FIRESTOP SUBMITTAL PACKAGE

Head-of-Wall

PROJECT:

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SUBMITTED BY:

Specified Technologies Inc.

SpecSeal FIRESTOP PRODUCTS

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

www.stifirestop.com

Head-of-Wall

Gypsum Wallboard

SYSTEM	DESCRIPTION	PRODUCT(S)
HW-D-0034	Steel floor or roof deck. 1 or 2-hr.	ES Sealant
HW-D-0043	Steel floor or roof deck. Optional conduit penetration. 1, 2, 3 or 4-hr.	AS Spray
HW-D-0044	Flat concrete slab. 1, 2, 3 or 4-hr.	AS Spray
HW-D-0054	Steel floor or roof deck. Parallel condition. 1, 2, 3 or 4-hr.	AS Spray
HW-D-0079	Flat concrete slab. 1 or 2-hr. Caulk only.	ES Sealant
HW-D-0088	Fireproofed steel floor or roof deck. 1 or 2-hr.	AS Spray
HW-D-0099	Fireproofed steel floor deck with I-beam or bar joist. 1 or 2-hr.	AS Spray
HW-D-0102	Steel floor or roof deck. Flutes filled with fireproofing. 1, 2, 3 or 4-hr.	AS Spray
HW-D-0103	Steel floor/roof deck. Castle cut. Optional fireproofing. 1 or 2-hr. Caulk only.	ES Sealant
HW-D-0136	Steel floor or roof deck. Slip-Track Channel. 1 or 2-hr.	AS Spray
HW-D-0137	Steel floor or roof deck. Slip-Track Channel. Parallel condition. 1 or 2-hr.	AS Spray
HW-D-0152	Steel floor or roof deck. Flutes filled with fireproofing. 1, 2, 3 or 4-hr.	AS Spray
HW-D-0153	Fireproofed steel floor deck with I-beam or bar joist. 1 or 2-hr.	AS Spray
HW-D-0194	Shaft assembly to concrete floor. 2-hr. Caulk only.	ES Sealant
HW-D-0210	Steel floor or roof deck. Parallel condition. 1 or 2-hr. Caulk only.	ES Sealant
HW-D-0241	Steel floor/roof deck. Castle cut. 1 or 2-hr. Caulk only.	LCI Sealant
HW-D-0242	Flat concrete slab. 1 or 2-hr. Caulk only.	LCI Sealant
HW-D-0243	Steel floor or roof deck. Parallel condition. 1 or 2-hr. Caulk only.	LCI Sealant
HW-D-0252	Steel floor deck. Wall assembly to fireproofed beam. 1 or 2-hr.	AS Spray
HW-S-0043	Flat concrete slab. Allows point contact. 1 or 2-hr. Caulk only.	ES Sealant
HW-S-0044	Steel floor deck. Castle cut. Allows point contact. 1 or 2-hr. Caulk only.	ES Sealant

Concrete Walls

SYSTEM	DESCRIPTION	PRODUCT(S)
HW-D-0039	Steel floor or roof deck. 1 or 2-hr.	ES Sealant
HW-D-0041	Flat concrete slab. 1 or 2-hr. Caulk only.	ES Sealant
HW-D-0055	Steel floor or roof deck. Parallel condition. 1, 2, 3 or 4-hr.	AS Spray
HW-D-0086	Steel floor or roof deck. Optional conduit penetration. 1, 2, 3 or 4-hr.	AS Spray
HW-D-0139	Fireproofed steel floor or roof deck. 1 or 2-hr.	AS Spray
HW-D-0140	Fireproofed steel floor deck with I-beam or bar joist. 1 or 2-hr.	AS Spray
HW-D-0156	Flat concrete slab. 2-in. joint width. 1, 2 or 3-hr.	ES Sealant
HW-D-0236	Steel floor or roof deck. Parallel condition. 1 or 2-hr. Caulk only.	ES Sealant
HW-D-0244	Flat concrete slab. 2-hr. Caulk only.	LCI Sealant
HW-D-0245	Steel floor or roof deck. Parallel condition. 2-hr. Caulk only.	LCI Sealant
HW-D-0253	Steel floor deck. Wall assembly to fireproofed beam. 2 or 3-hr.	AS Spray
HW-D-1005	Flat concrete slab. 4-in. joint width. 1 or 2-hr.	AS Spray
HW-D-1006	Flat concrete slab. 4-in. joint width. 1, 2 or 3-hr.	ES Sealant
HW-D-1034	Flat concrete slab. 4-in. joint width. 1, 2 or 3-hr.	AS Spray

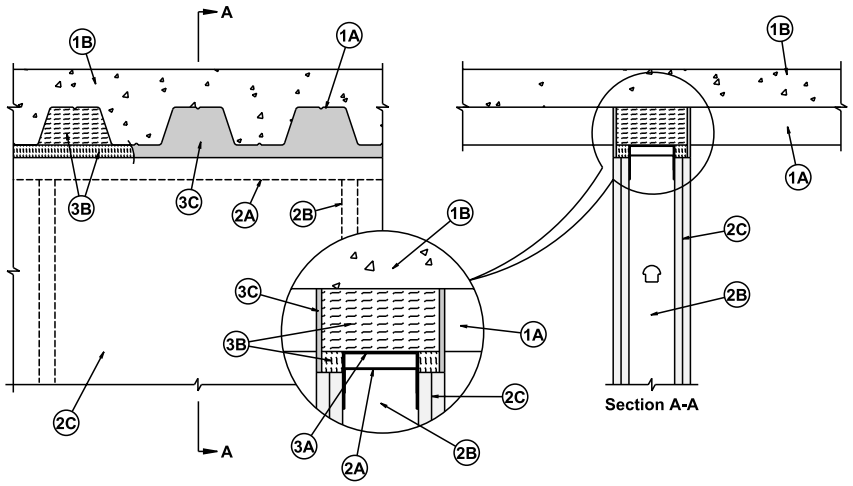
General Certificate of Conformance

Product Data Sheets

SpecSeal ES Elastomeric Sealant
SpecSeal AS200 Elastomeric Spray
SpecSeal LCI Intumescent Sealant

Material Safety Data Sheets

SpecSeal ES Elastomeric Sealant
SpecSeal AS200 Elastomeric Spray
SpecSeal LCI Intumescent Sealant



System No. HW-D-0034
November 01, 2001
Assembly Rating — 2 Hr
Nominal Joint Width — 1 In.
Class II Movement Capabilities — 25% Compression or Extension

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceilng Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Form Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 3 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.
   C. **Roof Covering*** — Hot mopped or cold-application materials compatible with insulating concrete.

2. **Wall Assembly** — The 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs. Ceiling runner to be provided with min 1-1/4 in. to max 2 in. flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 to 3/4 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, , ceiling runner to be provided with min. 1-1/2 in. flanges. Ceiling runner is secured to valleys of steel floor or roof deck with steel fasteners or welds spaced max 24 in. OC.
   B. **Studs** — Steel studs to be min 3-5/8 in wide. Studs cut 1/2 to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner with sheet metal screws located 1/2 in. below the bottom to the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. Stud spacing not to exceed 24 in. OC.
   C. **Gypsum Board*** — Gypsum board sheets installed to a min total 1-1/4 in. thickness on each side of wall. Wall to be constructed in the individual U400 Series Design in the UL Fire Resistance Directory, except that a nom 1 in. gap shall be maintained between the top of the wallboard and the bottom surface of the steel floor or roof deck. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel.

3. **Joint System** — **Max separation between bottom of floor or roof deck and top of wall (at time of installation of joint system) is 1 in. The joint system is designed to accommodate a max 25 percent compression or extension from its installed width.** The joint system shall consist of forming and fill materials, with or without a deflection channel (Item 3A), as follows:
   A. **Deflection Channel** — (Optional) — Max 2 in. deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection channel secured to valleys of steel floor or roof deck with steel fasteners or welds spaced max 24 in. OC. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1/2 to 3/4 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner nests inside the deflection channel without attachment.

(System No. HW-D-0034 Continued)

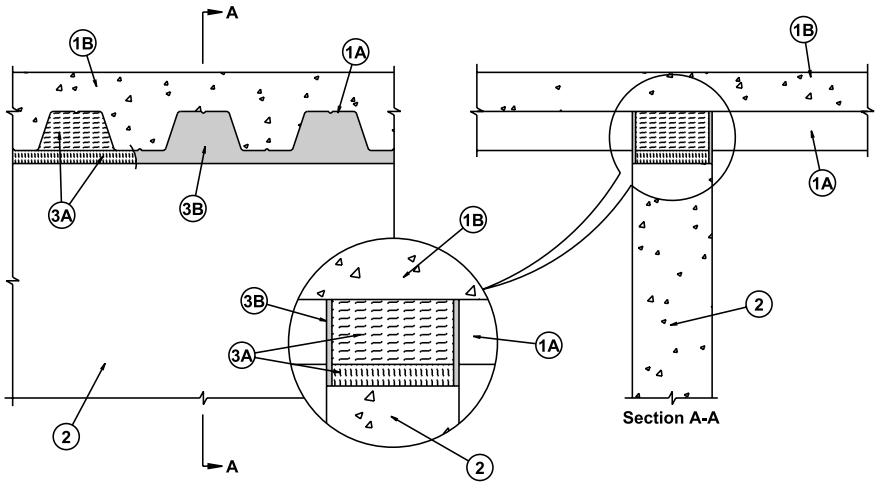
B. **Forming Material*** — Min 5-5/8 in. depth of 4 pcf mineral wool batt insulation cut to the shape of the fluted deck, approx 20 percent larger than the area of the flutes and compressed into the flutes of the steel floor or roof deck between the top of the deflection channel and the steel floor or roof deck. Additional 2 in. thick by 1 in. wide sections of mineral wool batt insulation are compressed 50 percent and installed cut edge first to fill the 1 in. gap between the top of the wall and bottom of the steel floor or roof deck. The forming material shall be recessed from each surface of wall to accommodate the required thickness of fill material.

FIBREX INSULATIONS INC — FBX Safing Insulation

B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/4 in. thickness of fill material installed on each side of the wall in the flutes of the steel floor or roof deck and between the top of the wall and the bottom of the steel floor or roof deck, flush with each surface of wall.

SPECIFIED TECHNOLOGIES INC — SpecSeal ES Sealant

*Bearing the UL Classification Mark



System No. HW-D-0039
September 25, 2001
Assembly Rating — 2 Hr
Nominal Joint Width — 1 In.
Class II Movement Capabilities — 25% Compression Or Extension

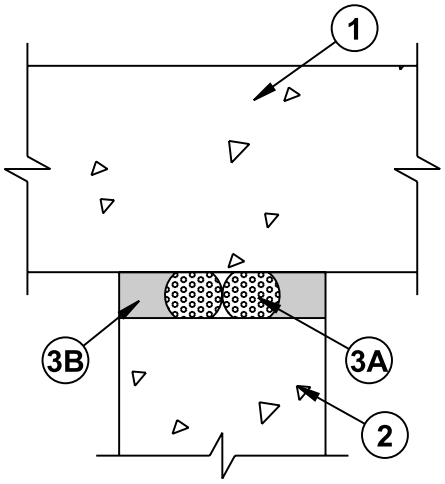
1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Form Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 3 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.
   C. **Roof Covering*** — Hot mopped or cold-application materials compatible with insulating concrete.

2. **Wall Assembly** — Min 8 in. thick reinforced light or normal weight (100-150) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.**
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

3. **Joint System** — **Max separation between bottom of floor or roof deck and top of wall (at time of installation of joint system) is 1 in. The joint system is designed to accommodate a max 25 percent compression or extension from its installed width.** The joint system shall consist of a forming material and fill material in the flutes of the steel floor or roof deck and between the top of the wall and bottom of the steel floor or roof deck as follows:
   A. **Forming Material*** — Min 7 in. width of 4 pcf mineral wool batt insulation firmly packed into the flutes of the steel floor or roof deck and between the top of the conrete wall and the bottom of the steel floor or roof deck and recessed from each surface of wall to accommodate the required thickness of fill material. Mineral wool batt insulation shall be packed into opening edge first with a min 50 percent compression.
      FIBREX INSULATIONS INC — FBX Safing Insulation
   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/4 in. thickness of fill material installed on each side of the concrete wall in the flutes of the steel floor or roof deck and between the top of the wall and the bottom of the steel floor or roof deck flush with each surface of concrete wall.
      SPECIFIED TECHNOLOGIES INC — SpecSeal ES Sealant

*Bearing the UL Classification Mark

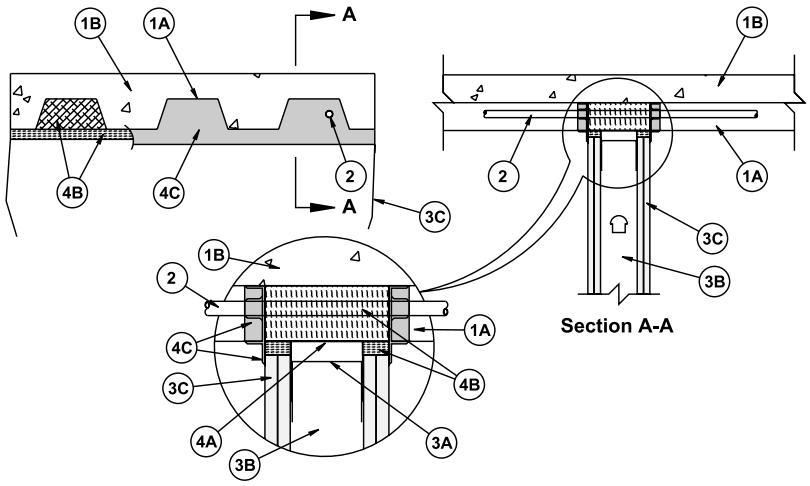


System No. HW-D-0041
September 25, 2001
Assembly Rating — 2 Hr
Nominal Joint Width — 1 In.
Class II Movement Capabilities — 12.5% Compression Or Extension

1. **Floor Assembly** — Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete.
2. **Wall Assembly** — Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.**
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
3. **Joint System** — **Max separation between bottom of floor and top of wall (at time of installation of joint system) is 1 in. The joint system is designed to accommodate a max 12.5 percent compression or extension, or max 25 percent in compression only, from its installed width.** The joint system shall consist of the following:
   A. **Packing Material** — Open or closed cell polyurethane foam backer rod used as a form to prevent the leakage of fill material. Packing material to be recessed from both surfaces of the wall as required to accommodate the required thickness of fill material.
   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1 in. thickness of fill material applied within the joint, flush with both surfaces of wall. When nom joint width is 3/4 in. or less and when dynamic movement of the joint opening is limited to a max of 25 percent in compression only, the thickness of fill material applied within the joint opening on each side of the wall may be reduced to 1/2 in.
      SPECIFIED TECHNOLOGIES INC — SpecSeal ES Sealant

*Bearing the UL Classification Mark

Created or Revised: 12/05/01
Specified Technologies, Inc., Somerville, NJ (800) 992-1180



System No. HW-D-0043

November 29, 2001

Assembly Ratings — 1, 2, 3 and 4 Hr (See Items 2 and 3)

Nominal Joint Widths — 1 and 2 In. (See Item 4)

Class II Movement Capabilities — 19% and 25% Compression and Extension (See Item 4)

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Form Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.
   C. **Roof Covering*** — Hot-mopped or cold-application materials compatible with insulating concrete.

2. **Through Penetrant** — (Optional) — Nom 3/8 in. or 1/2 in. diam rigid steel conduit, steel electrical metallic tubing (EMT) or Sch 40 PVC conduit may be installed parallel with and within the flutes of the steel floor or roof deck. The conduit or EMT shall be located near the middepth of the steel deck with a clearance of 1/2 to 1-1/2 in. between the conduit or EMT and the steel deck. A max of one conduit or EMT is permitted in an individual flute. **When conduit or EMT is installed in flute of steel deck, the hourly rating of the joint system is 1 hr.**

3. **Wall Assembly** — The 1, 2, 3 or 4 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs. Ceiling runner to be provided with min 1-1/4 in. to max 3 in. flanges. When deflection channel (Item 4A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 to 3/4 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, ceiling runner is secured to valleys of steel floor or roof deck with steel fasteners or welds spaced max 24 in. OC.
   A1. **Light Gauge Framing*** — **Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 3A, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 3B). Ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 4A) shall not be used.
      SLIPTRACK SYSTEMS INC — SLP-TRK
   A2. **Light Gauge Framing*** — **Vertical Deflection Ceiling Runner** — As an alternate to the ceiling runner in Items 3A and 3A1, vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips, provided with step bushings, for permanent fastening of steel studs. Vertical deflection ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 4A) shall not be used.
      THE STEEL NETWORK INC — VertiTrack VTD358, VTD400, VTD600 and VTD800

(System No. HW-D-0043 Continued)

B. **Studs** — Steel studs to be min 3-1/2 in wide. Studs cut 3/4 to 1 in. less in length than assembly height with bottom nesting in and secured to floor runner. When slotted ceiling runner (Item 3A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall. When deflection channel (Item 4A) is used, steel studs attached to ceiling runner with sheet metal screws located 1/2 in. below the bottom to the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. Stud spacing not to exceed 24 in. OC.

C. **Gypsum Board*** — Gypsum board sheets installed to a min total thickness of 5/8 in., 1-1/4 in., 1-1/2 in. or 2 in. on each side of wall for 1, 2, 3 and 4 hr fire rated assemblies, respectively. Wall to be constructed in the individual U400 Series Design in the UL Fire Resistance Directory, except that a max 1 or 2 in. gap (See Item 4) shall be maintained between the top of the gypsum board and the bottom surface of the steel floor or roof deck . The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel.

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

4. **Joint System** — **Max separation between bottom of floor or roof deck and top of gypsum board (at time of installation of joint system) is 2 in. for 1 and 2 hr ratings and 1 in. for 3 and 4 hr ratings. The joint system is designed to accommodate a max 25 percent compression or extension from its installed width for 1 and 2 hr ratings and a max 19 percent compression or extension from its installed width for 3 and 4 hr ratings.** The joint system shall consist of forming and fill materials, with or without a deflection channel (Item 4A), as follows:

A. **Deflection Channel** — (Optional) — Max 2 in. deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 3A). Deflection channel secured to valleys of steel floor or roof deck with steel fasteners or welds spaced max 24 in. OC. The ceiling runner is installed within the deflection channel to maintain a 1/2 to 3/4 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner nests inside the deflection channel without attachment.

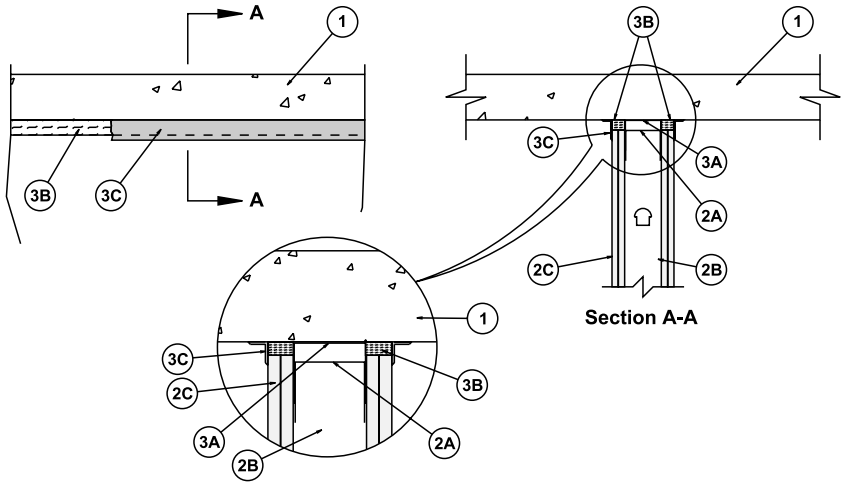
B. **Forming Material*** — Nom 4 pcf mineral wool batt cut to the shape of the steel deck flute and installed into the flutes above the ceiling channel. The mineral wool batt pieces are to be stacked to a thickness approx 1 in. greater than the overall thickness of the wall and compressed approx 14 percent in thickness such that it is flush with the gypsum board surface on both sides of the wall. Additional sections of mineral wool batt insulation are compressed 50 percent in thickness and installed cut edge first to completely fill the gap above the top of the gypsum board, flush with both surfaces of wall.

FIBREX INSULATIONS INC — FBX Safing Insulation
OWENS CORNING HT INC, DIV OF
OWENS CORNING — Paroc Safing Insulation
ROCK WOOL MANUFACTURING CO — Delta Board
ROXUL INC — Safe
THERMAFIBER LLC — SAF

C. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness (min 1/16 in. dry thickness) of fill material spray applied on each side of the wall in the flutes of the steel floor or roof deck and between the top of the wall and the bottom of the steel floor or roof deck and overlap a min 1/2 in. onto gypsum board on both sides of wall. Additional 1/8 in. wet thickness of fill material shall overlap a min 1/2 in. onto the steel deck and steel conduit or EMT (when used) on both sides of wall.

SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elastomeric Spray

*Bearing the UL Classification Mark



System No. HW-D-0044
November 29, 2001
Assembly Ratings — 1, 2, 3 and 4 Hr (See Item 2)
Nominal Joint Widths — 1 and 2 In. (See Item 3)
Class II Movement Capabilities — 19% and 25% Compression and Extension (See Item 3)

1. **Floor Assembly** — Min 4-1/2 in. thick steel-reinforced lightweight or normal weight (100 to 150 pcf) structural concrete.
2. **Wall Assembly** — The 1, 2, 3 or 4 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with min 1-1/4 in. to max 3 in. flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 3/4 to 1 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, ceiling runner is secured to concrete floor (Item 1) with steel fasteners spaced max 24 in. OC.
   A1. **Light Gauge Framing*** — **Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.
   SLIPTRACK SYSTEMS INC — SLP-TRK
   A2. **Light Gauge Framing*** — **Vertical Deflection Ceiling Runner** — As an alternate to the ceiling runner in Items 3A and 3A1, vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips, provided with step bushings, for permanent fastening of steel studs. Vertical deflection ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 4A) shall not be used.
   THE STEEL NETWORK INC — VertiTrack VTD358, VTD400, VTD600 and VTD800
   B. **Studs** — Steel studs to be min 3-1/2 in. wide. Studs cut 3/4 to 1 in. less in length than assembly height with bottom nesting in and secured to floor runner. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner (Item 2A) with sheet metal screws located 1/2 in. below the bottom to the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. Stud spacing not to exceed 24 in. OC.
   C. **Gypsum Board*** — Gypsum board sheets installed to a min total 5/8 in., 1-1/4 in., 1-1/2 in. or 2 in. thickness on each side of wall for 1, 2, 3 or 4 hr rated assemblies, respectively. Wall to be constructed as specified in the individual U400 Series Design in the UL Fire Resistance Directory, except that a max 1 or 2 in. gap (See Item 3) shall be maintained between the top of the gypsum board and the lower surface of the floor. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel.
   The hourly fire rating of the joint system is equal to the hourly fire rating of the wall.
3. **Joint System** — **Max separation between bottom of floor and top of gypsum board (at time of installation of joint system) is 2 in. for 1 and 2 hr ratings and 1 in. for 3 and 4 hr ratings. The joint system is designed to accommodate a max 25 percent compression or extension from its installed width for 1 and 2 hr ratings and a max 19 percent compression or extension from its installed width for 3 and 4 hr ratings.** The joint system shall consist of forming and fill materials, with or without a deflection channel (Item 3A), as follows:

(System No. HW-D-0044 Continued)

A. **Deflection Channel** — (Optional) — Max 3 in. deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection channel secured to concrete floor (Item 1) with steel fasteners spaced max 24 in. OC. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1/2 to 3/4 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner nests inside the deflection channel without attachment.

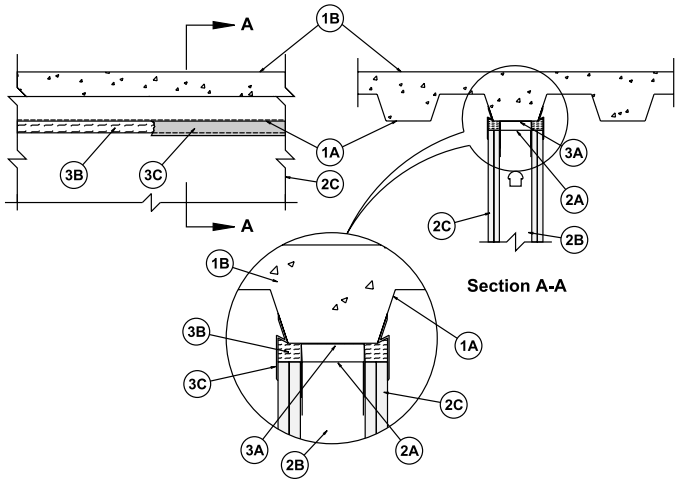
B. **Forming Material*** — Sections of min 4 pcf density mineral wool batt insulation compressed 50 percent in thickness and installed cut edge first to completely fill the gap between the top of the wallboard and the bottom of the concrete floor. The forming material shall be installed flush with both surfaces of wall.

FIBREX INSULATIONS INC — FBX Safing Insulation
OWENS CORNING HT INC, DIV OF
OWENS CORNING — Paroc Safing Insulation
ROCK WOOL MANUFACTURING CO — Delta Board
ROXUL INC — Safe
THERMAFIBER LLC —SAF

C. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness (min 1/16 in. dry) of fill material spray applied on each side of the wall between the top of the wall and the bottom of the floor, and overlap a min 1/2 in. onto wallboard on both sides of wall. Additional 1/8 in. wet thickness of fill material shall overlap a min 1/2 in. onto the floor on both sides of wall.

SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elastomeric Spray

*Bearing the UL Classification Mark



System No. HW-D-0054
December 05, 2000
Assembly Ratings — 1 and 2 Hrs (See Item 2)
Nominal Joint Width — 2 In.
Class II Movement Capabilities — 25% Compression or Extension

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Form Units*** — Max 3 in. deep galv steel fluted floor units having a min valley width of 4-3/4 in.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck having a min valley width of 4-3/4 in.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.
   C. **Roof Covering*** — Hot mopped or cold-application materials compatible with insulating concrete.

2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs . Ceiling runner to be provided with min 1-1/4 in. to max 3 in. flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 3/4 to 1 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, ceiling runner is secured to steel floor or roof deck with steel fasteners or welds spaced max 24 in. OC.
   B. **Studs** — Steel studs to be min 3-5/8 in wide. Studs cut 1/2 to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner (Item 2A) with sheet metal screws located 3/4 in. below the bottom to the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. Stud spacing not to exceed 24 in. OC.
   C. **Gypsum Board*** — Gypsum board sheets installed to a min total 5/8 in. or 1-1/4 in. thickness on each side of wall for 1 and 2 hr rated assemblies, respectively. Wall to be constructed as specified in the individual U400 Series Design in the UL Fire Resistance Directory, except that a max 2 in. gap shall be maintained between the top of the gypsum board and the lower surface of the steel floor or roof deck . The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the ceiling runner. No wallboard attachment screws shall be driven into the ceiling runner or into the optional deflection channel.

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

3. **Joint System** — **Max separation between bottom of floor or roof deck and top of gypsum board (at time of installation of joint system) is 2 in. The joint system is designed to accommodate a max 25 percent compression or extension from its installed width.** The joint system shall consist of forming and fill materials, with or without a deflection channel (Item 3A), as follows:
   A. **Deflection Channel** — Max 3 in. deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection channel secured to steel floor or roof deck with steel fasteners or welds spaced max 24 in. OC. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1/2 to 1 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner nests inside the deflection channel without attachment.

(System No. HW-D-0054 Continued)

B. **Forming Material*** — Min 5/8 in. or 1-1/4 in. wide strips of nom 6 pcf density mineral wool batt insulation for 1 or 2 hr rated assemblies, respectively. Strips of mineral wool compressed 50 percent in thickness and installed cut edge first to fill the gap between the top of the gypsum board and the bottom of the steel floor or roof deck. The forming material shall be installed flush with both surfaces of wall.

FIBREX INSULATIONS INC — FBX Safing Insulation
OWENS CORNING HT INC, DIV OF
OWENS CORNING — Paroc Safing Insulation
ROCK WOOL MANUFACTURING CO — Delta Board
THERMAFIBER LLC — Type SAF

C. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness of fill material spray applied on each side of the wall between the top of the wall and the bottom of the steel floor or roof deck and overlap a min 1/2 in. onto gypsum board on both sides of wall. Additional 1/8 in. wet thickness of fill material shall overlap a min 1/2 in. onto the steel deck on both sides of wall.

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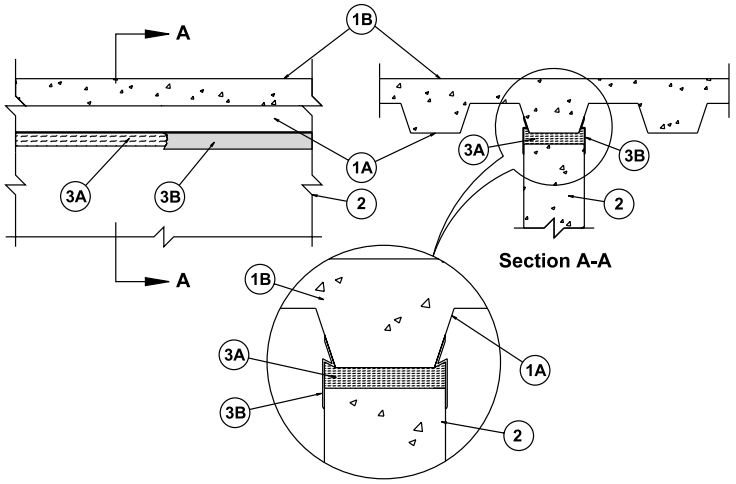


System No. HW-D-0055
December 05, 2000
Assembly Rating — 2 Hr
Nominal Joint Width — 1 In.
Class II Movement Capabilities — 18.75% Compression or Extension

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Form Units*** — Max 3 in. deep galv steel fluted floor units having a min valley width of 4-3/4 in.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck having a min valley width of 4-3/4 in.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulaitng concrete, as measured from the top plane of the steel roof deck.
   C. **Roof Covering*** — Hot-mopped or cold-application materials compatible with insulating concrete.

2. **Wall Assembly** — Min 6-1/8 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Wall assembly to be centered under and parallel with valley of fluted steel floor unit.

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

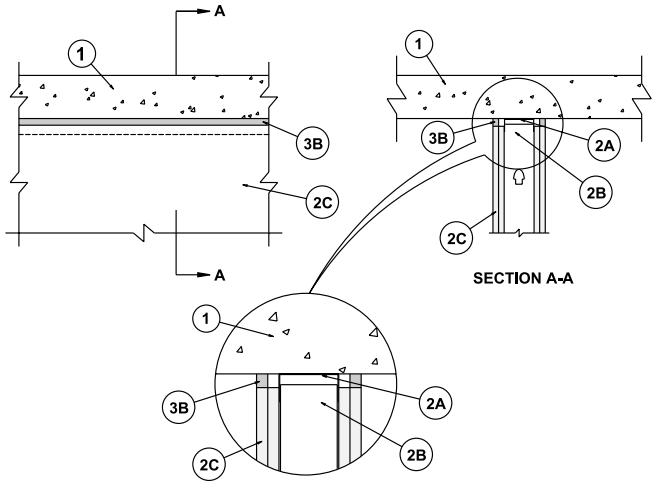
3. **Joint System** — **Max separation between bottom of floor or roof deck and top of wall (at time of installation of joint system) is 1 in. The joint system is designed to accommodate a max 18.75 percent compression or extension from its installed width.** The joint system shall consist of forming material and a fill material, as follows:
   A. **Forming Material*** — Min 6-1/8 in. wide sections of min 4 pcf density mineral wool batt insulation compressed 50 percent in thickness and installed cut edge first into gap between top of wall and bottom of steel floor or roof deck.

      FIBREX INSULATIONS INC — FBX Safing Insulation
      OWENS CORNING HT INC, DIV OF
      OWENS CORNING — Paroc Safing Insulation
      ROCK WOOL MANUFACTURING CO — Delta Board
      THERMAFIBER LLC — Type SAF

   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness of fill material sprayed or brushed on each side of the wall between the top of the wall and the bottom of the steel floor or roof deck to completely cover mineral wool and overlap a min 1/2 in. onto wall and steel deck on both sides of wall.

      SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elastomeric Spray

*Bearing the UL Classification Mark



System No. HW-D-0079
September 25, 2001
Assembly Ratings — 1 and 2 Hr (See Item 2)
Joint Width — 3/4 in. Maximum
Class II Movement Capabilities — 25% Compression

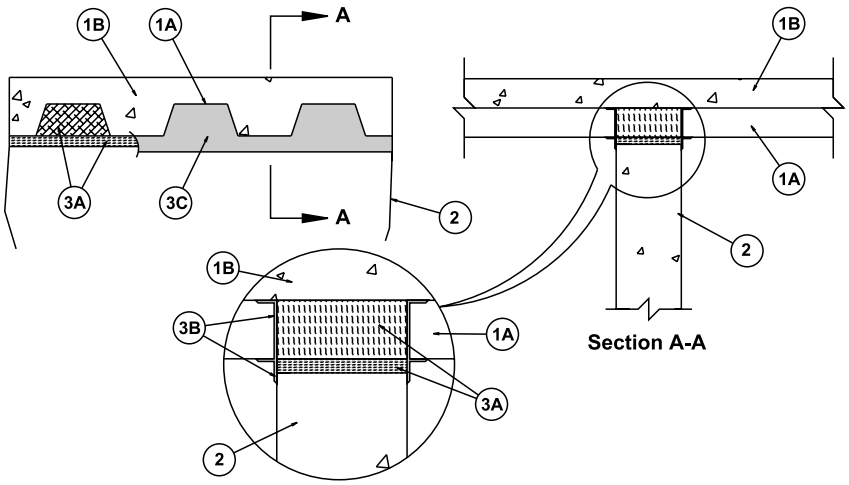
1. **Floor Assembly** — Min 4-1/2 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) structural concrete.
2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accomodate steel studs (Item 2B) with min 1-1/4 in. long flanges. Ceiling runner secured to concrete floor with steel fasteners spaced max 24 in. OC.
   B. **Studs** — Steel studs to be min 3-1/2 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. Stud spacing not to exceed 24 in. OC.
   C. **Gypsum Board*** — Wallboard sheets installed to a min total thickness of 5/8 in. and 1-1/4 in. on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a nom 3/4 in. gap shall be maintained between the top of the wallboard and the bottom surface of the floor. In addition, the top row of screws shall be installed into the steel studs 1/2 to 1 in. below the bottom edge of the ceiling runner flange.

   The hourly fire rating of the joint system is dependent on the hourly fire rating of the wall assembly in which it is installed.
3. **Joint System** — **Max separation between bottom of floor and top of wall is 3/4 in. The joint system is designed to accommodate a max 25 percent compression from its installed width.** The joint system consists of the following:
   A. **Forming Material** — (Optional, Not Shown) — In 2 hr fire rated wall assemblies, polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction fit into joint opening.
   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 5/8 in. thickness of fill material applied within joint opening on both sides of wall, flush with both surfaces of wall. In 1 hr fire rated walls, bond breaker tape applied to ceiling channel (Item 2A) prior to installation of fill material.

      SPECIFIED TECHNOLOGIES INC — SpecSeal ES Sealant

*Bearing the UL Classification Mark

Created or Revised: 12/05/01
Specified Technologies, Inc., Somerville, NJ (800) 992-1180



System No. HW-D-0086
November 29, 2001
Assembly Ratings — 1, 2, 3 and 4 Hr (See Items 3 and 4)
Nominal Joint Widths — 1 and 2 In. (See Item 3)
Class II Movement Capabilities — 19% and 25% Compression and Extension (See Item 3)

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the floor assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The floor assembly shall include the following construction features:
   A. **Steel Floor And Form Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck.
   B. **Roof Insulation** — Min 2-1/4 n. thick poured insulating concrete, as measured from the top plane of the steel roof deck.

2. **Wall Assembly** — Min 6-1/8 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) structural concrete. When the hourly rating is greater than 3 hr, the min thickness of the wall is 7-5/8 in. Wall may also be constructed of any UL Classified **Concrete Blocks*.**
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

3. **Joint System** — **Max separation between bottom of floor or roof and top of wall (at time of installation of joint system) is 2 in. for 1 and 2 hr ratings and 1 in. for 3 and 4 hr ratings. The joint system is designed to accommodate a max 25 percent compression or extension from its installed width for 1 and 2 hr ratings and a max 19 percent compression or extension from its installed width for 3 and 4 hr ratings.** The joint system consists of a forming material and a fill material, as follows:
   A. **Forming Material*** — Sections of min 4 pcf density mineral wool batt insulation cut to the width of the wall and inserted between the top of the wall and the valleys of the steel deck, compressed approx 50 percent in thickness beneath each valley. Additional pieces of mineral wool batt cut to the shape of the steel deck flute, stacked to a thickness approx 1 in. greater than the overall thickness of the wall and installed in the flutes above the wall. Mineral wool in flutes to be compressed approx 14 percent in thickness such that it is flush with each surface of the wall.
      FIBREX INSULATIONS INC — FBX Safing Insulation
      OWENS CORNING — Paroc Safing Insulation
      ROCK WOOL MANUFACTURING CO — Delta Board
      ROXUL INC — Safe
      THERMAFIBER LLC —SAF
   B. **Fill, Void or Cavity Material*— Sealant** — Min 1/8 in. wet thickness (min 1/16 in. dry) of fill material spray applied on each side of the wall in the flutes of the steel floor or roof deck and between the top of the wall and the bottom of the steel floor or roof deck and overlap a min 1/2 in. onto wall on both sides of wall. Additional 1/8 in. wet thickness of fill material shall overlap a min 1/2 in. onto the steel deck on both sides of wall.
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4. **Through Penetrant** — (Optional, Not Shown) — Nom 3/8 or 1/2 in. diam rigid steel conduit, steel electrical metallic tubing (EMT) or Sch 40 PVC conduit may be installed parallel with and within the flutes of the steel floor or roof deck. The conduit or EMT shall be located near the middepth of the steel deck with a clearance of 1/2 to 1-1/2 in. between the conduit or EMT and the steel deck. A max of one conduit or EMT is permitted in an individual flute. **When conduit or EMT is installed in flute of steel deck, the hourly rating of the joint system is 1 hr.**

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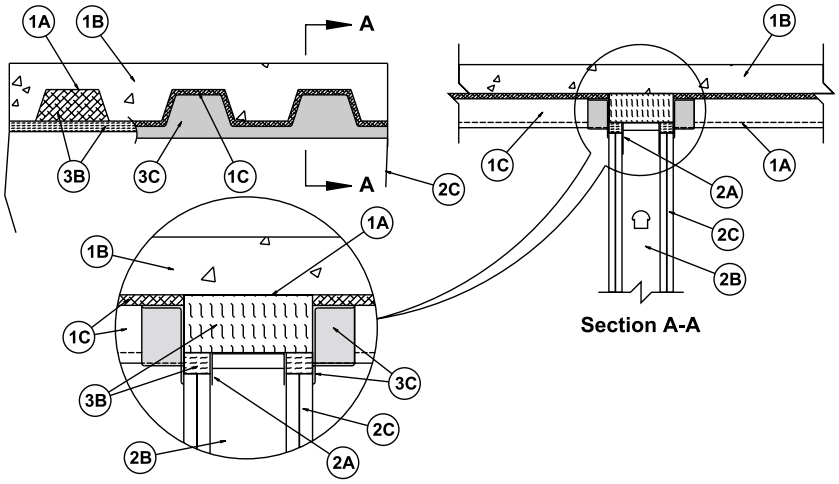

System No. HW-D-0088
December 05, 2000
Assembly Ratings — 1 and 2 Hr (See Item 2)
Nominal Joint Width — 1 in.
Class II Movement Capabilities — 18.75% Compression and Extension

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Form Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.
   C. **Spray-Applied Fire Resistive Material*** — After installation of the ceiling runner (Item 2A) or deflection track (Item 3A, if used), steel floor units to be sprayed with a min 5/16 in. to max 11/16 in. thickness of material in accordance with the specifications in the individual D700 Series Design. Material is to be excluded from the steel deck in the area immediately above the wall as well as from the flanges of the ceiling runner or deflection track. The spray applied fire resistive material is mixed with water in accordance with the mixing instructions on the bag. The min average density of the spray applied fire resistive material shall be 15 pcf with a min individual density of 14 pcf. See Design Information Section in Volume 1 of the Fire Resistance Directory for method of density determination.

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1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck.
   B. **Roof Insulation** — **Mineral and Fiber Board*** — Min 3/4 in. thick boards applied in one or more layers directly over steel roof deck or over gypsum board sheathing laid atop steel roof deck.
   C. **Roof Covering*** — Hot-mopped or cold-application materials compatible with mineral and fiber board insulation.
   D. **Spray-Applied Fire Resistive Material*** — After installation of the ceiling runner (Item 2A) or deflection track (Item 3A, if used), steel roof deck to be sprayed with a max 3/4 in. thickness of spray applied fire resistive material as specified in the individual P700 Series Roof-Ceiling design. Material is to be excluded from the steel deck in the area immediately above the wall as well as from the flanges of the ceiling runner or deflection track. The spray applied fire resistive material is mixed with water in accordance with the mixing instructions on the bag. The minimum average density of the spray applied fire resistive material shall be 15 pcf with a minimum individual density of 14 pcf. See Design Information Section in Volume 1 of the Fire Resistance Directory for method of density determination.

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2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Paratition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accomodate steel studs . Ceiling runner to be provided with min 1-1/4 in. to max 2 in. flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 in. to 3/4 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, ceiling runner is secured to steel floor or roof deck with steel fasteners or welds spaced max 24 in. OC.

(System No. HW-D-0088 Continued)

A1. **Light Gauge Framing*** — **Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Items 2B). Ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.

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B. **Studs** — Steel studs to be min 3-5/8 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner with sheet metal screws located 1/2 in. below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. Stud spacing not to exceed 24 in. OC.

C. **Gypsum Board*** — Gypsum board sheets installed to a min total 5/8 in. or 1-1/4 in. thickness on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed in the individual U400 Series Design in the UL Fire Resistance Directory, except that a max 1 in. gap shall be maintained between the top of the gypsum board and the bottom surface of the steel floor or roof deck. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel.

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

3. **Joint System** — **Max separation between bottom of floor or roof deck and top of gypsum board (at time of installation of joint system) is 1 in. The joint system is designed to accomodate a max 18.75 percent compression or extension from its installed width.** The joint system shall consist of forming and fill materials, with or without a deflection channel (Item 2A), as follows:

A. **Deflection Channel** — (Optional, Not Shown) — Max 2 in. deep min 24 gauge galv steel channel sized to accommodated ceiling runner (Item 2A). Deflection channel secured to steel floor or roof deck with steel fasteners or welds spaced max 24 in. OC. The ceiling runner is installed within the deflection channel to maintain a 1/2 in. to 3/4 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner nests inside the deflection channel without attachment.

B. **Forming Material*** — Min 5-5/8 in. or 7 in. thickness of 6 pcf mineral wool batt insulation for 1 and 2 hr fire rated assemblies, respectively, cut to the shape of the fluted deck and installed into the flutes of the steel floor or roof deck between the top of the deflection channel and the steel floor or roof deck. The mineral wool batt insulation is to be compressed min 14.3 percent in thickness such that it is flush with the gypsum board surface on both sides of the wall. Additional sections of mineral wool batt insulation are compressed 50 percent in thickness and installed cut edge first to completely fill the gap above the top of the gypsum board. The forming material shall be installed flush with both surfaces of wall.

FIBREX INSULATIONS INC — FBX Safing Insulation
OWENS CORNING HT INC, DIV OF
OWENS CORNING — Paroc Safing Insulation
ROCK WOOL MANUFACTURING CO — Delta Board
THERMAFIBER LLC — Type SAF

C. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness of fill material spray applied on each side of the wall in the flutes of the steel floor or roof deck and between the top of the wall and the bottom of the steel floor or roof deck and overlap a min 1/2 in. onto gypsum board and a min 2 in. onto the spray applied material on both sides of wall.

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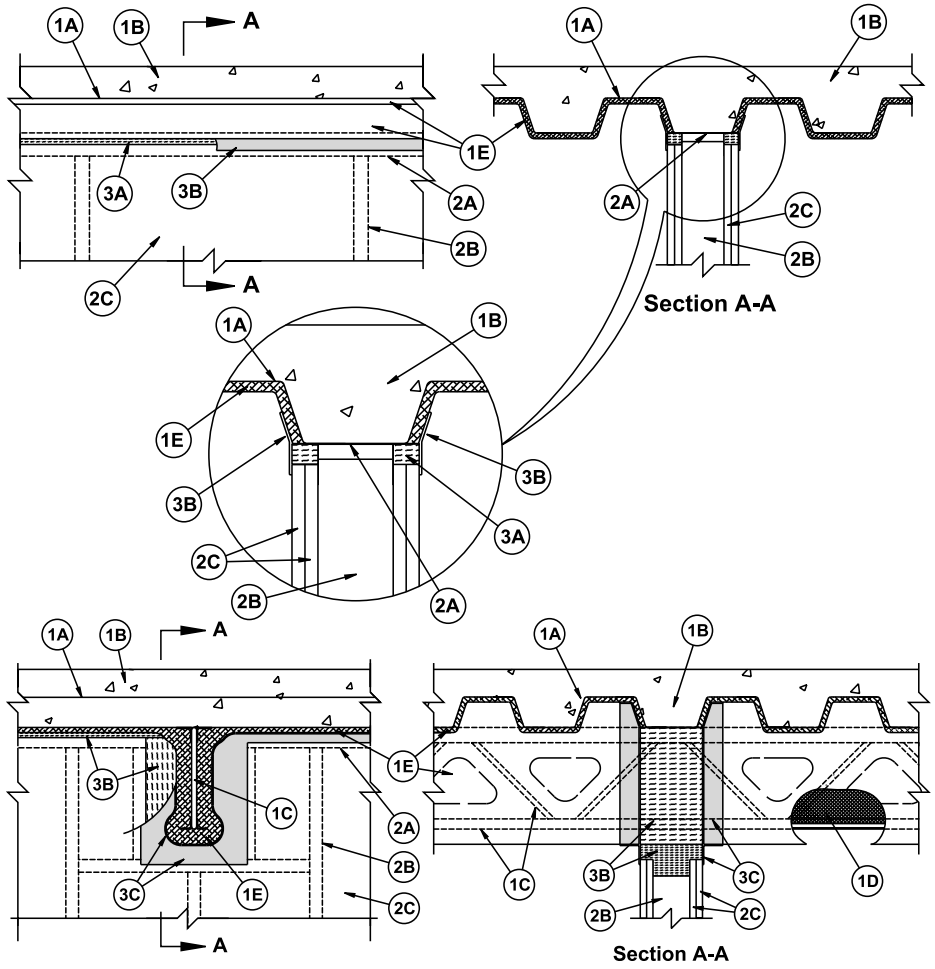


System No. HW-D-0099
December 05, 2000
Assembly Ratings — 1 and 2 Hr (See Item 1)
Nominal Joint Width — 1 In.
Class II Movement Capabilities — 18.75% Compression or Extension

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Floor Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.
   C. **Structural Steel Support** — (Optional) — Steel beam or open-web steel joist, as specified in the individual D700 Series Floor-Ceiling Design, used to support steel floor units. Structural steel support oriented perpendicular to wall assembly.
   D. **Steel Lath** — Where open-web steel joists pass through the fire rated wall, 3/8 in. diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd shall be secured to one side of each joist with steel tie wire and the lath shall be fully covered with spray applied fire resistive material with no min thickness requirement.
   E. **Spray-Applied Fire Resistive Material*** — After installation of the ceiling runner (Item 2A) or deflection track (Item 3A, if used), steel floor units and structural steel supports to be sprayed with the thickness of material specified in the individual D700 Series Design. The spray applied fire resistive material is mixed with water in accordance with the mixing instructions on the bag and is sprayed onto steel deck and structural steel support. Material is to be excluded from the flanges of the ceiling runner or deflection track. The min average density of the spray applied fire resistive material shall be 15 pcf with a min individual density of 14 pcf. See Design Information Section in Volume 1 of the Fire Resistance Directory for method of density determination.
      W R GRACE & CO — CONN
      CONSTRUCTION PRODUCTS DIV — Type MK-6/HY
2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

(System No. HW-D-0099 Continued)

A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with min 1-1/4 in. to max 2 in. flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 in. to 3/4 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, ceiling runner is secured to steel floor units (Item 1A) with steel fasteners or welds spaced max 24 in. OC. Ceiling runner or deflection channel to be centered beneath and parallel with valley of steel floor unit. A clearance of 1 in. shall be maintained between the end of the ceiling runner or deflection channel and the spray applied fire resistive material on the structural steel support members.

A1. **Light Gauge Framing*** — **Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Ceiling runner instsalled perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.

SLIPTRACK SYSTEMS INC — SLP-TRK

B. **Studs** — Steel studs to be min 3-5/8 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 long wafer head steel screws at midheight of slot on each side of wall. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner (Item 2A) with sheet metal screws located 1/2 in. below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. A framed opening shall be constructed around each structural steel support member. A min clearance of 1 in. to a maximum clearance of 3 in. shall be maintained between the framing and the spray applied fire resistive material on the two sides of the structural support member. The clearance between the framing and the spray applied fire resistive material on the bottom of the structural steel support member shall be max 1 in.

C. **Gypsum Board*** — Gypsum board sheets installed to a min total 5/8 in. or 1-1/4 in. thickness on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed in the individual U400 Series Design in the UL Fire Resistance Directory, except that a max 1 in. gap shall be maintained between the top of the gypsum board and the bottom plane of the steel floor units and between the top edge of the gypsum board and the spray applied fire resistive material on the structural steel support member. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel.

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

3. **Joint System** — **Max separation between bottom plane of steel floor unit and top of gypsum board (at time of installation of joint system) is 1 in. Max separation between spray applied fire resistive material on bottom of structural support member and framed opening in top of wall is 1 in. The joint system is designed to accommodate a max 18.75 percent compression or extension from its installed width as measured between bottom plane of steel floor unit and top of gypsum wallboard.** The joint system shall consist of forming and fill materials, with or without a deflection channel (Item 3A), as follows:

A. **Deflection Channel** — (Optional, Not Shown) — Max 2 in. deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection channel installed parallel with and centered beneath valley of steel floor unit (Item 1A) and secured to steel floor unit with steel fasteners or welds spaced max 24 in. OC. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1/2 in. to 3/4 in. gap between the top of the ceiling runner and the top of the deflection channel. A clearance of 1 in. shall be maintained between the end of the deflection channel and the spray applied fire resistive material on the structural steel support members. The ceiling runner nests inside the deflection channel without attachment.

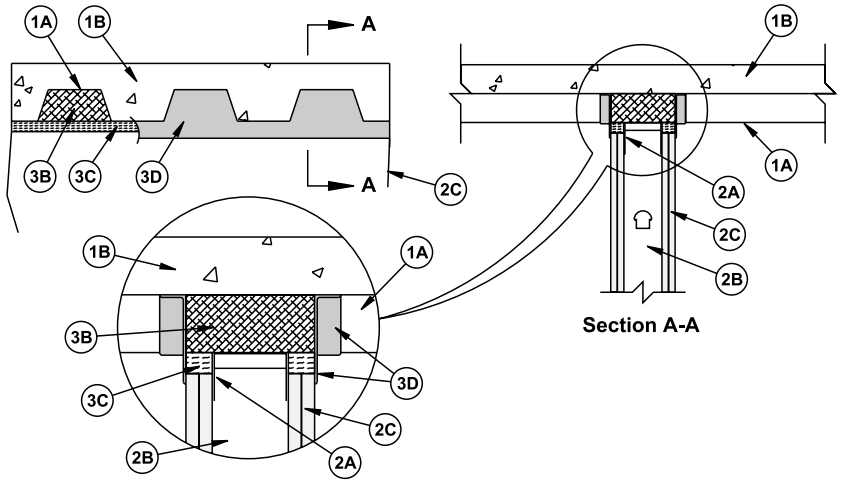
B. **Forming Material*** — Nom 6 pcf mineral wool batt insulation cut to a length approx 1 in. longer than overall thickness of wall and inserted edge-first into the spaces between the spray applied fire resistive material on the structural steel member and the framed notch at the top of the wall. The thickness of forming material shall be sufficient to attain a min compression of 20 percent between the sides of the framed notch and the protected structural steel member and a min compression of 33 percent between the bottom of the framed notch and the bottom of the protected structural steel member. The mineral wool batt insulation is to be additionally compressed in the length direction such that it is flush with the gypsum board surface on both sides of the wall. Additional sections of mineral wool batt insulation are compressed 50 percent in thickness and are installed cut edge first to completely fill the gap above the top of the gypsum board. The forming material shall be installed flush with both surfaces of wall.

FIBREX INSULATIONS INC — FBX Safing Insulation
OWENS CORNING HT INC, DIV OF
OWENS CORNING — Paroc Safing Insulation
ROCK WOOL MANUFACTURING CO — Delta Board
THERMAFIBER LLC — Type SAF

C. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness of fill material spray applied over the forming material on each side of the wall. Fill material to overlap a min of 1/2 in. onto the gypsum board and a min 2 in. onto the spray applied material (Item 1C) on the steel floor unit and on the structural steel support member on both sides of wall.

SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elastomeric Spray

*Bearing the UL Classification Mark



System No. HW-D-0102
November 29, 2001
Assembly Ratings — 1, 2, 3 and 4 Hr (See Item 2)
Nominal Joint Widths — 1 and 2 in. (See Item 3)
Class II Movement Capabilities — 19 and 25% Compression and Extension (See Item 3)

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the floor assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The floor assembly shall include the following construction features:
   A. **Steel Floor and Floor Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.

2. **Wall Assembly** — The 1, 2, 3 or 4 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 3/4 in. to 1 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, flange height of ceiling runner shall be min 3/4 in. greater than nom joint width. Ceiling runner secured to steel floor or roof deck, perpendicular to steel deck direction, with steel fasteners or welds spaced max 24 in. OC.
   A1. **Light Gauge Framing* — Slotted Ceiling Runner** — When nom joint width is less than or equal to 1-3/4 in., slotted ceiling runner may be used as an alternate to the ceiling runner in Item 2A. Slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.
   SLIPTRACK SYSTEMS INC — SLP-TRK
   A2. **Light Gauge Framing* — Vertical Deflection Ceiling Runner** — When nom joint width is less than or equal to 1 in., vertical deflection ceiling runner may be used as an alternate to the ceiling runner in Items 2A and 2A1. Vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips, provided with step bushings, for permanent fastening of steel studs. Vertical deflection ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.
   THE STEEL NETWORK INC — VertiTrack VTD358, VTD400, VTD600 and VTD800
   B. **Studs** — Steel studs to be min 3-1/2 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner with sheet metal screws located 3/4 in. below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to

(System No. HW-D-0102 Continued)

slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall. When vertical deflection ceiling runner (Item 2A2) is used, steel studs secured to slotted vertical deflection clips, through the bushings, with steel screws at midheight of each slot. Stud spacing not to exceed 24 in. OC.

C. **Gypsum Board*** — Gypsum board sheets installed to a min total thickness of 5/8 in., 1-1/4 in., 1-1/2 in. or 2 in. on each side of wall for 1, 2, 3 and 4 hr fire-rated assemblies, respectively. Wall to be constructed as described in the individual U400 Series Design in the UL Fire Resistance Directory, except that a max 1 or 2 in. gap (See Item 3) shall be maintained between the top of the gypsum board and the bottom plane of the steel floor units. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel.

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

3. **Joint System Max — separation between bottom of floor or roof deck and top of gypsum board (at time of installation of joint system) is 2 in. for 1 and 2 hr fire ratings and 1 in. for 3 and 4 hr ratings. The joint system is designed to accommodate a max 25 percent compression or extension from its installed width for 1 and 2 hr ratings and a max 19 percent compression or extension from its installed width for 3 and 4 hr ratings.** The joint system shall consist of spray applied fire resistive material, forming and fill materials, with or without a deflection channel (Item 3A) as follows:

A. **Deflection Channel** — (Optional, Not Shown) — Max 3 in. deep min 24 gauge galv steel channel sized to accomodate ceiling runner (Item 2A) and steel studs. Deflection channel secured to steel floor or roof deck, perpendicular to steel deck direction, and secured with steel fasteners or welds spaced max 24 in. OC. The ceiling runner is installed within the deflection channel to maintain a 1/2 in. to 1 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel.

B. **Spray Applied Fire Resistive Material*** — Min 4-7/8 in., 6-1/8 in., 6-5/8 in. or 7-5/8 in. depth of spray applied fire resistive material for 1, 2, 3 and 4 hr fire-rated assemblies, respectively, installed into the flutes of the steel floor or roof deck between the top of the deflection channel and the steel deck. Prior to the installation of the spray applied fire resistive material in the flutes of the steel floor or roof deck temporary forms with a thickness equal to the overall thickness of the gypsum board shall be installed to cover the vertical legs of the ceiling runner channel (Item 2A) or deflection channel (Item 3A). The spray applied fire resistive material is mixed with water in accordance with the mixing instructions on the bag and is sprayed and/or troweled to fill the flute above the channel and temporary forms. The minimum average density of the spray applied fire resistive material shall be 15 pcf with a minimum individual density of 14 pcf. See Design Information Section in Volume 1 of the Fire Resistance Directory for method of density determination.

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CONSTRUCTION PRODUCTS DIV — Type MK-6/HY

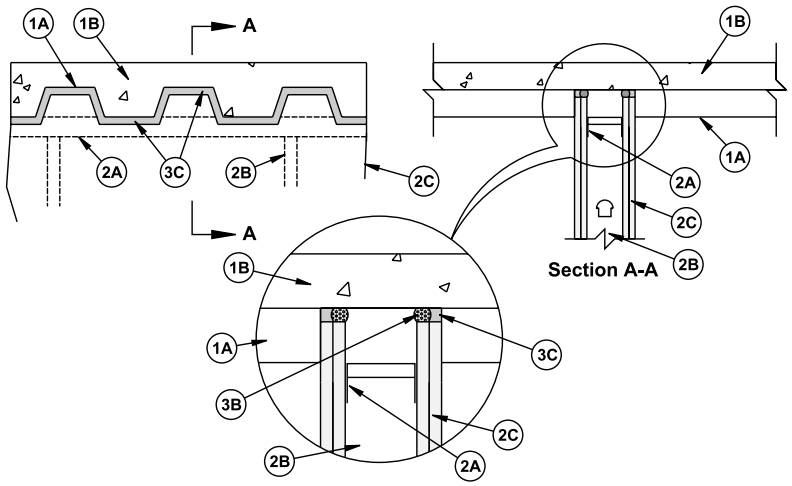
C. **Forming Material*** — Strips of nominal 4 pcf density mineral wool batt insulation are to be compressed 50 percent in thickness and installed cut edge first to completely fill the gap between the spray applied fire resistive material and the top of the gypsum board. The forming material shall be installed flush with both surfaces of wall.

FIBREX INSULATIONS INC — FBX Safing Insulation
OWENS CORNING HT INC, DIV OF
OWENS CORNING — Paroc Safing Insulation
ROCK WOOL MANUFACTURING CO — Delta Board
ROXUL INC — Safe
THERMAFIBER LLC — SAF

D. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness (min 1/16 in. dry) of fill material spray applied to cover the spray applied fire resistive material and the forming material on each side of the wall. The material shall be installed to overlap a min of 1/2 in. onto the gypsum board and a min of 1 in. on the steel floor or roof deck on both sides of wall.

SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elastomeric Spray

*Bearing the UL Classification Marking



System No. HW-D-0103
September 25, 2001
Assembly Ratings — 1 and 2 Hr (See Item 2)
Joint Width — 3/4 in. Maximum
Class II Movement Capabilities— 25% Compression

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Form Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.
   C. **Spray-Applied Fire Resistive Material*** — (Optional, Not Shown) — After installation of the ceiling runner (Item 2A) or deflection channel (Item 3A), steel floor units to be sprayed with a min 5/16 in. to max 11/16 in. thickness of material in accordance with the specifications in the individual D700 Series Design. When spray applied fire resistive material is used, ceiling runner or deflection channel to be provided with 2 in. flanges. Excess material to be scraped from flanges of ceiling runner or deflection channel prior to installation of gypsum board.
      W R GRACE & CO — CONN CONSTRUCTION PRODUCTS DIV — MK-6/HY

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.
   C. **Roof Covering*** — Hot-mopped or cold-application materials compatible with insulating concrete.
   D. **Spray-Applied Fire Resistive Material*** — (Optional, Not Shown) — After installation of the ceiling runner (Item 2A) or deflection channel (Item 3A), steel floor units to be sprayed with a min 5/16 in. to max 11/16 in. thickness of material in accordance with the specifications in the individual P700 Series Design. When spray applied fire resistive material is used, ceiling runner or deflection channel to be provided with 2 in. flanges. Excess material to be scraped from flanges of ceiling runner or deflection channel prior to installation of gypsum board.
      W R GRACE & CO - CONN CONSTRUCTION PRODUCTS DIV — MK-6/HY

2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs . Ceiling runner to be provided with min 1-1/4 in. to max 2 in. flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 in. to 3/4 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, ceiling runner is secured to steel floor or roof deck, perpendicular to steel deck direction, with steel fasteners or welds spaced max 24 in. OC.
   B. **Studs** — Steel studs to be min 3-5/8 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner with sheet metal screws located 1/2 in. below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment.

(System No. HW-D-0103 Continued)

C. **Gypsum Board*** — Gypsum board sheets installed to a min total thickness of 5/8 in. and 1-1/4 in. on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that the gypsum board is cut to follow the contour of the steel floor units with a nom 3/4 in. gap maintained between the gypsum board and the steel deck or the spray-applied fire resistive material. In addition, the top row of screws shall be installed into the steel studs 1/2 to 1 in. below the bottom edge of the ceiling runner flange.

The hourly fire rating of the joint system is dependent on the hourly fire rating of the wall assembly in which it is installed.

3. **Joint System** — **Max separation between bottom of floor or roof deck and top of wall is 3/4 in. The joint system is designed to accommodate a max 25 percent compression from its installed width.** The joint system consists of the following:

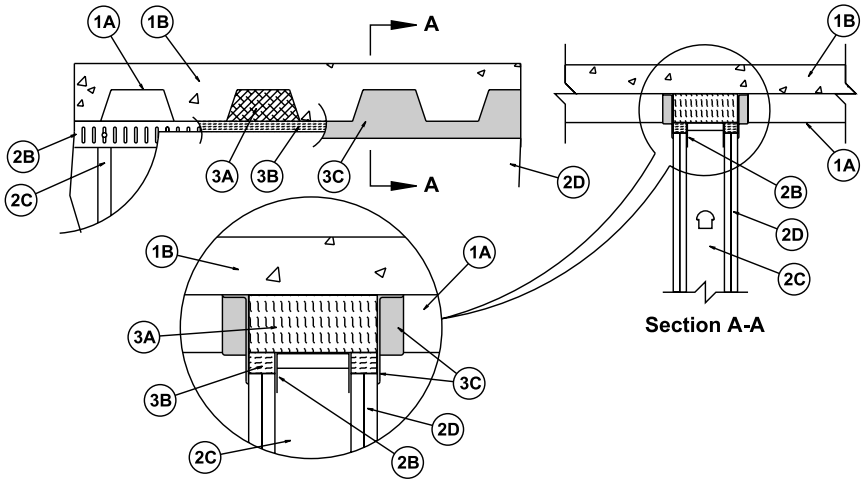
A. **Deflection Channel** — (Optional, Not Shown) — Max 2 in. deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection chanel secured to steel floor or roof deck perpendicular to steel deck direction, and secured with steel fasteners or welds spaced max 24 in. OC. The ceiling runner is installed within the deflection channel to maintain a 1/2 in. to 3/4 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel.

B. **Forming Material** — (Optional, Not Shown) — In 2 hr fire rated wall assemblies, foam backer rod friction fit into joint opening and recessed minimum 1/2 in. from each surface of wall.

C. **Fill, Void or Cavity Material*** — **Sealant** — Minimum 1/2 in. thickness of fill material applied within joint opening on both sides of wall, flush with both surfaces of wall. In 1 hr fire rated walls, apply bond breaker tape to ceiling channel (Item 2A) or deflection channel (Item 3A) prior to installation of fill material.

SPECIFIED TECHNOLOGIES INC — SpecSeal ES Sealant

*Bearing the UL Classification Mark



System No. HW-D-0136

December 05, 2000

Assembly Ratings — 1 and 2 Hr (See Item 2)

Nominal Joint Width — 1 in.

Class II Movement Capabilities — 18.75% Compression and Extension

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Form Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.
   C. **Roof Covering*** — Hot-mopped or cold-application materials compatible with insulating concrete.

2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Floor Runners** — (Not Shown) — Floor runners of wall assembly shall consist of min No. 25 gauge galv steel channels sized to accommodate steel studs .
   B. **Light Gauge Framing***— **Slotted Ceiling Runner** — Ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs. Ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC.
      SLIPTRACK SYSTEMS INC — SLP-TRK
   C. **Studs** — Steel studs to be min 3-5/8 in. wide. Studs cut 3/4 to 1 in. less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner. Steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall. Stud spacing not to exceed 24 in. OC.
   D. **Gypsum Board*** — Gypsum board sheets installed to a min total 5/8 in. or 1-1/4 in. thickness on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed in the individual U400 Series Design in the UL Fire Resistance Directory, except that a max 1 in. gap shall be maintained between the top of the wallboard and the bottom surface of the steel floor or roof deck and the top row of screws shall be installed into the studs 3 to 3-1/2 in. below the valleys of the steel deck.

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

3. **Joint System — Max separation between bottom of floor or roof deck and top of gypsum board (at time of installation of joint system) is 1 in. The joint system is designed to accommodate a max 18.75 percent compression or extension from its installed width.** The joint system shall consist of forming and fill materials in the flutes of the steel floor or roof deck and between the top of the wallboard and bottom of the steel deck, as follows:
   A. **Forming Material*** — Min 5-5/8 in. or 7 in. depth of 4 pcf mineral wool batt insulation for 1 and 2 hr fire rated assemblies, respectively, cut to the shape of the fluted deck and installed into the flutes of the steel floor or roof deck between the top of the slotted ceiling runner and the steel deck. The mineral wool batt insulation is to be compressed min 14.3 percent in depth such that it is flush with the gypsum board surface on both sides of the wall.

(System No. HW-D-0136 Continued)

FIBREX INSULATIONS INC — FBX Safing Insulation
OWENS CORNING HT INC, DIV OF OWENS CORNING — Paroc Safing Insulation
ROCK WOOL MANUFACTURING CO — Delta Board
THERMAFIBER LLC — Type SAF

A1. **Alternate Forming Material*— Spray Applied Fire Resistive Material*** — (Not Shown) — As an alternate to the mineral wool batt insulation (Item 3A), a min 4-7/8 in. or 6-1/8 in. depth of spray applied fire resistive material may be installed in the flutes of the steel floor or roof deck between the top of the slotted ceiling runner and the steel deck for the 1 and 2 hr fire ratings, respectively. The spray applied fire resistive material is to be finished flush with the valleys of the steel floor or roof deck and flush with the gypsum board surface on both sides of the wall to leave a nom 1 in. high gap above the top of the gypsum board. The spray applied fire resistive material is mixed with water in accordance with the mixing instructions on the bag. The minimum average density of the spray applied fire resistive material shall be 15 pcf with a minimum individual density of 14 pcf. See Design Information Section in Volume 1 of the Fire Resistance Directory for method of density determination.

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CONSTRUCTION PRODUCTS DIV — MK-6/HY

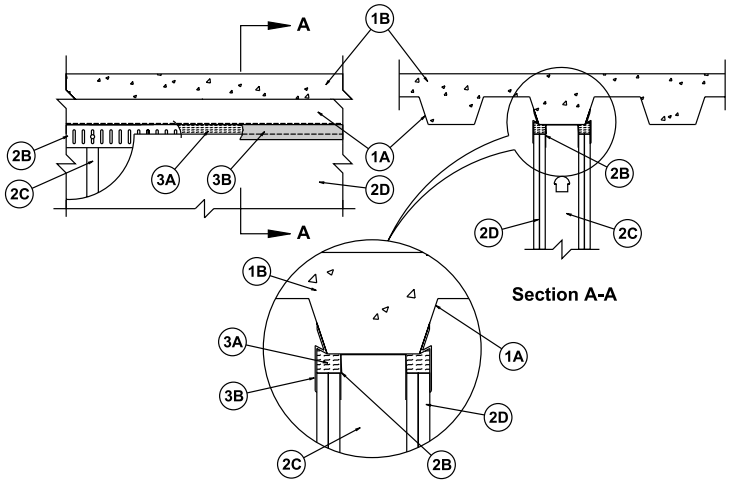
B. **Forming Material*** — Min 5/8 in. or 1-1/4 in. wide sections of mineral wool batt insulation for 1 or 2 hr rated assemblies, respectively. Mineral wool batt insulation cut into strips, compressed 50 percent in thickness and installed cut edge first to completely fill the gap above the top of the gypsum board. The forming material shall be installed flush with both surfaces of wall.

FIBREX INSULATIONS INC — FBX Safing Insulation
OWENS CORNING HT INC, DIV OF
OWENS CORNING — Paroc Safing Insulation
ROCK WOOL MANUFACTURING CO — Delta Board
THERMAFIBER LLC — Type SAF

C. **Fill, Void or Cavity Material*— Sealant** — Min 1/8 in. wet thickness of fill material spray applied to cover the forming material on each side of the wall in the flutes of the steel floor or roof deck and between the top of the wall and the bottom of the steel deck. Nom 1/8 in. wet thickness of fill material shall overlap a min 1/2 in. onto gypsum board and onto the steel deck on both sides of wall.

SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elastomeric Spray

*Bearing the UL Classification Mark



System No. HW-D-0137
December 05, 2000
Assembly Ratings— 1 and 2 Hr (See Item 2)
Nominal Joint Width —1 in.
Class II Movement Capabilities — 18.75% Compression or Extension

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor** and **Form Units*** — Max 3 in. deep galv steel fluted floor units having a min valley width of 4-3/4 in.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

   As an alternate to the steel deck/concrete floor, the floor assembly may consist of a min 4-1/2 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) concrete slab.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck having a min valley width of 4-3/4 in.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.
   C. **Roof Covering*** — Hot-mopped or cold-application materials compatible with insulation concrete.

2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Floor Runners** — (Not Shown) — Floor runners of wall assembly shall consist of min No. 25 gauge galv steel channels sized to accommodate steel studs.
   B. **Light Gauge Framing*** — **Slotted Ceiling Runner** — Ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs. Ceiling runner to be centered beneath valley of steel floor or roof deck when steel deck/concrete floor is used. Ceiling runner secured with steel fasteners spaced max 24 in. OC.
      SLIPTRACK SYSTEMS INC — SLP-TRK
   C. **Studs** — Steel studs to be min 3-5/8 in. wide. Studs cut 3/4 to 1 in. less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in slotted ceiling runner. Steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall. Stud spacing not to exceed 24 in. OC.
   D. **Gypsum Board*** — Gypsum board sheets installed to a min total 5/8 in. or 1-1/4 in. thickness on each side of wall for 1 and 2 hr rated assemblies, respectively. Wall to be constructed as specified in the individual U400 Series Design in the UL Fire Resistance Directory, except that a max 1 in. gap shall be maintained between the top of the gypsum board and the lower surface of the steel floor or roof deck and the top row of screws shall be installed into the studs 3 to 3-1/2 in. below the lower surface of the floor or roof.

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

3. **Joint System Max seperation between bottom of floor or roof deck and top of gypsum board (at time of installation of joint system) is 1 in. The joint system is designed to accommodate a max 18.75 percent compression or extension from its installed width.** The joint system shall consist of forming and fill materials, as follows:
   A. **Forming Material*** — Min 5/8 in. or 1-1/4 in. wide sections of mineral wool batt insulation for 1 or 2 hr rated assemblies, respectively. Sections of mineral wool compressed 50 percent in thickness and installed cut edge first to fill the gap between the top of the gypsum board and the bottom of the steel deck or the concrete floor slab. The forming material shall be installed flush with both surfaces of wall.

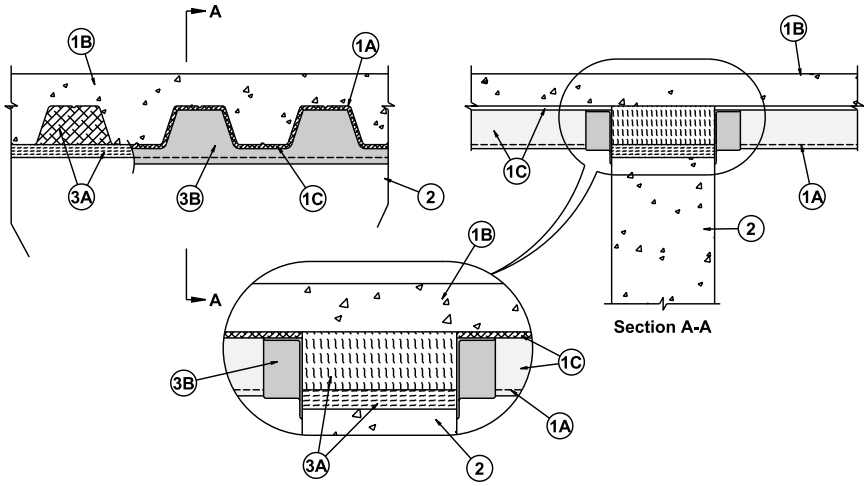
(System No. HW-D-0137 Continued)

FIBREX INSULATIONS INC — FBX Safing Insulation
OWENS CORNING HT INC, DIV OF
OWENS CORNING — Paroc Safing Insulation
ROCK WOOL MANUFACTURING CO — Delta Board
THERMAFIBER LLC — Type SAF

B. **Fill, Void or Cavity Material*— Sealant** — Min 1/8 in. wet thickness of fill material spray applied on each side of the wall between the top of the wall and the bottom of the steel floor or roof deck and overlap a min 1/2 in. onto gypsum board on both sides of wall. Additional 1/8 in. wet thickness of fill material shall overlap a min 1/2 in. onto the steel deck or concrete on both sides of the wall.

SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elastomeric Spray

*Bearing the UL Classification Mark



System No. HW-D-0139
May 23, 2000
Assembly Rating — 3 Hr
Nominal Joint Width — 1 In
Class II Movement Capabilities — 18.75% Compression or Extension

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Form Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.
   C. **Spray-Applied Fire Resistive Material*** — Prior to installation of the forming material (Item 3A) and sealant (Item 3B), steel floor units to be sprayed with a min 5/16 in. to max 11/16 in. thickness of material in accordance with the specifications in the individual D700 Series Design. Material is to be excluded from the steel deck in the area immediately above the wall. The spray applied fire resistive material is mixed with water in accordance with the mixing instructions on the bag. The min average density of the spray applied fire resistive material shall be 15 pcf with a min individual density of 14 pcf. See Design Information Section in Volume 1 of the Fire Resistance Directory for method of density determination.
      W R GRACE & CO — CONN
      CONSTRUCTION PRODUCTS DIV — Type MK-6/HY

1A . **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck.
   B. **Roof Insulation — Mineral and Fiber Board*** — Min 3/4 in. thick boards applied in one or more layers directly over steel roof deck or over gypsum board sheathing laid atop steel roof deck.
   C. **Roof Covering*** — Hot-mopped or cold-application materials compatible with mineral and fiber board insulation.
   D. **Spray-Applied Fire Resistive Material*** — Steel roof deck to be sprayed with a max 3/4 in.thickness of spray applied fire resistive material as specified in the individual P700 Series Roof-Ceiling design. Material is to be excluded from the steel deck in the area immediately above the wall. The spray applied fire resistive material is mixed with water in accordance with the mixing instructions on the bag. The min average density of the spray applied fire resistive material shall be 15 pcf with a min individual density of 14 pcf. See Design Information Section in Volume 1 of the Fire Resistance Directory for method of density determination.
      W R GRACE & CO — CONN
      CONSTRUCTION PRODUCTS DIV — Type MK-6/HY

2. **Wall Assembly** — Min 8 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Block*** .
   See **Concrete Block** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

3. **Joint System — Max separation between bottom of floor or roof deck and top of concrete wall (at time of installation of joint system) is 1 in. The joint system is designed to accommodate a max 18.75 percent compression or extension from its installed width.** The joint system shall consist of forming and fill materials, as follows:
   A. **Forming Material*** — Sections of min 6 pcf mineral wool batt insulation with a width equal to the thickness of the wall compressed 50 percent in thickness and installed cut edge first to completely fill the gap between the bottom of the steel deck and the top of the concrete wall. Min 9 in. thickness of min 6 pcf mineral wool batt insulation cut

(System No. HW-D-0139 Continued)

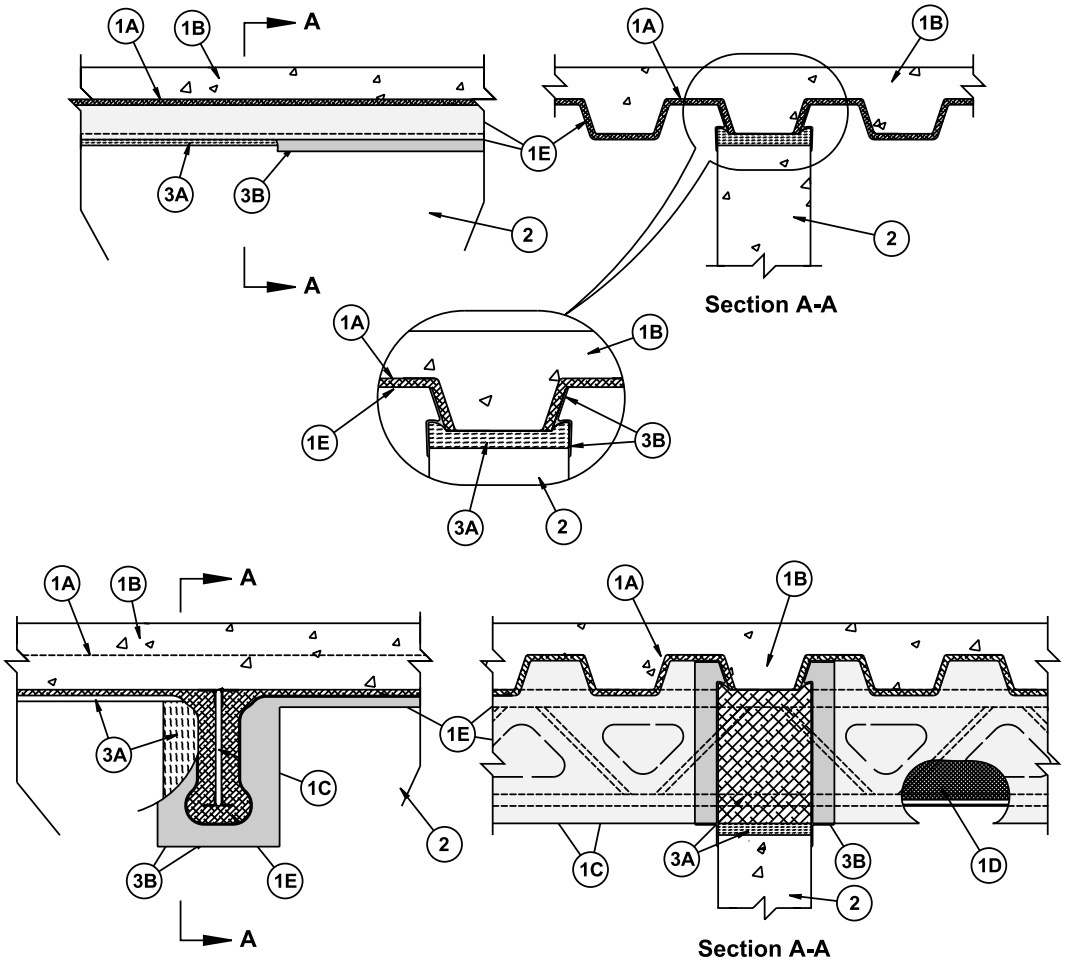
to the shape of the fluted deck installed into the flutes of the steel floor above the compressed mineral wool batt insulation atop the concrete wall. The mineral wool batt insulation is to be compressed min 14 percent in thickness such that it is flush with both sides of the wall.

FIBREX INSULATIONS INC — FBX Safing Insulation
OWENS CORNING HT INC, DIV OF
OWENS CORNING — Paroc Safing Insulation
THERMAFIBER LLC — Type SAF

B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness of fill material spray applied on each side of the wall in the flutes of the steel floor or roof deck and between the top of the wall and the bottom of the steel floor or roof deck and overlap a min 1/2 in. onto concrete and a min 2 in. onto the spray applied material (Item 1C) on both sides of wall.

SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elastomeric Spray

*Bearing the UL Classification Marking



System No. HW-D-0140
December 05, 2001
Assembly Rating — 3 Hr
Nominal Joint Width — 1 In.
Class II Movement Capabilities — 18.75% Compression or Extension

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.
   C. **Structural Steel Support** — (Optional) — Steel beam or open-web steel joist, as specified in the individual D700 Series Floor-Ceiling Design, used to support steel floor units. Structural steel support oriented perpendicular to wall assembly.
   D. **Steel Lath** — Where open-web steel joists pass through the fire rated wall, 3/8 in. diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd shall be secured to one side of each joist with steel tie wire and the lath shall be fully covered with spray applied fire resistive material with no min thickness requirement.
   E. **Spray-Applied Fire Resistive Material*** — Prior to installation of the forming material (Item 3A) and sealant (Item 3B), steel floor units and structural steel supports to be sprayed with the thickness of material specified in the individual D700 Series Design. Material is to be excluded from the steel deck in the area immediately above the wall. The spray applied fire resistive material is mixed with water in accordance with the mixing instructions on the bag. The min average density of the spray applied fire resistive material shall be 15 pcf with a min individual density of 14 pcf. See Design Information Section in Volume 1 of the Fire Resistance Directory for method of density determination.
      W R GRACE & CO — CONN
      CONSTRUCTION PRODUCTS DIV — Type MK-6/HY
2. **Wall Assembly** — Min 8 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Block*. Wall assembly to be centered beneath and parallel with valley of steel floor unit.
   See **Concrete Block** (CAZT) category in Fire Resistance Directory for names of manufacturers.

(System No. HW-D-0140 Continued)

3. **Joint System** — **Max separation between bottom plane of steel floor unit and top of concrete wall (at time of installation of joint system) is 1 in. Max separation between spray applied fire resistive material on bottom of structural support member and notched opening in top of wall is 1 in. Max clearance between spray applied fire resistive material on sides of structural steel member and notched opening in top of wall is 3 in. The joint system is designed to accommodate a max 18.75 percent compression or extension from its installed width as measured between bottom plane of steel floor unit and top of concrete wall.** The joint system shall consist of forming and fill materials, as follows:

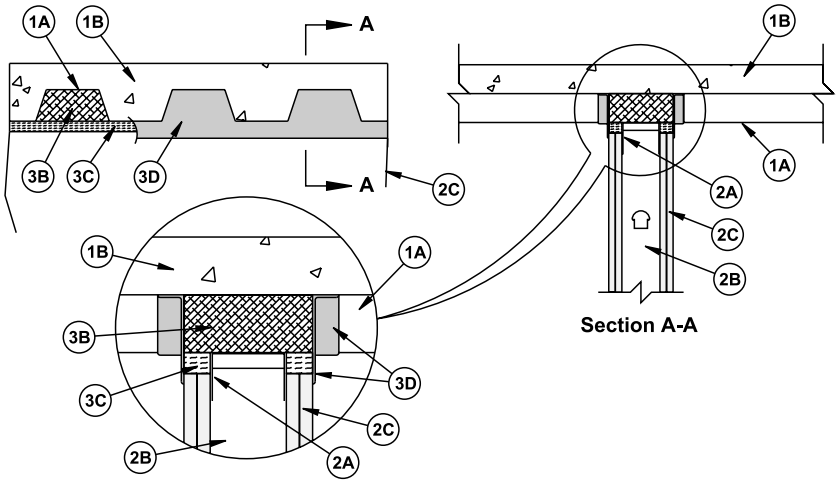
   A. **Forming Material*** — Nom 6 pcf mineral wool batt insulation cut to a length approx 1 in. longer than overall thickness of wall and inserted edge-first into the spaces between the spray applied fire resistive material on the structural steel member and the notched opening at the top of the wall. The thickness of forming material shall be sufficient to attain a min compression of 20 percent between the sides of the notched opening and the protected structural steel member and a min compression of 33 percent between the bottom of the notched opening and the bottom of the protected structural steel member. The mineral wool batt insulation is to be additionally compressed in the length direction such that it is flush with both surfaces of the wall. Additional min 8 in. wide sections of mineral wool batt insulation are compressed 50 percent in thickness and are installed cut edge first to completely fill the gap above the top of the wall. The forming material shall be installed flush with both surfaces of wall.

      FIBREX INSULATIONS INC — FBX Safing Insulation
      OWENS CORNING HT INC, DIV OF
      OWENS CORNING — Paroc Safing Insulation
      THERMAFIBER LLC — Type SAF

   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness of fill material spray applied over the forming material on each side of the wall. Fill material to overlap a min of 1/2 in. onto the concrete wall and a min 2 in. onto the spray applied material (Item 1C) on the steel floor unit and on the structural steel support member on both sides of wall.

      SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elastomeric Spray

*Bearing the UL Classification Mark



System No. HW-D-0152

November 29, 2001

Assembly Rating — 1, 2, 3 and 4 Hr (See Item 2)

Nominal Joint Widths — 1 and 2 in. (See Item 3)

Class II Movement Capabilities — 19% and 25% Compression and Extension (See Item 3)

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Floor Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.
   C. **Roof Covering*** — Hot-mopped or cold-application materials compatible with insulating concrete.

2. **Wall Assembly** — The 1, 2, 3 or 4 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs. Ceiling runner to be provided with min 1-1/4 in. to max 3 in. flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 3/4 in. to 1 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, ceiling runner is secured to steel floor or roof deck, perpendicular to steel deck direction, with steel fasteners or welds spaced max 24 in. OC.
   A1. **Light Gauge Framing*** — **Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.
      SLIPTRACK SYSTEMS INC — SLP-TRK
   A2. **Light Gauge Framing*** — **Vertical Deflection Ceiling Runner** — As an alternate to the ceiling runner in Items 2A and 2A1, vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips, provided with step bushings, for permanent fastening of steel studs. Vertical deflection ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.
      THE STEEL NETWORK INC — VertiTrack VTD358, VTD400, VTD600 and VTD800
   B. **Steel Studs** — Studs to be min 3-1/2 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner with sheet metal screws located 3/4 in. below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment.
   C. **Gypsum Board*** — Gypsum board sheets installed to a min total thickness of 5/8 in., 1-1/4 in., 1-1/2 in. or 2 in. on each side of wall for 1, 2, 3 and 4 hr fire-rated assemblies, respectively. Wall to be constructed as described in the individual U400 Series Design in the UL Fire Resistance Directory, except that a max 1 or 2 in. gap (See Item 3) shall be maintained between the top

(System No. HW-D-0152 Continued)

of the gypsum board and the bottom plane of the steel floor or roof deck. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel.

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

3. **Joint System** — **Max separation between bottom of floor or roof deck and top of gypsum board (at time of joint system installation) is 2 in. for 1 and 2 hr ratings and 1 in. for 3 and 4 hr ratings. The joint system is designed to accommodate a max 25 percent compression or extension from its installed width for 1 and 2 hr ratings and a max 19 percent compression or extension from its installed width for 3 and 4 hr ratings.** The joint system shall consist of spray applied fire resistive material, forming material and fill material, with or without a deflection channel (Item 3A), as follows:

   A. **Deflection Channel** — (Optional, Not Shown) — Min 24 gauge galv steel channel, 2 to 3 in. deep, sized to accommodate ceiling runner and steel studs. Deflection channel secured to steel floor or roof deck, perpendicular to steel deck direction, with steel fasteners or welds spaced max 24 in. OC. The ceiling runner is installed within the deflection channel to maintain a 3/4 in. to 1 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel.

   B. **Spray Applied Fire Resistive Material*** — Min 4-7/8 in., 6-1/8 in., 6-5/8 in. or 7-5/8 in. depth of spray applied fire resistive material for 1, 2, 3 and 4 hr fire-rated assemblies, respectively, installed into the flutes of the steel floor or roof deck between the top of the deflection channel and the steel deck. Prior to the installation of the spray applied fire resistive material in the flutes of the steel deck, temporary forms with a thickness equal to the overall thickness of the gypsum board shall be installed to cover the vertical legs of the ceiling runner channel or deflection channel. The spray applied fire resistive material is mixed with water in accordance with the mixing instructions on the bag and is sprayed and/or troweled to fill the flute above the channel and temporary forms. The min average density of the spray applied fire resistive material shall be 17.5 pcf with a min individual density of 16 pcf. See Design Information Section in Volume 1 of the Fire Resistance Directory for method of density determination.

      ISOLATEK INTERNATIONAL — Type 300

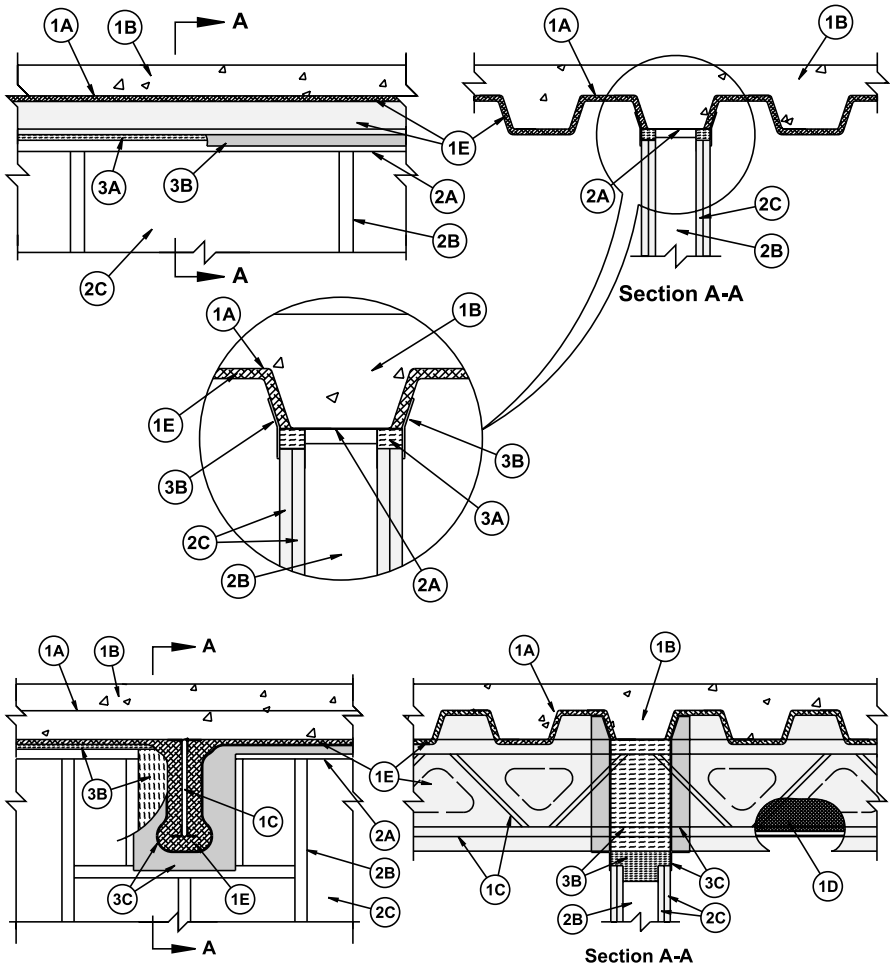
   C. **Forming Material*** — Strips of nominal 6 pcf density mineral wool batt insulation are to be compressed 50 percent in thickness and installed cut edge first to completely fill the gap between the spray applied fire resistive material and the top of the gypsum board. The forming material shall be installed flush with both surfaces of wall.

      FIBREX INSULATIONS INC — FBX Safing Insulation
      OWENS CORNING HT INC, DIV OF
      OWENS CORNING — Paroc Safing Insulation
      ROCK WOOL MANUFACTURING CO — Delta Board
      ROXUL INC — Safe
      THERMAFIBER LLC — SAF

   D. **Fill, Void or Cavity Material*** — **Sealant** — Minimum 1/8 in. wet thickness (min 1/16 in. dry) of fill material spray applied to cover the spray applied fire resistive material and the forming material on each side of the wall. The material shall be installed to overlap a minimum of 1/2 in. onto the gypsum board and a minimum of 1 in. on the steel floor or roof deck on both sides of wall.

      SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elastomeric Spray

*Bearing the UL Classification Mark



System No. HW-D-0153

December 05, 2000

Assembly Ratings — 1 and 2 Hr (See Item 1)

Nominal Joint Width — 1 in.

Class II Movement Capabilities — 18.75% Compression or Extension

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   - A. **Steel Floor and Floor Units*** — Max 3 in. deep galv steel fluted floor units.
   - B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.
   - C. **Structural Steel Support** — (Optional) — Steel beam or open-web steel joist, as specified in the individual D700 Series Floor-Ceiling Design, used to support steel floor units. Structural steel support oriented perpendicular to wall assembly.
   - D. **Steel Lath** — Where open-web steel joists pass through the fire rated wall, 3/8 in. diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd shall be secured to one side of each joist with steel tie wire and the lath shall be fully covered with spray applied fire resistive material with no min thickness requirement.
   - E. **Spray-Applied Fire Resistive Material*** — After installation of the ceiling runner (Item 2A) or deflection track (Item 3A, if used), steel floor units and structural steel supports to be sprayed with the thickness of material specified in the individual D700 Series Design. The spray applied fire resistive material is mixed with water in accordance with the mixing instructions on the bag and is sprayed onto steel deck and structural steel support. Material is to be excluded from the flanges of the ceiling runner or deflection track. The min average density of the spray applied fire resistive material shall be 17.5 pcf with a min individual density of 16 pcf. See Design Information Section in Volume 1 of the Fire Resistance Directory for method of density determination.

     ISOLATEK INTERNATIONAL — Type 300
2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

(System No. HW-D-0153 Continued)

A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with min 1-1/4 in. to max 2 in. flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 in. to 3/4 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, ceiling runner is secured to steel floor units (Item 1A) with steel fasteners or welds spaced max 24 in. OC. Ceiling runner or deflection channel to be centered beneath and parallel with valley of steel floor unit. A clearance of 1 in. shall be maintained between the end of the ceiling runner or deflection channel and the spray applied fire resistive material on the structural steel support members.

A1. **Light Gauge Framing*** — **Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Ceiling runner installed perpendicular to direction of fluted steel floor deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.

SLIPTRACK SYSTEMS INC — SLP-TRK

B. **Studs** — Steel studs to be min 3-5/8 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner (Item 2A) with sheet metal screws located 1/2 in. below the bottom of the deflection channel. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall. When deflection channel is not used, studs to nest in ceiling runner without attachment. A framed opening shall be constructed around each structural steel support member. A min clearance of 1 in. to a maximum clearance of 3 in. shall be maintained between the framing and the spray applied fire resistive material on the two sides of the structural support member. The clearance between the framing and the spray applied fire resistive material on the bottom of the structural steel support member shall be max 1 in.

C. **Gypsum Board*** — Gypsum board sheets installed to a min total 5/8 in. or 1-1/4 in. thickness on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed in the individual U400 Series Design in the UL Fire Resistance Directory, except that a max 1 in. gap shall be maintained between the top of the gypsum board and the bottom plane of the steel floor units and between the top edge of the gypsum board and the spray applied fire resistive material on the structural steel support member. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel.

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

3. **Joint System Max separation between bottom plane of steel floor unit and top of gypsum board (at time of installation of joint system) is 1 in. Max separation between spray applied fire resistive material on bottom of structural support member and framed opening in top of wall is 1 in.** The joint system is designed to accommodate a max 18.75 percent compression or extension from it's installed width as measured between the bottom plane of the steel floor units and the top of the gypsum board or between the spray applied fire resistive material on the structural steel member and the framed notch at the top of the wall, whichever is the smaller dimension. The joint system shall consist of forming and fill materials, with or without a deflection channel (Item 3A), as follows:

A. **Deflection Channel** — (Optional, Not Shown) — Min 24 gauge galv steel channel, 1-1/4 to 2 in. deep, sized to accommodate ceiling runner (Item 2A). Deflection channel installed parallel with and centered beneath valley of steel floor unit (Item 1A) and secured to steel floor unit with steel fasteners or welds spaced max 24 in. OC. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1/2 in. to 3/4 in. gap between the top of the ceiling runner and the top of the deflection channel. A clearance of 1 in. shall be maintained between the end of the deflection channel and the spray applied fire resistive material on the structural steel support members. The ceiling runner nests inside the deflection channel without attachment.

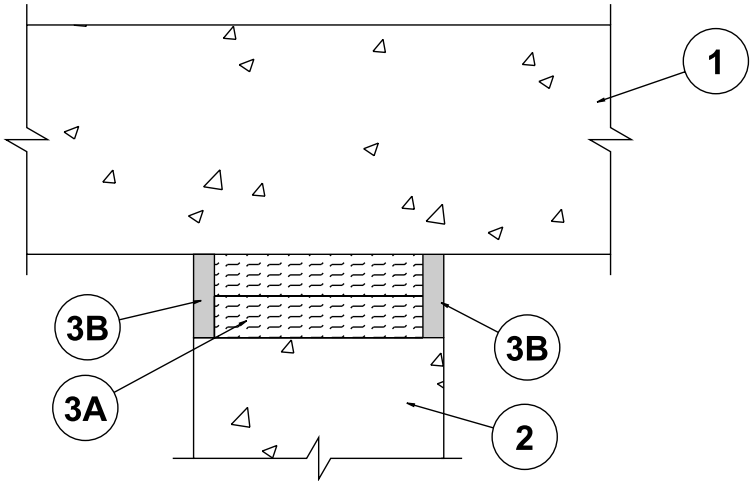
B. **Forming Material*** — Nom 6 pcf mineral wool batt insulation cut to a length approx 1 in. longer than overall thickness of wall and inserted cut edge first into the spaces between the spray applied fire resistive material on the structural steel member and the framed notch at the top of the wall. The thickness of forming material shall be sufficient to attain a min compression of 20 percent between the sides of the framed notch and the protected structural steel member and a min compression of 33 percent between the bottom of the framed notch and the bottom of the protected structural steel member. The mineral wool batt insulation is to be additionally compressed in the length direction such that it is flush with the gypsum board surface on both sides of the wall. Additional sections of mineral wool batt insulation are compressed 50 percent in thickness and are installed cut edge first to completely fill the gap above the top of the gypsum board. The forming material shall be installed flush with both surfaces of wall.

FIBREX INSULATIONS INC — FBX Safing Insulation
OWENS CORNING HT INC, DIV OF
OWENS CORNING — Paroc Safing Insulation
ROCK WOOL MANUFACTURING CO — Delta Board
THERMAFIBER LLC — Type SAF

C. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness of fill material spray applied over the forming material on each side of the wall. Fill material to overlap a min of 1/2 in. onto the gypsum board and a min 2 in. onto the spray applied material (Item 1C) on the steel floor unit and on the structural steel support member on both sides of wall.

SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elasomeric Spray

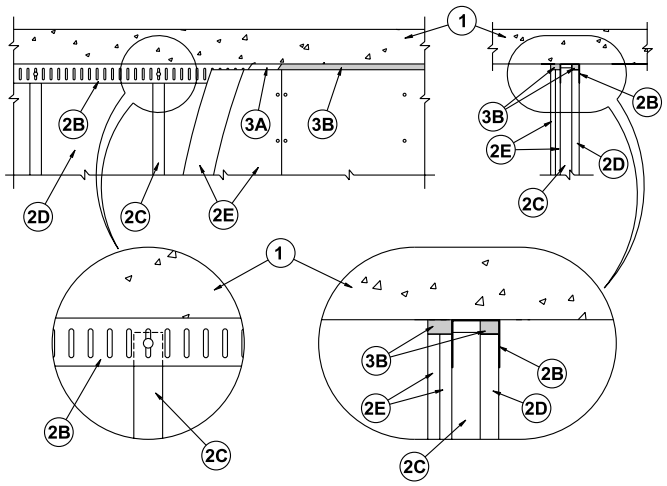
*Bearing the UL Classification Mark



System No. HW-D-0156
September 25, 2001
Assembly Rating — 4 Hr
Nominal Joint Width — 2 in.
Class II Movement Capabilities — 12.5% Compression or Extension

1. **Floor Assembly** — Min 5-1/2 in. thick steel reinforced lightweight or normal weight (100-150 pcf) structural concrete.
2. **Wall Assembly** — Min 6 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*** .
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
3. **Joint System** — **Max width of joint (at time of installation of joint system) is 2 in. The joint system is designed to accommodate a max 12.5 percent compression or extension from its installed width.** The joint system shall consist of forming and fill materials, as follows:
   A. **Forming Material*** — Min 4 pcf mineral wool batt insulation installed in joint opening as a permanent form. Pieces of batt cut to min width of 5 in. and installed vertically, edge-first into joint opening, such that batt sections are compressed min 50 percent in thickness and that the compressed batt sections are recessed from each surface of the wall as required to accommodate the required thickness of fill material. Adjoining lengths of batt to be tightly butted with butted seams spaced min 16 in. apart along the length of the joint.
      FIBREX INSULATIONS INC — FBX Safing Insulation
      OWENS CORNING HT INC, DIV OF
      OWENS CORNING — Safing Insulation/MW
      ROCK WOOL MANUFACTURING CO — Delta Board
      THERMAFIBER LLC — Type SAF
   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/2 in. thickness of fill material applied within the joint on each side of wall, flush with wall surfaces.
      SPECIFIED TECHNOLOGIES INC — SpecSeal ES Sealant

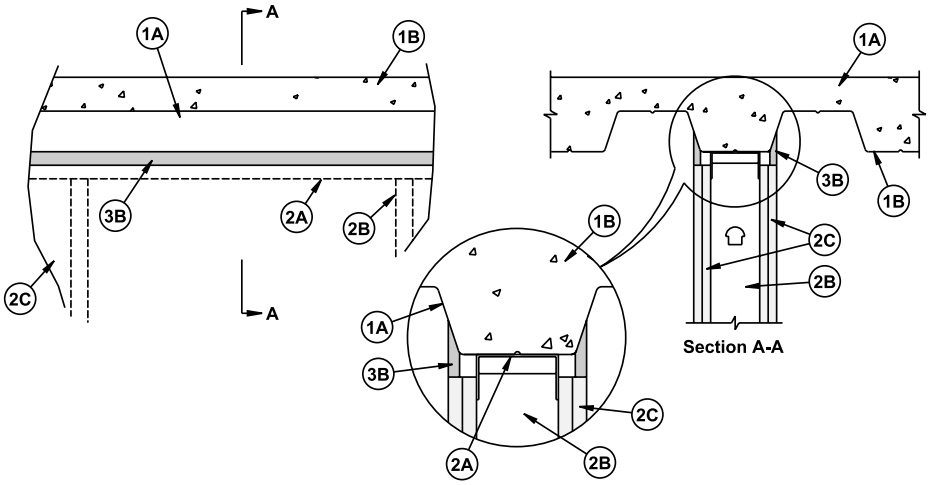
*Bearing the UL Classification Mark



System No. HW-D-0194
July 24, 2001
Assembly Rating — 2 Hr
Joint Width — 3/4 in. Max
Class II Movement Capabilities — 25 Percent Compression or Extension

1. **Wall Assembly** — Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete.
2. **Shaft Wall Assembly** — With the exception of the ceiling runner, the 2 hr fire rated shaft wall assembly shall be constructed of the materials and in the manner described in System B of Design No. U415 in the UL Fire Resistance Directory. The wall shall include the following construction features:
   A. **Floor and Wall Runners** — (Not Shown) — "J"-shaped runner, min 2-1/2 in. wide with unequal legs of 1 in. and 2 in., fabricated from min 24 MSG galv steel. Runners positioned with short leg toward finished side of wall. Runners attached to walls and floor with steel fasteners spaced max 24 in. OC. As an alternate to the "J"-shaped runner, a min 2-1/2 in. wide by 1 or 1-1/4 in. deep channel formed from min 24 MSG galv steel may be used for the floor runner.
   B. **Light Gauge Framing*** — **Slotted Ceiling Track** — Slotted ceiling track shall consist of galv steel channels with slotted flanges. Slotted ceiling track sized to accommodate steel "C-H" studs (Items 2C). Attached to concrete at ceiling with steel fasteners spaced max 12 in. OC.
      SLIPTRACK SYSTEMS INC — SLP-TRK
   C. **Steel Studs** — "C-H"-shaped steel studs to be min 2-1/2 in. wide and formed of min 24 MSG galv steel. Studs cut 1/2 to 3/4 in. less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in slotted ceiling track. Studs spaced 24 in. OC. After installation of gypsum board liner panels (Item 2D), studs secured to flange of floor runner on finished side of wall only with No. 6 by 1/2 in. long self-drilling, self-tapping steel screws. Studs secured to flange of slotted ceiling track on finished side of wall only with No. 8 by 1/2 in. long self-drilling, self-tapping wafer head steel screws at slot midheight.
   D. **Gypsum Board*** — 1 in. thick by 24 in. wide gypsum board liner panels as specified in Design No. U415. Panels cut 3/4 in. less in length than floor to ceiling height. Vertical edges inserted in "H"-shaped section of "C-H" studs. Free edge of end panels attached to long leg of "J" runner (Item 2A) with 1-5/8 in. long Type S steel screws spaced max 12 in. OC.
   E. **Gypsum Board*** — Gypsum board sheets, 1/2 or 5/8 in. thick, applied vertically or horizontally in two layers on finished side of wall as specified in System B of Design No. U415. A max 3/4 in. gap shall be maintained between the top of the gypsum board and the bottom surface of the concrete floor. The screws attaching the gypsum board layers to the C-H studs shall be located 1 in. below the bottom of the slotted ceiling track (Item 2C). No gypsum board attachment screws are to penetrate the slotted ceiling track.
3. **Joint System** — Max separation between bottom of floor and top of liner panel (Item 2D) and between bottom of floor and top of gypsum board sheets (Item 2E) at time of installation of joint system is 3/4 in. The joint system is designed to accommodate a maximum 33 percent compression or extension from its installed width. The joint system consists of bond breaker tape and sealant, as follows:
   A. **Bond Breaker Tape** — Polyethylene tape supplied in rolls. Tape applied to flanges of slotted ceiling track (Item 2D) to prevent bonding of the sealant at points other than the top and bottom of the linear gap.
   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1 in. depth of sealant to be installed to fill linear gap between top of gypsum board liner panel (Item 2D) and top inside surface of slotted ceiling track (Item 2B) prior to installation of gypsum board sheets on finished side of wall. Min 1 in. depth of sealant to be installed to fill linear gap between top of gypsum board sheets (Item 2E) and bottom of concrete floor.
      SPECIFIED TECHNOLOGIES INC — SpecSeal ES Elastomeric Sealant or SpecSeal LCI Sealant. When SpecSeal LCI Sealant is used, the movement capability of the joint is limited to 25 percent in compression only.

*Bearing the UL Classification Mark



System No. HW-D-0210
December 03, 2001
Assembly Ratings — 1 and 2 Hr (See Item 2)
Joint Width — 3/4 in. Maximum
Class II Movement Capabilities — 25% Compression

1. **Floor Assembly** —The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Form Units*** — Max 3 in. deep galv steel fluted floor units having a min valley width of 4-3/4 in.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck having a min valley width of 4-3/4 in.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.

2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs. When deflection channel (Item 3A) is used, ceiling runner to be provided with min 2 in. flanges. Ceiling runner installed within the deflection channel with a 1/2 in. to 3/4 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, flange height of ceiling runner shall be min 1/2 in. greater than nom joint width. Ceiling runner installed parallel with steel floor or roof deck, centered on steel deck valley, and secured with steel fasteners or welds spaced max 24 in. OC.
   A1. **Light Gauge Framing*** — **Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Items 2B). Slotted ceiling runner installed parallel with steel floor or roof deck, centered on valley, and secured with steel fasteners or welds spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.
   SLIPTRACK SYSTEMS INC — SLP-TRK
   B. **Studs** — Steel studs to be min 3-1/2 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner with sheet metal screws located 1/2 in. below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall. Stud spacing not to exceed 24 in. OC.
   C. **Gypsum Board*** — Gypsum board sheets installed to a min total thickness of 5/8 in. and 1-1/4 in. on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a nom 3/4 in. gap shall be maintained between the top of the wallboard and the bottom surface of the steel floor units. In addition, the top row of screws shall be installed into the steel studs 1/2 to 1 in. below the bottom edge of the ceiling runner flange.

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

3. **Joint System** — Max separation between bottom of floor or roof deck and top of wall is 3/4 in. The joint system is designed to accommodate a max 25 percent compression from its installed width. The joint system consists of the following:

(System No. HW-D-0210 Continued)

(System No. HW-D-0210 Continued)

A. **Deflection Channel** — (Optional, Not Shown) — Max 2 in. deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection channel centered on valley of fluted steel floor or roof deck and secured with steel fasteners or welds spaced max 24 in. OC. The ceiling runner is installed within the deflection channel to maintain a 1/2 in. to 3/4 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel.

B. **Forming Material** — (Optional, Not Shown) — In 2 hr fire rated wall assemblies, foam backer rod friction fit into joint opening and recessed minimum 1/2 in. from each surface of wall.

C. **Fill, Void or Cavity Material*** — **Sealant** — Minimum 1/2 in. thickness of fill material applied within joint opening on both sides of wall, flush with both surfaces of wall. In 1 hr fire rated walls, apply bond breaker tape to ceiling channel (Item 2A) or deflection channel (Item 3A) prior to installation of fill material.

SPECIFIED TECHNOLOGIES INC — SpecSeal ES Elastomeric Sealant

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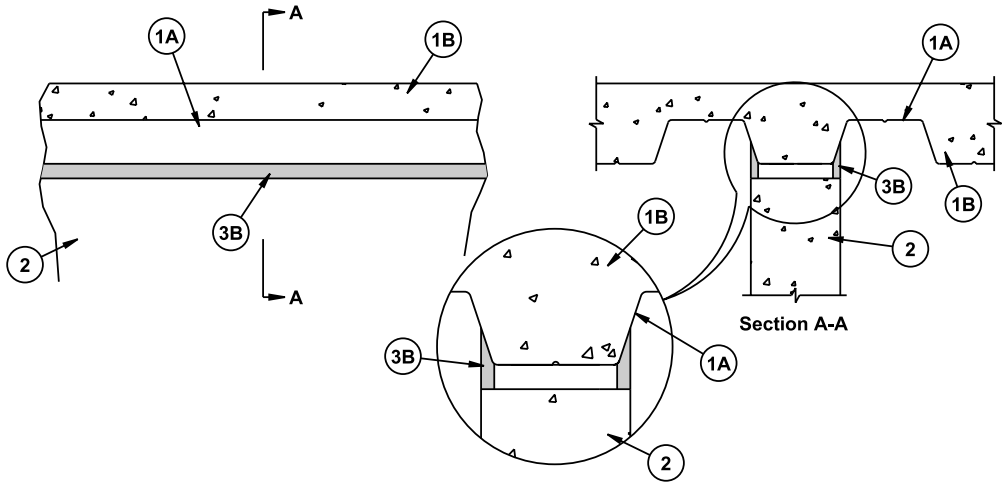

System No. HW-D-0236
December 03, 2001
Assembly Rating — 2 Hr
Joint Width — 3/4 in. Maximum
Class II Movement Capabilities— 25% Compression

1. **Floor Assembly** —The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Form Units*** — Max 3 in. deep galv steel fluted floor units having a min valley width of 4-3/4 in.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck having a min valley width of 4-3/4 in.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.

2. **Wall Assembly** — **Wall Assembly** — Min 6-1/8 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*** Wall assembly to be centered under and parallel with valley of fluted steel floor unit.
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

3. **Joint System** — Max separation between bottom of floor or roof deck and top of wall is 3/4 in. The joint system is designed to accommodate a max 25 percent compression from its installed width. The joint system consists of the following:
   A. **Forming Material** — (Optional, Not Shown) — Foam backer rod friction fit into joint opening and recessed minimum 1/2 in. from each surface of wall.
   B. **Fill, Void or Cavity Material*** — **Sealant** — Minimum 1/2 in. thickness of fill material applied within joint opening on both sides of wall, flush with both surfaces of wall.
      SPECIFIED TECHNOLOGIES INC — SpecSeal ES Elastomeric Sealant

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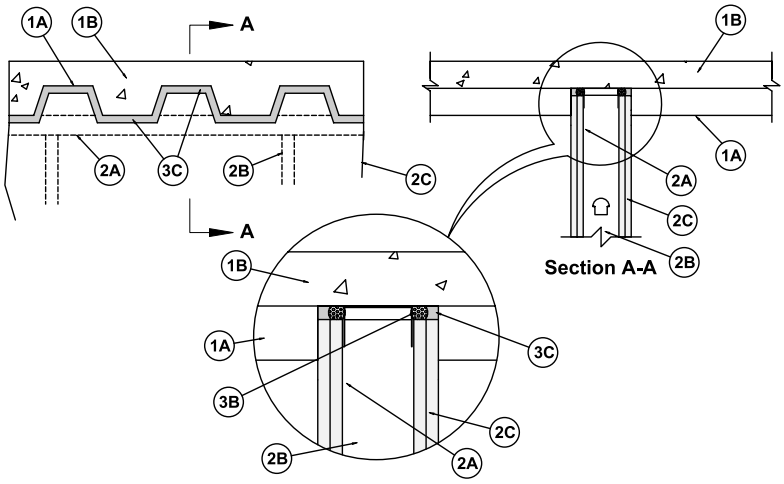

System No. HW-D-0241
Assembly Ratings — 1 and 2 Hr (See Item 2)
Joint Width — 3/4 in. Max
Class II Movement Capabilities— 33% Compression

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the floor assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The floor assembly shall include the following construction features:
   A. **Steel Floor And Form Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.

2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs. Ceiling runner to be provided with min 1-1/4 in. to max 2 in. flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 in. to 3/4 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, ceiling runner is secured to steel floor or roof deck, perpendicular to steel deck direction, with steel fasteners or welds spaced max 24 in. OC.

   A1. **Light Gauge Framing*** — **Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Items 2B). Ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners or welds spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.

   SLIPTRACK SYSTEMS INC — SLP-TRK

   B. **Studs** — Steel studs to be min 3-1/2 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner with sheet metal screws located 1/2 in. below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall.

   C. **Gypsum Board*** — Gypsum board sheets installed to a min total thickness of 5/8 in. and 1-1/4 in. on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual U400 or V400 Series Design in the UL Fire Resistance Directory except that the gypsum board is cut to follow the contour of the steel floor units with a nom 3/4 in. gap maintained between the gypsum board and the steel deck. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel.

The hourly fire rating of the joint system is dependent on the hourly fire rating of the wall assembly in which it is installed.

(System No. HW-D-0241 Continued)

3. **Joint System** — **Max separation between bottom of floor or roof deck and top of wall is 3/4 in. The joint system is designed to accommodate a max 33 percent compression from its installed width.** The joint system consists of the following:
   A. **Deflection Channel** — (Optional, Not Shown) — Max 2 in. deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection channel secured to steel floor or roof deck perpendicular to steel deck direction, and secured with steel fasteners or welds spaced max 24 in. OC. The ceiling runner is installed within the deflection channel to maintain a 1/2 in. to 3/4 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel.
   B. **Forming Material** — (Optional, Not Shown) — In 2 hr fire rated wall assemblies, foam backer rod friction fit into joint opening and recessed minimum 1/2 in. from each surface of wall.
   C. **Fill, Void or Cavity Material*** — **Sealant** — Minimum 1/2 in. thickness of fill material applied within joint opening on both sides of wall, flush with both surfaces of wall. In 1 hr fire rated walls, apply bond breaker tape to ceiling channel (Item 2A) or deflection channel (Item 3A) prior to installation of fill material.
      SPECIFIED TECHNOLOGIES INC — SpecSeal LCI Sealant

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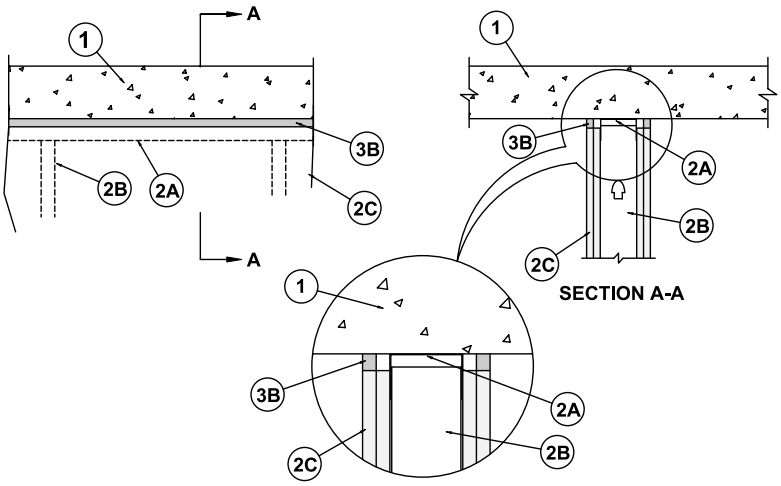

System No. HW-D-0242
Assembly Ratings — 1 and 2 Hr (See Item 2)
Joint Width — 3/4 in. Max
Class II Movement Capabilities — 33% Compression

1. **Floor Assembly** — Min 4-1/2 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) structural concrete.
2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B) with min 1-1/4 in. to max 2 in. flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 in. to 3/4 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, ceiling runner is secured to concrete floor with steel fasteners spaced max 24 in. OC.
   A1. **Light Gauge Framing*** — **Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Items 2B). Ceiling runner secured to bottom of concrete floor with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.
   SLIPTRACK SYSTEMS INC — **SLP-TRK**
   B. **Studs** — Steel studs to be min 3-1/2 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner with sheet metal screws located 1/2 in. below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall.
   C. **Gypsum Board*** — Gypsum board sheets installed to a min total thickness of 5/8 in. and 1-1/4 in. on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a max 3/4 in. gap shall be maintained between the top of the gypsum board and the bottom surface of the floor. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel.

   The hourly fire rating of the joint system is dependent on the hourly fire rating of the wall assembly in which it is installed.
3. **Joint System** — **Max separation between bottom of floor and top of wall is 3/4 in. The joint system is designed to accommodate a max 33 percent compression from its installed width.** The joint system consists of the following:
   A. **Deflection Channel** — (Optional, Not Shown) — Max 2 in. deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection channel secured to bottom of concrete floor with steel fasteners spaced max 24 in. OC. The ceiling runner is installed within the deflection channel to maintain a 1/2 in. to 3/4 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel.
   B. **Forming Material** — (Optional, Not Shown) — In 2 hr fire rated wall assemblies, polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction fit into joint opening.
   C. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/2 in. thickness of fill material applied within joint opening on both sides of wall, flush with both surfaces of wall. In 1 hr fire rated walls, bond breaker tape applied to ceiling channel (Item 2A or 2A1) prior to installation of fill material.
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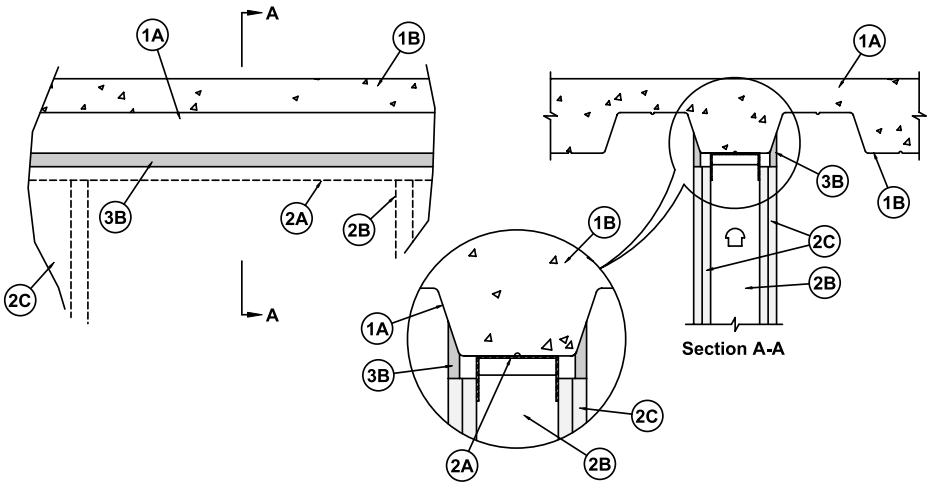

System No. HW-D-0243
Assembly Ratings — 1 and 2 Hr (See Item 2)
Joint Width — 3/4 in. Max
Class II Movement Capabilities — 33% Compression

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Form Units*** — Max 3 in. deep galv steel fluted floor units having a min valley width of 4-3/4 in.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck having a min valley width of 4-3/4 in.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.

2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs. When deflection channel (Item 3A) is used, ceiling runner to be provided with min 2 in. flanges. Ceiling runner installed within the deflection channel with a 1/2 in. to 3/4 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, flange height of ceiling runner shall be min 1/2 in. greater than nom joint width. Ceiling runner installed parallel with steel floor or roof deck, centered on steel deck valley, and secured with steel fasteners or welds spaced max 24 in. OC.
   A1. **Light Gauge Framing*** — **Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Items 2B). Slotted ceiling runner installed parallel with steel floor or roof deck, centered on valley, and secured with steel fasteners or welds spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.
      SLIPTRACK SYSTEMS INC — SLP-TRK
   B. **Studs** — Steel studs to be min 3-1/2 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner with sheet metal screws located 1/2 in. below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall. Stud spacing not to exceed 24 in. OC.
   C. **Gypsum Board*** — Gypsum board sheets installed to a min total thickness of 5/8 in. and 1-1/4 in. on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a nom 3/4 in. gap shall be maintained between the top of the gypsum board and the bottom surface of the steel floor units. In addition, the top row of screws shall be installed into the steel studs 1/2 to 1 in. below the bottom edge of the ceiling runner flange.

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

3. **Joint System** — **Max separation between bottom of floor or roof deck and top of wall is 3/4 in. The joint system is designed to accommodate a max 33 percent compression from its installed width.** The joint system consists of the following:
   A. **Deflection Channel** — (Optional, Not Shown) — Max 2 in. deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection channel centered on valley of fluted steel floor or roof deck and secured with steel fasteners or welds spaced max 24 in. OC. The ceiling runner is installed within the deflection channel to maintain a 1/2 in. to 3/4 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel.
   B. **Forming Material** — (Optional, Not Shown) — In 2 hr fire rated wall assemblies, foam backer rod friction fit into joint opening and recessed min 1/2 in. from each surface of wall.
   C. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/2 in. thickness of fill material applied within joint opening on both sides of wall, flush with both surfaces of wall. In 1 hr fire rated walls, bond breaker tape applied to ceiling channel (Item 2A) or deflection channel (Item 3A) prior to installation of fill material.
      SPECIFIED TECHNOLOGIES INC — SpecSeal LCI Sealant

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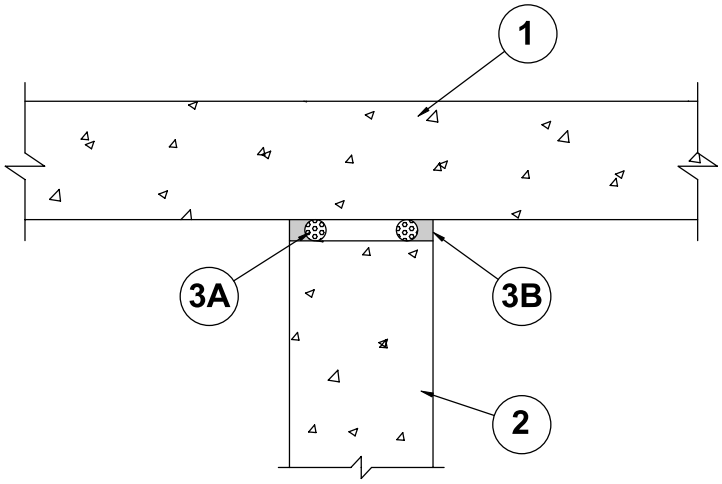

System No. HW-D-0244
Assembly Rating — 2 Hr
Joint Width — 3/4 in. Max
Class II Movement Capabilities — 33% Compression

1. **Floor Assembly** — Min 4-1/2 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) structural concrete.
2. **Wall Assembly** — Min 6-1/8 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.**
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
3. **Joint System** — **Max separation between bottom of floor and top of wall is 3/4 in**. The joint system is designed to accommodate a max 33 percent compression from its installed width. The joint system consists of the following:
   A. **Forming Material** — Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction fit into joint opening and recessed 1/2 in. from each surface of wall.
   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/2 in. thickness of fill material applied within joint opening on both sides of wall, flush with both surfaces of wall.
      SPECIFIED TECHNOLOGIES INC — SpecSeal LCI Sealant

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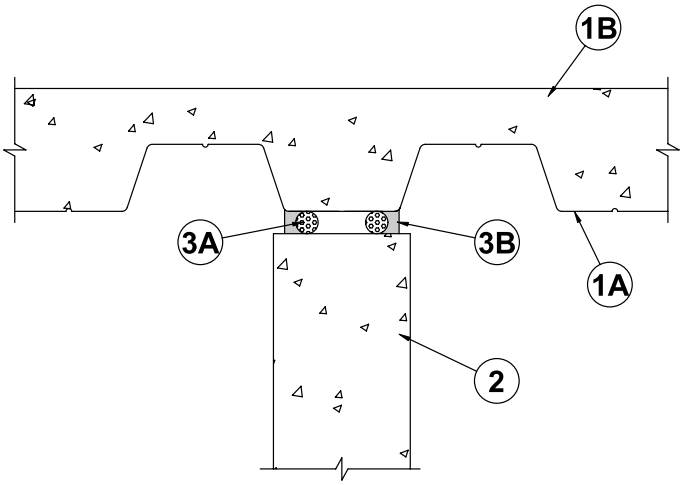

System No. HW-D-0245
Assembly Rating — 2 Hr
Joint Width — 3/4 in. Max
Class II Movement Capabilities — 33% Compression

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Form Units*** — Max 3 in. deep galv steel fluted floor units having a min valley width of 4-3/4 in.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:
   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck having a min valley width of 4-3/4 in.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the steel roof deck.

2. **Wall Assembly** — Min 6-1/8 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Wall assembly to be centered under and parallel with valley of fluted steel floor unit.

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

3. **Joint System** — **Max separation between bottom of floor or roof deck and top of wall is 3/4 in. The joint system is designed to accommodate a max 33 percent compression from its installed width.** The joint system consists of the following:
   A. **Forming Material** — Foam backer rod, mineral wool batt insulation or glass fiber insulation friction fit into joint opening and recessed min 1/2 in. from each edge of steel deck valley.
   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/2 in. thickness of fill material applied within joint opening on both sides of wall, flush with edges of steel deck valley.

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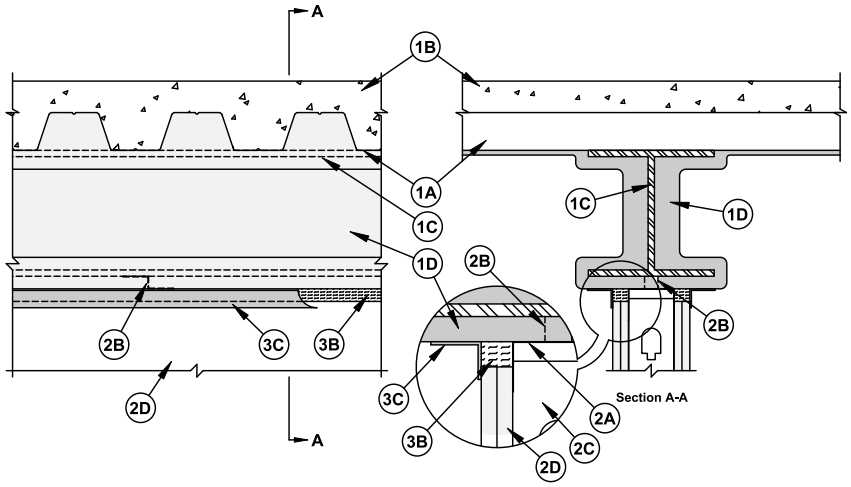

System No. HW-D-0252
Assembly Ratings — 1 and 2 Hr (See Item 1D)
Nominal Joint Width — 1 in.
Class II Movement Capabilities — 18.75% Compression or Extension

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Floor Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.
   C. **Structural Steel Support** — Steel beam, as specified in the individual D700 Series Floor-Ceiling Design, used to support steel floor units. Steel beam centered over and parallel with wall assembly.
   D. **Spray-Applied Fire Resistive Material*** — After installation of the steel attachment clips (Item 2B), steel floor units and structural steel support to be sprayed with the min thickness of material specified in the individual D700 Series Design. The flutes of the steel floor units are to be filled with material across the entire top flange of the steel beam. Additional material shall be applied to the web of the steel beam on each side of the wall. **For a 1 hr Assembly Rating, the thickness of material applied to each side of the steel beam web shall be 1-1/4 in. For a 2 hr Assembly Rating, the thickness of material applied to each side of the steel beam web shall be 2 in.**
      W.R. Grace & Co. — Conn Construction Products Div. — Type MK-6/HY
      Isolatek International – Type 300
2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with min 1-1/4 in. to max 2 in. flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 in. to 3/4 in. gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, ceiling runner is secured to steel beam (Item 1A) with steel attachment clips (Item 2B) spaced max 24 in. OC. Ceiling runner or deflection channel to be centered beneath and parallel with bottom flange of steel beam. A clearance equal to the required thickness of spray-applied fireproofing material (Item 1D) shall be maintained between the top of the ceiling runner or deflection channel and the bottom flange of the steel beam.
   B. **Steel Attachment Clips** — Z-shaped clips formed from 1 in. wide strips of min 20 ga galv steel. Clips to be sized to extend through the thickness of the spray-applied fire-resistive material on the bottom flange of the steel beam with 2 in. long upper and lower legs. Legs of clips fastened to bottom of beam (prior to application of spray-applied fire-resistive materials) and top of ceiling runner (or deflection channel) with steel fasteners or welds. Clips spaced max 16 in. OC.
   C. **Studs** — Steel studs to be min 3-1/2 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner (Item 2A) with sheet metal screws located 1/2 in. below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment.
   D. **Gypsum Board*** — Gypsum board sheets installed to a min total 5/8 in. or 1-1/4 in. thickness on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed in accordance with the individual U400 Series Design in the UL Fire Resistance Directory, except that a max 1 in. high gap shall be maintained between the top of the gypsum board and the bottom plane of the spray applied fire resistive material on the structural steel support member. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel.

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

(System No. HW-D-0252 Continued)

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FOD-3540

3. **Joint System** — Max separation between spray applied fire resistive material on bottom of structural support member and top of gypsum board (at time of installation of joint system) is 1 in. The joint system is designed to accommodate a max 19 percent compression or extension from it's installed width as measured between bottom plane of the protective material on the steel beam and the top of the gypsum board. The joint system shall consist of forming and fill materials, with or without a deflection channel (Item 3A), as follows:
   A. **Deflection Channel** — (Optional, Not Shown) — Max 2 in. deep min 24 gauge galv steel channel sized to accommodated ceiling runner (Item 2A). Deflection channel installed parallel with and centered beneath bottom flange of steel beam (Item 1C) and secured to steel beam with steel clips (Item 2B) spaced max 16 in. OC. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1/2 in. to 3/4 in. gap between the top of the ceiling runner and the top of the deflection channel. A clearance equal to the required thickness of spray-applied fireproofing material (Item 1D) shall be maintained between the top of the ceiling runner or deflection channel and the bottom flange of the steel beam. The ceiling runner nests inside the deflection channel without attachment.
   B. **Forming Material*** — Sections of nom 6 pcf mineral wool batt insulation to be compressed 50 percent in thickness and installed cut edge first to completely fill the gap above the top of the gypsum board. The forming material shall be installed flush with both surfaces of wall.
      Fibrex Insulation Inc. — FBX Safing Insulation
      Thermafiber LLC.— Type SAF
      Owens Corning — Paroc Safing Insulation
      Rock Wool Mfg — Delta Safing Insulation
   C. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness of fill material spray applied over the forming material on each side of the wall. Fill material to overlap min 1/2 in. onto gypsum board and min 2 in. onto the spray applied material (Item 1D) on the steel beam on both sides of wall.
      Specified Technologies Inc.— SpecSeal AS200 Elastomeric Spray

* Bearing the UL Classification Marking

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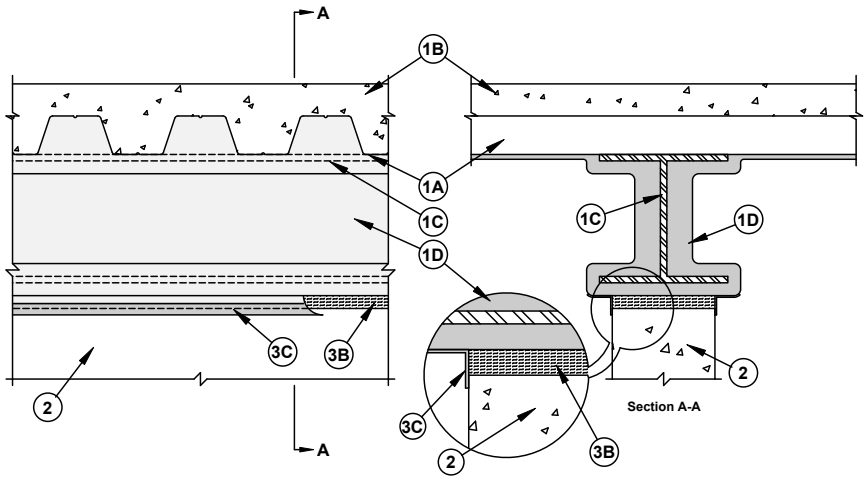

System No. HW-D-0253
Assembly Ratings — 2 and 3 Hr (See Item 1D)
Nominal Joint Width — 1 in.
Class II Movement Capabilities — 19% Compression or Extension

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor And Floor Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.
   C. **Structural Steel Support** — Steel beam, as specified in the individual D700 Series Floor-Ceiling Design, used to support steel floor units. Steel beam centered over and parallel with wall assembly.
   D. **Spray-Applied Fire Resistive Material*** — Steel floor units and structural steel support to be sprayed with the thickness of material specified in the individual D700 Series Design. The flutes of the steel floor units are to be filled with material across the entire top flange of the steel beam. Additional material shall be applied to the web of the beam on each side of the wall. **For a 2 hr Assembly Rating, the thickness of material applied to each side of the steel beam web shall be 2 in. For a 3 hr Assembly Rating, the thickness of material applied to each side of the steel beam web shall be 3 in.**
      W.R. Grace & Co. — **Conn Construction Products Div.** — Type MK-6/HY
      Isolatek International — Type 300
2. **Wall Assembly** — Min 8 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Block***. Concrete wall to be centered beneath and parallel with bottom of structural support beam.
      See **Concrete Block** (CAZT) category in Fire Resistance Directory for names of manufacturers
3. **Joint System** — Max separation between spray applied fire resistive material on bottom of structural support member and top of concrete wall (at time of installation of joint system) is 1 in. The joint system is designed to accommodate a max 19 percent compression or extension from it's installed width as measured between bottom plane of structural support member and top of concrete wall. The joint system shall consist of forming and fill materials as follows:
   A. **Forming Material*** — Min 8 in. wide section of nom 6 pcf mineral wool batt insulation compressed 50 percent in thickness and installed cut edge first to completely fill the gap above the top of the concrete wall. The forming material shall be installed flush with both surfaces of wall.
      Fibrex Insulation Inc. — FBX Safing Insulation
      Thermafiber LLC.— Type SAF
      Owens Corning — Paroc Safing Insulation
      Rock Wool Mfg — Delta Safing Insulation
   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness of fill material spray applied over the forming material on each side of the wall. Fill material to overlap min 1/2 in. onto concrete and min 2 in. onto the spray applied material (Item 1D) on the structural steel support member on both sides of wall.
      Specified Technologies Inc.— SpecSeal AS200 Elastomeric Spray

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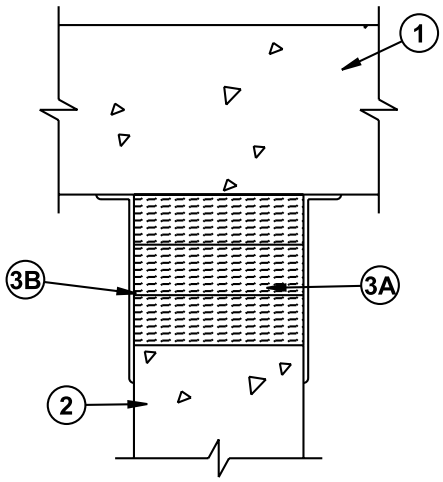
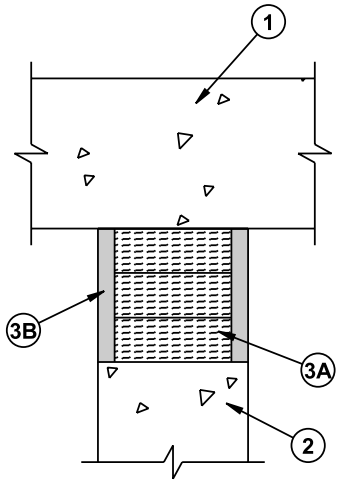


System No. HW-D-1005
December 01, 2000
Assembly Rating — 2 Hr
Nominal Joint Width — 4 In.
Class II Movement Capabilities — 15% Compression

1. **Floor Assembly** — Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete.
2. **Wall Assembly** — Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.**
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
3. **Joint System** — **Max separation between bottom of floor and top of wall (at time of installation of joint system) is 4 in. The joint system is designed to accommodate a max 15 percent compression or extension from its installed width.** The joint system shall consist of the following:
   A. **Forming Material*** — Min 4 pcf mineral wool batt insulation installed in joint opening as a permanent form. Pieces of batt cut to min width of 4 in. and installed edge-first into joint opening, parallel with joint direction, such that batt sections are compressed min 33 percent in thickness and that the compressed batt sections are recessed from each surface of the wall as required to accommodate the required thickness of fill material. Adjoining lengths of batt to be tightly-butted with butted seams spaced min 16 in. apart along the length of the joint.
      FIBREX INSULATIONS INC — FBX Safing Insulation
      OWENS CORNING HT INC, DIV OF
      OWENS CORNING — Paroc Safing Insulation
      ROCK WOOL MANUFACTURING CO — Delta Board
      THERMAFIBER LLC — Type SAF
   B. **Fill, Void or Cavity Material*** — **Spray** — Min 3/16 in. wet thickness of fill material applied within the joint, flush with each surface of wall and lapping a min 1 in. onto the bottom surface of the floor and each surface of wall.
      SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elastomeric Spray

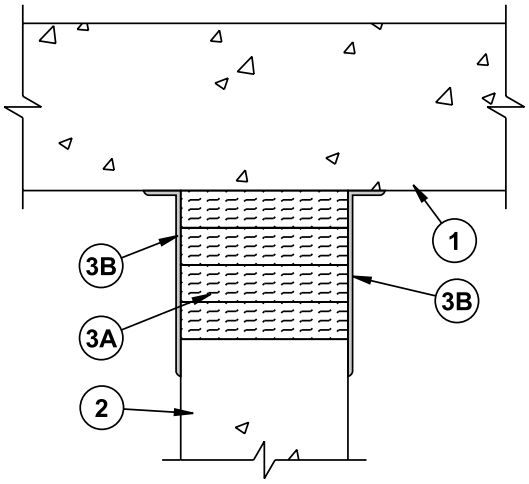
*Bearing the UL Classification Mark



System No. HW-D-1006
September 25, 2001
Assembly Rating — 3 Hr
Nominal Joint Width — 4 In.
Class II Movement Capabilities — 15% Compression or Extension

1. **Floor Assembly** — Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete.
2. **Wall Assembly** — Min 5 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.**
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
3. **Joint System** — **Max separation between bottom of floor and top of wall (at time of installation of joint system) is 4 in. The joint system is designed to accommodate a max 15 percent compression or extension from its installed width.** The joint system shall consist of the following:
   A. **Forming Material*** — Min 4 pcf mineral wool batt insulation installed in joint opening as a permanent form. Pieces of batt cut to min width of 4 in. and installed edge-first into joint opening, parallel with joint direction, such that batt sections are compressed min 33 percent in thickness and that the compressed batt sections are recessed from each surface of the wall as required to accommodate the required thickness of fill material. Adjoining lengths of batt to be tightly-butted with butted seams spaced min 16 in. apart along the length of the joint.
      FIBREX INSULATIONS INC — FBX Safing Insulation
   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/2 in. thickness of fill material applied within the joint, flush with each surface of wall.
      SPECIFIED TECHNOLOGIES INC — SpecSeal ES Sealant

*Bearing the UL Classification Mark



System No. HW-D-1034
July 26, 2001
Assembly Rating — 3 Hr
Nominal JointWidth — 4 In.
Class II Movement Capabilities — 25% Compression or Extension

1. **Floor Assembly** — Min 4-1/2 in. thick lightweight or normal weight reinforced (100-150 pcf) structural concrete.
2. **Wall Assembly** — Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***.
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
3. **Joint System** — **Max width of joint (at time of installation of joint system) is 4 in. The joint system is designed to accommodate a max 25 percent compression or extension from its installed width**. The joint system shall consist of forming and fill materials, as follows:
   A. **Forming Material*** — Min 4 pcf mineral wool batt insulation installed in joint opening as a permanent form. Pieces of batt cut to min width of 4-1/2 in. and installed edge-first into joint opening, parallel with joint direction, such that batt sections are compressed min 50 percent in thickness and such that the compressed batt sections are flush with each surface of the wall. Adjoining lengths of batt to be tightly butted with butted seams spaced min 16 in. apart along the length of the joint.
      FIBREX INSULATIONS INC — FBX Safing Insulation
      OWENS CORNING HT INC, DIV OF
      OWENS CORNING — Paroc Safing Insulation
      ROCK WOOL MANUFACTURING CO — Delta Safing Board
      THERMAFIBER LLC — Type SAF
   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/8 in. wet thickness of fill material applied to cover the surface of the mineral wool batt forming material and to lap min 1 in. onto the concrete on each side of the joint opening on both sides of the wall.
      SPECIFIED TECHNOLOGIES INC — SpecSeal AS200 Elastomeric Spray

*Bearing the UL Classification Mark

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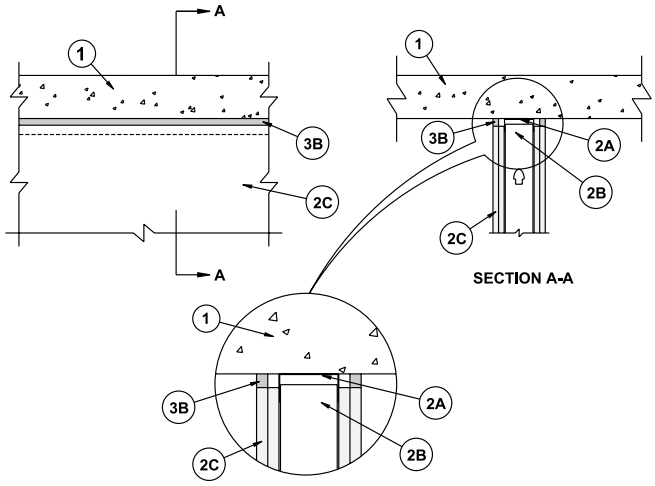


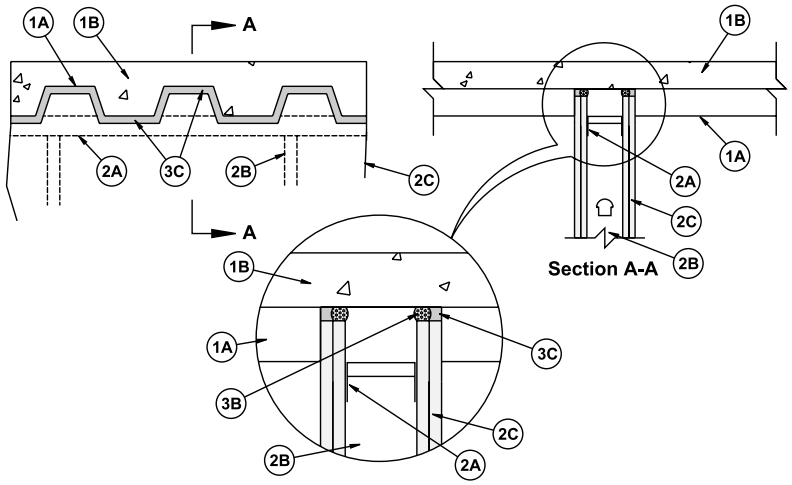
System No. HW-S-0043
September 25, 2001
Assembly Rating — 1 and 2 Hr (See Item 2)
Joint Width — 3/4 In. Max

1. **Floor Assembly** — Min 4-1/2 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) structural concrete.
2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels with min 1-1/4 in. long flanges sized to accommodate steel studs (Item 2B). Ceiling runner secured to concrete floor with steel fasteners spaced max 24 in. OC.
   B. **Studs** — Steel studs to be min 3-1/2 in. wide. Studs cut 1/2 in. to 3/4 in. less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. Stud spacing not to exceed 24 in. OC.
   C. **Gypsum Board*** — Gypsum board sheets installed to a min total thickness of 5/8 in. and 1-1/4 in. on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory. A max 3/4 in. gap shall be maintained between the top of the wallboard and the bottom surface of the floor.

   The hourly rating of the joint system is dependent on the hourly fire rating of the wall assembly in which it is installed.
3. **Joint System** — Max separation between bottom of floor and top of wall is 3/4 in. The joint system consists of the following:
   A. **Forming Material** — (Optional, Not Shown) — In 2 hr fire rated wall assemblies, polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction fit into joint opening.
   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 5/8 in. thickness of fill material applied within joint opening on both sides of wall, flush with both surfaces of wall. A min 1/4 in. diam bead of sealant shall be applied at point contact locations.

      SPECIFIED TECHNOLOGIES INC — SpecSeal ES Sealant

*Bearing the UL Classification Mark



System No. HW-S-0044
September 25, 2001
Assembly Rating — 1 and 2 Hr (See Item 2)
Joint Width — 3/4 In. Max

1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Floor Units*** — Max 3 in. deep galv steel fluted floor units.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.
2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with min 1-1/4 in. flanges. Ceiling runner secured to steel floor units, perpendicular to steel floor unit direction, with steel fasteners or welds spaced max 24 in. OC.
   B. **Studs** — Studs to be min 3-5/8 in. wide, 1-1/4 in. deep No. 25 ga steel channels. Stud spacing not to exceed 24 in. OC.
   C. **Gypsum Board*** — Gypsum board sheets installed to a min total thickness of 5/8 in. and 1-1/4 in. on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that the gypsum board is cut to follow the contour of the steel floor units with a max 3/4 in. gap maintained between the gypsum board and the steel floor units.

   The hourly fire rating of the joint system is dependent on the hourly fire rating of the wall assembly in which it is installed.
3. **Joint System** — Max separation between bottom of floor and top of wall is 3/4 in. The joint system consists of the following:
   A. **Forming Material** — (Optional, Not Shown) — In 2 hr fire rated wall assemblies, foam backer rod friction fit into joint opening and recessed min 1/2 in. from each surface of wall.
   B. **Fill, Void or Cavity Material*** — **Sealant** — Min 1/2 in. thickness of fill material applied within joint opening on both sides of wall, flush with both surfaces of wall. A min 1/4 in. diam bead of sealant shall be applied at point contact locations.

      SPECIFIED TECHNOLOGIES INC — SpecSeal ES Sealant

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GENERAL CERTIFICATE of CONFORMANCE

Description: SpecSeal® Firestop Products

Included Products:

Series SSS Intumescent Sealant
Series LCI Intumescent Sealant
Series LC Latex Endothermic Sealant
Series SSP Intumescent Putty
Series EP Power Shield™ Box Insert
Series SSWRED Intumescent Wrap Strips
Series SSWBLU Intumescent Wrap Strips
Series SSC Intumescent Firestop Collars
Series LCC Intumescent Firestop Collars
Series SSB Intumescent Firestop Pillows
Series AS100 Elastomeric Spray
Series AS200 Elastomeric Spray
Series ES100 Elastomeric Sealant
Series SSM Firestop Mortar
Pensil Series PEN200 Silicone Foam
Pensil Series PEN300 Silicone Sealant
Pensil Series PEN300SL Silicone Sealant

These products are tested to the following standards where applicable:

ASTM STANDARD:

E 814	Fire Tests of Through-Penetration Fire Stops
E 119	Fire Tests of Building Construction and Materials
E 1966	Fire-Resistive Joint Systems
E 84	Surface Burning Characteristics of Building Materials
E 1399	Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems

UL STANDARD

1479	Fire Tests of Through-Penetration Firestops
263	Fire Tests of Building Construction and Materials
2079	Tests for Fire-Resistance of Building Joint Systems
723	Tests for Surface Burning Characteristics of Building Materials

Chemical Content Statements:

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

February 1, 2002

James P. Stahl, Jr.
Technical Manager

Date

Material Safety Data Sheet

01-JAN-2003

SpecSeal® AS200 ELASTOMERIC SPRAY

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

PRODUCT NAME .....SpecSeal® AS200 SPRAY
CHEMICAL FAMILY.....Mixture

Company Identification

MANUFACTURER/DISTRIBUTOR

Specified Technologies, Inc.
200 Evans Way
Somerville, NJ 08876

PHONE NUMBERS

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

COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER
Proprietary mixture	----------

HAZARDS IDENTIFICATION

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

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 ..... Blue paste
SPECIFIC GRAVITY..... 1.1
PERCENT VOLATILES..... 22+/-2
EVAPORATION RATE..... >1
BOILING POINT ..... 100 deg. C
SOLUBILITY IN WATER..... Infinitely dilutable

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 produce symptoms of nausea in poorly ventilated areas.

None of the components are listed as carcinogens.

Material Safety Data Sheet

01-JAN-2003

SpecSeal® TYPE ES SEALANT

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

PRODUCT NAME.....SpecSeal® ES Sealant
CHEMICAL FAMILY.....Mixture

Company Identification

MANUFACTURER/DISTRIBUTOR

Specified Technologies, Inc.
200 Evans Way
Somerville, NJ 08876

PHONE NUMBERS

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

COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	PERCENT
CALCIUM CARBONATE	1317-65-3	30-40
TITANIUM DIOXIDE	13463-67-7	2-6
PHTHALATE ESTERS	85-68-7	4-6

HAZARDS IDENTIFICATION

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

Potential Health Effects:

EYE: Contact may cause irritation.

SKIN: Contact may cause irritation.

INGESTION: Should be relatively non-toxic.

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

CHRONIC (CANCER) INFORMATION: Phthalate esters classified by EPA as possible human carcinogen.

LONG TERM TOXIC EFFECTS: None known.

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

Flash point >93 deg. C.
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. Avoid excessive heat and freezing.

EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION REQUIREMENTS:.....Safety glasses/goggles.
SKIN PROTECTION REQUIREMENTS: .....Gloves. Barrier skin cream.
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 ..... Smooth paste, slight ammonia odor
SPECIFIC GRAVITY..... 1.2-1.5
PERCENT VOLATILES..... 17-20
EVAPORATION RATE (ether = 1)..... Slower
BOILING POINT ..... 100-105 deg. C
SOLUBILITY IN WATER..... Dissolves wet, insoluble when cured
PH…….....….8.0-8.5

STABILITY AND REACTIVITY

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

TOXICOLOGICAL INFORMATION

Mixture not tested but based on components:
May be irritating to skin and eyes. As a precautionary measure, preclude from those individuals with a history of respiratory ailments.
EPA Integrated Risk Information System IRIS):
Butyl benzyl phthalate, CAS# 85-68-7, carcinogen assessment is: C (Possible human carcinogen)

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 : 2
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-ES100 (titanium dioxide, phthalate esters)

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.
200 Evans Way
Somerville, NJ 08876

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-AS200

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.
200 Evans Way
Somerville, NJ 08876

Material Safety Data Sheet

01-JAN-2003

SpecSeal® TYPE LCI SEALANT

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

PRODUCT NAME.....SpecSeal® LCI Sealant

CHEMICAL FAMILY.....Mixture

Company Identification

MANUFACTURER/DISTRIBUTOR

Specified Technologies, Inc.
200 Evans Way
Somerville, NJ 08876

PHONE NUMBERS

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

COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER
Proprietary mixture	----------

HAZARDS IDENTIFICATION

**********EMERGENCY OVERVIEW**********
* Possible skin and eye irritant. Pale, red 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.

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 ..... Pale, red paste with minimal odor
SPECIFIC GRAVITY..... 1.10
PERCENT VOLATILES..... 22
EVAPORATION RATE..... >1
BOILING POINT ..... 100 deg. C
SOLUBILITY IN WATER..... Infinitely dilutable

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-LCI300

WARNING: SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER: Possible traces of formaldehyde, ethyl acrylate, acetaldehyde, acrylamide and acrylonitrile.

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.
200 Evans Way
Somerville, NJ 08876

SpecSeal FIRESTOP PRODUCTS®

Reproduced from Electronic Media

PRODUCT DATA SHEET

Series ES Elastomeric Sealant

1. PRODUCT DESCRIPTION

SpecSeal® Elastomeric Sealant is a non-halogenated latex-based, highly elastomeric caulk designed to provide passive smoke and fire protection in construction joints. This material is also designed to restore sound attenuation properties to sound-rated ceilings and partitions.

SpecSeal® Elastomeric Sealant is engineered to adhere to virtually all construction surfaces and may be applied using standard caulking equipment or by toweling. SpecSeal® Elastomeric Sealant dries to form a flexible shield against the propagation of fire. Its premium latex binder system is totally resistant to water and will not re-emulsify after drying. SpecSeal® Elastomeric Sealant contains no inorganic fibers, asbestos, solvents.

2. APPLICATIONS

SpecSeal® Elastomeric Sealant is designed primarily for the protection of construction joints.

3. PHYSICAL PROPERTIES

See Table A.

4. PERFORMANCE

When applied to a wet film thickness of 1/4" (6.3 mm) to 1/2" (12.5 mm) over appropriate backing materials, SpecSeal® Elastomeric Sealant has been successfully tested in one, two, and three hour joints when tested in accordance with UL2079 (ASTM E1966). All tested systems have been cycled 500 times at total movement up to 50%. Consult factory for individual system designs and application requirements.

LIMITATIONS: Use product as per manufacturer's instructions. Use only in applications per the manufacturer's tested and published designs or per specific recommendations. End user must ultimately determine the suitability of the product and designs to his specific requirement and assumes responsibility for its use.

FEATURES

- **Water-Based** for easy installation and cleanup.
- **Non-halogenated.**
- **Thixotropic** for high-build application.
- **Auto bonding.**
- **Safe...** No solvents! No asbestos!
- **Elastomeric!**
- **Water-Resistant!**
- **UL Classified.**
- **Acoustical** sealant!

CLASSIFIED UL 3L73

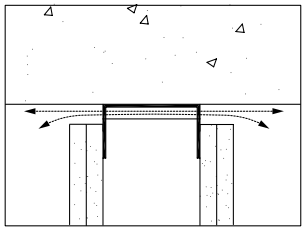
FILL, VOID OR CAVITY MATERIALS CLASSIFIED BY UNDERWRITERS LABORATORIES INC. ® FOR USE IN JOINT SYSTEMS.

SEE UL FIRE RESISTANCE DIRECTORY

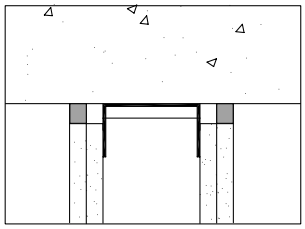
CLASSIFIED C UL

FILL, VOID, OR CAVITY MATERIALS CLASSIFIED BY UNDERWRITERS LABORATORIES INC. FOR USE IN JOINT SYSTEMS. SEE UL DIRECTORY OF PRODUCTS CERTIFIED FOR CANADA AND UL FIRE RESISTANCE DIRECTORY

Fig. 1: EXAMPLE OF MAINTAINING STC VALUES OF WALL AND CREATING AN EFFECTIVE SOUND BARRIER

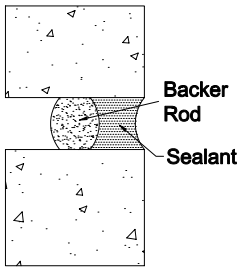


Arrows show path of sound travel.

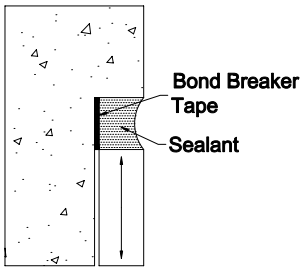


Sealant reduces sound transmission by blocking path of sound travel.

Fig 2: RECOMMENDED JOINT DESIGNS - AVOIDING THREE-POINT ADHESION



In the example shown above, sealant is applied (over foam backer rod) flush with wall surface. Backer rod provides a release surface allowing sealant to contract after drying to the recommended hour glass cross-sectional profile.



This example illustrates sealant applied to three planes. Bond breaker tape is applied to one surface to prevent three-point adhesion, eliminating stress on joint as sealant dries and enhancing movement capabilities.

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

Product Name	Series ES Elastomeric Sealant
Color	Pale Blue
Odor	Mild Latex
Density	10 Lb/Gal
Solids	66%
pH	7.5
In-Service Temp.	≤ 120°F (49°C)
Flame Spread	5*
Smoke Development	5*
Movement	±15%**
Solvent Content	None
Drying Time	
Tack Free	2 Hours[A]
Dry Through	5 to 7 Days[A]
Acoustical	ASTM C919

* Tested to ASTM E84 (UL723) at 14% surface
** 500 Cycles per UL2079, AC30 (ICBO) and ASTM E1399
[A] Dependent on temperature and humidity

5. SPECIFICATIONS

Consult factory for recommended specification.

6. INSTALLATION INSTRUCTIONS

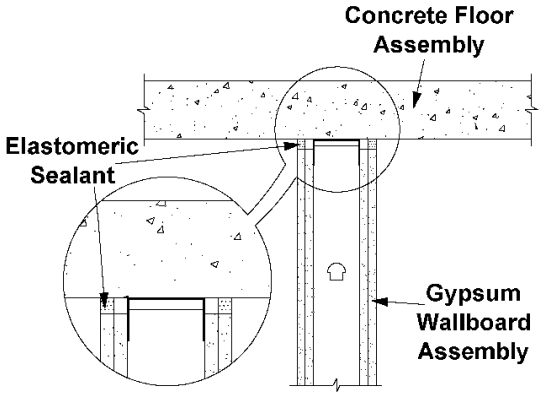
GENERAL: Areas to be protected must be clean and free of oil, loose dirt, rust or scale. Recommended storage and application temperatures range between 40°F (4°C) and 95°F (35°C). When applying product at the lower end of the temperature range, warming the material to 70°F (21°C) will enhance drying characteristics. Drying time will vary according to prevailing temperature and humidity. Allow to thoroughly dry before exposure to moisture.

Consult appropriate manufacturer's drawing for system design requirements. Forming or packing materials may be required as an integral part of various system designs. See Table B on Page 4 for estimation information.

Sealant is auto-bonding and may be applied in stages. DO NOT ATTEMPT TO THIN PRODUCT BY ADDING WATER.

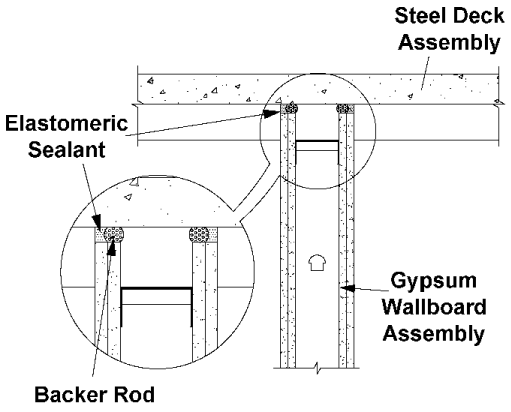
THIS PRODUCT IS DESIGNED FOR PROFESSIONAL INSTALLATION ONLY. This sealant is designed to contract while drying. Proper joint design is critical to sealant performance. Avoid three point adhesion through the use of appropriate backing or bond-breaking materials.

Fig. 3: HEAD-OF-WALL JOINT - GYPSUM WALLBOARD WALL TO CONCRETE FLOOR



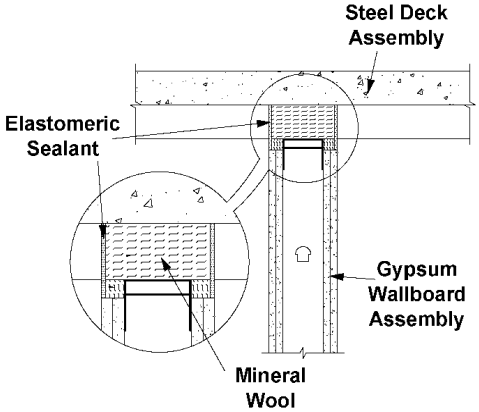
UL System No. HW-D-0079
Assembly Rating – 1 & 2 Hr • Movement Capabilities: 25% Compress.
Nominal Joint Width: 3/4″ • Forming Material: In 1 hr walls, apply bond breaker tape to ceiling track.
Sealant Depth: 1/2″ depth on both sides.

Fig. 4: HEAD-OF-WALL JOINT - GYPSUM WALLBOARD WALL CUT TO FIT CONTOURS OF STEEL DECK



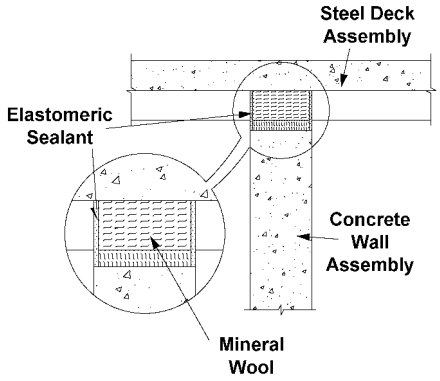
UL System No. HW-D-0103
Assembly Rating – 1 & 2 Hr • Movement Capabilities: 25% Compress.
Nominal Joint Width: 3/4″ • Forming Material: In 1 hr walls, apply bond breaker tape to ceiling track.
Sealant Depth: 1/2″ depth on both sides.

Fig. 5: HEAD-OF-WALL JOINT - GYPSUM WALLBOARD WALL TO CONCRETE OVER STEEL DECK



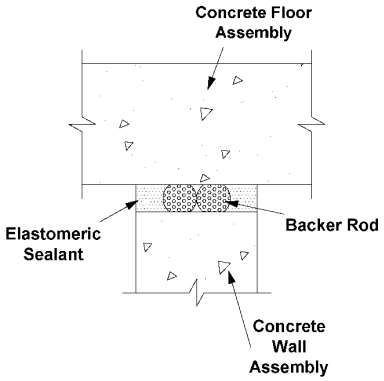
UL System No. HW-D-0034
Assembly Rating – 1 & 2 Hr • Movement Capabilities: ±25% Compress/Extend.
Nominal Joint Width: 1″ • Forming Material: Nom 4 pcf mineral wool to full depth.
Sealant Depth: 1/2″ depth on both sides.

Fig. 6: HEAD-OF-WALL JOINT - MASONRY WALL TO CONCRETE OVER STEEL DECK



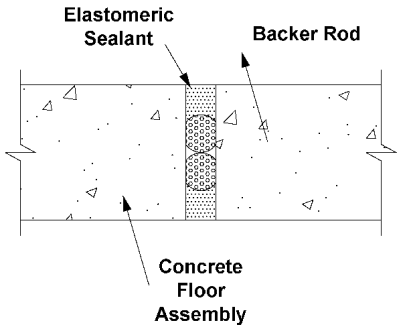
UL System No. HW-D-0039
Assembly Rating – 2 Hr
Movement Capabilities: ±25% Compress/Extend.
Nominal Joint Width: 1″
Forming Material: Nom 4 pcf mineral wool to full depth.
Sealant Depth: 1/4″ depth on both sides.

Fig. 7: HEAD-OF-WALL JOINT - MASONRY WALL TO CONCRETE FLOOR



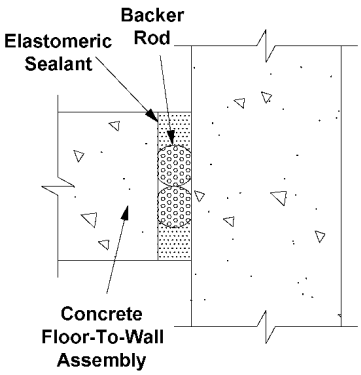
UL System No. HW-D-0041
Assembly Rating – 2 Hr
Movement Capabilities: ±12.5% Compress/Extend or 25% Compress.
Nominal Joint Width: 1″ or 3/4″ (See System).
Forming Material: Optional foam backer rod.
Sealant Depth: 1″ or 1/2″ (See System) on both sides.

Fig. 8: FLOOR TO FLOOR JOINT - CONCRETE FLOOR TO CONCRETE FLOOR



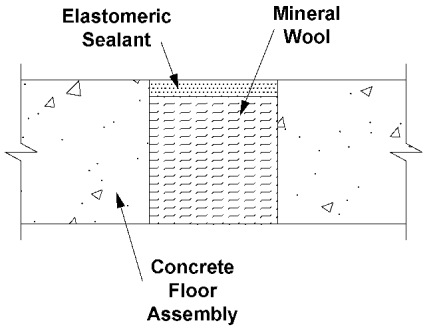
UL System No. FF-D-0005
Assembly Rating – 2 Hr
Movement Capabilities: ±12.5% Compress/Extend
Nominal Joint Width: 1″
Forming Material: Optional foam backer rod.
Sealant Depth: 1″ top and bottom.

Fig. 9: FLOOR TO WALL JOINT - CONCRETE FLOOR TO CONCRETE WALL



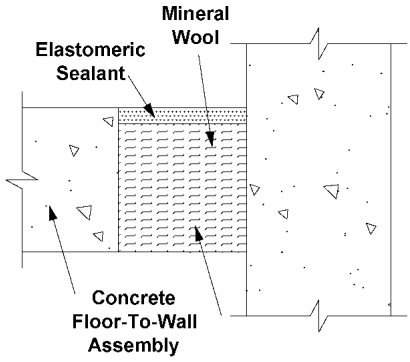
UL System No. FW-D-0005
Assembly Rating – 2 Hr
Movement Capabilities: ±12.5% Compress/Extend
Nominal Joint Width: 1″
Forming Material: Optional foam backer rod.
Sealant Depth: 1″ top and bottom.

Fig. 10: FLOOR TO FLOOR JOINT - CONCRETE FLOOR TO CONCRETE FLOOR



UL System No. FF-D-1008
Assembly Rating – 3 Hr
Movement Capabilities: ±15% Compress/Extend
Nominal Joint Width: 4″
Forming Material: Nom 4 pcf mineral wool to 4″ depth.
Sealant Depth: 1/2″ depth of sealant.

Fig. 11: FLOOR TO WALL JOINT - CONCRETE FLOOR TO CONCRETE WALL



UL System No. FW-D-1007
Assembly Rating – 3 Hr
Movement Capabilities: ±15% Compress/Extend
Nominal Joint Width: 4″
Forming Material: Nom 4 pcf mineral wool to 4″ depth.
Sealant Depth: 1/2″ depth of sealant.

See Figure 2 for recommended joint designs. Consult ASTM C1193 Standard Guide for Use of Joint Sealants for additional guidelines concerning the proper application of sealant materials.

7. MAINTENANCE

Inspection: Installations should be inspected periodically for subsequent damage. Following safety precautions listed below (See 9. Precautionary Information) and pertinent installation guidelines, remove coating in damaged areas down to undamaged material. Reapply fresh coating material to original coating thickness.

8. TECHNICAL SERVICE

Specified Technologies Inc. provides toll free technical support to assist in product selection and installation information.

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. Apply in areas with adequate ventilation.

10. AVAILABILITY

SpecSeal® Elastomeric Sealant is available from authorized distributors. Consult factory for the names and locations of the nearest sales representatives or distributors. Packaging information and catalog numbers are listed in Table C.

Table B: PRODUCT ESTIMATION INFORMATION (Construction Joints)

JOINT WIDTH	PER 1/4" INSTALLED DEPTH			PER 1/2" INSTALLED DEPTH			PER 1" INSTALLED DEPTH		
	CU IN/FT	FT/GAL	GAL/100 FT	CU IN/FT	FT/GAL	GAL/100 FT	CU IN/FT	FT/GAL	GAL/100 FT
0.5	1.5	154	.65	3	77.0	1.3	6	38.5	2.6
0.75	2.3	102	.95	4.5	51.3	1.9	9	25.7	3.9
1.0	3.0	77	1.3	6.0	38.5	2.6	12	19.3	5.2
1.5	4.5	51	2	9.0	25.7	3.9	18	12.8	7.8
2.0	6.0	38	2.6	12	19.3	5.2	24	9.6	10.4
2.5	8.0	31	3.3	15	15.4	6.5	30	7.7	13.0
3.0	9.0	25	3.9	18	12.8	7.8	36	6.4	15.6
3.5	11	22	4.6	21	11.0	9.1	42	5.5	18.2
4.0	12	19	5.2	24	9.6	10.4	48	4.8	20.8
5.0	15	15	6.5	30	7.7	13.0	60	3.9	26.0
6.0	18	12	7.8	36	6.4	15.6	72	3.2	31.2

Table C: ORDERING INFORMATION

SpecSeal® Elastomeric Sealant is available in caulk tubes, sausages and pails.

Cat. No.	Description
ES100	10.3 oz. Tube (304 ml) 18 cu.in.
ES129	29.0 oz. Tube (858 ml) 52 cu.in.
ES120	20 oz. Sausage (592 ml) 36 cu. in.
ES105	5 Gal. Pail (19.0 liters) 1,155 cu.in.

Additional SpecSeal Products...

Series AS200 Spray	Inexpensive water-based Elastomeric Spray Coating for construction joint applications. Designed to provide up to ±18.75% movement.
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!
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.
Intumescent Wrap Strips	Two 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!
Molded Firestop Collars	Easy to install, economical protection for ABS and PVC pipes (both solid and foam core) as well as CPVC, PVDF, and FRPP. Collars available up to 6" trade size.

CITY OF NEW YORK MEA 290-98M

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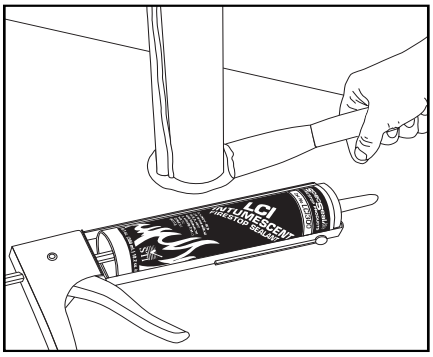
Phone: (800) 992-1180 • Fax: (908) 526-9623
Facts-On-Demand: (888) 526-6800
STI on the WEB: www.stifirestop.com

Specified Technologies, Inc.

PRODUCT DATA SHEET

SpecSeal® Series LCI Intumescent Sealant



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 c UL®

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

FM APPROVED

FEATURES

- **Economical** High performance without the high price!
- **Highly Intumescent** Expands up to 10X.
- **Excellent Smoke Seal**
- **Safe** for contact with plastics.
- **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

1. PRODUCT DESCRIPTION

SpecSeal® LCI Sealant is a versatile and economical intumescent product intended for firestopping a wide array of applications in small commercial or grouped residential construction and other structures with similar applications. SpecSeal® LCI Sealant is available in a single grade 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 does not contain PCB's or asbestos.

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

2. APPLICATIONS

See Table A for a summary application list.

SpecSeal® LCI Sealant has a broad application base designed to seal a wide variety of common penetrations in light commercial and grouped residential construction. 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.

3. PHYSICAL PROPERTIES

See Table B.

4. PERFORMANCE

SpecSeal® LCI Sealant is the basis for systems that meet the exacting criteria of ASTM E814 (UL1479) as well as to the time-temperature requirements of ASTM E119 (UL263). LCI provides up to a 2-hour fire rating for typical service penetrations through concrete or wood floors, concrete or masonry walls, as well as gypsum board walls (3-hour for metallic pipe, conduit and tubing). LCI meets Class A finish requirements for Flame Spread and Smoke Development when tested in accordance with ASTM E84 (UL723). LCI Sealant is also acoustically tested, demonstrating excellent sound attenuation properties.

5. 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 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

Table A: APPLICATIONS

- **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.

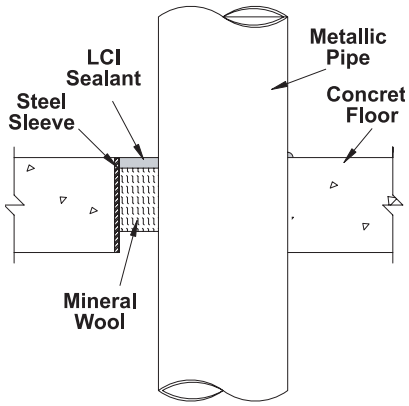
Table B: Physical Properties

Product Name	Series LCI Sealant
Color	Pale Red
Odor	Mild Latex
Density	9.0 Lb/Gal
pH	9.0
Expansion Begins	320°F (160°C)
Volume Expansion	10X Free Expansion
In-Service Temp.	≤ 130°F (54°C)
Flame Spread	0*
Smoke Development	5*
STC Rating	50
VOC Content**	0.00lbs/gal (0.0 g/l)

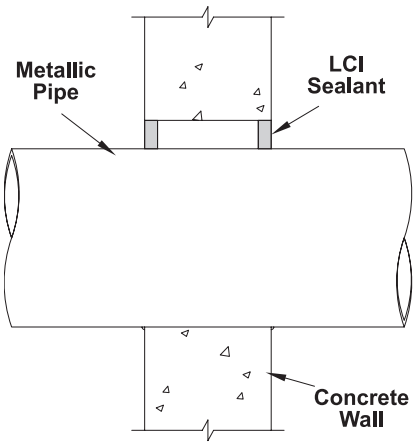
* Tested to ASTM E84 (UL723) at 14% surface coverage (modified test for sealants and caulks)

**ASTM D 3960 and EPA Federal Reference Method 24

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

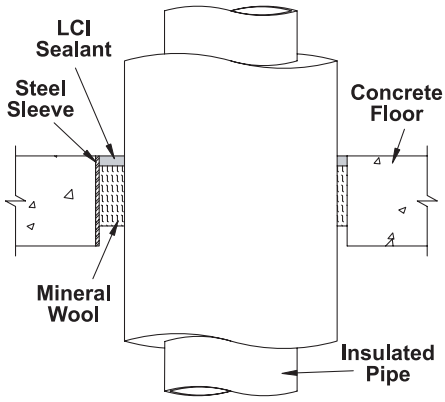


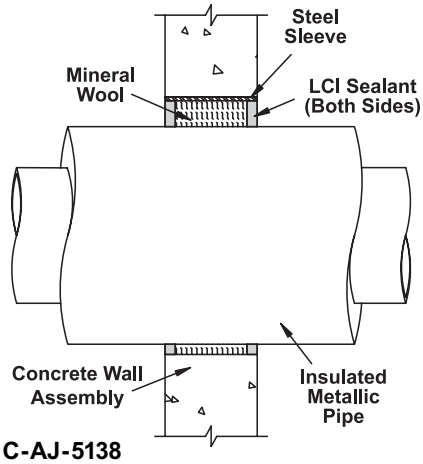
UL System No. C-AJ-1353
F Rating: 3 Hr • T Rating: 0 Hr
Steel or Iron Pipe: <12″, Copper Pipe: <4″
Annulus: 0″ to 2″
Sealant Depth: 1/4″
Forming Material: Nom 4 pcf mineral wool (2 ¼" Depth)



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″
Steel or Iron Pipe: <12", 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: ¾ or 1 Hr
Steel or Iron Pipe: 6″, Copper Pipe: 4″
Pipe Covering: Max. 2″ fiber glass or mineral wool pipe insulation.
Annulus: ¼″ to 1-5/8″ • Sealant: ½″
Forming: Nom. 4 pcf mineral wool (3″ depth)

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

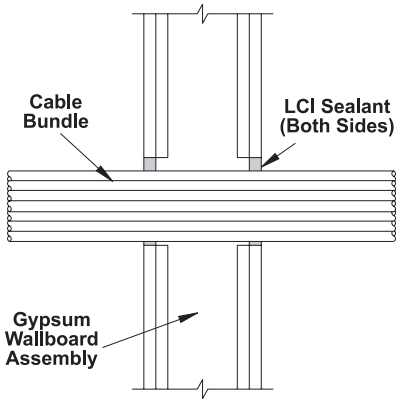
Pipe Size		Diameter of Opening (in.)											
Trade Size	Pipe O.D.	1.5	2.0	3.0	4.0	5.0	6.0	7.0	8.0	10	12	14	26
0.5″	0.840	0.3	0.6	1.6	3.0	4.8	6.9	9.5	12.4	19.5	28.1	38.3	132.6
1″	1.315	0.1	0.4	1.4	2.8	4.6	6.7	9.3	12.2	19.3	27.9	38.1	132.4
1.5″	1.900			1.1	2.4	4.2	6.4	8.9	11.9	18.9	27.6	37.8	132.0
2″	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?**

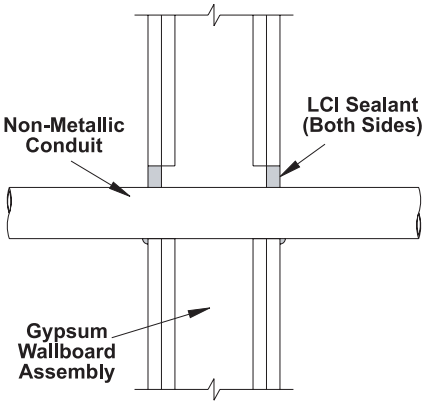
1/2″	Multiply by 2
5/8″	Multiply by 2.5
1″	Multiply by 4
1-1/4″	Multiply by 5

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

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

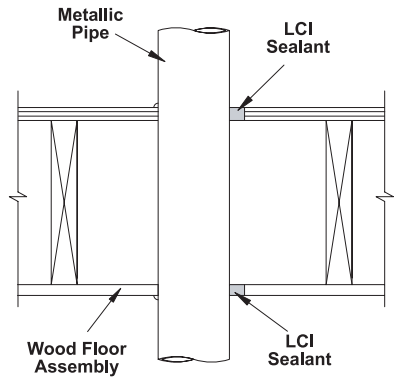


UL System No. W-L-3169
F Rating: 1, 2 Hr • T Rating: ¼ and ¾
Up to 4″ cable bundle
Annulus: 0″ to 4½″ • Sealant: 5/8″

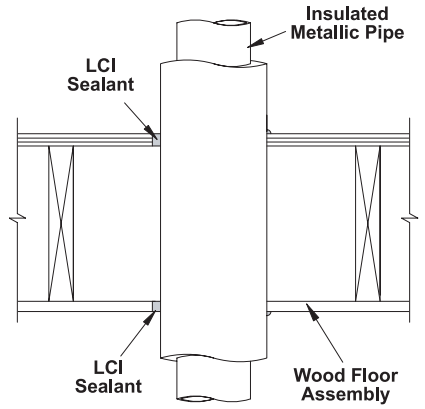


UL System No. W-L-2241
F Rating: 1, 2 Hr • T Rating: ¼, 1, 1-3/4
<2″ Rigid PVC or ENMT, CPVC, ABS
Annulus: 0-1″ • Sealant 5/8″

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



UL System No. F-C-1074
F Rating: 1 & 2 Hr • T Rating: ¼, ½ and 1 Hr
Steel, Iron or Copper: 4″ • Chase wall optional.
Annulus: 0″ to 1″ • Sealant: 5/8″ bottom, ¾″ top



UL System No. F-C-5043
F Rating: 1 Hr • T Rating: ¾ 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, ¾″ top.

6. INSTALLATION INSTRUCTIONS

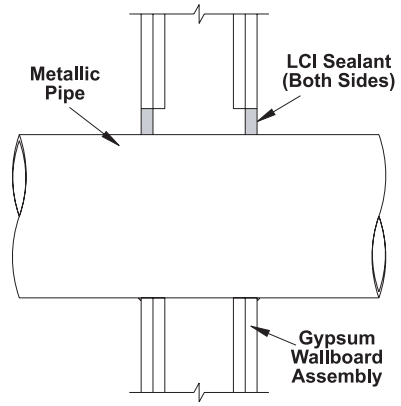
GENERAL: Areas to be protected must be clean and free of oil, loose dirt, rust or scale. Installation temperatures must be between 35°F (2°C) and 100°F (38°C). Allow product to dry a minimum of 24 hours before exposure to moisture.

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.

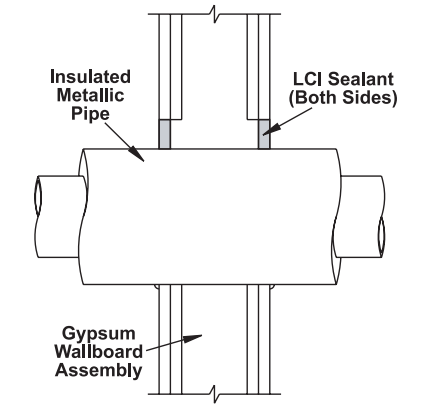
FORMING: Some installations may require forming as either an integral part of the system or as an option to facilitate installation. In systems where forming is required, mineral wool batts with a minimum nominal density of 4 PCF are generally required. Cut forming material oversize to allow for tight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

FILL MATERIAL: SpecSeal® LCI 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.

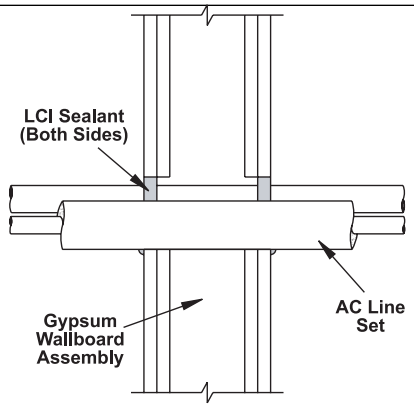
Fig. 5: BARE & INSULATED METALLIC PIPES - Gypsum Walls



UL System No. W-L-1222
F Rating: 1, 2 Hr • T Rating: ¼, ¾, 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: ¼ and 1 Hr
Steel or Iron pipe: 6″, Copper pipe: 4″
Pipe covering: Max. 2″ fiber glass,
¾″ 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: ¼ Hr
AC Line Set: Two copper tubes,
one with ¾″ AB/PVC and thermostat wire
Annulus: 0″ to 1″ • Sealant 5/8″

In gypsum wallboard penetrations, apply a minimum cove bead of 1/4" 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.

7. 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.

8. 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 at the Technical Library at www.stifirestop.com or through STI's automated attendant fax back system at 888-526-6800.

9. PRECAUTIONARY INFORMATION

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

10. AVAILABILITY

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

TABLE D: 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 Liters)
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
Two 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.

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

STI Specified Technologies Inc.

200 Evans Way • Somerville, NJ 08876

Phone: (800) 992-1180 • Fax: (908) 526-9623

STI on the WEB: www.stifirestop.com

Specified Technologies, Inc.

PRODUCT DATA SHEET

SpecSeal® Series AS Elastomeric Spray

CLASSIFIED UL 3L73

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

SEE UL FIRE RESISTANCE DIRECTORY

CLASSIFIED cUL

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

FM APPROVED

FEATURES

- **Water-Based** for easy installation and cleanup.
- **Non-halogenated.**
- **Thixotropic** for high-build application.
- **Auto Bonding.**
- **Safe**...no solvents! No asbestos!
- **Flexible!**
- **Water Resistant!**
- **Low Abrasion** for longer pump life and less maintenance.
- **UL Classified.**
- Tested with **Direct-Applied Fireproofing.**

1. PRODUCT DESCRIPTION

SpecSeal® Elastomeric Spray Coating is a non-halogenated latex-based, highly elastomeric coating designed to provide passive smoke and fire protection in construction joints.

SpecSeal® Elastomeric Spray Coating is engineered to adhere to virtually all construction surfaces and may be applied using airless spray equipment or with a brush (for small applications or touch ups).

SpecSeal® Elastomeric Spray Coating dries to form a flexible shield against the propagation of fire. Its premium latex binder system is totally resistant to water and will not re-emulsify after drying. SpecSeal® Elastomeric Spray Coating contains no inorganic fibers, asbestos, solvents.

2. APPLICATIONS

SpecSeal® Elastomeric Spray Coating is designed primarily for the protection of construction joints and certain through-penetrations.

3. PHYSICAL PROPERTIES

See Table A.

4. PERFORMANCE

When applied to a wet film thickness of 1/8" (3.2mm) over appropriate backing materials, SpecSeal® Elastomeric Spray Coating has been successfully tested in one, two, three and four hour joints. Consult factory for individual system designs and application requirements.

LIMITATIONS: Use product as per manufacturer's instructions. Use only in applications per the manufacturer's tested and published designs or specific recommendations. End user must ultimately determine the suitability of the product and designs to his specific requirement and assumes responsibility for its use. PRODUCT CONTAINS WATER AND IS CONDUCTIVE UNTIL DRY. DO NOT APPLY IN THE PRESENCE OF EXPOSED OR ENERGIZED ELECTRICAL CONDUCTORS.

5. SPECIFICATIONS

The fire protective joint coating shall be a water-based, non-halogenated elastomeric coating and shall contain no solvents, inorganic fibers, nor asbestos. The coating shall dry to form a flexible, moisture resistant film and shall adhere to all common construction surfaces. The coating shall be thixotropic and shall be capable of being applied by brush, trowel or by airless spray. The approved coating shall be SpecSeal® Elastomeric Spray.

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

Table B: PHYSICAL PROPERTIES

Color	Pale Blue
Odor	Mild Latex
Specific Gravity	1.1
Solids	75%
Flame Spread	0*
Smoke Developed	25*
Movement	±18.75%**
Coverage	12.8 sq ft/gal @ 1/8˝ 0.31 sq m/l @ 3.2mm
Viscosity	110,000 cps
pH	7.5
Solvent Content	None
In-Service Temp.	≤120° F (49° C)
Drying Time	Tack Free 2 Hours
	Dry Through 24-48 Hours[A]
STC Rating	51
VOC Content* **	0.16 lb/gal (20.0 g/L)

* Tested to ASTM E84 (UL723) @ 14% coverage.
**500 Cycles per UL2079, AC30 (ICBO) and ASTM E1399
[A] Dependent on temperature and humidity.
***ASTM D3960 and EPA Federal Refrerence Method 24.

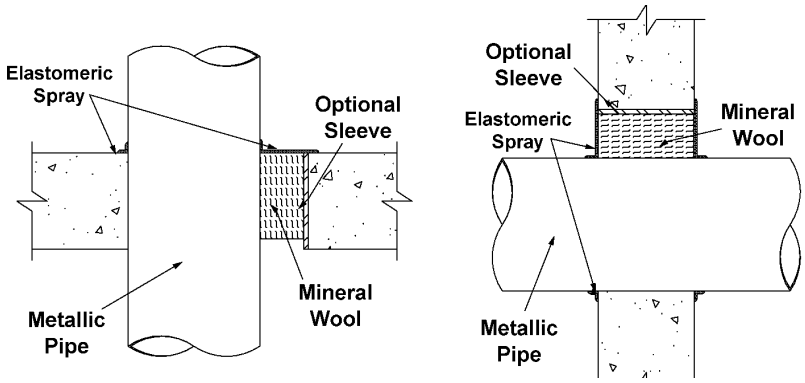
6. INSTALLATION INSTRUCTIONS

GENERAL: Areas to be protected must be clean and free of oil, loose dirt, rust or scale. Recommended storage temperatures range between 40°F (4°C) and 95°F (35°C). Recommended application temperature range is 60°F (16°C) to 90°F (32°C). When applying product at the lower end of the temperature range, warming the material to 70°F (21°C) will enhance drying characteristics. Drying time will vary according to prevailing temperature and humidity. Allow to thoroughly dry before exposure to moisture.

Consult appropriate manufacturer's drawing for system design requirements. Forming or packing materials may be required as an integral part of various system designs.

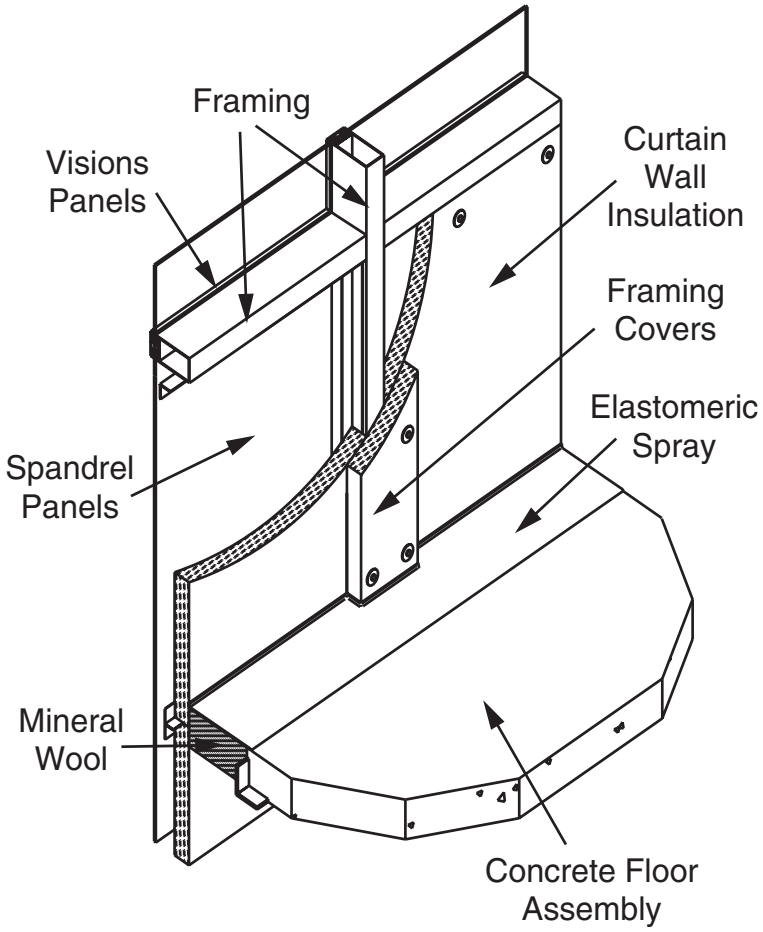
Coating may be applied by airless spray in a single pass up to 3/16" (4.8mm) wet coating depth. If applying by brush or spraying on vertical surfaces where coating appears to be prone to slumping, multiple coats or the application of a thin tack coat may be required. DO

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



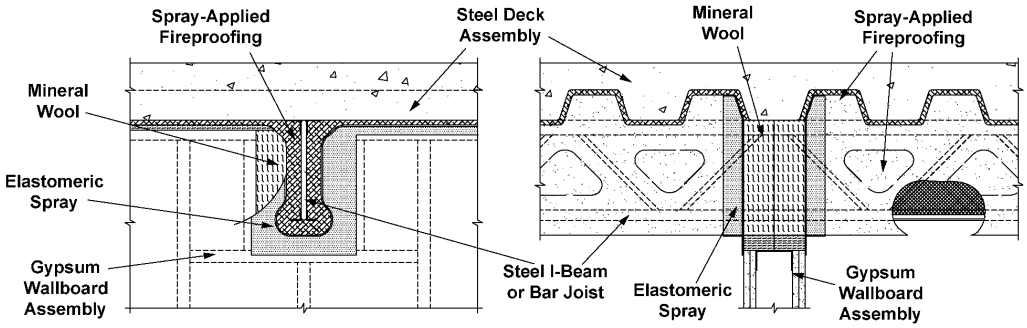
UL System No. C-AJ-1318
F Rating – 2 Hr • T Rating – 0 Hr
Steel or Iron Pipe: <12", Copper Pipe: <6"
Annulus: Point Contact to 2"
Forming Material: Nom 4 pcf mineral wool to 4" depth
Spray Depth: 1/8" wet depth (+1/2" overlap)Sealant Depth: 1/2"
Forming Material: 3" Tightly Packed
Min. Wool (nom 4 pcf)

FIG. 2: SLAB-EDGE SAFING GAP APPLICATIONS



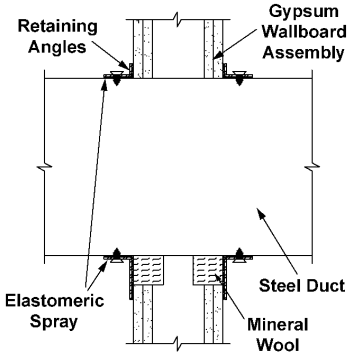
UL System No. CW-S-2003
Integrity Rating – 1-1/2 and 2 Hr
Insulation Rating – 0 and 1/4 Hr
Joint Width: Nom 8 in. wide.
Forming Material: Nom 4 pcf mineral wool to 4" depth.
Spray Depth: 1/8" wet depth (+1/2" lap onto adjoining substrates)

FIG. 3: FIREPROOFED STRUCTURAL PENETRATIONS - GYPSUM WALLBOARD WALLS



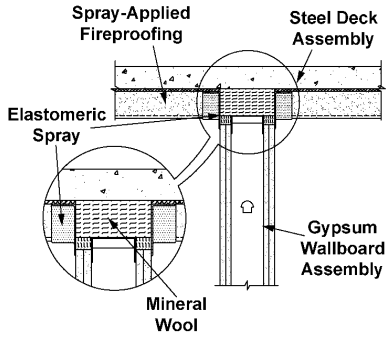
UL System No. HW-D-0099
Assembly Rating – 1 & 2 Hr
Movement Capabilities: ±18.75% Compress/Extend
Structural Support: Steel I Beam or Bar Joist protected with Spray-Applied Fire Resistive Materials.
Forming Material: Nom 6 pcf mineral wool to full depth.
Spray Depth: 1/8" wet depth (+2" lap onto fireproofing and 1/2" lap onto wall) on both sides.

FIG. 4: STEEL HVAC DUCT PENETRATIONS - GYPSUM WALLBOARD WALLS



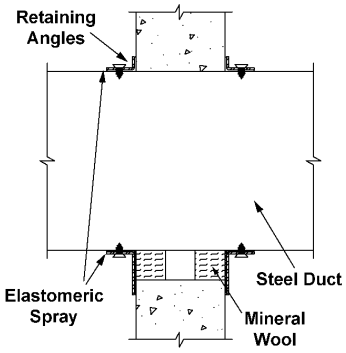
UL System No. W-L-7024
F Rating – 1 & 2 Hr • T Rating – 0 Hr
Steel Duct: 20" by 12"
Forming Material: Nom 4 pcf mineral wool to 2" depth.
Spray Depth: 1/8" wet depth (+2" overlap onto duct, 1" lap onto wall) on both sides.
Steel Angles: No. 16 MSG steel angles.

FIG. 5: HEAD-OF-WALL JOINTS BETWEEN WALLS AND FIREPROOFED STEEL DECKS



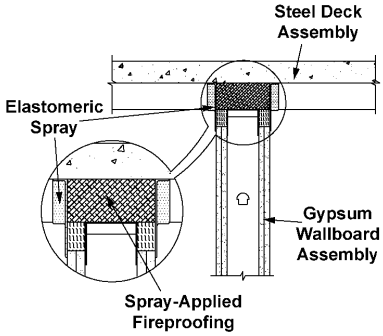
UL System No. HW-D-0088
Assembly Rating – 1 & 2 Hr
Movement Capabilities: ±18.75% Compress/Extend
Nominal Joint Width: 1"
Forming Material: Nom 6 pcf mineral wool to full depth.
Spray Depth: 1/8" wet depth (+2" lap onto fireproofing and 1/2" lap onto wall) on both sides.

FIG. 6: STEEL HVAC DUCT PENETRATIONS - CONCRETE/MASONRY WALLS



UL System No. W-J-7006
F Rating – 2 Hr • T Rating – 0 Hr
Steel Duct: 20" by 12"
Forming Material: Nom 4 pcf mineral wool to 2" depth.
Spray Depth: 1/8" wet depth (+2" overlap onto duct, 1" lap onto wall) on both sides.
Steel Angles: No. 16 MSG steel angles.

FIG. 7: HEAD-OF-WALL JOINTS WITH FIREPROOFING INSTALLED INTO FLUTES AS FORMING



UL System No. HW-D-0102
Assembly Rating – 1, 2, 3 and 4 .Hr
Movement Capabilities: ±25% Compress/Extend • Nominal Joint Width: 2"
Forming Material: Spray-Applied Fire Resistive Materials
to full depth allowing for a 2 in. relief gap between wallboard and fireproofing.
Relief gap packed with 4 pcf mineral wool insulation.
Spray Depth: 1/8" wet depth (+1/2" lap onto adjoining substrates) on both sides.

NOT ATTEMPT TO THIN PRODUCT BY ADDING WATER.

7. MAINTENANCE

Inspection: Installations should be inspected periodically for subsequent damage. Following safety precautions listed below (See 9. Precautionary Information) and pertinent installation guidelines, remove coating in damaged areas down to undamaged material. Reapply fresh coating material to original coating thickness.

8. TECHNICAL SERVICE

Specified Technologies Inc. provides toll free technical support to assist in product selection and installation information.

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. The use of an OSHA or NIOSH approved mask for dust and mist environment is recommended. Apply in areas with adequate ventilation.

CAUTION: COATING IS CONDUC-TIVE UNTIL DRY. DO NOT APPLY TO OR IN THE PRESENCE OF ENERGIZED ELECTRICAL CON-DUCTORS. INSTALL UNDER THE SUPERVISION OF PLANT OR FACILITY ELECTRICAL ENGINEER OR SAFETY MANAGER.

10. AVAILABILITY

SpecSeal® Elastomeric Spray is available from authorized distributors. Consult factory for the names and locations of the nearest sales representatives or distributors.

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

NOTICE: Spray application of SpecSeal Elastomeric Spray requires airless spray equipment meeting the following specifications:
Working Pressure: Min. 3,000 PSI

Delivery: Min. 1.0 U.S. gpm (2.1 l/min.) recommended

Spray Tip Orifice: 0.023˝ to 0.026˝ recommended

Wetted Parts: All seals and contact surfaces suitable for contact with latex emulsions.

The following airless spray equipment has demonstrated suitability for application of this product. STI makes no warranties concerning the suitability or use of this equipment and has no affiliation of any kind with its manufacturer.

A minimum 3/8˝ fluid line is required, a 1/2˝ line is preferred. Consult pump manufacturer for long hose runs or lifts to higher elevations. A reversible spray tip is recommended. A 6˝ fan pattern is suggested to minimize overspray.

The following equipment is manufactured by Titan Tool, Inc. Franklin Lakes, NJ:

Item	Item Name & Description
PowrTwin Model 3500 Sprayer	Electric or gas powered airless sprayer

TABLE C: ORDERING INFORMATION

SpecSeal® Elastomeric Spray Coating is available in 5 gal. pails, 55 gal. drums are available on a special order basis.

AS205 5 gal. Pail 1,155 cu. in. (19 liters)

Additional SpecSeal Products...

ES Series Sealant
Inexpensive water-based Elastomeric Sealant for construction joint applications. Design to provide up to ± 25% movement.

SSS Series 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!

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

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.

Intumescent Wrap Strips
Two 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!

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

CITY OF NEW YORK MEA 310-99-M

Important Notice: All statements, technical information, and recommendations contained herein are based upon testing believed to be reliable, but the accuracy and completeness thereof is not guaranteed.
WARRANTY: Specified Technologies Inc. manufactures its goods in a manner to be free of defects. Should any defect occur in its goods (within one year), Specified Technologies Inc., upon prompt notification, will at its option, exchange or repair the goods or refund the purchase price.
Limitations and Exclusions: THIS WARRANTY IS IN LIEU OF ALL OTHER REPRESENTATIONS EXPRESSED OR IMPLIED (INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR USE) AND UNDER NO CIRCUMSTANCES SHALL SPECIFIED TECHNOLOGIES INC. BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL PROPERTY DAMAGE OR LOSSES. PRIOR TO USE, THE USER SHALL DETERMINE THE SUITABILITY OF THE PRODUCT FOR ITS INTENDED USE, AND THE USER ASSUMES ALL RISKS AND LIABILITY FOR SUBSEQUENT USE.
No statement or recommendation not contained herein shall have any force or effect unless in an agreement signed by officers of seller and manufacturer.

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