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KNOWLEDGE SHARE: 014

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Passive Fire Knowledge Group

TITLE: EXTERNAL WALL CAVITY BARRIER & FIRE STOP SUBSTRATES

BUILDING TYPE: ALL BUILDING TYPES

OVERVIEW OF THE PROBLEM

Cavity Barriers and Fire Stops are key elements of passive fire protection commonly used in many external wall systems. Refer to Knowledge Share 12 for information on their definitions and key differences.

However, with the exception of Cavity Barriers/Fire Stops at the junctions of curtain walling systems (as tested to BS EN 1364-4) and Open-State Cavity Barriers (as tested to ASFP TGD19 and/or the new BS EN 1364-6), there remains a lack of dedicated test standards for Cavity/Fire Stop products in most common external wall configurations.

Instead, Cavity Barriers/Fire Stops are typically tested to BS EN 1366-4, which is a test standard for linear joint seals.

BS EN 1366-4 specifies a test method for assessing linear joint seals installed between defined "standard" supporting constructions, most commonly rigid (concrete) walls and floors. It also includes standard configurations for symmetrical flexible walls, as well as joint faces formed from rigid, composite concrete/steel, timber, and steel floor substrates.

Specific, non-standard supporting constructions/substrates may also be tested to BS EN 1366-4, although the direct field of applicability for such a test is limited strictly to the tested arrangement only.

While non-standard supporting constructions/substrates can also be tested under BS EN 1366-4, the direct field of application of such tests is strictly limited to the tested arrangement only.

WHY IS THIS A PROBLEM?

A common issue arises on projects when Cavity Barrier/Fire Stop products require to be installed within external wall systems with non-standard substrates, such as asymmetric structural framing systems (SFS) with sheathing board, rainscreen cladding panels or sandwich panels.

In these situations, manufacturers may be unable to provide tested/certified details that directly support the proposed arrangement. Design advice is therefore often caveated, requiring review and acceptance by a competent designer (typically the project Fire Engineer) and/or approval by the relevant authority having jurisdiction, such as Building Control.

However, in many cases, these parties may be unable or unwilling to provide such approval without supporting test evidence or certification. This can lead to uncertainty regarding the appropriate route to compliance for the detail.

If these issues are not identified during the design stage, projects may encounter significant difficulties in developing compliant construction details later in the programme. This can lead to redesign, additional testing, further assessments, programme delays, and increased costs.

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RECOMMENDATIONS

Where possible, designers and contractors should ensure that external wall Cavity Barriers/Fire Stops are installed between substrates supported by manufacturers tested/certified details. This will typically involve either "standard" supporting constructions under BS EN 1366-4, or other substrates directly tested by the manufacturer and supported with relevant certification and/or test evidence.

For curtain walling systems, fire stopping should be installed between the compartment floor and the specific curtain wall system, as tested to BS EN 1364-4, since the fire resistance periods obtained may vary between curtain walling systems.

Where non-standard substrates are proposed, each specific detail should be reviewed and coordinated as early as possible with the manufacturer and project Fire Engineer to confirm the appropriate route to compliance.

Early (design stage) coordination between designers and Cavity Barrier/Fire Stop manufacturers is critical to ensure all relevant passive fire protection details can be supported with suitable products, via an appropriate compliance route.

Detailed guidance on the available routes to compliance for passive fire protection is provided in ASFP Advisory Note 34. These include full-scale fire testing, conducted either to recognised standards or through ad hoc/indicative testing, as well as assessments undertaken both within and beyond the scope of published rules.



Figure 1: Image shows a commonly advertised arrangement of cavity barriers installed between concrete slabs/columns and masonry external wall, with an SFS infill system. Early design coordination is crucial, particularly when proposing cavity barriers between other, non-standard substrates (© AIM Ltd)