mm).

   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 1/4 in. (6 mm) to max 2 in. (51 mm). The annular space between the pipes, conduits or tubing and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). 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. (102 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.

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

   C. **Conduit -** Nom 4 in. (102 mm) diam (or smaller) rigid steel conduit, steel electrical metallic tubing (EMT) or flexible aluminum or 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) Type L (or heavier) copper tube.

   When through penetrant A, B or C is used without insulation, the T Rating is 1/4 hr. When through penetrant D or E is used without insulation, the T Rating is 0 Hr.

2A. **Cables - (Optional, Not Shown) -** Max four lengths of four pair No. 18 AWG (or smaller) copper conductor thermostat cable with PVC insulation and jacket. Cable space 0 in. (0mm, point contact) to max 1-1/2 in.(38 mm) from insulated and bare penetrants. The annular space between the cable and the periphery of the opening shall be min 0 in. (point contact) to max 1-1/2 in. (38 mm) .Cable rigidly supported on both sides of floor or wall assembly.

3. **Pipe coverings -** One of the following types of pipe coverings may be used:

   A. **Pipe and Equipment Covering Materials* -** Nom 2 in. (51 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 56 kg/m3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or butt tape supplied with the product.

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

   B. **Pipe Covering Materials* -** Nom 2 in. (51 mm) thick unfaced mineral fiber pipe insulation having a min density of 3.5 pcf (56 kg/m3) and sized to the outside diam of pipe or tube. Pipe insulation secured with min No. 18 AWG steel wire spaced max 12 in. (305 mm) OC.

   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.

   D. **Tube Insulation-Plastics# -** Nom 1/2 in. (13 mm) or 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing.

   See **Plastics**(QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation meeting the above specifications and having a UL94 Flammability Classification of 94-5VA may be used.

   The pipe coverings may be installed on one or more of the through penetrants having a nom diam of 2 in. (51 mm) or less. The space between the insulated pipes or tubes shall be min 1/4 in. (6 mm) to max 2 in. (51 mm). The annular space between the insulated pipes or tubing and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm).

   When pipe covering A or B is used, the T Rating is 1-1/2 hr. When pipe covering D is used, the T Rating is 3/4 hr.

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

   A. **Packing Material -** Min 4 pcf (64 kg/m3) mineral wool batt insulation compressed and tightly packed to min 3 in. (76 mm) 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 4B).

   B. **Fill, Void or Cavity Material*-Sealant -** Min 1/2 in. (13 mm) 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. (6 mm) diam bead of fill material applied at through penetrant/concrete interface on top surface of floor or both surfaces of wall or precast concrete units. Fill material to be forced into interstices of cable group to max extent possible.

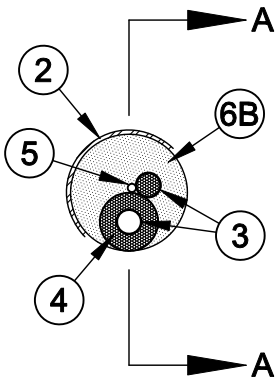
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

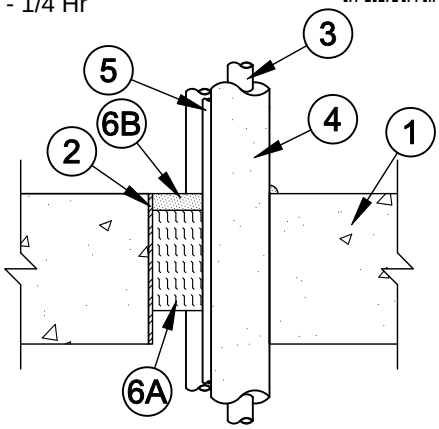
   *Bearing the UL Classification Mark

   #Bearing the UL Recognized Component Mark

System No. C-AJ-8084

F Rating - 2 Hr
T Rating - 1/4 Hr





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 diam of opening is 3-1/2 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 3-1/2 in. diam (or smaller) Schedule 10 (or heavier) steel pipe sleeve cast or grouted into concrete. Steel sleeve may be installed flush or may project a max 2 in. beyond the floor or wall surfaces.

3. **Through Penetrants** - A max of two pipes, conduits or tubing to be installed within the opening. The annular space between the pipes, conduits or tubing and the periphery of the opening shall be min 0 in. (point contact) to max 1-1/2 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 3/4 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.

   B. **Iron Pipe** - Nom 3/4 in. diam (or smaller) cast or ductile iron pipe.

   C. **Conduit** - Nom 3/4 in. diam (or smaller) rigid steel conduit or steel electrical metallic tubing (EMT).

   D. **Copper Pipe** - Nom 3/4 in. diam (or smaller) regular (or heavier) copper pipe.

   E. **Copper Tube** - Nom 3/4 in. diam (or smaller) Type L (or heavier) copper tube.

4. **Tube Insulation** - **Platics#** - Nom 1/2 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PBC) flexible foam furnished in the form of tubing. The tube insulation may be installed on a max of one pipe or tubing. The annular space between the pipes, conduits or tubing and the periphery of the opening shall be min 0 in. (point contact) to max 1-1/2 in.

   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. **Cables** - Max four pair No. 18 AWG (or smaller) copper conductor thermostat cable with PVC insulation and jacket. Cable space 0 in. (point contact) to max 1-1/2 in. from insulated and bare penetrants. The annular space between the cable and the periphery of the opening shall be min 0 in. (point contact) to max 1-1/2 in. Cable rigidly supported on both sides of floor or wall assembly.

6. **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 6B). 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 1/2 in. thickness of fill material applied within annulus, flush with top surface of floor assembly or top edge of steel sleeve. In walls, min 1/2 in. thickness of fill material applied within annulus flush with both surfaces of wall assembly or both ends of steel sleeve. In floors constructed of hollow-core precast concrete, fill material to be installed symmetrically on both sides, flush with floor surfaces. At point contact locations, min 1/4 in. diam bead of fill material applied at pipe/concrete or pipe/steel interface on top surface of floor or both surfaces of wall or precast concrete units.

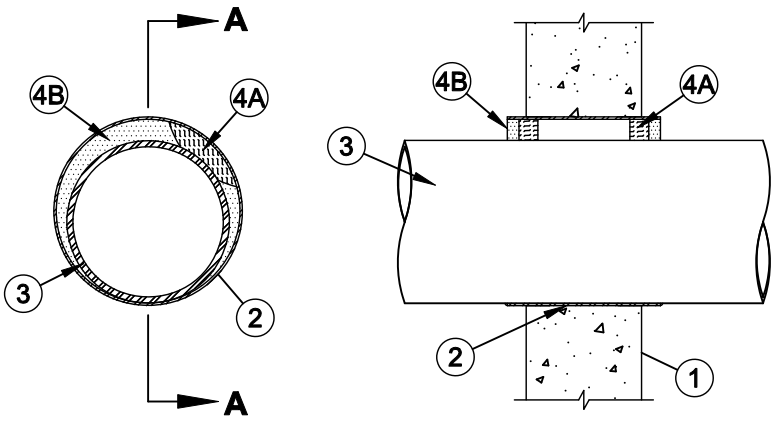
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

   *Bearing the UL Classification Marking

   #Bearing the UL Recognized Component Mark

System No. W-J-1099

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



Section A-A

1. **Wall Assembly** - Min 6 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 2 in. larger than OD of through penetrant.

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

2. **Steel Sleeve** - Cylindrical sleeve fabricated from 0.0125 in thick (30 gauge) galv sheet steel and having a min 2 in. lap along the longitudinal seam. Length of the sleeve to be equal to or max 6 in. greater than 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 opening in concrete. The ends of the steel sleeve shall be flush with or extend a max 3 in. beyond each surface of the wall.

   As an alternate, steel sleeve may consist of nom 14 in. diam (or smaller) Schedule 5 (or heavier) steel pipe sleeve cast or grouted into concrete. The ends of the steel sleeve shall be flush with or extend a max 3 in. beyond each surface of the wall.

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 steel sleeve shall be min 0 in. (point contact) to max 2 in. Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of metallic pipes, conduits and tubes may be used:

   A. **Steel Pipe** - Nom 12 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.

   B. **Iron Pipe** - Nom 12 in. diam (or smaller) cast or ductile iron pipe.

   C. **Conduit** - Nom 6 in. diam (or smaller) rigid steel conduit, nom 4 in. diam (or smaller) steel electrical metallic tubing (EMT) or nom 4 in. diam (or smaller) flexible 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.

Type of Penetrant	Max Diam	T Rating
Steel or iron pipe, steel conduit or EMT	2 in.	1 hr
Steel or iron pipe, steel conduit or EMT	8 in.	3/4 hr
Steel or iron pipe	12 in.	0 hr
Copper pipe or tube	4 in.	1/4 hr

3A. **Through Penetrating Product*** - Flexible Metal Piping As an alternate to Item 3, one nom 2 in. diam (or smaller) steel flexible metal pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe, conduit or tube and the steel sleeve shall be min 0 in. (point contact) to max 2 in. Pipe to be rigidly supported on both sides of the wall assembly. When flexible metal piping is used, T Rating is 1 hr.

OMEGA FLEX INC

TITEFLEX CORP

A BUNDY CO

WARD MFG INC

4. **Firestop System** - The firestop system consists of the following items:

A. **Packing Material** - Min 1 in. thickness of min 4 pcf mineral wool batt insulation compressed and tightly packed into each end of steel sleeve. When steel sleeve projects more than 1 in. beyond wall surface, packing material thickness shall be increased to 2 in. Packing material recessed from each end of steel sleeve to accommodate fill material. When alternate steel pipe sleeve is used, packaging material may be omitted from the firestop system.

B. **Fill, Void or Cavity Material*** - Sealant Min 5/8 in. thickness of fill material applied within annulus, flush with each end of steel sleeve. At point contact location, min 1/4 in. diam bead of fill material applied at metallic pipe/steel sleeve interface on both surfaces of wall. Optionally, a min 1/4 in. diam bead of fill material shall be applied around the circumference of the steel sleeve at its egress from each side of the wall.

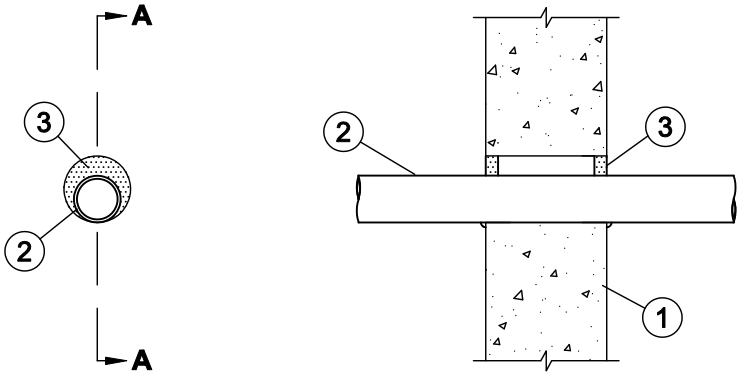
SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

*Bearing the UL Classification Mark

System No. W-J-2076

F Rating - 2 Hr

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

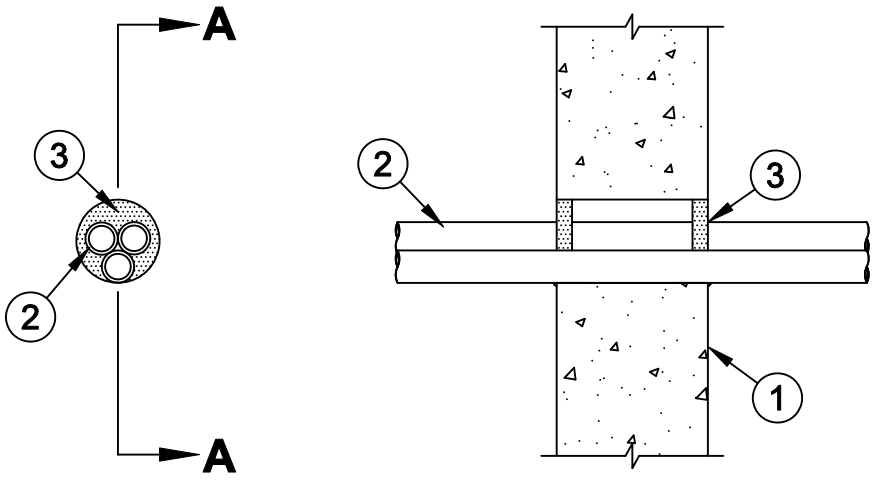


Section A-A

1. **Wall Assembly** - Min 6 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 3-1/2 in.
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
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. 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. (point contact) to max 1 in.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** - Nom 2 in. diam (or smaller) SDR17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Annular space shall be min 0 in. (point contact) to max 1 in.
   C. **Rigid Nonmetallic Conduit+** - Nom 2 in. 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. (point contact) to max 1 in.
   D. **Electrical Nonmetallic Tubing+** - Nom 2 in 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. (point contact) to max 1 in.
   E. **Cross Linked Polyethylene (PEX) Tubing** - Nom 1 in. diam (or smaller) SDR9 PEX tubing for use in. closed (process or supply) piping systems. Annular space shall be min 0 in. (point contact) to max 1 in.
   F. **Acrylonitrile Butadiene Styrene (ABS) Pipe** - Nom 1-1/2 in. 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. to max 3/4 in.
   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 1-3/4 hr. When Item 2F is used, T Rating is 0 hr.
3. **Fill, Void or Cavity Material*** - **Sealant** - Min 5/8 in. thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. diam bead of fill material applied at nonmetallic pipe/concrete interface on both surfaces of wall
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant
   *Bearing the UL Classification Marking

System No. W-J-2077

F Rating - 2 Hr
T Rating - 1-3/4 Hr

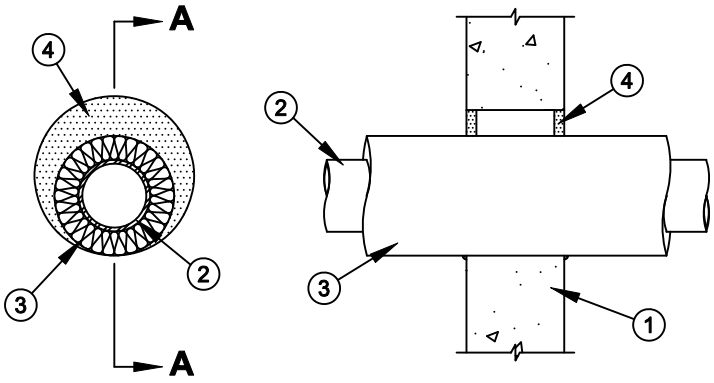


Section A-A

1. **Wall Assembly** - Min 6 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 3-1/2 in.
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. **Through Penetrant** - One to three nonmetallic pipes, conduits or tubes to be bundled together and installed eccentrically or concentrically within the firestop system. The annular space between the grouped pipes, conduits or tubes and the periphery of the opening shall be min 0 in. (point contact) to max 1 in. Separation between pipes, conduits or tubes to be min 0 in. (point contact) to max 1 in. Pipes, conduits or tubes 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 1 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** - Nom 1 in. diam (or smaller) SDR17 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+** - Nom 1 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70).
   D. **Electrical Nonmetallic Tubing+** - Nom 1 diam (or smaller) PVC tubing installed in accordance with Article 331 of the National Electrical Code (NFPA 70).
   E. **Cross Linked Polyethylene (PEX) Tubing** - Nom 1 in. diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) piping systems.
3. **Fill, Void or Cavity Material*** - **Sealant** - Min 5/8 in. thickness of fill material applied within annulus, flush with both surfaces of wall assembly. Sealant to be forced into interstices between penetrants to max extent possible. At point contact location, min 1/4 in. diam bead of fill material applied at nonmetallic pipe/concrete interface on both surfaces of wall.
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant
   *Bearing the UL Classification Marking

System No. W-J-5054

F Rating - 2 Hr
T Rating - 1 Hr



Section A-A

1. **Wall Assembly -** Min 6 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 12 in.

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

2. **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 wall assembly. The following types and sizes of metallic pipes and tubes may be used:

   A. **Steel Pipe -** Nom 6 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.

   B. **Iron Pipe -** Nom 6 in. diam (or smaller) cast or ductile iron pipe.

   C. **Copper Pipe -** Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe.

   D. **Copper Tube -** Nom 4 in. diam (or smaller) Type L (or heavier) copper tube.

3. **Pipe Coverings -** One of the following types of pipe coverings shall be used:

   A. **Pipe and Equipment Covering Materials* -** Nom 2 in. thick hollow cylindrical heavy density (min 3.5 pcf) 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 butt tape supplied with the product. Annular space between the insulated through penetrant and periphery of opening shall be min 0 in. (point contact) to max 1-1/2 in.

   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* -** Nom 2 in. thick unfaced mineral fiber pipe insulation sized to the outside diam of pipe or tube. Pipe insulation secured with min No. 8 AWG steel wire spaced max 12 in. OC. Annular space between the insulated through penetrant and periphery of opening shall be min 0 in. (point contact) to max 1-1/2 in.

   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. Annular space shall be min 0 in. (point contact) to max 1-1/2 in.

   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.

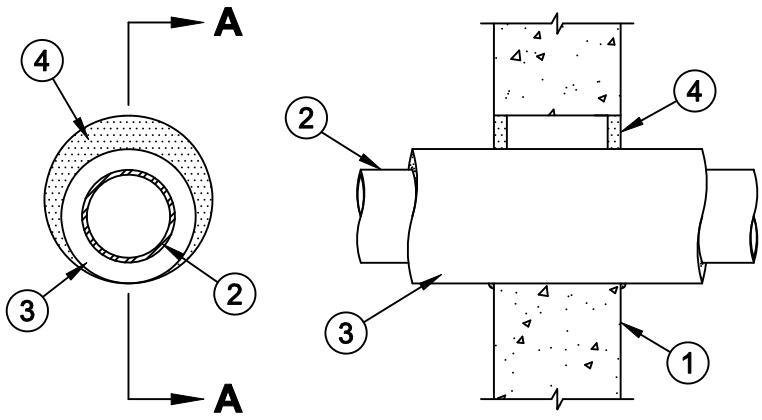
4. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. diam bead of fill material applied at insulated metallic pipe/concrete interface on both surfaces of wall.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

   *Bearing the UL Classification Mark

System No. W-J-5055

F Rating - 2 Hr
T Rating - 1/4 Hr



Section A-A

1. **Wall Assembly** - Min 6 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 7-1/2 in.

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

2. **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 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.

3. **Tube Insulation** - **Plastics#** - Nom 3/4 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. Annular space shall be min 0 in. (point contact) to max 1-1/2 in.

   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.

4. **Fill, Void or Cavity Material*** - **Sealant** - Min 5/8 in. thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. diam bead of fill material applied at insulated metallic pipe/concrete interface on both surfaces of wall.

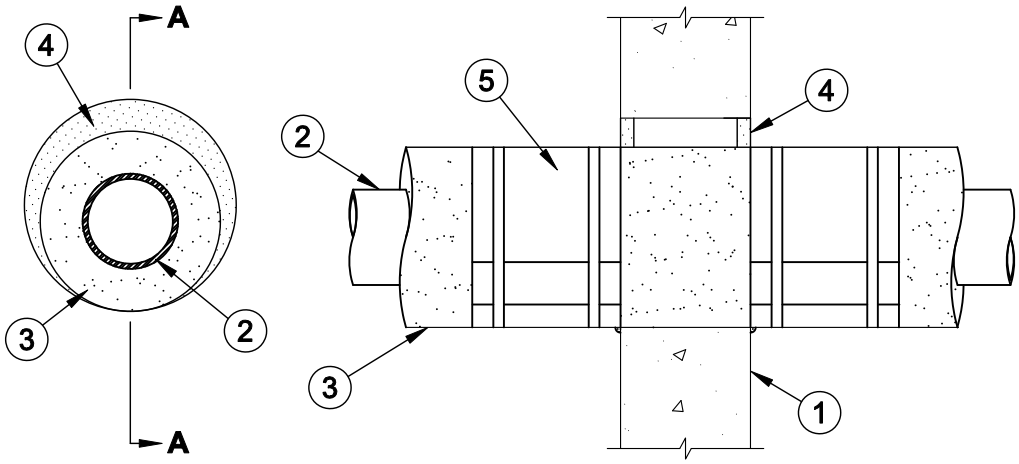
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

   *Bearing the UL Classification Marking

   # Bearing the UL Recognized Component Marking

System No. W-J-5056

F Rating - 2 Hr
T Rating - 2 Hr



Section A-A

1. **Wall Assembly** - Min 6 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 14 in.

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

2. **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 6 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.

   B. **Iron Pipe** - Nom 6 in. diam (or smaller) cast or ductile iron pipe.

   C. **Copper Pipe** - Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe.

   D. **Copper Tube** - Nom 4 in. diam (or smaller) Type L (or heavier) copper tube.

3. **Pipe Covering Materials*** - **Cellular Glass Insulation** - Nom 3 in. thick cellular glass units sized to the outside diam of the through-penetrant and supplied in nom 24 in. long half sections or nom 18 in. long segments. Pipe insulation installed on pipe in accordance with the manufacturer's instructions. Annular space shall be min 0 in. (point contact) to max 1-1/2 in.

   PITTSBURGH CORNING CORP - FOAMGLAS

4. **Fill, Void or Cavity Material*** - **Sealant** - Min 5/8 in. thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. diam bead of fill material applied at insulated metallic pipe/concrete interface on both surfaces of wall.

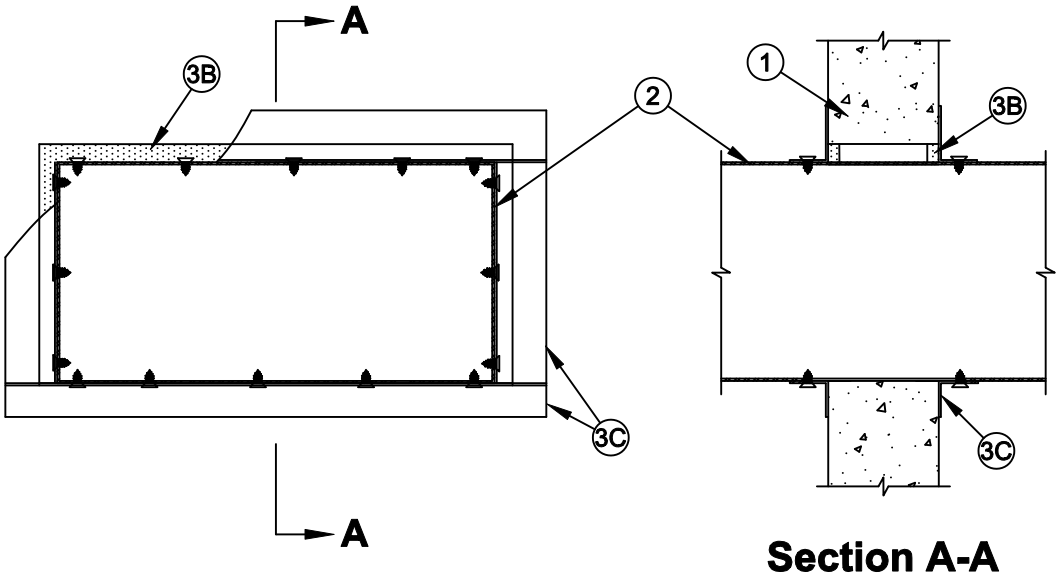
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

5. **Metal Jacket** Min 12 in. long jacket formed of min 0.010 in. thick aluminum sheet cut to wrap tightly around the pipe insulation with a min 2 in. lap and secured using bands and seals of similar material or No. 18 AWG steel tie wire. Bands or tie wire to be located within 2 in. of each end of the jacket and spaced max 10 in. OC. Jacket to be installed with the edge abutting surface of fill material (Item 5B) on both surfaces of wall. Metal jacket to be used in addition to any other jacketing material, which may be required on the pipe covering.

   *Bearing the UL Classification Marking

System No. W-J-7031

F Rating - 2 Hr
T Rating - 1/2 Hr



Section A-A

1. **Wall Assembly -** Min 6 in. (152 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 diam of opening is 960 sq in. (0.62 m2) with a max dimension of 32 in. (813 mm).

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

2. **Steel Duct -** Max 24 by 30 in. (610 by 762 mm) No. 26 gauge (or heavier) galv steel duct installed eccentrically or concentrically within the opening. Annular space between duct and periphery of opening to be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Duct to be rigidly supported on both sides of the wall assembly.

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

   A. **Packing Material -** (Optional, Not Shown) - Foam backer rod, mineral wool batt insulation or glass fiber insulation installed as permanent form to facilitate installation of fill material.

   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. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at steel duct/concrete interface on both surfaces of wall.

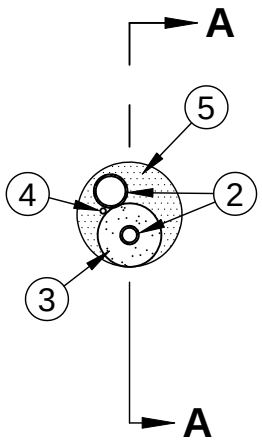
      SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

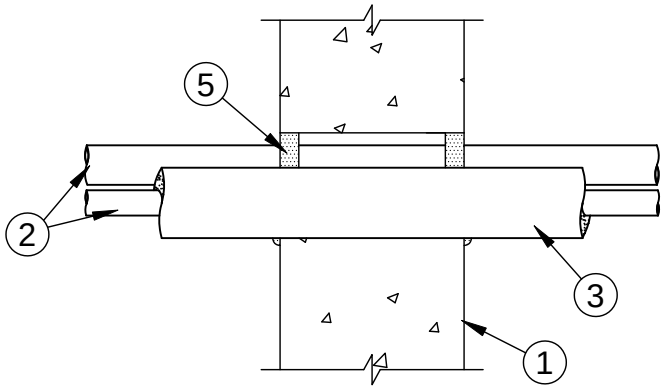
   C. **Retaining Angles -** Min 16 GA galv steel angles sized to lap duct a min of 2 in. (51 mm) and to lap periphery of opening a min of 1 in. (25 mm). Angles attached to all four sides of steel duct on both surfaces of wall with No. 10 (or larger) steel sheet metal screws located 1 in. (25 mm) from each end and spaced max 4 in. (102 mm) OC.

      *Bearing the UL Classification Mark

System No. W-J-8011

F Rating - 2 Hr
T Rating - 1/4 Hr





Section A-A

1. **Wall Assembly** - Min 6 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 3-1/2 in.

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

2. **Through Penetrant** - A max of two pipes or tubes to be installed within the opening. Of the two pipes or tubes, only one may have a nom diam greater than 1/2 in. Annular space between pipes or tubing and periphery of opening shall be min 0 in. (point contact) to max 1-1/2 in. Separation between uninsulated pipes or tubes shall be min 0 in. (point contact) to max 1-1/2 in. Pipes or tubing to be rigidly supported on both sides of the wall assembly. The following types and sizes of through penetrants may be used:

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

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

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

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

3. **Tube Insulation** - **Plastics#** - Nom 3/4 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. The tube insulation may be installed on a max of one pipe or tube. The annular space between the insulated penetrating item and the periphery of the opening shall be min 0 in. (point contact) to max 1/2 in. The space between insulated and uninsulated pipes or tubing 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 Classificatioin of 94-5VA may be used.

4. **Cable** - One 4 pair No. 18 AWG (or smaller) thermostat cable with polyvinyl chloride (PVC) insulation and jacket materials. Cable to be spaced min 0 in. (point contact) to max 1/2 in. from the other penetrants. The space between the cable and the periphery of the opening shall be min 0 in. (point contact) to max 1/2 in. Cable to be rigidly supported on both sides of wall assembly.

5. **Fill, Void or Cavity Material*** - **Sealant** - Min 5/8 in. thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. diam bead of fill material applied at through penetrant.concrete interface on both surfaces of wall. Additional fill material forced into grouped penetrant interstices to max extent possible.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

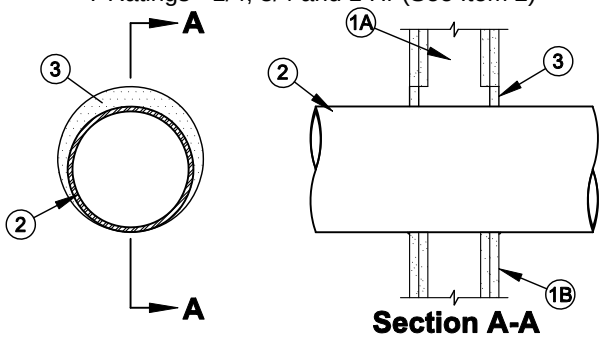
   *Bearing the UL Classification Marking

   # Bearing the UL Recognized Component Marking

System No. W-L-1222

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

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



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 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 3-1/2 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. Max diam of opening is 10-5/8 in. (270 mm).

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

2. **Through Penetrant -** One metallic pipe, conduit or tube to be installed eccentrically or concentrically 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 the pipe, conduit or tube and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of metallic pipes, conduits and tubes may be used:

   A. **Steel Pipe -** Nom 8 in. (203 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.

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

   C. **Conduit -** Nom 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) Type L (or heavier) copper tube.

Type of Penetrant	Max Diam	T Rating
Steel or iron pipe, steel conduit or EMT	2 in. (51 mm)	1 hr
Steel or iron pipe, steel conduit or EMT	8 in. (203 mm)	3/4 hr
Copper pipe or tube	4 in. (102 mm)	1/4 hr

2A. **Through Penetrating Product* - Flexible Metal Piping -** As an alternate to Item 2, one nom 1-1/4 in. (32 mm) diam (or smaller) steel flexible metal pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Pipe to be rigidly supported on both sides of the wall assembly.

OMEGA FLEX INC

TITEFLEX CORP

A BUNDY CO

WARD MFG INC

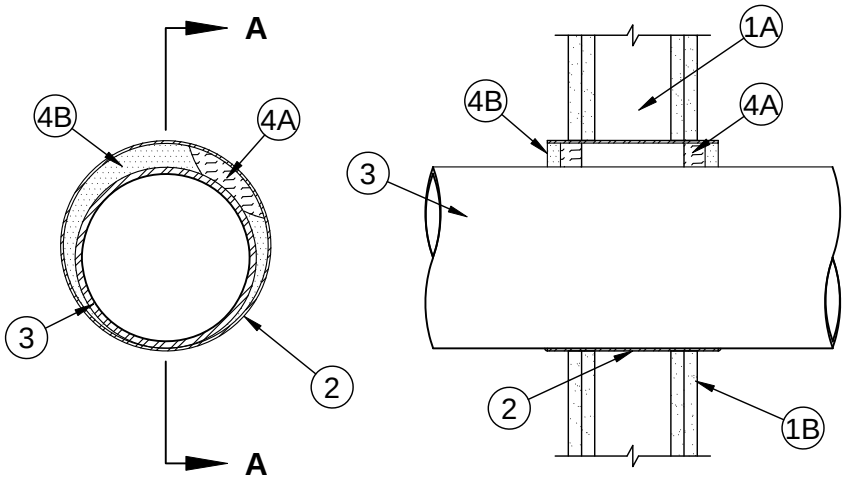
3. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at metallic pipe/gypsum board interface on both surfaces of wall.

SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

*Bearing the UL Classification Mark

System No. W-L-1223

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



Section A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner 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. 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 specified in the individual Wall and Partition Design. Max diam of opening is 10-5/8 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. **Steel Sleeve -** Cylindrical sleeve fabricated from 0.0125 in. thick (30 gauge) galv sheet steel and having a min 2 in. lap along the longitudinal seam. Length of the sleeve to be equal to or max 2 in. greater than 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 or extend a max 1 in. beyond each surface of the wall.

   As an alternate, steel sleeve may consist of nom 10 in. diam (or smaller) Schedule 5 (or heavier) steel pipe sleeve friction-fitted into circular cutouts in the gypsum board layers. The ends of the steel sleeve shall be flush with or extend a max 1 in. beyond each surface of the wall.

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 steel sleeve shall be min 0 in. (point contact) to max 2 in. Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of metallic pipes, conduits and tubes may be used:

   A. **Steel Pipe -** Nom 8 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.

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

   C. **Conduit -** Nom 6 in. diam (or smaller) rigid steel conduit, nom 4 in. diam (or smaller) steel electrical metallic tubing (EMT) or nom 4 in. diam (or smaller) flexible 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.

Type of Penetrant	Max Diam	T Rating
Steel or iron pipe, steel conduit or EMT	2 in.	1 hr
Steel or iron pipe, steel conduit or EMT	8 in.	3/4 hr
Copper pipe or tube	4 in.	1/4 hr

3A. **Through Penetrating Product* - Flexible Metal Piping -** As an alternate to Item 3, one nom 2 in. diam (or smaller) steel flexible metal pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe, conduit or tube and the steel sleeve shall be min 0 in. (point contact) to max 2 in. Pipe to be rigidly supported on both sides of the wall assembly. **When flexible metal piping is used, T Rating is 1 hr.**

OMEGA FLEX INC

GASTITE, DIV OF TITEFLEX

WARD MFG INC

4. **Firestop System -** The firestop system consists of the following items:

A. **Packing Material -** Min 1 in. thickness of min 4 pcf mineral wool batt insulation compressed and tightly packed into each end of steel sleeve. Packing material recessed from each end of steel sleeve. When alternate steel pipe sleeve is used, packing material may be omitted from the firestop system.

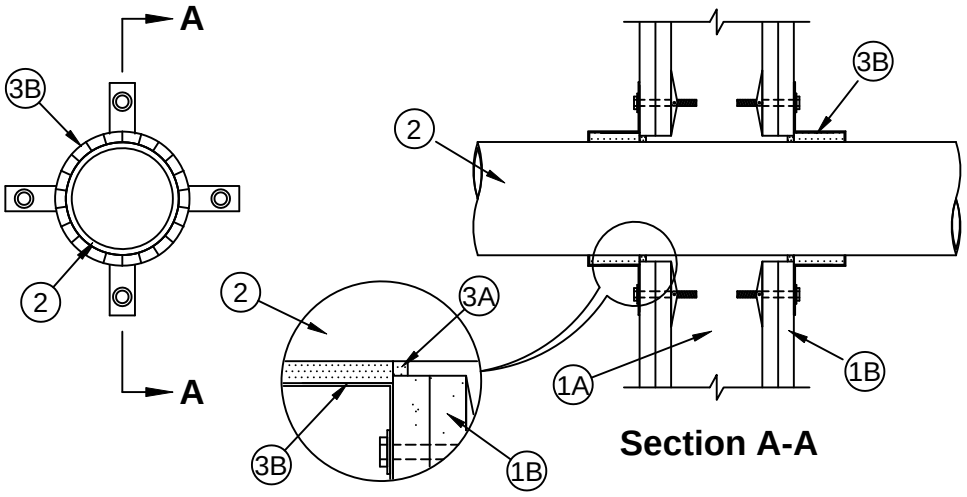
B. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. thickness of fill material applied within annulus, flush with each end of steel sleeve. At point contact location, min 1/4 in. diam bead of fill material applied at metallic pipe/steel sleeve interface on both surfaces of wall. Optionally, a min 1/4 in. diam bead of fill material shall be applied around the circumference of the steel sleeve at its egress from each side of the wall.

SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

*Bearing the UL Classification Mark

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.

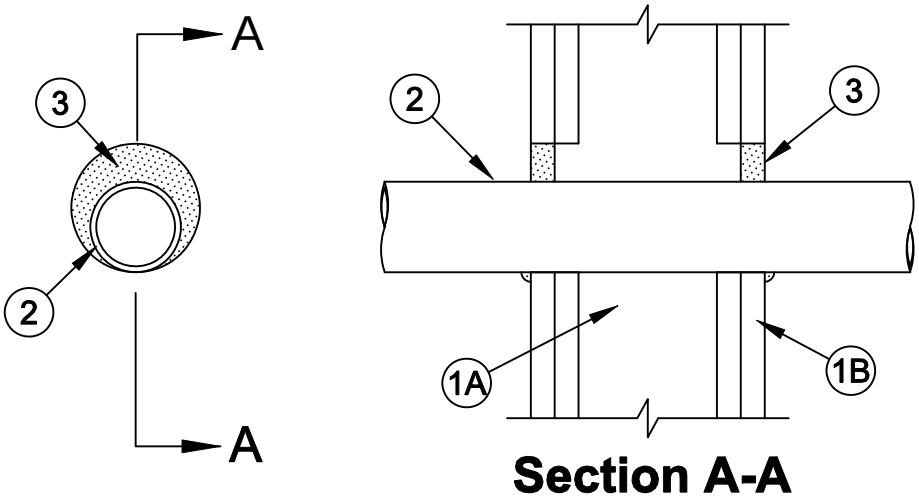
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCC Collar or SpecSeal SSC Collar

   *Bearing the UL Classification Mark

   +Bearing the UL Listing Mark

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



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 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).

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.

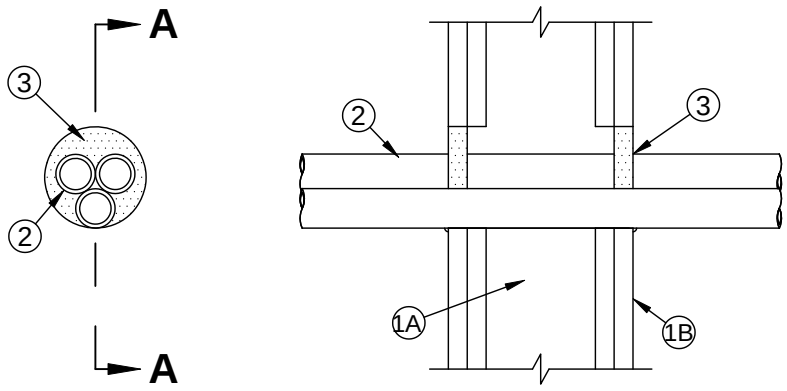
3. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at nonmetallic pipe/gypsum board interface on both surfaces of wall.

SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant or Type WF300 Firestop Caulk (for wood studs only)

*Bearing the UL Classification Mark

System No. W-L-2242

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 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



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 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 in. (92 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. Max diam of opening is 3 in. (76 mm).

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

2. **Through Penetrant -** One or more nonmetallic pipes, conduits or tubes to be bundled together and installed eccentrically or concentrically within the firestop system. Aggregate cross-sectional area of penetrants not to exceed 42 percent of the cross-sectional area of the opening. The annular space between the grounded pipes, conduits or tubes and the periphery of the opening shall be min 0 in. (point contact) to max 1 in. (25 mm). Separation between pipes, conduits or tubes to be min 0 in. (point contact) to max 1 in. (25 mm). Pipes, conduits or tubes 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 1 in. (25 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems.

   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) SDR17 CPVC pipe for use in closed (process or supply) piping systems.

   C. **Rigid Nonmetallic Conduit+ -** Nom 1 in. (25 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA 70).

   D. **Electrical Nonmetallic Tubing+ -** Nom 1 in. (25 mm) diam (or smaller) PVC tubing installed in accordance with the National Electrical Code (NFPA 70).

   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.

   The T Rating is 1 hr and 1-3/4 hr for 1 hr and 2 hr fire rated walls, respectively.

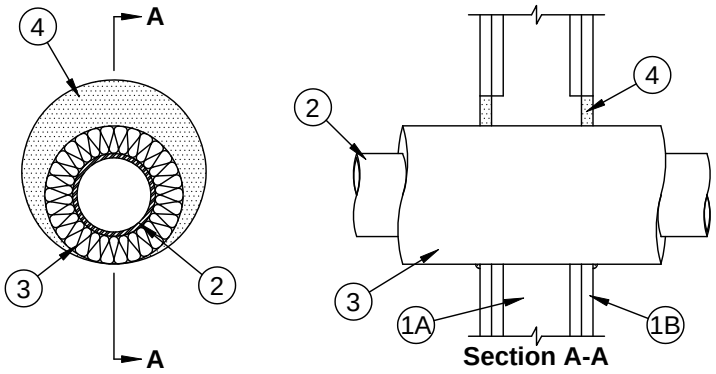
3. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. Sealant to be forced into interstices between penetrants to max extent possible. At point contact location, min 1/4 in. (6 mm) diam bead 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 (wood stud walls only)

   *Bearing the UL Classification Mark

System No. W-L-5121

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



Section A-A

1. **Wall Assembly** - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner 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. 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 specified in the individual Wall and Partition Design. Max diam of opening is 12 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 tube to be installed eccentrically or concentrically within the firestop system. Pipe or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of metallic pipes and tubes may be used:
   A. **Steel Pipe** - Nom 6 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. **Iron Pipe** - Nom 6 in. diam (or smaller) cast or ductile iron pipe.
   C. **Copper Pipe** - Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe.
   D. **Copper Tube** - Nom 4 in. diam (or smaller) Type L (or heavier) copper tube.
3. **Pipe Coverings** - One of the following types of pipe coverings shall be used:
   A. **Pipe and Equipment Covering Materials*** - Nom 2 in. thick hollow cylindrical heavy density (min 3.5 pcf) 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 butt tape supplied with the product. The annular space between the insulated through penetrant and periphery opening shall be min 0 in. (point contact) to max 1-1/2 in.

   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*** - Nom 2 in. thick unfaced mineral fiber pipe insulation sized to the outside diam of pipe or tube. Pipe insulation secured with min No. 8 AWG steel wire spaced max 12 in. OC. The annular space between the insulated through penetrant and periphery opening shall be min 0 in. (point contact) to max 1-1/2 in.

   OWENS CORNING HT INC, DIV OF

   OWENS CORNING - 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.

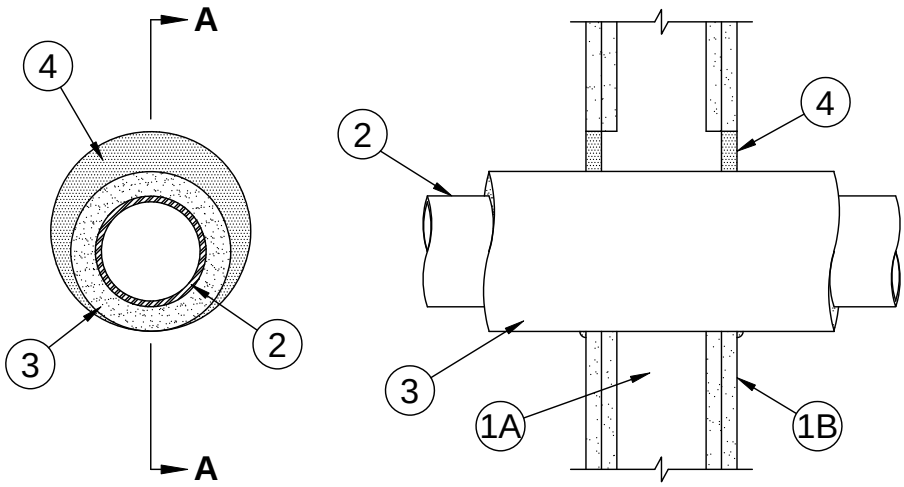
   See **Sheathing Materials** (BVDV) category in the Building Materials Directory for names of manufacturers. Any sheathing material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
4. **Fill, Void or Cavity Material*** - **Sealant** - Min 5/8 in. thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. diam bead of fill material applied at insulated metallic pipe/gypsum board interface on both surfaces of wall.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

   *Bearing the UL Classification Mark

System No. W-L-5122

F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 1/4 Hr



Section A-A

1. **Wall Assembly** - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner 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. 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 specified in the individual Wall and Partition Design. Max diam of opening is 7-1/2 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 tube to be installed eccentrically or concentrically within the firestop system. Pipe or tube to be rigidly supported on both sides of the 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.

3. **Tube Insulation** - **Plastics#** - Nom 3/4 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. Annular space shall be min 0 in. (point contact) to max 1-1/2 in.

   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.

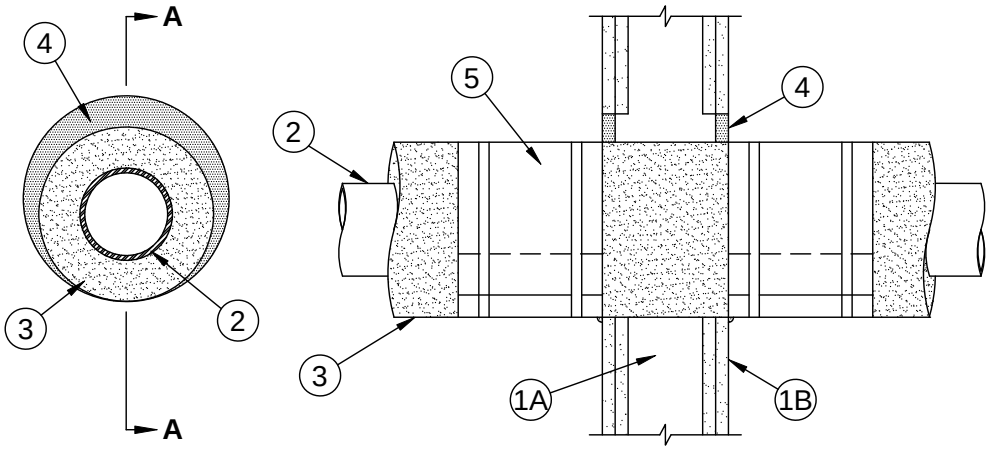
4. **Fill, Void or Cavity Material*** - **Sealant** - Min 5/8 in. thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. diam bead of fill material applied at insulated metallic pipe/gypsum board interface on both surfaces of wall.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

   *Bearing the UL Classification Marking

System No. W-L-5123

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)



Section A-A

1. **Wall Assembly** - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner 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. 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 specified in the individual Wall and Partition Design. Max diam of opening is 14-1/8 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 tube to be installed eccentrically or concentrically within the firestop system. Pipe or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of metallic pipes and tubes may be used:

   A. **Steel Pipe** - Nom 6 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.

   B. **Iron Pipe** - Nom 6 in. diam (or smaller) cast or ductile iron pipe.

   C. **Copper Pipe** - Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe.

   D. **Copper Tube** - Nom 4 in. diam (or smaller) Type L (or heavier) copper tube.

3. **Pipe Covering Materials*** - **Cellular Glass Insulation** - Nom 3 in. thick cellular glass units sized to the outside diam of the through-penetrant and supplied in nom 24 in. long half sections or nom 18 in. long segments. Pipe insulation installed on pipe in accordance with the manufacturer's instructions. Annular space shall be min 0 in. (point contact) to max 1-1/2 in.

   PITTSBURGH CORNING CORP - FOAMGLAS

4. **Fill, Void or Cavity Material*** - **Sealant** - Min 5/8 in. thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. diam bead of fill material applied at insulated metallic pipe/gypsum board interface on both surfaces of wall.

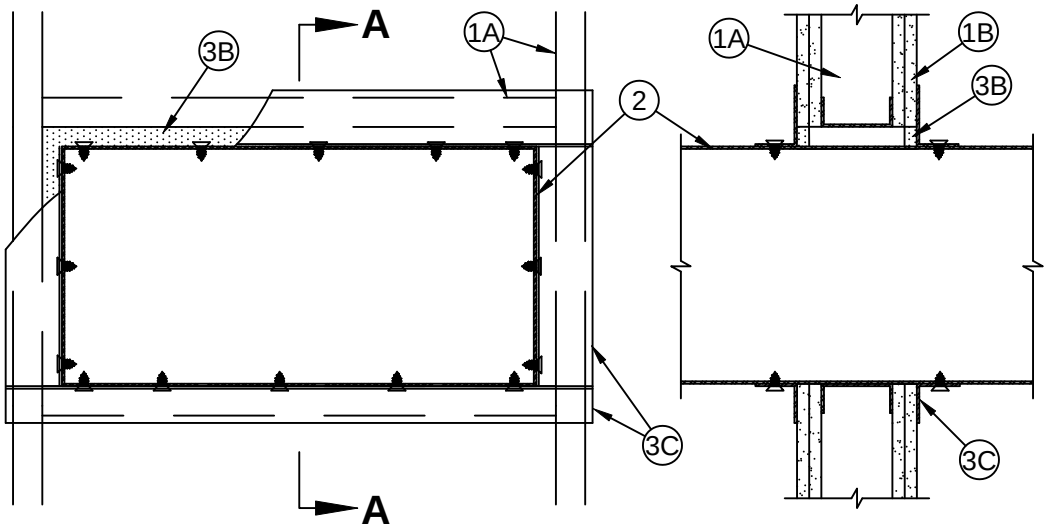
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

5. **Metal Jacket** - Min 12 in. long jacket formed of min 0.010 in. thick aluminum sheet cut to wrap tightly around the pipe insulation with a min 2 in. lap and secured using bands and seals of similar material or No. 18 AWG steel tie wire. Bands or tie wire to be located within 2 in. of each end of the jacket and spaced max 10 in. OC. Jacket to be installed with edge abutting surface of fill material (Item 5B) on both surfaces of wall. Metal jacket to be used in addition to any other jacketing material, which may be required on the pipe covering.

   *Bearing the UL Classification Marking

System No. W-L-7060

F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 1/2 Hr



Section A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional horizontal framing members installed to form a rectangular box around the steel duct (Item 2).

   B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. When wood studs are used, interior of through opening to be lined with sheets of gypsum board around entire periphery to a total thickness of 5/8 in. (16 mm) or 1-1/4 in. (32 mm) for 1 or 2 hr wall assemblies, respectively. Max area of opening is 952 sq in. (0.61 m2) with a max dim of 32 in. (813 mm).

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

2. **Steel Duct -** Max 24 by 30 in. (610 by 762 mm) No. 26 gauge (or heavier) galv steel duct installed eccentrically or concentrically within opening. Annular space between duct and periphery of opening to be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Duct to be rigidly supported on both sides of the wall assembly.

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. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at steel duct/gypsum board interface on both surfaces of wall.

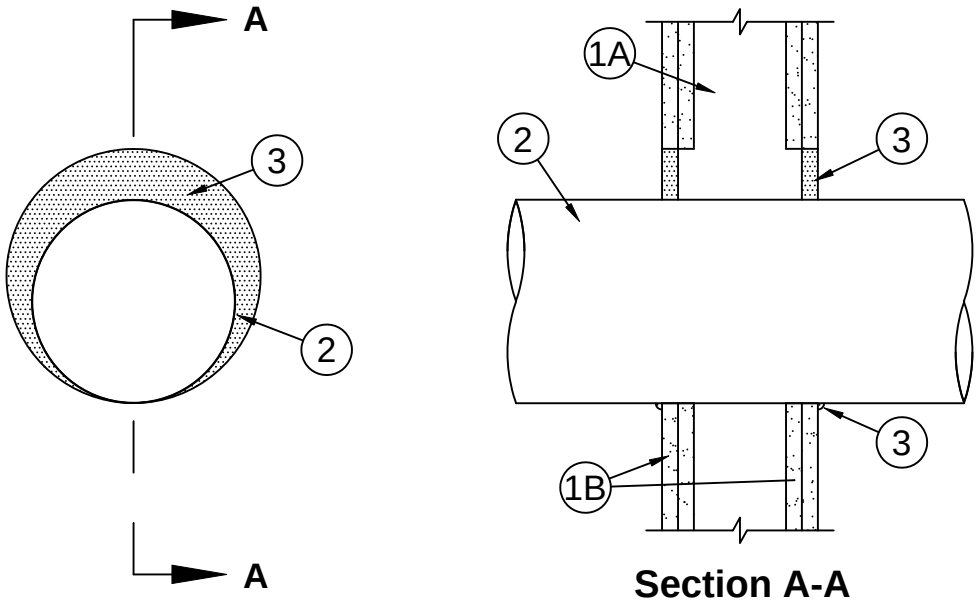
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

   C. **Retaining Angles -** Min 16 gauge galv steel angles sized to lap onto duct a min of 2 in. (51 mm) and to lap onto wall around periphery of opening a min of 1 in. (25 mm). Angles attached to all four sides of steel duct on both surfaces of wall with No. 10 (or larger) steel sheet metal screws located 1 in. (25 mm) from each end and spaced max 4 in. (102 mm) OC.

   *Bearing the UL Classification Mark

System No. W-L-7061

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



Section A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 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 and fasteners as specified in the individual Wall and Partition Design. Max diam of opening is 2 in. (51 mm) larger than OD of steel duct (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. **Steel Duct -** Nom 8 in. (203 mm) diam (or smaller) No. 28 gauge (or heavier) or nom 4 in. (102 mm) diam (or smaller) No. 30 gauge (or heavier) spiral wound or long seam galv steel duct. Annular space between duct and periphery of opening to be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Duct to be rigidly supported on both sides of the wall assembly.

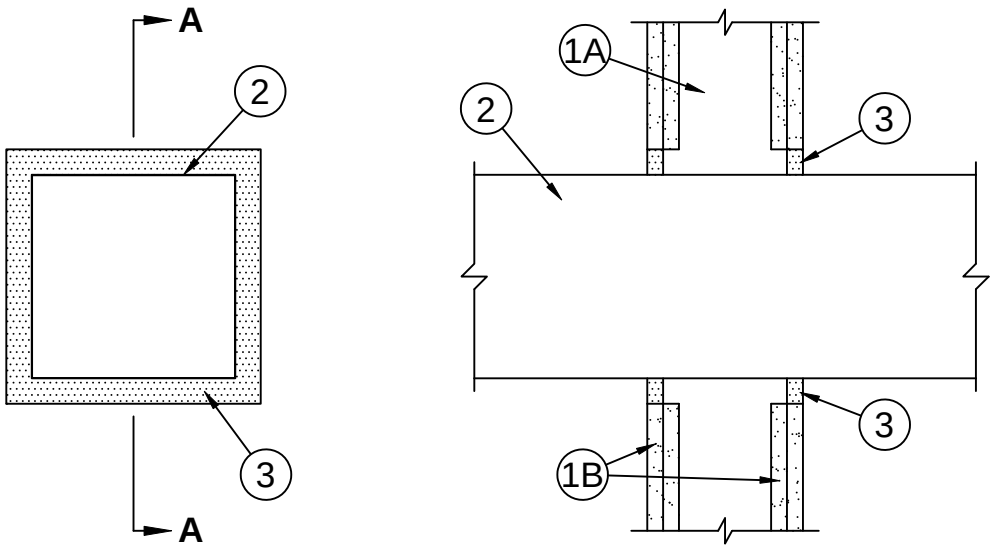
3. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at steel duct/gypsum board interface on both surfaces of wall.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

   *Bearing the UL Classification Mark

System No. W-L-7062

F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr



Section A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 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 and fasteners as specified in the individual Wall and Partition Design. Max area of opening is 100 sq in. (0.064 m2) with a max dim of 10 in. (254 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 8 by 8 in. diam (203 by 203 mm) No. 28 gauge (or heavier) galv steel duct. Annular space between duct and periphery of opening to be nom 1 in. (25 mm). Duct to be rigidly supported on both sides of the wall assembly.

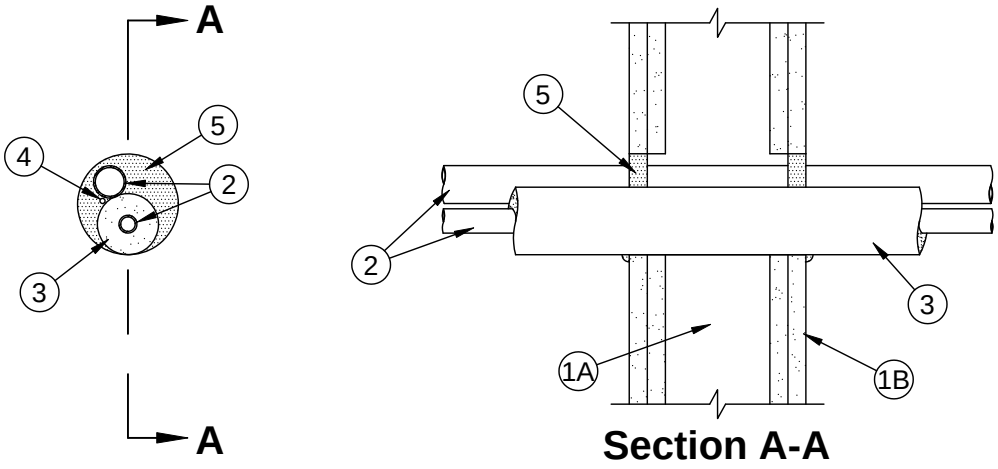
3. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

   *Bearing the UL Classification Mark

System No. W-L-8025

F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 1/4 Hr



Section A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner 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 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. Max diam of opening is 3-1/2 in. (89 mm).

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

2. **Through Penetrant -** A max of two pipes or tubes to be installed within the opening. Of the two pipes or tubes, only one may have a nom diam greater than 1/2 in. (13 mm). Annular space between pipes or tubing and periphery of opening shall be min 0 in. (point contact) to max 1-1/2 in. (38 mm). Separation between uninsulated pipes or tubes shall be min 0 in. (point contact) to max 1-1/2 in. (38 mm). Pipes or tubing to be rigidly supported on both sides of the wall assembly. 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.

3 **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 a max of one pipe or tube. The annular space between the insulated penetrating item and the periphery of the opening shall be min 0 in. (point contact) to max 1/2 in. (13 mm). The space between insulated and uninsulated pipes or tubing 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 94-5VA may be used.

4. **Cable -** One 4 pair No. 18 AWG (or smaller) thermostat cable with polyvinyl chloride (PVC) insulation and jacket materials. Cable to be spaced min 0 in. (point contact) to max 1/2 in. (13 mm) from the other penetrants. The space between the cable and the periphery of the opening shall be min 0 in. (point contact) to max 1/2 in. (13 mm). Cable to be rigidly supported on both sides of wall assembly.
5. **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 through penetrant/gypsum board interface on both surfaces of wall. Additional fill material forced into grouped penetrant interstices to max extent possible.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant or Type WF300 Firestop Caulk (wood stud walls only).

   *Bearing the UL Classification Mark

   #Bearing the UL Recognized Component Marking

Specified Technologies Inc.

GENERAL CERTIFICATE OF CONFORMANCE

January 25, 2011

Description:

SpecSeal® Firestop Products; Pensil® Silicone Sealants; EZ-Path® Fire Rated Pathways; Ready® Sleeve Firestop Sleeves; STI Firestop Products

Included Products:

SpecSeal® Series SSS Intumescent Sealant	SpecSeal® Series LCI Intumescent Sealant	SpecSeal® Series LC Firestop Sealant
SpecSeal® Series ES Elastomeric Sealant	SpecSeal® Series SIL300 Silicone Sealant	SpecSeal® Series SIL300SL Silicone Sealant
Pensil® PEN300 Silicone Sealant	Pensil® PEN300SL Silicone Sealant	Pensil® PEN200 Silicone Foam
Type WF300 Firestop Caulk	SpecSeal® Series AS200 Elastomeric Spray	SpecSeal® Series FT Fast Tack™ Firestop Spray
SpecSeal® Series SSP Putty & Putty Pads	SpecSeal® Series EP PowerShield™ Box Insert	SpecSeal® Series SSM Firestop Mortar
SpecSeal® Series SSB Firestop Pillows	SpecSeal® Series CS Composite Sheet	SpecSeal® Series SSW Wrap Strips
SpecSeal® Series LCC Firestop Collars	SpecSeal® Series SSC Firestop Collars	SpecSeal® Series RTC Firestop Collars
SpecSeal® Series FP Firestop Plugs	SpecSeal® Series CD Cast-In Firestop Devices	FyreFlange™Firestop Angle
EZ-Path® Series 22	EZ-Path® Series 33	EZ-Path® Series 44 or 44+
Ready™ Sleeve	Ready™ Sleeve Split	Ready™ Firestop Grommet
SpecSeal® Series SSAMW Mineral Wool	SpecSeal® SpeedFlex™ Fire Rated Joint Profile	

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

- ASTM E814 (ANSI/UL1479) Standard Test Method for Fire Tests of Penetration Firestop Systems
- ASTM E1966 (ANSI/UL2079) Standard Test Method for Fire-Resistive Joint Systems
- ASTM E119 (ANSI/UL263) Standard Test Methods for Fire Tests of Building Construction and Materials
- ASTM E2307 Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate Scale, Multi-Story Test Apparatus
- ASTM E1399 Standard Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems
- ASTM E84 (ANSI/UL723) Standard Test Method for Surface Burning Characteristics of Building Materials
- CAN/ULC S115 Standard Method of Fire Tests of Firestop Systems
- CAN/ULC S101 Standard Methods of Fire Endurance Tests of Building Construction and Materials
- IMO Resolution A.754(18)

Chemical Content Statement:

No asbestos, PCB's, lead, or water-soluble intumescent ingredients are used or contained in these products.

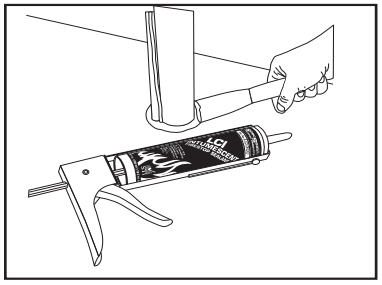
James P. Stahl Jr., CFPS
Vice President of Engineering

Paul M. Jankowski
Quality Control Manager

SERIES LCI INTUMESCENT SEALANT

APPLICATIONS

SpecSeal® LCI Sealant has a broad application base designed to seal a wide variety of common penetrations and construction joints. Penetrant types include insulated and non-insulated metallic pipes and tubes, non-metallic pipes and tubes, and common electrical service and power distribution, telephone, data, and TV cabling. This product is also used in conjunction with other SpecSeal® Products such as SpecSeal® Firestop Collars and Wrap Strips to protect larger plastic pipes. See Table A for a summary application list.



PHYSICAL PROPERTIES

Properties	Series LCI
Color	Red
Odor	Mild Latex
Density	9.0 lb/gal (1.08 kg/L)
pH	9.0
Solids Content By Weight	80%
Solids Content By Volume	66.9%
In Service Temperature	≤ 185°F (85°C)
Flame Spread	0*
Smoke Developed	5*
STC Rating (ASTM E90/ASTM C919)	62
VOC Content (EPA Method 24/ASTM D3960)	32.7 g/L
Shelf Life	2 yrs
Volume Expansion	10X Free Expansion
Storage Temp.	40°F (4°C) - 95°F (35°C)

* Tested to ASTM E84 (UL723) at 14% surface coverage (modified test for sealants and caulks)

PRODUCT DESCRIPTION

SpecSeal® LCI Sealant is a versatile and economical intumescent sealant that has excellent caulking properties as well as high build properties on vertical or overhead surfaces. This single grade may be caulked (standard cartridge or bulk loaded), knifed or troweled. In addition, SpecSeal® LCI Sealant does not contain PCB's or asbestos.

SpecSeal® LCI Sealant is storage stable (when stored according to the manufacturer's recommendations), and will not separate or shrink when dried. SpecSeal® Series LCI Sealant will adhere to all common construction and penetrant materials and contains no solvents that might adversely effect plastic pipes or cable jackets.

FEATURES

- **Economical**: High performance without the high price!
- **Highly Intumescent**: Expands up to 8 times.
- **Excellent Smoke Seal**
- **Water Resistant** : Will not re-emulsify when dry.
- **Water-Based** for easy installation, cleanup, and disposal.
- **Acoustically Tested**: Reduces noise transmission
- **Safe...**Low VOC's, No Solvents, Non-Halogenated
- **Paintable**

PERFORMANCE

SpecSeal® LCI Sealant is the basis for systems that meet the exacting criteria of ASTM E814 (UL1479) and ASTM E1966 (UL2079) as well as to the time-temperature requirements of ASTM E119 (UL263). LCI provides up to a 4-hour fire rating for typical service penetrations through concrete or wood floors, concrete or masonry walls, as well as gypsum board walls. SpecSeal® LCI Sealant meets Class A finish requirements for Flame Spread and Smoke Development when tested in accordance with ASTM E84 (UL723). SpecSeal® LCI Sealant is also acoustically tested, demonstrating excellent sound attenuation properties.

FBC SYSTEM COMPATIBLE

FBC™ System Compatible indicates that this product has been tested, and is monitored on an ongoing basis, to assure its chemical compatibility with FlowGuard Gold®, BlazeMaster® and Corzan® pipe and fittings. FBC, FlowGuard Gold, BlazeMaster and Corzan are licensed trademarks of The Lubrizol Corporation.

CLASSIFIED C UL US

FILL, VOID OR CAVITY MATERIALS FOR USE IN JOINT SYSTEMS AND THROUGH-PENETRATION FIRESTOP SYSTEMS. SEE UL FIRE RESISTANCE DIRECTORY.
3L73

FM APPROVED

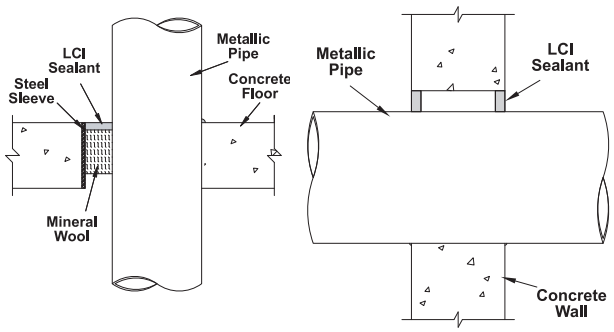
SPECIFICATIONS

The firestopping sealant shall be a water-resistant, intumescent latex sealant. The sealant when exposed to high heat or flame shall exhibit a free expansion of up to 8 times its original volume. The firestopping sealant shall contain no water soluble nor hygroscopic ingredients and shall be acoustically tested. The sealant shall be UL Classified and/or FM approved and tested to the requirements of ASTM E814 (UL1479) and shall meet Class A finish requirements when tested in accordance with ASTM E84 (UL723).

SPECIFIED DIVISIONS

DIV.	7	07840	Through-Penetration Firestopping
DIV.	13	13900	Special Construction Fire Suppression & Supervisory Systems
DIV.	15	15250	Mechanical Insulation – Fire Protection
DIV.	16	16050	Basic Electrical Materials & Methods

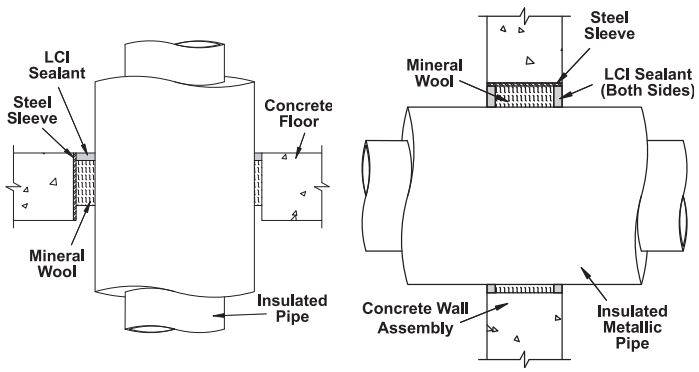
Fig 1: METALLIC PIPES - Concrete/Masonry Floors & Walls



UL System No. C-AJ-1353
F Rating: 3 Hr • T Rating: 0 Hr
Steel or Iron Pipe: <12", Copper Pipe: <4"
Annulus: 0" to 2"
Sealant Depth: 1/4"
Forming Material: Nom 4 pcf mineral wool (2 1/4" Depth)

UL System No. W-J-1098
F Rating: 2 Hr • T Rating: 1/4, 3/4 & 1 Hr
Steel or Iron Pipe: <8", Copper Pipe: <4"
Annulus: 0" to 2"
Sealant Depth: 5/8"

Fig 2: INSULATED METALLIC PIPES - Concrete/Masonry Floors & Walls



UL System No. C-AJ-5138
F Rating: 2 Hr • T Rating: 3/4 or 1 Hr
Steel or Iron Pipe: 6", Copper Pipe: 4"
Pipe Covering: Max. 2" fiber glass or mineral wool pipe insulation.
Annulus: 1/4" to 1-5/8" • Sealant: 1/2"
Forming: Nom. 4 pcf mineral wool (3" depth)

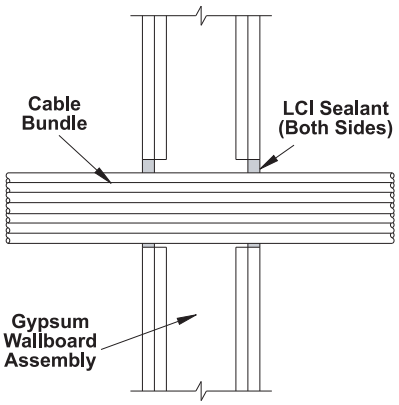
SEALANT REQUIREMENTS IN CUBIC INCHES PER 1/4 INCH OF INSTALLED DEPTH*

		Diameter of Opening - in. (mm)											
PIPE SIZE		1.5 (38)	2.0 (51)	3.0 (76)	4.0 (102)	5.0 (127)	6.0 (152)	7.0 (178)	8.0 (203)	10 (254)	12 (305)	14 (356)	26 (660)
Trade Size in. (mm)	Pipe O.D. in. (mm)												
0.5 (13)	0.840 (21)	0.3 (4.9)	0.6 (9.8)	1.6 (26.2)	3.0 (49.2)	4.8 (78.7)	6.9 (113.0)	9.5 (155.7)	12.4 (203.2)	19.5 (319.5)	28.1 (460.5)	38.3 (627.6)	132.6 (2173)
1.0 (25)	1.315 (33)	0.1 (1.6)	0.4 (6.6)	1.4 (22.9)	2.8 (45.9)	4.6 (75.4)	6.7 (109.8)	9.3 (152.4)	12.2 (200.0)	19.3 (316.3)	27.9 (457.2)	38.1 (624.3)	132.4 (2170)
1.5 (38)	1.900 (48)			1.1 (18.0)	2.4 (39.3)	4.2 (68.8)	6.4 (104.9)	8.9 (145.8)	11.9 (195.0)	18.9 (309.0)	27.6 (452.3)	37.8 (619.4)	132.0 (2163)
2.0 (51)	2.375 (60)			0.7 (11.5)	2.0 (32.8)	3.8 (62.3)	6.0 (98.3)	8.5 (139.2)	11.5 (188.4)	18.5 (309.7)	27.2 (445.7)	37.4 (568.6)	131.6 (2157)
2.5 (64)	2.875 (73)			0.1 (1.6)	1.5 (24.6)	3.3 (54.1)	5.4 (88.4)	8.0 (131.1)	10.9 (178.6)	18.0 (295.0)	26.7 (437.5)	36.9 (604.7)	131.1 (2148)
3.0 (76)	3.500 (79)				0.7 (11.5)	2.5 (41.0)	4.7 (77.0)	7.2 (118.0)	10.2 (167.1)	17.2 (281.9)	25.9 (424.4)	36.1 (591.6)	130.3 (2135)
3.5 (89)	4.000 (102)					1.8 (29.5)	3.9 (63.9)	6.5 (106.5)	9.4 (154.0)	16.5 (270.4)	25.1 (411.3)	35.3 (578.5)	129.6 (2124)
4.0 (102)	4.500 (114)					0.8 (13.1)	3.0 (49.2)	5.6 (91.8)	8.5 (139.3)	15.6 (255.6)	24.2 (396.6)	34.4 (563.7)	128.7 (2109)
6.0 (152)	6.625 (168)							1.1 (18.0)	4.0 (65.5)	11.1 (181.9)	19.7 (322.8)	29.9 (490.0)	124.2 (2035)
8.0 (203)	8.625 (219)									4.9 (80.3)	13.6 (222.9)	23.8 (390.0)	118.0 (1934)
10.0 (254)	10.750 (273)										5.6 (91.8)	15.8 (259.0)	110.0 (1803)
12.0 (305)	12.750 (324)											6.6 (108.1)	100.8 (1652)
24.0 (610)	24.000 (610)												19.6 (321.2)

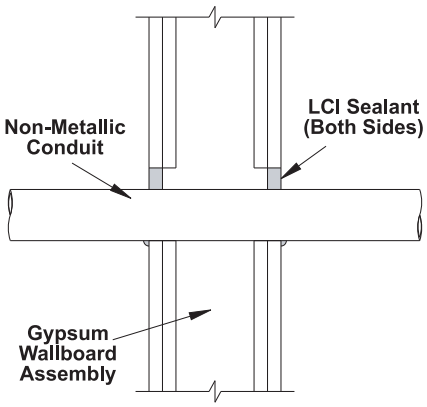
*Different Sealant Depth?

1/2" (12.7)	Multiply by 2
5/8" (15.9)	Multiply by 2.5
1" (25.4)	Multiply by 4
1-1/4" (31.8)	Multiply by 5

Fig. 3: ELECTRICAL, DATA OR COMMUNICATIONS - Gypsum Walls



UL System No. W-L-3169
F Rating: 1, 2 Hr • T Rating: 1/4 and 3/4
Up to 4-1/2˝ cable bundle
Annulus: 0˝ to 1/2˝ • Sealant: 5/8˝



UL System No. W-L-2241
F Rating: 1, 2 Hr • T Rating: 0, 1/4, 1, 1-3/4
<2˝ Rigid PVC or ENMT, CPVC, ABS
Annulus: 0-1˝ • Sealant 5/8˝

TABLE A: APPLICATIONS

TESTED AND CLASSIFIED FOR FIRE RESISTANCE

- **Metallic Pipes** including steel, iron, or copper pipe and tubing.
- **Nonmetallic Pipes, Conduits & Tubing** including PVC, CPVC, ABS, and PEX.
- **Electrical & Electronic Cabling** including service entrance, power distribution, computer, telephone, and television.
- **Metal Ductwork** including HVAC, bath and dryer vents.
- **Insulated Pipes** including heating, cooling, and condensation applications.
- **Complete Wood Floor firestopping package** for electrical, plumbing, HVAC, telephone, and television.

INSTALLATION INSTRUCTIONS

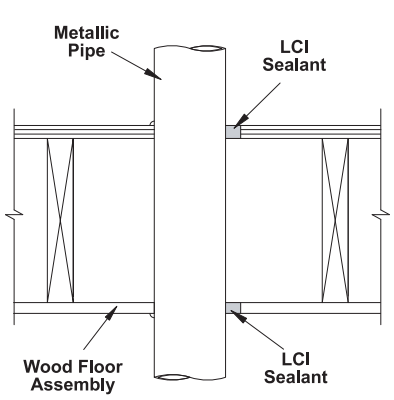
GENERAL: Areas to be protected must be clean and free of oil, loose dirt, rust or scale. Installation temperatures must be between 35°F (2°C) and 100°F (38°C). Allow product to dry a minimum of 24 hours before exposure to moisture.

SYSTEM SELECTION: Selection of an appropriate firestop system design is critical to the fire protection process. Space limitations preclude highly detailed information pertaining to individual application systems. Please consult the Product & Application Guide as well as the UL® Fire Resistance Directory for additional information.

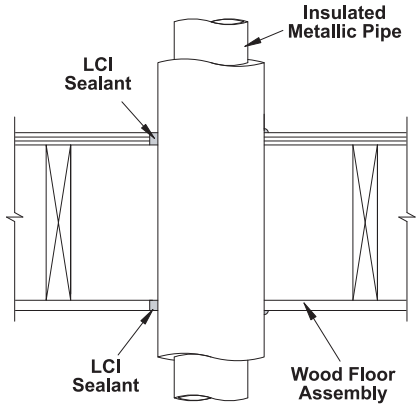
FORMING: Some installations may require forming as either an integral part of the system or as an option to facilitate installation. In systems where forming is required, mineral wool batts with a minimum nominal density of 4 PCF (64 kg/m^3) are generally required. Cut forming material oversize to allow for tight packing. Position forming material to allow for the proper depth of fill material.

FILL MATERIAL: SpecSeal® LCI Sealant may be installed by caulking using a standard caulking gun or from bulk containers using a bulk loading caulk gun, or by manually troweling using a mason's trowel or putty knife. If the sealant tends to pull back from a surface, clean the surface with a damp rag or sponge and reapply. Work sealant into all areas exercising care to eliminate voids or seams. The surface of the sealant can be smoothed using a putty knife dipped in water. Adding water to the sealant itself is not recommended. Sealant (when dry) may be painted using most non-solvent based paints.

Fig. 4: BARE & INSULATED METALLIC PIPES - Wood Floor Assemblies



UL System No. F-C-1074
F Rating: 1 & 2 Hr • T Rating: 1/4, 1/2 and 1 Hr
Steel, Iron or Copper: 4″ • Chase wall optional.
Annulus: 0″ to 1″ • Sealant: 5/8″ bottom, 3/4″ top



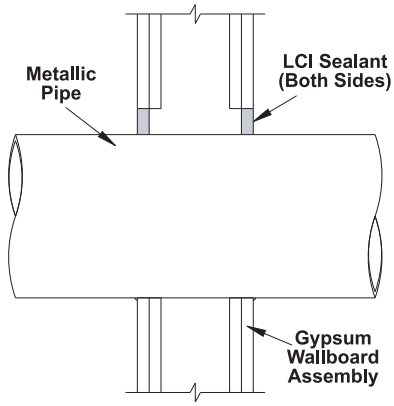
UL System No. F-C-5043
F Rating: 1 & 2 Hr • T Rating: 3/4 and 1 Hr
Steel, Iron or Copper: 4″
Pipe covering: 1″ Fiber Glass, Mineral fiber or AB/PVC • Chase wall optional.
Annulus: 0″ to 1″ • Sealant: 5/8″ bottom, 3/4″ top.

In gypsum wallboard penetrations, apply a minimum cove bead of 1/4" (6 mm) at the interface of the penetrant with both exterior wall surfaces.

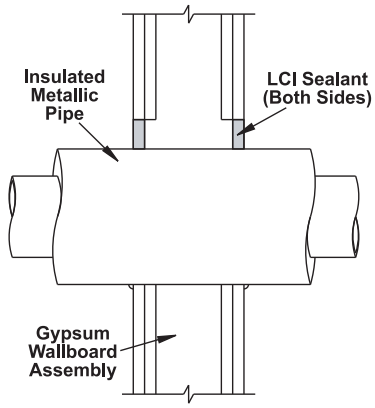
SMOKE SEALING: In some applications including firestop collars, SpecSeal® LCI Sealant is recommended as a smoke seal. It is suggested in these applications that the sealant be applied to both sides of walls. In floor applications, a sealing bead is suggested top and bottom.

LIMITATIONS: SpecSeal® LCI Sealant is water-based and cures through the evaporation of water. Low temperatures as well as high humidity may retard drying. Non-porous or impermeable backing materials, plates, or coatings may retard the drying process. Do not paint or seal in any way that prevents contact with air until sealant has dried through completely. This product has been designed to be safe with plastics and has been used extensively and successfully with a variety of different types of plastic pipes, tubes, and plastic cable insulations. Variations in these materials however, make it impossible to guarantee compatibility. STI strongly recommends that the user consult with the manufacturer of the pipe, tubing, or cable in question regarding any known sensitivities or potential restrictions before applying this product.

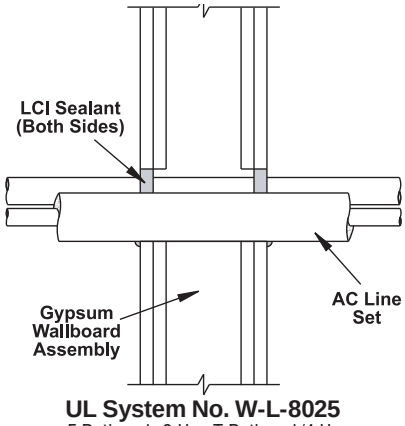
Fig. 5: BARE & INSULATED METALLIC PIPES - Gypsum Walls



UL System No. W-L-1222
F Rating: 1, 2 Hr • T Rating: 1/4, 3/4, 1 Hr
Steel or Iron pipe: 8″, Copper pipe: 4″
Annulus: 0″ to 2″ • Sealant: 5/8″



UL System Nos. W-L-5121, W-L-5122
F Rating: 1, 2 Hr • T Rating: 1 Hr & 1/4 Hr
Steel or Iron pipe: 6″, Copper pipe: 4″
Pipe covering: Max. 2″ fiber glass, 3/4″ AB/PVC or 2″ mineral fiber
Annulus: 0″ to 1-1/2″ • Sealant: 5/8″



UL System No. W-L-8025
F Rating: 1, 2 Hr • T Rating: 1/4 Hr
AC Line Set: Two copper tubes, one with 3/4″ AB/PVC and thermostat wire
Annulus: 0″ to 1″ • Sealant 5/8″

MAINTENANCE

No maintenance is normally required, however a periodic inspection of rated barriers is recommended to make sure that any new openings, modifications of previously installed firestops, or areas exhibiting physical damage, have been properly sealed or repaired. Subsequent sealing or repairs should be accomplished using SpecSeal® products per the original approved design.

RETROFIT: When adding or removing penetrants, care should be taken to minimize damage to the seal. Reseal using SpecSeal® products per the approved design. NOTE: New penetrants of a different nature than the original design may require a totally new firestop design or extensive modifications to the existing design. Reseal all openings as per the requirements of the modified design.

TECHNICAL SERVICE

Specified Technologies Inc. provides toll free technical support to assist in product selection and appropriate installation design. UL Systems, Material Safety Data Sheets and other technical information is available through the Technical Library at www.stifirestop.com.

PRECAUTIONARY INFORMATION

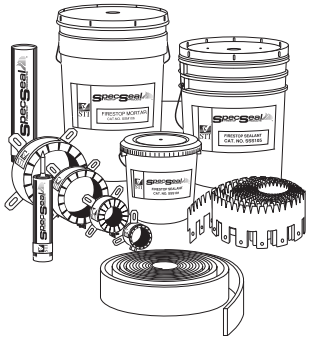
Consult Material Safety Data Sheet for additional information on the safe handling and disposal of this material.

AVAILABILITY

SpecSeal® Series LCI Sealant is available from authorized STI distributors. Consult factory or website for the names and locations of the nearest sales representatives or distributors.

ORDERING INFORMATION

CAT. NO.	DESCRIPTION	
LCI300	Sealant 10.1 oz Tube	18.2 Cu In (300 ml)
LCI305	Sealant 5 Gal Pail	1,155 Cu In (19.0 L)
LCI320	Sealant 20 oz Sausage	36 Cu in. (592 ml)
LCI329	Sealant 29 oz Quart Tube	52 Cu in. (858 ml)



Additional SpecSeal Products...

Series SSS Sealant
The industry's most versatile sealant provides the firestopping solutions for a wide range of combustible and noncombustible applications. Water-based intumescent sealant expands up to 8X!

Intumescent Wrap Strips
Three grades of intumescent wrap strips provide an unmatched combination of flexibility, economy, and expansion (up to 30X). Systems for plastic pipes including FR Polypropylene up to 8" trade size!

SSC & LCC Firestop Collars
Easy to install, economical protection for ABS and PVC pipes (both solid and foam core) as well as CPVC, PVDF, and FRPP. LCC Collars are available up to 4" and SSC Collars are available up to 6" trade size.

Firestop Mortar
Lightweight, versatile and economical! The best choice for large or complex installations.

SSP Firestop Putty
Available both in bar form and in pads, putty provides easy retrofit for through-penetrations and economical protection for electrical boxes.

SIL Silicones
Sealants and foam for through-penetrations and construction joints. Unexcelled aging characteristics and flexibility.

Elastomeric Joint Seals
Economical products for sealing construction joints. Choose caulk or spray applied products tested to UL2079.

Specified Technologies Inc.

Specified Technologies Inc. • 210 Evans Way, Somerville, NJ 08876 USA • Phone: 800.992.1180 • Fax: 908.526.9623

SpecSeal FIRESTOP PRODUCTS®

Reproduced from Electronic Media

PRODUCT DATA SHEET

Intumescent RED Wrap Strip

1. PRODUCT DESCRIPTION

SpecSeal® Red Wrap Strip is a highly flexible, elastomeric strip designed to firestop penetrations in fire-rated walls, floors and floor/ceiling assemblies. It is available in convenient 12' rolls that facilitate installation and cut down on waste.

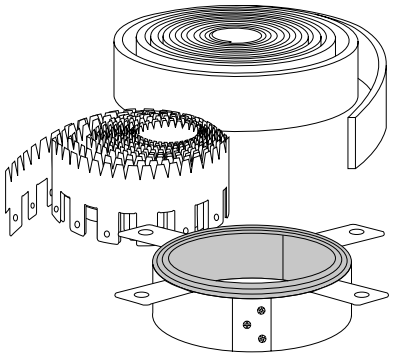
This product utilizes STI's patented two-stage intumescent technology, providing a very responsive and highly directionalized expansion. Expansion is extremely fast, providing quick closure for burning combustible penetrants.

When exposed to temperatures in excess of 250°F (121°C), the SpecSeal® Red Wrap Strip begins to expand (intumesce) rapidly to form a dense, highly insulative char. Its free expansion ranges from 16-24 times original (pre-expanded) volume. Expansion continues up to temperatures of 1,000°F.

2. APPLICATIONS

SpecSeal® Red Wrap Strips are used for firestopping combustible penetrants such as nonmetallic pipes and cables. It is also used around metal duct work to close gaps that may develop during a fire due to expansion and deflection.

Installations have been developed for both "tuck-in" applications (where strips are fastened around the penetrant and then slid into the opening) and restraining collar assemblies (for surface mounting). For larger openings or complex penetrant configurations, systems have been developed to utilized the wrap strips in conjunction with other SpecSeal® products. SpecSeal® Red Wrap Strips are suitable for use in all common forms of construction including concrete floors, concrete over steel deck, concrete walls, concrete block walls, gypsum board walls, and wood floor assemblies.



3. PHYSICAL PROPERTIES

See Table A. This material is extremely stable. Long term aging studies indicate no significant loss of physical properties nor significant change in expansion properties after elevated temperature, humidity, and immersion testing. Consult factory for additional information.

4. PERFORMANCE

SpecSeal® Intumescent Red Wrap Strips are the basis for systems that meet the exacting criteria of ASTM E814 (UL1479). Systems have been tested for all common forms of construction and penetrants with ratings up to 3 hours.

CLASSIFIED UL® 3L73

FILL, VOID OR CAVITY MATERIALS CLASSIFIED BY UNDERWRITERS LABORATORIES INC. ® FOR USE IN THROUGH-PENETRATION FIRESTOP SYSTEMS.

SEE UL FIRE RESISTANCE DIRECTORY

CLASSIFIED cUL®

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

NOTICE: The use of this product may be regulated by regional or local codes. CONSULT THE LOCAL AUTHORITY HAVING JURISDICTION.

FEATURES

- **Rapid Expansion:** Closes off burning penetrants faster.
- **High Volume Char:** Expands up to 24 times!
- **Water-Resistant:** No soluble or hygroscopic ingredients.
- **Economical:** 12' roll means no piecing... less waste!
- **Highly Flexible:** No foil... soft...supple... easier to install!
- **Versatile** performer for a wide range of complex applications.

5. SPECIFICATIONS

The wrap strip material shall be a highly flexible, two-stage intumescent material. The wrap strip shall provide a minimum of 15x free expansion and shall contain no water soluble expansion ingredients. The specified material shall be approved for a wide range of applications including combustible and noncombustible penetrants when used by itself or in combination with other products from the same manufacturer. The wrap strip shall be UL Classified and/or FM Systems Approved and tested to the requirements of ASTM E814 (UL1479).

SPECIFIED DIVISIONS

DIV.	7	07840	Through-Penetration Firestopping
DIV.	13	13900	Special Construction Fire Suppression & Supervisory Systems
DIV.	15	15250	Mechanical Insulation – Fire Protection
DIV.	16	16050	Basic Electrical Materials & Methods

For the latest Product and System Information, Call STI'S FACTS-ON-DEMAND automated information attendant system by dialing toll-free (888)526-6800!

Table A: PHYSICAL PROPERTIES

Catalog Number	SSWRED
Color	Red
Weight	2.9 Lb. (12' Roll)
Dimensions	12' x 1-1/2" x 1/4" (nom.)
Expansion Begins	250° F. (1st stage)
	350°F (2nd stage)
Volume Expansion	16 to 24X (free expansion)
In-Service Temp.	≤ 130° F.
Oven Aging	No Change (60°C)*
Humidity Exposure	No Change (60°C, 98% R.H.)*

* Evaluation of physical properties and total expansion.

Fig 1

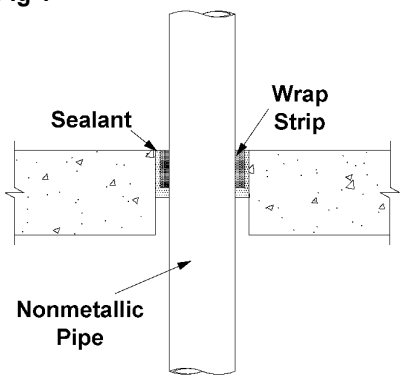
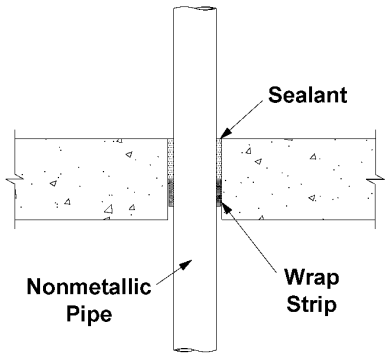


Fig 2



STI designed firestop systems are engineered to maximize the fire resistance of the seal by not only sealing off the spread of fire and hot gasses but also by minimizing the amount of heat conducted through the assembly. Thus all systems have been designed to provide T Ratings capable of matching the rating of the wall or floor assembly (where possible). Consult factory for information not available in the UL Fire Resistance Directory as of this printing.

5. SPECIFICATIONS

See page 1.

6. INSTALLATION

GENERAL: Areas to be protected must be free of oil, loose dirt, rust or scale. In most cases, walls require symmetrical applications. Wrap strips must be applied to both sides.

SYSTEM SELECTION: Proper methods and materials are critical to firestopping. A number of methods have been developed to suit a wide variety of firestopping applications. Some of these methods are illustrated here. System drawings more precise to a given application may be available. Additional systems may also be available for applications not shown here. Consult your local distributor, sales rep. or call STI toll free at (800)992-1180.

TUCK-IN INSTALLATIONS: Place layer of wrap strip around penetrant. Masking tape may be used to temporarily secure wrap strip. Apply successive layers of wrap strip as required by system chosen. Secure layers in place using steel tie wire or foil tape as required. Slide wrap strip into opening and position as indicated by the appropriate UL system or STI design. Apply SpecSeal® Sealant as required for smoke seal.

POURED OR EMBEDDED INSTALLATIONS: Where annular spaces are larger than those suitable for "tuck-in" installations, poured in or embedded installations may be a better choice. Apply wrap strip as described above. Position wrap strip as follows: In

Fig 3

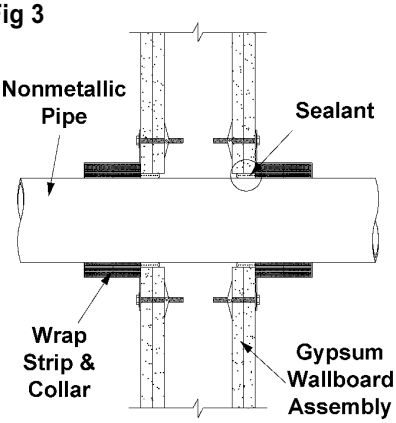


Fig 4

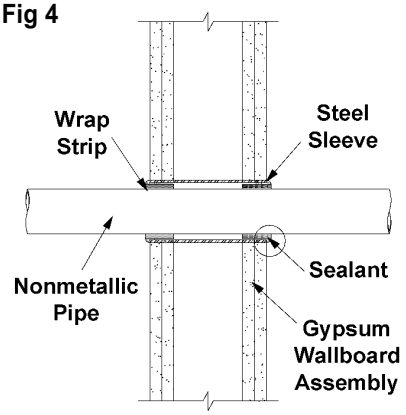


Table B: RED WRAP STRIP AND RESTRAINING COLLAR REQUIREMENTS

This table provides the following information related to the firestopping of plastic pipes utilizing "tuck-in" or restraining collar assemblies:

1. Number of layers.
2. Length of each layer and total number of required layers.
3. Length of restraining collars (1" min. added for overlap)

Trade Size	Pipe O.D.	Length of Layers & Restraining Collar (R.C.) in Inches				
		1st	2nd	3rd	TOTAL	R.C.
1/2"	0.84"	4.2			4.2	
3/4"	1.1"	5.0			5.0	
1"	1.3"	5.7			5.7	
1-1/4"	1.7"	6.9			6.9	
1-1/2"	1.9"	7.5			7.5	8.5
2"	2.4"	9.1			9.1	11.0
2-1/2"	2.9"	10.7	12.3		23.0	13.3
3"	3.5"	12.6	14.1		26.7	15.5
3-1/2"	4.0"	14.1	15.7	17.3	47.1	18.3
4"	4.5"	15.7	17.3	18.8	51.8	20.5
6"	6.62"	22.4	24.0	25.5	143.8*	26.5**

* Requires double stack of 3 layers of wrap strip.
** Requires 3" high, 26 gauge metal (use WSC-RED).

Fig 5

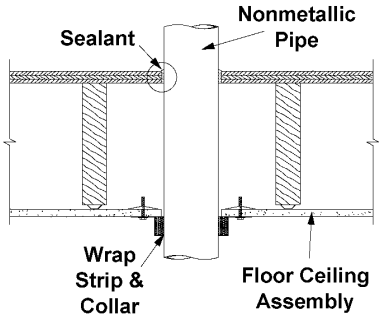


Fig 6

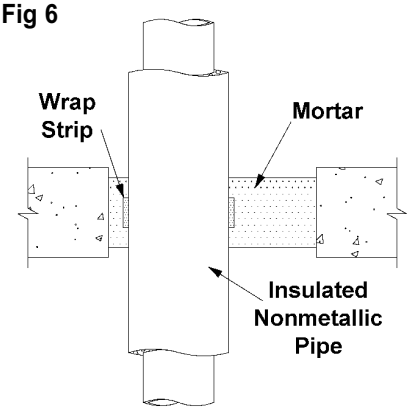


Fig 7

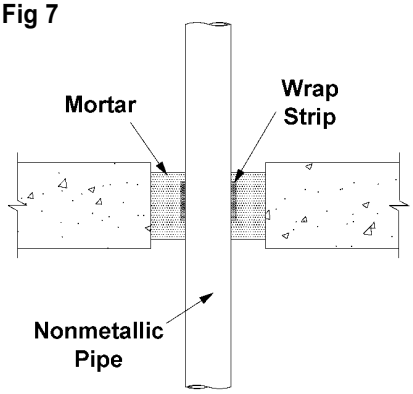
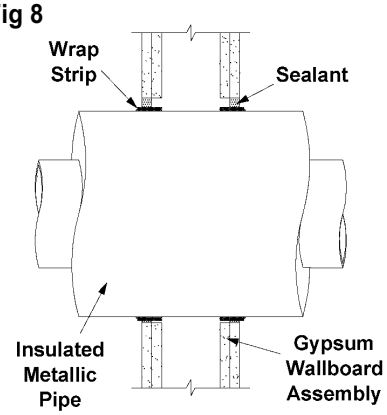


Fig 8



mortar applications, position wrap strip such that they are embedded flush with the bottom surface of the mortar (outside surface in wall applications). In sealant applications, position strip into mineral wool forming and sealant such that 1" of ring is contained within forming material and 1/2" is embedded in sealant. Position and secure strip before pouring mortar or applying sealant.

RESTRAINING COLLAR INSTALLATIONS: Where annular spaces are restricted or where tuck-in, poured or embedded systems are unsuitable, surface mounted restraining collars may be used (See Fig. 6). Caulk annular space around pipe with a sufficient amount of SpecSeal® Series SSS Sealant to close gap and effect smoke seal. Caulking both sides of wall and top and bottom of floors is recommended. Apply layers of wrap strip as required and secure using masking tape or tie wire. Calculate the length of restraining collar required to completely wrap around the outer diameter of the wrap strip rings plus an additional inch of overlap. Secure restraining collars with stainless steel hose clamp positioned at the mid-point of the wrap strip stack.

Request STI's "Product Estimation & Installation Sheet - Wrap Strip Collars" for additional information concerning the use of restraining collar.

PLASTIC PIPES: “Tuck-In” installations are suitable for vented or closed systems up to and including 3" trade size pipes. For penetrations above 3" trade size, surface mounted collars are recommended. Figures 1, 2 and 4 illustrate “tuck-in” installations for plastic pipes through common forms of construction. Figures 11 through 14 illustrate the use of surface mounted collars. See Table B (Page 2) for number of layers, the length of the wrap strip layers and the length of the required restraining collar.

Fig 9

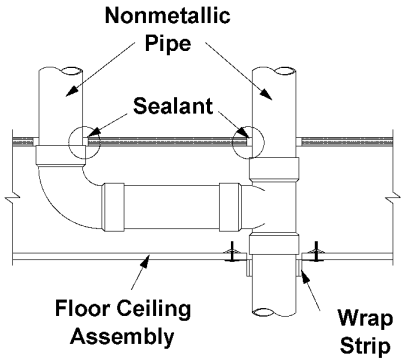
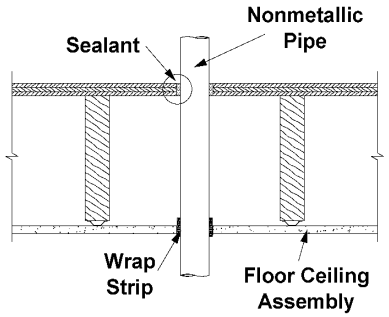


Fig 10



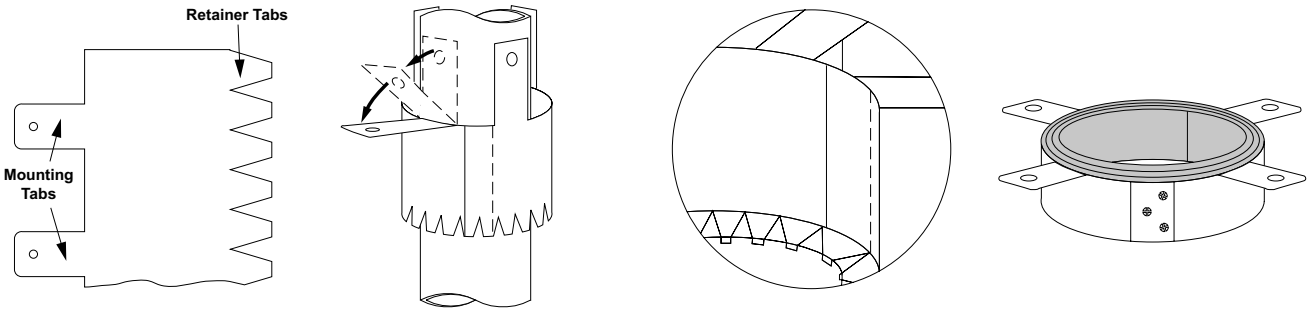
7. MAINTENANCE

INSPECTION: Installations should be inspected periodically for subsequent damage. Any damage should be repaired using SpecSeal® products per the original approved design.

RETROFIT: When adding or removing penetrants, care should be taken to minimize damage to the seal. Reseal using SpecSeal® products per the approved design.

NOTE: New penetrants of a different nature than the original design may require a totally new firestop design or extensive modifications to the existing design. Reseal all openings as per the requirements of the new design.

Fig 11: USE OF RESTRAINING COLLAR



1.Measure and cut collar to length.

2. Secure to pipe and bend mounting tabs.

3. Bend retainer tabs*.

4. Finished collar.

* NOTE: Retainer tabs shall be sufficient length to contain all wrap strip layers. At the option of the installer, retainer tabs may be either cut or bent flush against pipe as shown.

Fig 12

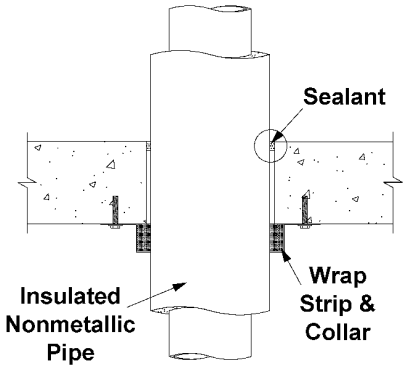


Fig 13

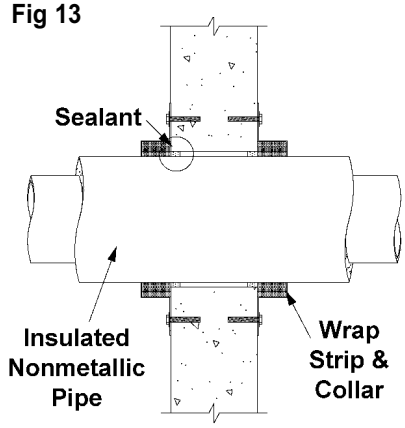
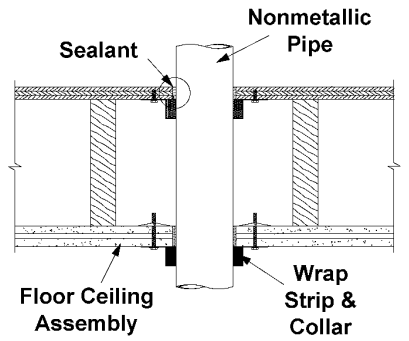


Fig 14



8. TECHNICAL SERVICE

Specified Technologies Inc. provides toll free technical support to assist in product selection and appropriate installation design. Design System Drawings suitable for submittal or specification purposes are available on request.

9. PRECAUTIONARY INFORMATION

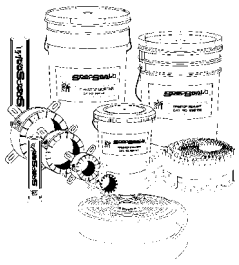
Consult Material Safety Data Sheet for additional information on the safe handling and disposal of this material. Wash areas of skin contact with soap and water. Avoid contact with eyes.

10. AVAILABILITY

SpecSeal® Red Wrap Strips (Cat No. SSWRED) are available as a roll 1-1/2" x 12' packed one per box. SpecSeal® products are available from authorized STI distributors nationwide. Consult factory for the names and locations of the nearest sales representatives or distributors. Available packages and additional SpecSeal® Products are listed in Table C.

Table C: ORDERING INFORMATION

Cat. No.	Name	Description
SSWRED	Wrap Strip	12' x 1-1/2" x 1/4" Intumescent Strip
SSWRC2	1-1/2" Restr. Collar	30 gauge sheet metal for ≤ 4" pipes (25' roll)
WSCRED	3" Restr. Collar	22 gauge sheet metal for 6" pipes (36" length)



Additional SpecSeal Products...

Series SSS Sealant	The industry's most versatile sealant provides the firestoppping solutions for a wide range of combustible and noncombustible applications. Water-based intumescent sealant expands up to 8x!
Series LC Sealant	An economical latex firestop sealant for noncombustible applications. Non-halogenated, easy clean up, flexible, water-resistant!
SSP Firestop Putty	Available both in bar form and in pads, putty provides easy retrofit for through-penetrations and economical protection for electrical boxes.
SSB Firestop Pillows	Durable, monolithic pillows for installations requiring quick and easy retrofitting. Systems designed for pipes, cables and cable tray in all types of construction!
Firestop Mortar	Lightweight, versatile and economical! The best choice for large or complex installations.
Pensil® Silicones	Sealants and foam for through-penetrations and construction joints. Unexcelled aging characteristics and flexibility.
Elastomeric Joint Seals	New economical products for sealing construction joints. Choose caulk or spray applied products tested to UL2079.

CITY OF NEW YORK MEA 130-96M

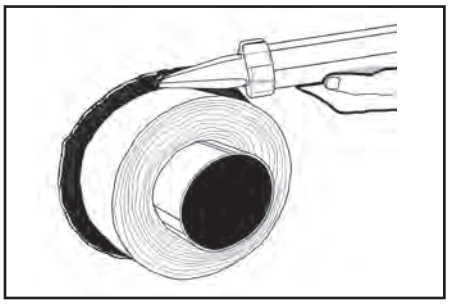
Specified Technologies STI Inc.
200 Evans Way • Somerville, NJ 08876
Phone: (800) 992-1180 • Fax: (908) 526-9623
Facts-On-Demand: (888) 526-6800
STI on the WEB: www.stifirestop.com

SERIES SSS INTUMESCENT SEALANT

APPLICATIONS

SpecSeal® Series SSS Sealant is used to seal through-penetrations as well as construction gaps and blank openings. SpecSeal Series SSS has been tested for use with metallic penetrants up to 30" (762 mm) trade size. This product is also used with other SpecSeal® Products such as SpecSeal® Firestop Collars and Wrap Strips.

See Table A for a summary application list.



PRODUCT DESCRIPTION

SpecSeal® Series SSS Sealant is a latex based, high solids firestop compound. This material, when properly installed, will effectively seal penetration openings against the spread of fire, smoke, toxic gasses and water.

SpecSeal® Series SSS Sealant features STI's patented and proprietary two-stage intumescent technology. When exposed to high temperatures or fire, this material expands aggressively in a highly directionalized fashion to quickly close off voids left by the burning or melting of combustible materials.

SpecSeal® Series SSS Sealant's unique multi-viscosity formula yields a single grade that has excellent caulking properties as well as high build properties on vertical or overhead surfaces. This single grade may be pumped, caulked (standard cartridge or bulk loaded), knifed or troweled. In addition, SpecSeal Series SSS Sealant does not contain PCB's or asbestos.

SpecSeal® Series SSS Sealant is storage stable (when stored according to the manufacturer's recommendations) and will not separate nor shrink when dried. SpecSeal Series SSS Sealant will adhere to all common construction and penetrant materials and contains no solvents that might adversely effect plastic pipes or cable jackets.

FEATURE	BENEFIT
• **Water-Based**	Easy installation, cleanup, and disposal.
• **Two-Stage Intumescence**	Extremely fast and directionalized expansion.
• **Endothermic Fillers**	Absorb heat & release water.
• **High Solids Formula**	No shrinkage!
• **Sandable & Paintable**	(when dry)
• **Water-Resistant**	Will not re-emulsify when dry!
• **Safe**	Safe for contact with plastics.
• **Red Color**	Easy identification and inspection.
• **Multi Viscosity Grade**	Excellent caulking properties along with high build capabilities.
• **Excellent Smoke Seal**	

PERFORMANCE

SpecSeal® Series SSS Sealant is the basis for systems that meet the exacting criteria of ASTM E814 (UL1479) as well as the time-temperature requirements of ASTM E119 (UL263). Systems have been tested for all common forms of construction and most common penetrants with ratings up to 4 hours. STI firestop systems are designed to maximize the fire resistance of the seal by not only sealing off the spread of fire and hot gasses but also by minimizing the amount of heat conducted through the assembly. Thus all systems have been designed to provide T Ratings capable of matching the rating of the wall or floor assembly (where possible) when tested without penetrants.

CLASSIFIED C UL US

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

3L73

FM APPROVED

PHYSICAL PROPERTIES

Properties	Series SSS
Color	Red
Odor	Mild Latex
Density	9.4 lb/gal (1.13 kg/L)
Solids Content	80% ± 2%
pH	8.3
In Service Temperature	-10°F (-23°C) - 185°F (85°C)
Storage Temperature	40°F (4°C) - 95°F (35°C)
Flame Spread	0*
Smoke Developed*	10*

Properties	Series SSS
STC Rating (ASTM E90/ASTM C919)	62
VOC Content (EPA Method 24/ASTM D3960)	0.18 lbs/gal (22.0 g/L)
Shelf Life	2 yrs
Expansion Begins	230°F (110°C) 1st Stage 350°F (177°C) 2nd Stage
Expansion Range	230°F to > 1,000°F (110°C to > 538°C)
Volume Expansion	> 500% Free Expansion

* Tested to ASTM E84 (UL723) at 14% surface coverage (modified test for sealants and caulks)

Table A:
APPLICATIONS

TESTED AND CLASSIFIED FOR FIRE RESISTANCE

- **Metallic Pipes** including steel, iron, or copper pipe and tubing through all common constructions.
- **Nonmetallic Pipes, Conduits &Tubing** including PVC, CPVC, PVDF, PEX, PEX-AL-PEX, ABS, PB through all common constructions.
- **Cable, Cable Trays & Bus Duct**
- **HVAC Ductwork**
- **Insulated Pipes**
- **Multi-Service Penetrations** including AC line sets, electrical, telephone, or TV service entrance and interior penetrations.
- **Complete Wood Floor firestopping package** for electrical, plumbing, HVAC, TV and telephone.

SPECIFICATIONS

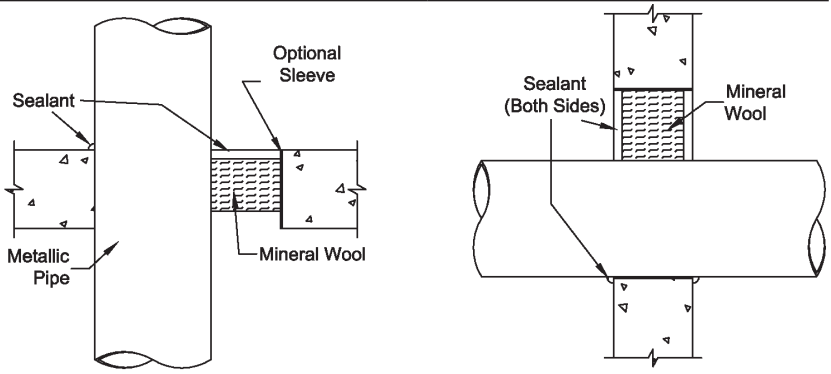
The firestopping sealant shall be a one-part, two-stage intumescent latex compound. The sealant when exposed to high heat or flame shall be capable of expanding a minimum of 8 times. Range of continuing expansion shall be from 230°F to >1,000°F (110°C to > 538°C). The sealant shall be thixotropic and shall be capable of caulking or troweling onto vertical surfaces or overhead. The sealant shall be UL Classified and/or FM Systems Approved and tested to the requirements of ASTM E814 (UL1479).

SPECIFIED DIVISIONS

DIV.	7	07840	Through-Penetration Firestopping
DIV.	13	13900	Special Construction Fire Suppression & Supervisory Systems
DIV.	15	15250	Mechanical Insulation – Fire Protection
DIV.	16	16050	Basic Electrical Materials & Methods

Shown below and on the following page are just a few of the most common applications for SpecSeal Series SSS Sealant. Consult the Technical Library at www.stifirestop.com for over 200 available designs utilizing this product.

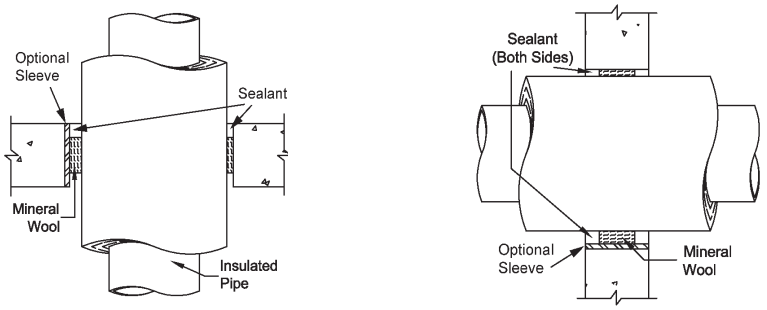
Fig. 1: METALLIC PIPE PENETRATIONS - CONCRETE/MASONRY FLOORS & WALLS



UL SYSTEM C-AJ-1079
F Rating: 4 Hr • T Rating: 0
Steel or Iron Pipe: 24", Copper Pipe 6"
Annulus: Point Contact to 4" • S alant Depth: 1/2" Forming Material: Nom 4 pcf Mineral Wool
Thickness: 1-1/2" for 6" Steel or Iron Pipe
3" for 4" Copper or 6" Iron or Steel Pipe

UL SYSTEM C-AJ-1217
F Rating: 4 Hr • T Rating: 0
Steel or Iron Pipe: 30", Copper Pipe 6"
Annulus: Point Contact to 2" • S alant Depth: 1/2"
Forming Material: Nom 4 pcf Mineral Wool
Tightly Packed to a 3" Depth.

Fig. 2: INSULATED METALLIC PIPE PENETRATIONS - CONCRETE/MASONRY FLOORS & WALLS



UL SYSTEM C-AJ-5087
F Rating: 2 Hr • T Rating: 1
Steel or Iron Pipe: 24"
Insulated with 2" Thick Fiber Glass or Mineral Wool Pipe Insulation
Annulus: 1/2" to 1-1/2" • Sealant Depth: 1/2"
Forming Material: Nom 4 pcf Mineral Wool Tightly Packed to a 4" Depth.

SEALANT REQUIREMENTS IN CUBIC INCHES PER 1/4 INCH OF INSTALLED DEPTH*

Pipe Size		Diameter of Opening (in.)											
		1.5	2.0	3.0	4.0	5.0	6.0	7.0	8.0	10	12	14	26
Trade Size	Pipe O.D.												
0.5"	0.840	0.3	0.6	1.6	3.0	4.8	6.9	9.5	12.4	19.5	28.1	38.3	132.6
1"	1.315	0.1	0.4	1.4	2.8	4.6	6.7	9.3	12.2	19.3	27.9	38.1	132.4
1.5"	1.900			1.1	2.4	4.2	6.4	8.9	11.9	18.9	27.6	37.8	132.0
2"	2.375			0.7	2.0	3.8	6.0	8.5	11.5	18.5	27.2	37.4	131.6
2.5"	2.875			0.1	1.5	3.3	5.4	8.0	10.9	18.0	26.7	36.9	131.1
3"	3.500				0.7	2.5	4.7	7.2	10.2	17.2	25.9	36.1	130.3
3.5"	4.000					1.8	3.9	6.5	9.4	16.5	25.1	35.3	129.6
4"	4.500					0.8	3.0	5.6	8.5	15.6	24.2	34.4	128.7
6"	6.625							1.1	4.0	11.1	19.7	29.9	124.2
8"	8.625									4.9	13.6	23.8	118.0
10"	10.750										5.6	15.8	110.0
12"	12.750											6.6	100.8
24"	24.000												19.6

*Different Sealant Depth?

1/2"	Multiply by 2
5/8"	Multiply by 2.5
1"	Multiply by 4
1-1/4"	Multiply by 5

IMPORTANT NOTE: This table is for estimation purposes only. Consult UL Fire Resistance Directory or STI Product & Application Guide for specific installation requirements and limitations
Metric Estimation Table available upon request.

INSTALLATION INSTRUCTIONS

General: Areas to be protected must be clean and free of oil, loose dirt, rust or scale. Installation temperatures must be between 35°F and 100°F (2°C and 38°C). Allow product to dry a minimum of 24 hours before exposure to moisture.

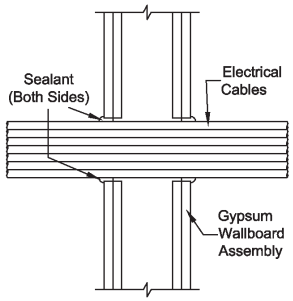
System Selection: Selection of an appropriate firestop system design is critical to the fire protection process. Space limitations preclude highly detailed information pertaining to individual application systems. Please consult the STI Product & Application Guide as well as the UL® Fire Resistance Directory for additional information.

Forming: Some installations may require forming as either an integral part of the system or as an option to facilitate installation. In systems where forming is required, mineral wool batts (min. nom. 4 lb/cu. ft (64 kg/m^3) density) are recommended. Some gypsum wallboard systems utilize fiberglass. Cut forming material over-size to allow for tight packing. Position forming material to allow for the proper depth of fill material.

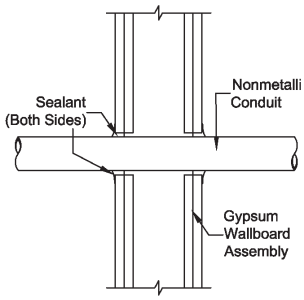
Fill Material: SpecSeal® Series SSS Sealant may be installed by caulking using a standard caulking gun or from bulk containers using a bulk loading caulk gun, or by manually troweling using a mason's trowel or putty knife. If the sealant tends to pull back from a surface, clean the surface with a damp rag or sponge and reapply. Work sealant into all areas exercising care to eliminate voids or seams. The surface of the sealant can be smoothed using a putty knife dipped in water. Adding water to the sealant itself is not recommended. Sealant (when dry) may be sanded and painted using most non-solvent based paints. In gypsum wallboard penetrations, crown sealant 1/4" (6 mm) from penetrant to wallboard surface at a point approximately 1/2" (13 mm) or more from opening. Sealant (ehen dry) may be painted using most non-solvent based paints,

Smoke Sealing: In some applications including firestop collars, SpecSeal® Series SSS Sealant is recommended as a smoke seal. It is suggested in these application that the sealant be applied to both sides of walls. In floor applications, a sealing bead is suggested top and bottom.

Fig. 3: ELECTRICAL, DATA OR COMMUNICATIONS PENETRATIONS - RATED GYPSUM WALLBOARD ASSEMBLIES

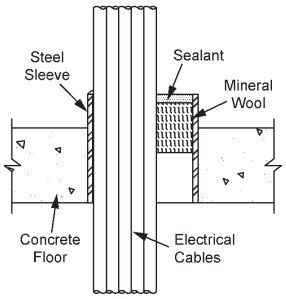


UL SYSTEM W-L-3076
F Rating: 1 or 2 Hr • T Rating: 0 hr
Up to 4" Cable Bundle
Centered in 4 - 1/2" Opening
Sealant Depth: 5/8" with 1/4" Crown

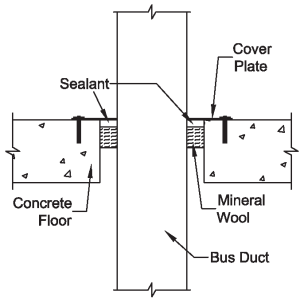


UL SYSTEM W-L-2093
F Rating: 1 or 2 Hr • T Rating: 1, 1-1/2 Hr
2" Rigid PVC, ENMT,
or Optical Fiber Raceway.
1-1/4" PVDF Optical Fiber Raceway.
Sealant Depth: 5/8" with 1/4" Crown

Fig. 4: ELECTRICAL PENETRATIONS - CONCRETE/MASONRY FLOORS & WALLS

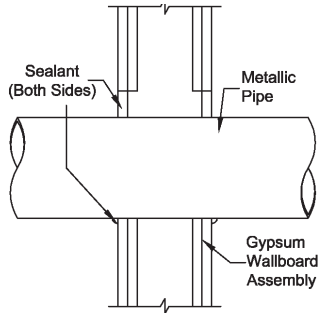


UL SYSTEM C-AJ-3154
F Rating: 1, 2, 3 & 4 Hr • T Rating: 0, 1/2, & 2 3/4 Hr
Optional Sleeve-PVC or Steel
Electrical, Telephone or Data Cables
Annulus: 0" to 2"
Sealant Depth: 1/2"
Forming Materials: Nom 4 pcf Mineral Wool
Sealant Depth: 1/2" for 1, 2, 3 Hr; 1" for 4 Hr

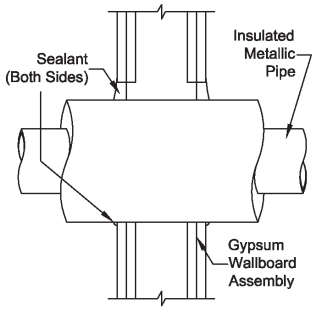


UL SYSTEM C-AJ-6008
F Rating: 3 Hr • T Rating: 0 Hr
Aluminum or Copper Bus Duct 5,000 Amp
Steel Cover Plate
Sealant Depth: 1/2"
Forming Materials: Nom 4 pcf Mineral Wool
Tightly Packed to a depth of 1-1/2"

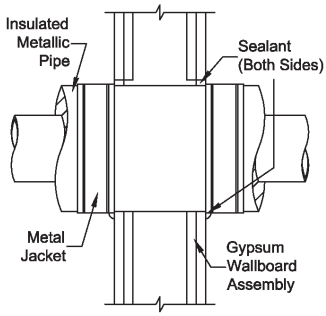
Fig. 5: BARE & INSULATED METALLIC PIPE PENETRATIONS - RATED GYPSUM WALLBOARD ASSEMBLIES



UL SYSTEM W-L-1049
F Rating: 2 hr • T Rating: 0 hr
Steel or Iron Pipe: 24", Copper Pipe: 6"
Annulus: Point Contact to 2"
Sealant Depth: 5/8" with 3/8" Crown



UL SYSTEM W-L-5014
F Rating: 1 & 2 Hr • T Rating: 1 & 2 hr
Steel or Iron Pipe: 12", Copper Pipe: 4"
Insulated with 2" Thick Fiber Glass
or Mineral Wool Pipe Insulation
Annulus: 0" to 1-1/4"
Sealant Depth: 5/8" with 3/8" Crown



UL SYSTEM W-L-5051
F Rating: 1 & 2 Hr • T Rating: 3/4, 1, 1-1/2 & 2 Hr
Steel or Iron Pipe: 16", Copper Pipe: 6"
Foam Glass Pipe Insulation: 1" to 3" Thick
12" Wide 0.010" Thick Metal Jacket Wrapped Around Insulation and
Secured with Metal Banding as Shown Annulus: 0" to 1-1/2"
Sealant Depth: 5/8"

INSTALLATION INSTRUCTIONS

LIMITATIONS: SpecSeal® Series SSS Sealant is water-based and cures through the evaporation of water. Low temperatures as well as high humidity may retard drying. Non-porous or impermeable backing materials, plates, or coatings may retard the drying process. Do not paint or seal in any way that prevents contact with air until sealant has dried through completely. This product has been designed to be safe with plastics and has been used extensively and successfully with a variety of different types of plastic pipes, tubes, and plastic cable insulations. Variations in these materials however, make it impossible to guarantee compatibility. STI strongly recommends that the user consult with the manufacturer of the pipe, tubing, or cable in question regarding any known sensitivities or potential restrictions before applying this product.

MAINTENANCE

Inspection: Installations should be inspected periodically for subsequent damage. Any damage should be repaired using SpecSeal® products per the original approved design.

Retrofit: When adding or removing penetrants, care should be taken to minimize damage to the seal. Reseal using SpecSeal® products per the approved design. NOTE: New penetrants of a different nature than the original design may require a totally new firestop design or extensive modifications to the existing design. Reseal all openings as per the requirements of the modified design.

TECHNICAL SERVICE

Specified Technologies Inc. provides toll free technical support to assist in product selection and appropriate installation design. UL Systems, Material Safety Data Sheets and other technical information is available through the Technical Library at www.stifirestop.com.

PRECAUTIONARY INFORMATION

Consult Material Safety Data Sheet for additional information on the safe handling and disposal of this material. Wash areas of skin contact with soap and water. Avoid contact with eyes. SEALANT IS CONDUCTIVE UNTIL DRY.

AVAILABILITY

SpecSeal® Series SSS Sealant is available from authorized STI distributors. Consult factory or website for the names and locations of the nearest sales representatives or distributors.

CATALOG NUMBER	DESCRIPTION
SSS100	10.1 oz. Tube (300 ml) 18.2 cu.in.
SSS129	29 oz. Tube (858 ml) 52 cu. in.
SSS120	20 oz. Sausage (592 ml) 36 cu. in.
SSS102	2 Gal. Pail (7.6 liters) 462 cu.in.
SSS105	5 Gal. Pail (19.0 liters) 1,155 cu.in.

CITY OF NEW YORK MEA 28-92-M

Specified Technologies Inc.

Specified Technologies Inc. • 210 Evans Way, Somerville, NJ 08876 USA • Phone: 800.992.1180 • Fax: 908.526.9623

Material Safety Data Sheet

22-JULY-2013

SpecSeal® SERIES LCI SEALANT

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

PRODUCT NAME.....SpecSeal® LCI Sealant

CHEMICAL FAMILY.....Mixture

Company Identification

MANUFACTURER/DISTRIBUTOR

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

PHONE NUMBERS

Product Information : 1-908-526-8000
Emergency : 1-800-255-3924

HAZARDS IDENTIFICATION

**********EMERGENCY OVERVIEW**********
* Possible skin and eye irritant. Paste. *
****

Potential Health Effects:

EYE: Contact may cause irritation.

SKIN: Contact may cause irritation.

INGESTION: Relatively non-toxic.

INHALATION: Irritation of the nose, throat, and lungs may result from over-exposure to vapors or mist.

CHRONIC (CANCER) INFORMATION: Not classified as carcinogenic.

LONG TERM TOXIC EFFECTS: None known.

COMPOSITION/INFORMATION ON INGREDIENTS

Proprietary mixture containing in part:

INGREDIENT NAME	CAS NUMBER
ACRYLIC POLYMER	67967-61-7
ALUMINA TRIHYDRATE	21645-51-2
SULPHURIC ACID, COMPOUND WITH GRAPHITE	12777-87-6
CALCIUM CARBONATE	1317-65-3

FIRST AID MEASURES

First Aid

INHALATION: Remove to fresh air.
SKIN CONTACT: Wash thoroughly.
EYE CONTACT: Irrigate eyes with running water for at least 15 minutes. Get medical attention if irritation develops.
INGESTION: None applicable.

FIRE FIGHTING MEASURES

Not a fire hazard.

EXTINGUISHING MEDIA.....Dry Chemical; Carbon Dioxide; Foam; Water spray for large fires.

SPECIAL FIRE FIGHTING PROCEDURES:.....As for surrounding fire.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)
NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up

HANDLING AND STORAGE

Store under ambient conditions. No special handling required.

EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION REQUIREMENTS:.....Safety glasses/goggles.
SKIN PROTECTION REQUIREMENTS: .....Gloves.
RESPIRATOR REQUIREMENTS: .....None.
VENTILATION REQUIREMENTS:.....If needed, use local exhaust ventilation to keep airborne concentrations below the TLV.

Exposure Guidelines
Exposure Limits
PEL(OSHA) : Particulates (Not Otherwise Classified) 15 mg/m3, 8 Hr. TWA, total dust 5 mg/m3, 8 Hr. TWA, respirable dust
TLV(ACGIH): None Established

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL FORM ..... Paste with minimal odor
SPECIFIC GRAVITY 1.38
PERCENT VOLATILES 22
EVAPORATION RATE..... >1
BOILING POINT ..... 100 deg. C
SOLUBILITY IN WATER..... Infinitely dilutable
CARB VOC (Calculated)…… 0.42 Wt. %
SCAQMD VOC (US EPA Method 24)…….32.7 Grams/Liter

STABILITY AND REACTIVITY

STABILITY: ..... This is a stable material.
CONDITIONS TO AVOID ..... Storage >55 deg. C
HAZARDOUS POLYMERIZATION:..... Will not occur.
INCOMPATIBILITIES:…….....None special.

TOXICOLOGICAL INFORMATION

Mixture not tested but based on components:
May be irritating to skin and eyes and may aggravate existing skin and eye conditions.
None of the components are listed as carcinogens.

ECOLOGICAL INFORMATION

No data.

DISPOSAL CONSIDERATIONS

Waste Disposal:
Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

TRANSPORTATION INFORMATION

DOT – not regulated.

REGULATORY INFORMATION

U.S. Federal Regulations
TSCA Inventory Status: Reported/Included.
Section 313 Supplier Notifications.
This product contains no toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

OTHER INFORMATION

NPCA-HMIS Rating
Health : 1
Flammability : 0
Reactivity : 0
Personal Protection rating to be supplied by user depending on use conditions.

STATE RIGHT-TO-KNOW LAWS

No substances on the state hazardous substances list, for the states indicated below, are used in the manufacture of products on this Material Safety Data Sheet, with the exceptions indicated. While we do not specifically analyze these products, or the raw materials used in their manufacture, for substances on various state hazardous substances lists, to the best of our knowledge the products on this Material Safety Data Sheet contain no such substances except for those specifically listed below:

SUBSTANCES ON THE NEW JERSEY WORKPLACE HAZARDOUS SUBSTANCE LIST PRESENT AT A CONCENTRATION OF 1% OR MORE (0.1% FOR SUBSTANCES IDENTIFIED AS CARCINOGENS, MUTAGENS OR TERATOGENS): Graphite, Alumina,

WARNING: SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER:
None known.

WARNING: SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM: None known.

This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief accurate and reliable as of the data compiled. However, no representation, warranty, or guarantee is made as to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. We do not accept liability for any loss or damage that may occur form the use of this information.

Responsibility for MSDS :

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

Material Safety Data Sheet

20-JUNE-2012

SpecSeal® RED WRAP STRIP

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

PRODUCT NAME.....SpecSeal® RED Wrap Strip
CHEMICAL FAMILY.....Does not apply

Company Identification

MANUFACTURER/DISTRIBUTOR

Specified Technologies Inc.
210 Evans Way
Somerville, NJ 08876

PHONE NUMBERS

Product Information : 1-908-526-8000
Emergency : 1-800-255-3924

COMPOSITION/INFORMATION ON INGREDIENTS

Non-hazardous, flexible rubber strip.

HAZARDS IDENTIFICATION

**********EMERGENCY OVERVIEW******
* Non-hazardous. Flexible rubber strip *
****

Potential Health Effects:

EYE: Physical contact may cause irritation.

SKIN: Contact should not cause problems.

INGESTION: Not likely.

INHALATION: No hazard.

CHRONIC (CANCER) INFORMATION: None known.

LONG TERM TOXIC EFFECTS: None known.

FIRST AID MEASURES

First Aid

INHALATION: None applicable.
SKIN CONTACT: None applicable.
EYE CONTACT: Irrigate eyes with running water for at least 15 minutes. Get medical attention if irritation develops.
INGESTION: None applicable.

FIRE FIGHTING MEASURES

Flash point: Not established.

EXTINGUISHING MEDIA..... Dry Chemical; Carbon Dioxide; Foam; Water spray for large fires.

SPECIAL FIRE FIGHTING PROCEDURES:..... As for surrounding fire.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)
NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

HANDLING AND STORAGE

Store under ambient conditions. No special handling required.

EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION REQUIREMENTS:..... Safety glasses/goggles.
SKIN PROTECTION REQUIREMENTS: ..... None.
RESPIRATOR REQUIREMENTS: ..... None.
VENTILATION REQUIREMENTS:..... If needed, use local exhaust ventilation to keep airborne concentrations below the TLV.

Exposure Guidelines
Exposure Limits
None.

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL FORM ..... Red flexible solid rubber strip
SPECIFIC GRAVITY 1.38
PERCENT VOLATILES 0
SOLUBILITY IN WATER..... Insoluble

STABILITY AND REACTIVITY

STABILITY: ..... This is a stable material.
CONDITIONS TO AVOID ..... None.
HAZARDOUS POLYMERIZATION:..... Will not occur.
INCOMPATIBILITIES:…….....None special.

TOXICOLOGICAL INFORMATION

Mixture not tested but based on components:

Particles may cause physical irritation to eyes.

Contains no carcinogens as specified by IARC, ACGIH and NTP or OSHA.

ECOLOGICAL INFORMATION

No data but not expected to be environmental hazard.

DISPOSAL CONSIDERATIONS

Waste Disposal:
Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

TRANSPORTATION INFORMATION

DOT – not regulated.

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status: Article.

Section 313 Supplier Notifications.
This product contains no toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

OTHER INFORMATION

NPCA-HMIS Rating
Health : 0
Flammability : 1
Reactivity : 0
Personal Protection rating to be supplied by user depending on use conditions.

STATE RIGHT-TO-KNOW LAWS

No substances on the state hazardous substances list, for the states indicated below, are used in the manufacture of products on this Material Safety Data Sheet, with the exceptions indicated. While we do not specifically analyze these products, or the raw materials used in their manufacture, for substances on various state hazardous substances lists, to the best of our knowledge the products on this Material Safety Data Sheet contain no such substances except for those specifically listed below:

SUBSTANCES ON THE NEW JERSEY WORKPLACE HAZARDOUS SUBSTANCE LIST PRESENT AT A CONCENTRATION OF 1% OR MORE (0.1% FOR SUBSTANCES IDENTIFIED AS CARCINOGENS, MUTAGENS OR TERATOGENS): NJTSRN-SSWRED.

WARNING: SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER: None known.

WARNING: SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM: None known.

This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief accurate and reliable as of the data compiled. However, no representation, warranty, or guarantee is made as to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. We do not accept liability for any loss or damage that may occur form the use of this information.

Responsibility for MSDS :

Specified Technologies Inc.
210 Evans Way
Somerville, NJ 08876

Material Safety Data Sheet

22-JULY-2013

SpecSeal® SERIES SSS SEALANT

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

PRODUCT NAME.....SpecSeal® SERIES SSS Sealant

CHEMICAL FAMILY.....Mixture

Company Identification

MANUFACTURER/DISTRIBUTOR

Specified Technologies Inc.
210 Evans Way
Somerville, NJ 08876

PHONE NUMBERS

Product Information : 1-908-526-8000
Emergency : 1-800-255-3924

HAZARDS IDENTIFICATION

**********EMERGENCY OVERVIEW**********
* Possible skin and eye irritant. Paste. *
****

Potential Health Effects:

EYE: Contact may cause irritation.

SKIN: Contact may cause irritation.

INGESTION: Relatively non-toxic.

INHALATION: Irritation of the nose, throat, and lungs may result from over-exposure to vapors or mist.

CHRONIC (CANCER) INFORMATION: Not classified as carcinogenic.

LONG TERM TOXIC EFFECTS: None known.

COMPOSITION/INFORMATION ON INGREDIENTS

Proprietary mixture containing in part:

INGREDIENT NAME	CAS NUMBER
ACRYLIC POLYMER	67967-61-7
ALUMINA TRIHYDRATE	21645-51-2
SULPHURIC ACID, COMPOUND WITH GRAPHITE	12777-87-6
CALCIUM CARBONATE	1317-65-3

FIRST AID MEASURES

First Aid

INHALATION: Remove to fresh air.
SKIN CONTACT: Wash thoroughly.
EYE CONTACT: Irrigate eyes with running water for at least 15 minutes. Get medical attention if irritation develops.
INGESTION: None applicable.

FIRE FIGHTING MEASURES

Not a fire hazard.

EXTINGUISHING MEDIA.....Dry Chemical; Carbon Dioxide; Foam; Water spray for large fires.

SPECIAL FIRE FIGHTING PROCEDURES:.....As for surrounding fire.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)
NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up

HANDLING AND STORAGE

Store under ambient conditions. No special handling required.

EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION REQUIREMENTS:.....Safety glasses/goggles.
SKIN PROTECTION REQUIREMENTS: .....Gloves.
RESPIRATOR REQUIREMENTS: .....None.
VENTILATION REQUIREMENTS:.....If needed, use local exhaust ventilation to keep airborne concentrations below the TLV.

Exposure Guidelines
Exposure Limits
PEL(OSHA) : Particulates (Not Otherwise Classified) 15 mg/m3, 8 Hr. TWA, total dust 5 mg/m3, 8 Hr. TWA, respirable dust
TLV(ACGIH): None Established

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL FORM ..... Red paste with minimal odor
SPECIFIC GRAVITY 1.24
PERCENT VOLATILES 20
EVAPORATION RATE..... >1
BOILING POINT ..... 100 deg. C
SOLUBILITY IN WATER..... Infinitely dilutable
CARB VOC (Calculated)…… 0.40 Wt. %
SCAQMD VOC (US EPA Method 24)……29.2 Grams/Liter

STABILITY AND REACTIVITY

STABILITY: ..... This is a stable material.
CONDITIONS TO AVOID ..... Storage >55 deg. C
HAZARDOUS POLYMERIZATION:..... Will not occur.
INCOMPATIBILITIES:…….....None special.

TOXICOLOGICAL INFORMATION

Mixture not tested but based on components:
May be irritating to skin and eyes and may aggravate existing skin and eye conditions.
None of the components are listed as carcinogens.

ECOLOGICAL INFORMATION

No data.

DISPOSAL CONSIDERATIONS

Waste Disposal:
Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

TRANSPORTATION INFORMATION

DOT – not regulated.

REGULATORY INFORMATION

U.S. Federal Regulations
TSCA Inventory Status: Reported/Included.
Section 313 Supplier Notifications.
This product contains no toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

OTHER INFORMATION

NPCA-HMIS Rating
Health : 1
Flammability : 0
Reactivity : 0
Personal Protection rating to be supplied by user depending on use conditions.

STATE RIGHT-TO-KNOW LAWS

No substances on the state hazardous substances list, for the states indicated below, are used in the manufacture of products on this Material Safety Data Sheet, with the exceptions indicated. While we do not specifically analyze these products, or the raw materials used in their manufacture, for substances on various state hazardous substances lists, to the best of our knowledge the products on this Material Safety Data Sheet contain no such substances except for those specifically listed below:

SUBSTANCES ON THE NEW JERSEY WORKPLACE HAZARDOUS SUBSTANCE LIST PRESENT AT A CONCENTRATION OF 1% OR MORE (0.1% FOR SUBSTANCES IDENTIFIED AS CARCINOGENS, MUTAGENS OR TERATOGENS): NJTSRN-SSS100 Graphite, Alumina

WARNING: SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER:
None known.,

WARNING: SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM: None known.

This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief accurate and reliable as of the data compiled. However, no representation, warranty, or guarantee is made as to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. We do not accept liability for any loss or damage that may occur form the use of this information.

Responsibility for MSDS :

Specified Technologies Inc.
210 Evans Way
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