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KNOWLEDGE SHARE: 015

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TITLE: LIFT LANDING DOORS: FIRE TEST EVIDENCE AND FIELD OF APPLICATION LIMITATIONS

BUILDING TYPE: ALL BUILDING TYPES

OVERVIEW OF THE PROBLEM

Lift landing doors are frequently relied upon as part of fire-resisting constructions that enclose lift shafts. Therefore, they play an important role in maintaining compartmentation. Their fire performance is generally demonstrated through testing to BS EN 81-58, which is a standard that evaluates doors installed within a standard rigid supporting wall and exposed to fire from the landing side.

BS EN 81-58 defines standard supporting constructions as masonry or concrete walls with a density of 1,200 ± 400 kg/m³ and a thickness of 150-250 mm. However, lift landing doors are routinely installed within alternative wall types, including lightweight blockwork, steel-framed systems, drylined constructions and other non-rigid assemblies.

While such applications are common, there appears to be limited evidence available to demonstrate the fire performance of lift landing doors when installed in these non-standard supporting constructions (e.g. steel frame dry wall). This raises questions over the applicability of existing test evidence to some installed conditions.



Figure 1: BS EN 81-58 fire resistance test assembly for a lift landing door installed within a standard rigid supporting construction (Courtesy of Otis Ltd)

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WHY IS THIS A PROBLEM?

Behaviour of different supporting wall constructions can vary significantly under fire conditions. It is therefore essential that the supporting construction is capable of maintaining the stability and integrity of the lift landing door throughout the required fire resistance period. Demonstrating this performance generally requires evidence from appropriate fire testing of the complete assembly.

To demonstrate compliance, lift landing doors should be installed strictly in accordance with the relevant fire test evidence and within the stated Field of Application (FOA). Where the proposed supporting construction falls outside the FOA, its suitability should be justified through a robust assessment based on relevant and appropriate evidence.

BS EN 81-58 places significant limitations on the FOA of lift landing doors tested in non-standard supporting constructions. In such cases, the scope of application is generally restricted to the specific wall construction tested, and the test evidence cannot be automatically extended to support alternative wall types.

In addition, lift landing doors are commonly installed with raised thresholds set above the structural slab to accommodate screeds, floor finishes and construction tolerances. However, this arrangement is not typically represented in standard fire tests. Unless specifically addressed, such installations may create a weakness in the compartmentation line beneath the lift door threshold.

RECOMMENDATIONS

- Lift door fire test certification and FOA reports should be requested from the manufacturer before a lift shaft wall construction type is selected for the design team to review and query the interface details as needed. Designers should ensure that the lift door, accessories, and supporting construction specific to their project are within the FOA of testing of the door supplied by the lift manufacturer.
- Owing to the limited availability of BS EN 81-58 field-of-application evidence for lift landing doors installed in non-standard supporting constructions within the UK supply chain (at the time of publication of this Knowledge Share), it is recommended that fire-rated lift landing doors are installed within walls that correspond to the standard supporting constructions defined in BS EN 81-58, namely masonry or concrete walls.
- Where a non-standard shaft construction is proposed, project-specific fire testing of the complete assembly may be required. The supporting construction wall type and its relevant firestopping, including tested installation tolerances should be within the FOA of the test.
- 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.
- Details for firestopping relevant to the lift door and wall substrate should be provided by the lift manufacturer as tested details, for incorporation into design.
- For lift landing doors with raised access levels or screed build up, a rigid upstand (of standard supporting constructions) should be designed to complete the compartmentation of the supporting construction, at the bottom of the lift door threshold, unless an alternate tested detail is provided by the manufacturer.

Further information:

EN 81-58. 2022 : Safety rules for the construction and installation of lifts - Examination and tests - Part 58: Landing doors fire resistance test