

BACKGROUND

Requirements

The Building Regulations - this is the law.

Approved Documents - These are published guides described as “practical guidance” to meeting the requirements of the building regulations.

British and European Standards - These are published standards on product definition, testing and classification, system requirements, recommendations and maintenance.

Certification Standards - These are standards published by certification bodies to ensure products have undergone the necessary third party testing. They are then used by a notified body as the basis to ensure that products remain as tested, and that changes are re-tested or assessed by qualified personnel.

There are further documents available, which are referenced in ADB that give details to designers to allow the consideration of business risk issues from smoke and fire – i.e. financial loss, and is sponsored by insurers, to help assess premiums.

Building Regulations

By following the instructions in the approved documents you will fulfil the requirements of the regulations.

If you can prove (with evidence or calculation) that another method is satisfactory you may use this - this is called fire engineering, but must be approved by a Building Control Authority (BCA) before use.

England & Wales

The document that gives an interpretation of the rules for Fire Safety is Approved Document B (ADB). This is available as a free download from the Planning Portal website.

It has been republished dated 2006 and will be applicable to all projects submitted for planning approval from April 2007.

It recommends the use of products meeting independent certification schemes, such schemes certifying compliance with the requirements of a recognised document, which is appropriate to the purpose for which the material is to be used. In addition to life safety it mentions the protection of property, including the building itself, stating that this may require additional measures, and insurers may seek their own higher standards, before accepting the insurance risk.

There have been a considerable number of changes with regard to fire dampers. They now have their own section giving very specific guidance.

Paragraphs 5.46 to 5.48 "Mechanical ventilation and air conditioning systems" state that fire dampers protecting escape routes should respond to a smoke detector or suitable fire detection system, noting that a fusible link alone is not acceptable and this implies that some type of actuator be used. The purpose of this is to ensure early closure to prevent passage of smoke. It also states that a damper with an ES classification may be used. The reader is then directed to paragraph 10.15.

Paragraphs 10.11 to 10.15 "Fire dampers" are more specific and also require actuation for fire dampers in buildings where there are levels of sleeping risk. The note that “fusible link only dampers being unsuitable to protect escape routes” is repeated together with the suitability of an ES rated product. 10.15 then explains the requirements for E and ES classifications. To achieve any classification fire dampers must be tested to BS1366-2:1999. A Fire Damper has an E (Integrity) classification. A Leakage Rated Fire Damper has an E (Integrity) and an S (Reduced leakage) classification.

SmokeShield dampers fulfil the ES requirements for escape routes and areas with sleeping risk. FireShield fulfil the E requirements and can be used in all other areas for run out ducting etc.

ADB states that dampers should be mounted within the structure that they are seeking to protect and should be installed as tested.

Finally there is a statement saying that fire dampers tested only to BS476 may only be appropriate for fan off situations.

For the purposes of application, what are presently known as “combination fire and smoke dampers”, providing that they have an ES classification to BS EN 13501-3:2005, now termed “leakage rated fire dampers”, actuated via a smoke detection system will fulfil the requirements for the protection of escape routes and the protection of areas with sleeping risk. Curtain fire dampers and other dampers having an E classification to BS EN 13501-3:2005 will fulfil the general requirements for all other applications/areas.

Scotland

These exist as technical standards (AMD's). They give very similar guidance to ADB. They already include direct references to the application of European standards. They are available as a free download from the Scottish Executive website.

Standards

Fire damper Standards

BS EN 1366-2:1999 (Test standard) gives requirements for testing dampers to the standard time/temperature curve with a requirement to close within two minutes of the start of the test. After closure a 300Pa pressure differential is applied to the damper and the damper leakage (corrected to 20°C) is recorded throughout the rest of the test. The largest size of damper to be offered for sale must be fire tested. Pass and fail criteria is included in the standard.

Integrity – E – the damper must leak no more than 360m³/hr/m² at any point during the test.

Optional Integrity and Leakage – ES – the damper must leak no more than 200m³/hr/m² at any point during the fire test. This also applies to the largest and smallest size of damper to be offered for sale at ambient temperatures for the ES criteria to be applicable.

Optional Insulation – I – insulation rating - not required by legislation for dampers in the UK.

BS EN 13501-3:2005 (Classification Standard) – states times and performance to enable the classification of fire dampers (E, ES and I requirements)

BS EN 15650:2010 (Product standard) contains the basic performance and requirements for fire dampers

System design and related standards

BS 9999:2008 Code of practice for fire safety in the design, management and use of buildings-

provides guidance on the ongoing management of fire safety in a building throughout the entire life cycle of the building, including guidance for designers to ensure that the overall design of a building assists and enhances the management of fire safety. It can be used as a tool for assessing existing buildings, although fundamental change in line with the guidelines might well be limited or not practicable.

The standard builds on government guidance to legislative requirements, providing an advanced approach to fire safety in the design, management and use of buildings. It promotes a more flexible approach to fire safety design through use of structured risk-based design where designers can take account of varying human factors.

BS EN 12101-6:2005 Smoke and heat control systems. Specification for pressure differential systems- gives test procedures for the systems used, as well as describing relevant, and critical, features of the installation and commissioning procedures needed to implement the calculated design in a building. It covers systems intended to protect means of escape such as stairwells, corridors and lobbies, as well as systems intended to provide a protected fire fighting bridgehead for the Fire Services.

Certification Standards

LPS 1162 is a typical product certification standard. It contains all the tests that the Loss Prevention Certification Board (LPCB) requires the product to undergo, before certification may be offered. It also states that to meet it, a company must have full BS EN ISO 9001 accreditation. The LPCB visit the factory at least once a year to confirm by measurement that the certificated products maintain all the tested dimensions, and confirm that the products still comply with any assessments that may have been made. Using certificated products mean less time needs to be taken checking up that products meet the required standards, as a third party is making sure that this is the case.

Extended fields of application (Assessments)

Under BS EN 1366-2 etc. specific documents are being drafted for the extended field of application for all products. It is becoming clear that assessments for small component changes and the use of units smaller than those tested are allowable. However the use of methods of installation other than that tested will lead to problems, with assessments being difficult to acquire. The reason for this is the fact that the test is passed or failed based on the leakage of the unit during the test, as well as any failure at the boundary between the damper and the supporting construction. The damper closing is just the start of the test.

The laboratories are unwilling to state that a change in building in method will not affect the leakage performance.

Previously, under the BS 476 ad-hoc testing, assessments were forthcoming with respect to installation, this was because the test pass or fail criteria were purely mechanical with gap gauges etc, not leakage measurement.

INSTALLATION METHODS

The following sections deal with the installation methods. There is a description of each method and a drawing showing all the dimensional details.

In each case the classifications are shown, together with the fire test reference. Fire test reports are available in full from the Actionair sales office. These are large documents and we are not permitted to abridge them. They are available in pdf document format.

Alternative partition systems to those shown within this installation manual can be used if they have been shown by test to have at least the same fire resistance when tested to BS EN 1364-1:1999 as is required of the damper. If the partition system has been successfully tested without stone mineral wool, it does not have to be used in practice when only considering the fire performance of the complete system. The mineral wool may still be needed for other reasons, e.g. acoustic performance.

DW145

Guide to good practice, for the installation of fire and smoke dampers

The DW145 guide is intended to highlight and clarify the important aspects of fire and smoke barrier / damper installation, including the responsibilities of all parties involved in the overall sequence from system specification through to a compliant installation. Emphasis is placed on the need for all parties to work as a team by recognising not only their individual responsibilities, but also those of all other parties in achieving this goal.

The guidance only relates to the installation of fire dampers and leakage rated fire smoke dampers as used in ventilation systems to maintain fire compartments and / or protect means of escape from buildings and does not cover the installation of powered smoke control dampers.

The importance of installing damper arrangements that have been selected / specified by the system designer and that have been successfully fire tested by an independent body on behalf of the damper manufacturer is emphasised throughout the guide.

Communication between team members and the need for consistency in both design and approach are key factors in achieving a compliant design. The guide recommends that check lists are utilised and adapted to suit the specific requirements of an individual project. Typical check sheet are included in appendix E of the guide and we have developed check lists for inspection and handover (E3 in the guide) specifically for our dampers. These can be downloaded from our web site for the installations shown in this installation guide.

Useful Contacts

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