

When choosing a fire stop joint system, it is important to understand the nomenclature associated with the type of listed system. For this example we use the Underwriters Laboratories Inc. (UL) nomenclature for Fire stop Joint systems.

There are five types of wall joint systems:

- Bottom of Wall (BW)
- Floor to Floor (FF)
- Floor to Wall (FW)
- Wall to Wall (WW)
- Head of Wall (HW)**

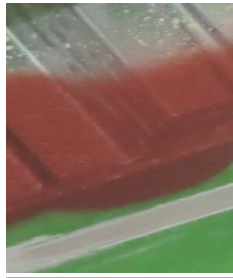
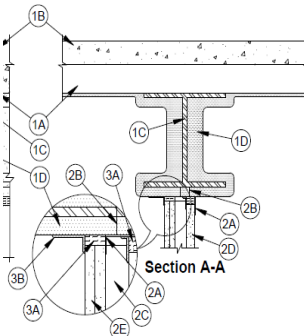
Each system is either tested as a Static or Dynamic joint:

S – Static: Indicates that the fire stop joint system has **NOT** been designed or tested for movement.

D – Dynamic: Indicates that the fire stop joint system has been designed and tested for movement capabilities.

Example:

HW-D = head of wall, dynamic joint



When installing a fire wall (for example a U419 system) the wall has been tested for a certain hourly rating. This tested system accounts for a static wall system, with NO movement at the floor/roof above. Typically, our walls have a deflection requirement at the top, or “Head of Wall”. Since our floors/roof will move up and down, depending on many factors, the joint at the head of the wall is no longer static, it is dynamic and will cycle up and down many times during its life. This is why we need a joint system at the “head of wall” that has been tested for this type of movement in order to not compromise the fire wall under building movement. The following bulletin will briefly describe why and where it is required.

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- Head-of-Wall (HW) is the gap located between the top of a fire-rated wall assembly and the underside of the floor/roof assembly. This will generally be a Dynamic joint, unless there is no deflection requirement.
- There a concern for the Head of Wall Fire Joint because joints move. A “Head of Wall” fire joint is a tested assembly that tests for the accommodation of movement.
- If the floor below the partition deflects, a gap could open at the top of the wall **AND/OR** if the floor above the partition deflects, the partition will crush at the top, both allowing the passage of smoke and fire and **compromising the integrity of the fire wall system.**

What do the Code indicate:

IBC 2000 - 2012—Section 713.1 Fire Resistive Joint systems

“Joints installed in or between fire resistance rated assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the assembly in which it is installed.”

IBC 2000 - 2012—Section 713.2: Installation

“Fire-resistant joint systems shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gasses.”

NFPA 101 – 2009—Section 8.3.6.5

Joints within or between fire-rated assemblies shall be protected with a joint system that is designed & tested to prevent the spread of fire & shall be tested in accordance with requirements of ASTM E 1966 or ASNI/UL 2079.

- All types of partitions need this type of joint...CMU, Concrete, Gypsum Board, Shaft Board, Etc...Each will have its own UL Assembly Design(s) and construction requirements.
- “Head of Wall” fire joint systems will specify movement of extension & compression. The movement of these joints can be caused by many factors:
 1. Floor/Roof loading, will cause the floor to deflect, compressing the partition below and or lowering the partition on that floor.
 2. Horizontal & vertical movement, such as wind, settlement/heaving, and earthquakes.
 3. Differing assembly types, such as gypsum, concrete, concrete over metal deck, masonry block, etc. can cause wall and floor assemblies to react differently to loads, movement, and thermal changes (even in a fire).
 4. Thermal changes have different reactions to floor / wall assemblies based on construction type & temperature.
- The cycling of a “Head of Wall” fire joint is a critical part of the design. The sealant or fire spray must be able to maintain a proper bond with the wall & floor assemblies and compress or stretch with the movement in order to maintain the proper fire protection.
- There are many variables to consider when choosing the correct joint for the specific condition. (all of which will be discussed in future bulletins) The assembly must match the system in its entirety, as tested.
- One important variable to understand when choosing a system is the maximum compression of the tested assembly and the deflection requirement from the Architect. If the joint has a maximum compression capability of 50% movement, and we have a 1/2” deflection criteria from the Architect, we calculate the total joint width...1/2” divided by 50% movement = 1” gap for the drywall below the deck. This will give us the true amount to hold down the drywall with the particular “Head of Wall” fire joint...allowing for the joint movement without damaging the wall.
- It is important to obtain all the “Head of Wall” fire joints for our walls as early as possible, as the system chosen will dictate the distance to hold down the drywall at the top of the wall.**
- Typically, there should be a “Head of Wall” fire joint for each wall type and head condition. Each one will have its own requirement that needs to be followed (This will be further discussed in future bulletins)



The next technical Bulletin will discuss the types of “Head of Wall” fire joint assemblies required for each partition.

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

