

ADVISORY NOTE 31:

ASFP position on performance smoke seals in active fire curtains

Background to active fire curtains

The ASFP publication “Active Fire Curtains: Compartmentation and Protected routes” better known as the Black Book was published in September 2020 to provide a guide for those involved in the manufacture, testing, certifying, specification, installation, maintenance and use of active fire curtains.

These curtains are recognised as a way to allow architects and designers to create large open plan spaces yet provide compartmentation should it be required in a fire / smoke scenario.

Active fire curtains are typically used to provide one of two functions are required by the building regulations. One use of active fire curtains is to provide compartmentation as required by ‘Clause B3(3)’ of the Building Regulations 2010, as reproduced below.

“B3. (3) Where reasonably necessary to inhibit the spread of fire within the building, measures shall be taken, to an extent appropriate to the size and intended use of the building, comprising either or both of the following—

(a) sub-division of the building with fire-resisting construction;

(b) installation of suitable automatic fire suppression systems.”

The other use is to provide protected escape routes, so as to achieve a necessary means of escape, as reproduced below.

“B1. The building shall be designed and constructed so that there are appropriate provisions for the early warning of fire, and appropriate means of escape in case of fire from the building to a place of safety outside the building capable of being safely and effectively used at all material times.”

The Approved Documents, in this case Approved Document B (AD-B) parts 1 & 2 gives recommendation on how one might demonstrate that a project team has made the appropriate provisions with consideration to the above points.

AD-B further relates the provisions above to test methods and performance levels required. This information is contained in Appendix B and allows classification in accordance with BS EN standards where appropriate, or alternatively minimum provisions when tested to relevant parts of BS 476.

One of the challenges for active fire curtains, is that as a new technology, they are not specifically referenced in AD-B, unless they are used in place of a fire resisting door, in which case it is realistic to accept that the same testing classifications would apply.

For applications beyond the simple replacement or augmentation of a door, such as where a curtain is used to protect an escape route, design advice can be sought out in either of BS 9999 (or BS 9991 as appropriate) or BS 7974. These documents provide guidance on acceptable fire design and fire engineering principles which can also legitimately be used in determining how to comply with the building regulations.

Guidance on performance smoke seals

The ASFP's position on any passive fire protection system is that it should be fully backed up by third party certification for the manufactured product. This product should be installed by a contractor with the appropriate activities covered in scope of a third-party certification installer scheme. This is recognised in AD-B as the simplest method to meet the requirements of Building Regulation 38 – Materials and Workmanship.

The installed product should match the tested and certified design, using the same components. This will ensure the same level of fire resistance performance and where relevant smoke resistance performance, for the installation as the certified system.

When active fire curtains are used on a protected escape route, a level of smoke resistance performance is necessary. This is normally achieved by the addition of flexible edge seals to the guides of the system. These edge seals are typically based on technologies used in smoke resistant classified fire doors. They are not simple draught excluders, but a well proven and tested series of technologies in their own right. They cannot be added to an active fire curtain system without the whole system being tested for fire resistance either in accordance with BS EN 13501-2 or BS 8524-1 as appropriate.

If a level of smoke resistance performance is called for, then again, AD-B does not make precise provisions for active fire curtains. However, AD-B Appendix C gives advice concerning the requirements for fire doors. Where smoke resistance testing is required for purposes of a protected escape route, this is either done by achieving the S_a classification, following testing to BS EN 1634-3, or the smoke leakage test (not exceeding $3\text{m}^3/\text{m}/\text{Hr}$) up to 25Pa pressure under BS 476-31.1. Both of these tests are conducted at ambient temperatures. It is therefore not unreasonable to test active fire curtains on the same protected routes, to the same level of performance as a fire door would be tested for the passage of smoke.

Smoke leakage testing for as required by AD-B appendix C is only specified as an ambient smoke leakage test in UK. The smoke leakage requirements are set as such, with consideration for keeping an escape route as a tenable means of escape. Typically, smoke detectors will alert occupants to the fire before flash-over has occurred. The curtain will deploy, and occupants can make their escape. Ambient smoke resistance is the important factor at this point. The limiting factor in determining the occupation time is the length of time before the radiation through the curtain will cause the escape route conditions to become untenable. Appendix 5 of the ASFP's black book contains background information on development of fire, responses, and tenability of escape routes.

Recommendation

In summary, the use of ambient temperature smoke seals within fire curtains is not unsafe provided that they have been appropriately fire and smoke leakage tested in the required application. This is completely in accordance with the guidance provided within Approved Document B. The smoke leakage performance requirements against which they are being attested and types of seal being used are also completely consistent with those being used on other fire and smoke rated door products.

Any claims that a product is capable of providing a smoke leakage performance under elevated temperatures, e.g. S₂₀₀ classification to EN 13501-2, must be supported by test evidence and Extended Application, but this is outside of the guidance provided within Approved Document B and not typically required to meet UK legislation.

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