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KNOWLEDGE SHARE: 012

PFKG
Passive Fire Knowledge Group

TITLE: FIRE BARRIERS AND CAVITY BARRIERS – WHAT'S THE DIFFERENCE?

BUILDING TYPE: All BUILDINGS

OVERVIEW OF THE PROBLEM

Within passive fire systems, fire barriers and cavity barriers are defined accordingly:

Fire Barriers (sometimes referred to as firestops) are defined as a construction designed to complete the compartment line of a fire resisting construction, such as a compartment wall up to a roof or the underside of a compartment floor. Fire barriers must maintain the fire resistance performance (integrity and insulation) of the wall/floor system in which they are mounted.

Cavity Barriers are defined as a construction, other than a smoke curtain, designed to close and/or divide a concealed space, such as that in a cavity wall, ceiling or floor void, against penetration of smoke or flame, or to restrict the unseen movement of smoke or flame within such a space. According to the requirements of relevant Building Regulations statutory guidance, cavity barriers can be required to have a lower level of fire resistance performance (integrity and insulation) than fire barriers that continue the fire compartment line. Indeed, in certain statutory guidance, the insulation requirement for cavity barriers is reduced to zero.

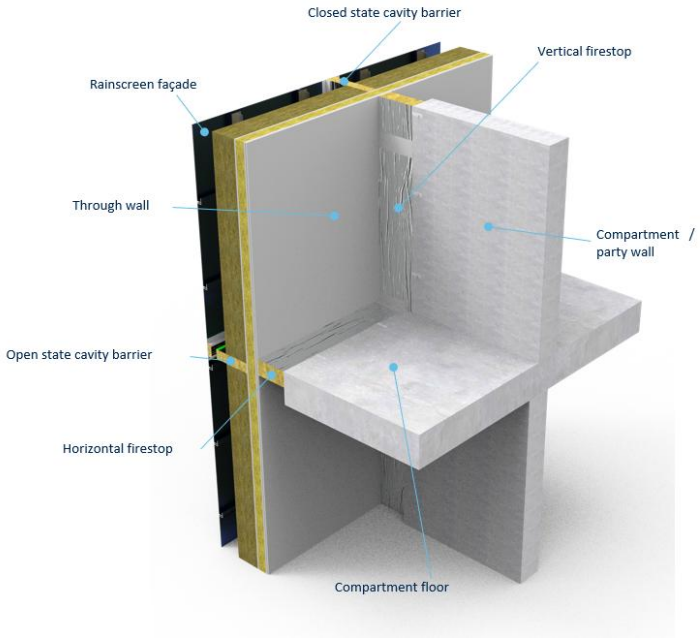

Figure 1: Internal compartment wall and floor interfacing with building envelope showing examples of both cavity barriers and fire barriers (firestops).

Confusion between fire barriers and cavity barriers is common for the following reasons:

- Reasonable/understandable overspecification of cavity barrier performance.
- Fire barriers are often present in a cavity due to design constraints of compartmentation.
- In some cases (subject to the above), both functions may be fulfilled by the same product.
- Poor use of terminology, informal/colloquial use of “cavity barrier” to describe both.

WHY IS THIS A PROBLEM?

The principal risk is associated with the varying level of performance between the applications. Specifically, cavity barriers often have lower levels of performance (for example 30 minutes integrity and 15 minutes insulation in England – 30 mins integrity only in Scotland). Whereas fire barriers will always match the compartment rating so will often have much higher levels of performance (typically 60 -120 minutes integrity and insulation).

It is important to note that fire barriers and cavity barriers are designed to serve fundamentally different purposes within building regulations guidance. However, a fire barrier may be capable of performing both functions. It is also possible to see a cavity barrier coincide with a non-fire resisting partition in order to sub-divide a cavity above or seal the edges.

Despite these overlaps, different products exist to fulfil each of these functions. Whether they were tested for the application, the relevant interfaces and/or with any penetrations is crucial to ensuring compliance.

RECOMMENDATIONS:

Always check the correct terminology and required fire resistance performance (integrity and insulation). This information should be provided by the project Fire Engineer.

Be cautious wherever fire barriers are being used above suspended ceilings or below raised access flooring as these interfaces are typically unsupported by test evidence.

Doorsets acting above raised access flooring typically require a fire-resistant upstand that both penetrates the floor and provides loadbearing support for the foot traffic. (see FIS Guidance Note: Fire resistant interfaces with raised access flooring - limitations of testing).

Make sure that any service penetrations through either a fire barrier or a cavity barrier are supported by appropriate evidence compatible with the appropriate supporting construction and with adequate separation/proximity of services/apertures (refer to other PFKG knowledge shares).

The FIS and ASFP jointly published detailed guidance on the design, specification and installation of firestopping of service penetrations which is available as a free download or e-Learning module.

Firestopping of Service Penetrations - FIS

Firestopping of Service Penetrations Guide 11-09 - Association for Specialist Fire Protection