

Head of Wall Fire Joint

How to read a UL Head of Wall & what to look for— typical wall & shaft wall

Part 3 of 7

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Construction Excellence Bulletin

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The previous bulletin covered the various types of head-of-wall fire joints that may be necessary for a standard partition type. This bulletin focuses on how to interpret a typical UL Assembly system. Familiarizing yourself with the components and structure of the report will help determine if the submitted assembly is appropriate for the partition type being installed. Each assembly is rigorously tested with the specific procedures and materials outlined in the report, so substitutions are not permitted, as they have not been tested with other components in the assembly. Please feel free to reach out if you have any questions or would like a second opinion.

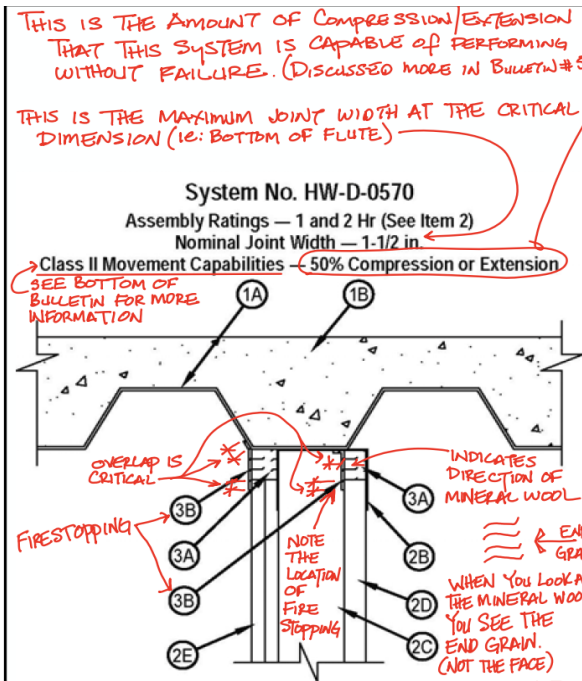
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- Each UL Assembly is specific to the exact construction and materials. Construction and materials cannot be modified or changed, as it has NOT been tested. The picture typically indicates the type of joint that has been tested.
- Different wall types including typical rated partition, shaft partition, and CMU wall have their own specific UL Assembly. If any part of the construction does not match, an Engineering Judgment (EJ) will be needed.

The following is one specific UL Assembly for a Shaft Wall that is parallel with the deck flutes.
(your project will vary):

Head of Wall Fire Joint Bulletins will address:

- I - What is a "Head of Wall" fire joint & why do we need it.
- II - Types of UL Assemblies.
- III - How to read a Head of Wall & what to look for - Typical Wall & Shaft Wall.
- IV - Engineering Judgments and 3rd Party Verification - How to read an EJ.
- V - Deflection calculations & Compression limitations
- VI - Mineral Wool Installation
- VII - Concerns with the different types of fire stopping materials - Spray, Sealant, Mechanical



- 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. The floor assembly shall include the following construction features:
 - Steel Floor and Form Units* — Max 3 in. (76 mm) deep galv fluted floor units.
 - Concrete — Min 2-1/2 in. (64 mm) thick lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete, as measured from the top plane of the floor units. **MINIMUM THICKNESS & WEIGHT... ALWAYS VERIFY**
 - Spray-Applied Fire Resistive Materials* — (Optional, Not Shown) — After installation of the steel ceiling runners (Item 2B) the steel floor unit may be sprayed with a min 5/16 in. (8 mm) to max 1 3/4 in. (45 mm) thickness of fire resistive material. **ISOLATEK INTERNATIONAL — Type 300 W R GRACE & CO - CONN — Type MK-6-HY** **2 SPECIFIC MANUFACTURERS & PRODUCTS ONLY**
- Shaft Wall Assembly — The 1 hr or 2 hr fire rated gypsum board/steel stud shaft wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
 - Floor and Wall Runners — (Not Shown) - J-shaped runner, equal in width to steel studs (Item 2C), with unequal legs of 1 in. (25 mm) and 2 in. (51 mm), fabricated from 24 MSG galv steel. Runners positioned with short leg toward finished side of wall. Runners attached to floor with steel fasteners located not greater than 2 in. (51 mm) from ends and not greater than 24 in. (610 mm) OC. **SPECIFIC FASTENING**
 - Ceiling Runner — Ceiling runner of wall assembly shall consist of galv steel channel sized to accommodate steel studs (Item 2C). Flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width. Ceiling runner installed parallel with direction of fluted steel deck and secured to steel deck valley with steel fasteners or welds spaced max 24 in. (610 mm) OC.
 - Light Gauge Framing* - Slotted Ceiling Runner — As an alternate to the ceiling runner in Item 2B, slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2C). Flange height of slotted ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width. Slotted ceiling runner installed parallel with direction of fluted steel deck and secured to steel deck valley with steel fasteners or welds spaced max 24 in. (610 mm) OC. **THESE ARE THE TESTED MANUFACTURERS OF THE LIGHT GA. FRAMING IDENTIFIES MIN GA & TOP OF STUD DIMENSIONS...**
 BRADY CONSTRUCTION INNOVATIONS INC.
 CLARKDIETRICH BUILDING SYSTEMS — Type SLT, SLT-H
 MARINOWARE, DIV OF WARE INDUSTRIES
 INC — Type SLT
 METAL-LITE INC — The System
 SCAFCO STEEL STUD MANUFACTURING CO — Slotted Track
 TELLING INDUSTRIES L L C — True-Action Deflection Track
 - Steel Studs — C-H-shaped studs, min 4 in. (102 mm) wide by 1-1/2 in. (38 mm) deep, fabricated from 25 MSG galv steel, cut to lengths 3/4 to 1 in. (19 to 25 mm), less than floor to ceiling height and spaced 24 in. (610 mm) OC.
 - Gypsum Board* — Nom 1 in. (25 mm) thick gypsum board liner panels. Panels cut 1-1/2 in. (38 mm) less in length than floor to ceiling height. Vertical edges inserted in H-shaped section of C-H studs. At the ends of the assembly, the free edge of the end panels are attached to the long leg of vertical J-runners (Item 2A) with 1-5/8 in. (41 mm) long Type S steel screws spaced max 12 in. (305 mm) OC.
 - Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board applied vertically in one or two layers for 1 hr and 2 hr fire rated assemblies, respectively (Panels cut 1-1/2 in. (38 mm) less in length than floor to ceiling height). The screws attaching the gypsum board layers to the C-H studs shall be located 1 to 1-1/2 in. (25 to 38 mm) below the bottom of the ceiling runner or slotted ceiling track. No gypsum board attachment screws are to penetrate the ceiling runner or slotted ceiling track.
- Joint System — Max separation between bottom of fluted deck surface and top of gypsum board (at the time of installation of the joint system) is 1 1/2 in. (38 mm). The joint system is designed to accommodate a max 50 percent compression or extension from its installed width. The joint system consists of the following:
 - Forming Material* — Min 4 pcf (64 kg/m³) density mineral wool batt insulation cut to a thickness twice larger than the distance between the top of the gypsum board and the bottom of the steel floor unit. (Material compressed 50 percent and installed within ceiling runner above top of gypsum board and the bottom of the steel floor units, flush with the surface of the wall. FIBREX INSULATIONS INC — FBX Safing Insulation ROCK WOOL MANUFACTURING CO — Delta Board ROXUL INC — SAFE THERMAFIBER INC — Type SAF) **SPECIFIC MINERAL WOOL MANUFACTURERS**
 - Forming Material* - Strips — As an alternate to Item 3A, the strips are stacked to a height twice larger than the distance between the top of the gypsum board and the bottom of the steel floor unit. Strips compressed 50 percent and installed within ceiling runner above top of gypsum board and the bottom of the steel floor units, flush with the surface of the wall. Strips compressed and installed on finished side of the wall between the top of the gypsum board and the bottom of the steel floor units, flush with the surface of the wall. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 767 Speed Strips **ALTERNATE**
 - Fill, Void or Cavity Material* — Min 1/16 in. (1.6 mm) dry thickness (1/8 in. or 3.2 mm wet thickness) of fill material sprayed or troweled within stud cavity and on finished side of the shaft wall to completely cover mineral wool forming material. Fill material to overlap a min of 1/2 in. (13 mm) onto gypsum board and ceiling runner within stud cavity (Fill material to overlap a min of 1/2 in. (13 mm) onto gypsum board and steel deck on finished side of wall). When spray-applied fire resistive material (Item 1C) is applied to the steel deck, the fill material is to overlap the spray-applied fire resistive material a min of 2 in. (51 mm) on the finished side of the wall. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 672 Firestop Spray or CFS-SP WR Firestop Joint Spray **SPECIFIC MATERIALS TO USE**

- (1C) NOTE THAT EVEN THOUGH SPRAY INSULATION IS NOT DRAWN, IT COULD BE PART OF THE CONSTRUCTION.
- (2B) NOTE THAT THIS IS IDENTIFYING THE FLANGE OF THE HEADER AND THE FASTENING PATTERN
- (2B1) THIS IDENTIFIES AN ALTERNATE FOR THE TOP TRACK
- (2D+E) THIS IDENTIFIES THE DRYWALL, THE HEIGHT OF DRYWALL (SPACE ABOVE T/DRYWALL) AND THE INSTALLATION & FASTENING PATTERN
- (3A) THIS IDENTIFIES THE PSF FOR THE MINERAL WOOL AND THE COMPRESSION REQUIRED... (4psf @ 50%) → (1/2" JOINT WOULD NEED 3" OF MINERAL WOOL THICKNESS (THE 3" THICKNESS WOULD COMPRESS 50% = 1/2"))
- (3B) THIS SECTION DETAILS THE TYPE & INSTALLATION OF THE FIRE STOPPING MATERIAL... THICKNESS, OVERLAP ONTO DRYWALL & METAL DECK OR SPRAY FIREPROOFING IS ALL IDENTIFIED FOR PROPER INSTALLATION OF MATERIALS.

Movement Classifications: Class I = Thermal Class II = Wind Sway Class III = Seismic
The next technical Bulletin will discuss what is 3rd Party Verification & how to read an Engineering Judgment



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