

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 3<sup>rd</sup> Party Verification - How to read an E.J.
- V - Deflection calculations & Compression limitations
- VI - Mineral Wool Installation
- VII - Concerns with the different



The last bulletin discussed the different types of head-of-wall fire joints that may be needed for a typical partition type. This bulletin discusses how to read a typical UL Assembly system. Understanding the parts and pieces of the report will assist your ability to understand if the submitted assembly is correct for the type of partition being installed. Each assembly is tested specifically with the procedure and materials listed in the report. Substitutions are not allowed because they were not tested with the other parts of the assembly. Please do not hesitate to contact me if you have any questions or need a second opinion.

Corey Zussman, AIA, NCARB - Director of Quality Management

- Each UL Assembly is specific to the specific construction and materials. Construction and materials cannot be modified or changed, as it has NOT been tested. The picture typically indicates 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):

**THIS IS THE AMOUNT OF COMPRESSION/EXTENSION THAT THIS SYSTEM IS CAPABLE OF PERFORMING WITHOUT FAILURE. (DISCUSSED MORE IN BULLETIN #5)**

**THIS IS THE MAXIMUM JOINT WIDTH AT THE CRITICAL DIMENSION (i.e. BOTTOM OF FLUTE)**

**SEE BOTTOM OF BULLETIN FOR MORE INFORMATION**

**OVERLAP IS CRITICAL**

**FIRESTOPPING**

**INDICATES DIRECTION OF MINERAL WOOL**

**WHEN YOU LOOK AT THE MINERAL WOOL YOU SEE THE END GRAIN. (NOT THE FACE)**

**NOTE THE LOCATION OF FIRE STOPPING**

**END GRAIN**

**NOTE THAT EVEN THOUGH SPRAY INSULATION IS NOT DRAWN, IT COULD BE PART OF THE CONSTRUCTION.**

**NOTE THAT THIS IS IDENTIFYING THE FLANGE OF THE HEADER AND THE FASTENING PATTERN**

**THIS IDENTIFIES AN ALTERNATE FOR THE TOP TRACK**

**THIS IDENTIFIES THE DRYWALL, THE HEIGHT OF DRYWALL (SPACE ABOVE DRYWALL) AND THE INSTALLATION & FASTENING PATTERN**

**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 1/2")

**THIS SECTION DETAILS THE TYPE & INSTALLATION OF THE FIRE STOPPING MATERIAL... THICKNESS, OVERLAP ONTO DRYWALL & METAL DECK OR SPRAY FIRESTOPPING IS ALL IDENTIFIED FOR PROPER INSTALLATION OF MATERIALS.**

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. The floor assembly shall include the following construction features:

- A. Steel Floor and Form Units\* — Max 3 in. (76 mm) deep galv fluted floor units.
- B. Concrete — Min 2-1/2 in. (64 mm) thick lightweight or normal weight (100-150 pcf or 1600-2400 kg/m<sup>3</sup>) concrete, as measured from the top plane of the floor units.
- C. 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.

**MINIMUM THICKNESS & WEIGHT... ALWAYS VERIFY**

ISOLATEK INTERNATIONAL — Type 300  
 WR GRACE & CO - CONN — Type MK-6-HY  
**2 SPECIFIC MANUFACTURERS & PRODUCTS ONLY**

2. 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:

- A. 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.
- B. 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.
- B1. 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  
 CLARK/DIETRICH 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

- C. 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.
- D. 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.
- E. 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.

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 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:

- A. Forming Material\* — Min 4 pcf (64 kg/m<sup>3</sup>) 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 liner panel flush with the inside surface of the panel. Material 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.
- FIBREX INSULATIONS INC — FBX Safing Insulation  
 ROCK WOOL MANUFACTURING CO — Delta Board  
 ROXUL INC — SAFE  
 THERMAFIBER INC — Type SAF  
**SPECIFIC MINERAL WOOL MANUFACTURERS**
- A1. 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 liner panel flush with the inside surface of the panel. 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**
- B. 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 CES-SP WB Firestop Joint Spray  
**SPECIFIC MATERIALS TO USE**

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

