Fire damper frequently asked questions for ASFP

Fire Dampers to protect escape routes

1. **Q.** Can I use fire dampers where ductwork passes through an escape route such as a protected stairway or corridor?

   A. Fire dampers (including intumescent) are not suitable for use on protected escape routes because they do not protect the escape route from smoke. In this instance there are two solutions:-

   Option 1 Ductwork protected
   Ductwork passing through the protected route be enclosed with fire resisting construction/the ductwork itself be fire resisting (known as method 2 and 3 respectively) in both cases tested to BS 476: Part 24 or EN1366-1 (with fire exposure from the inside) and not serve the protected route. See Figure 1 and 2.

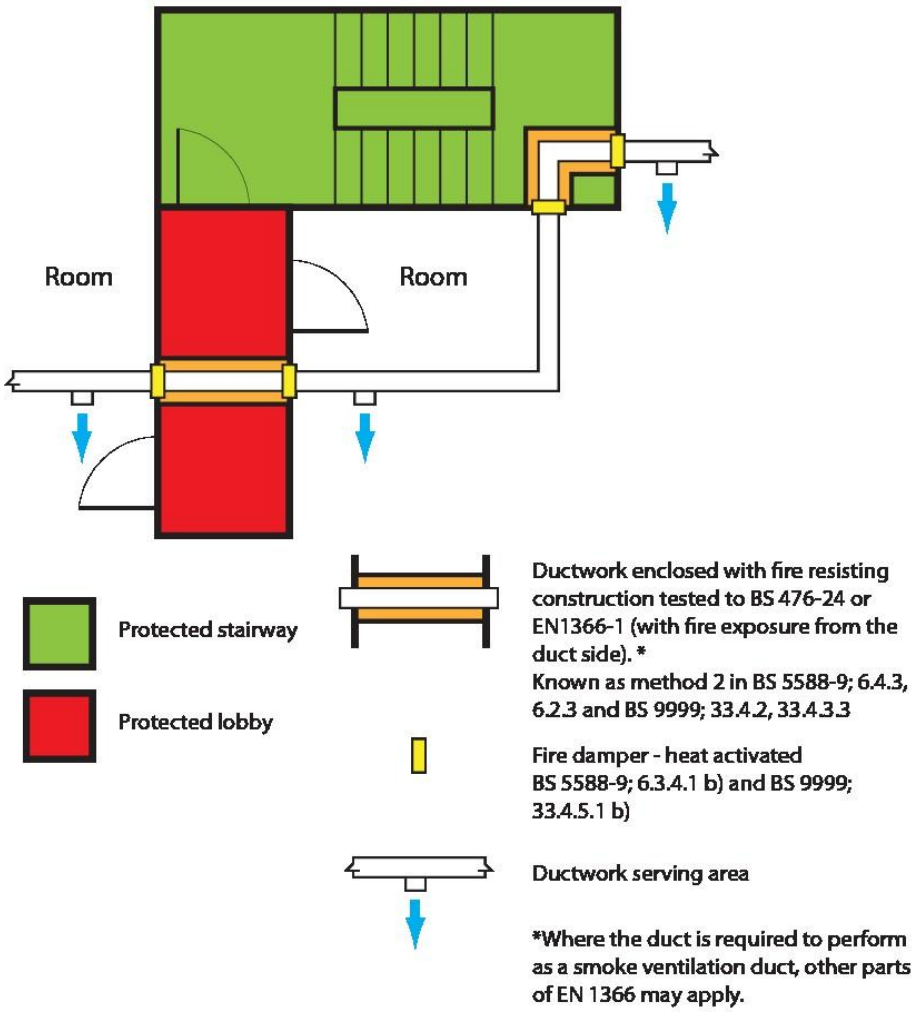

Figure 1 - Protected ductwork solution - Method 2 - Ductwork passing through protected routes without serving the route (Method 2 in BS 5588-9; 6.4.3 and BS 9999; 33.4.2)

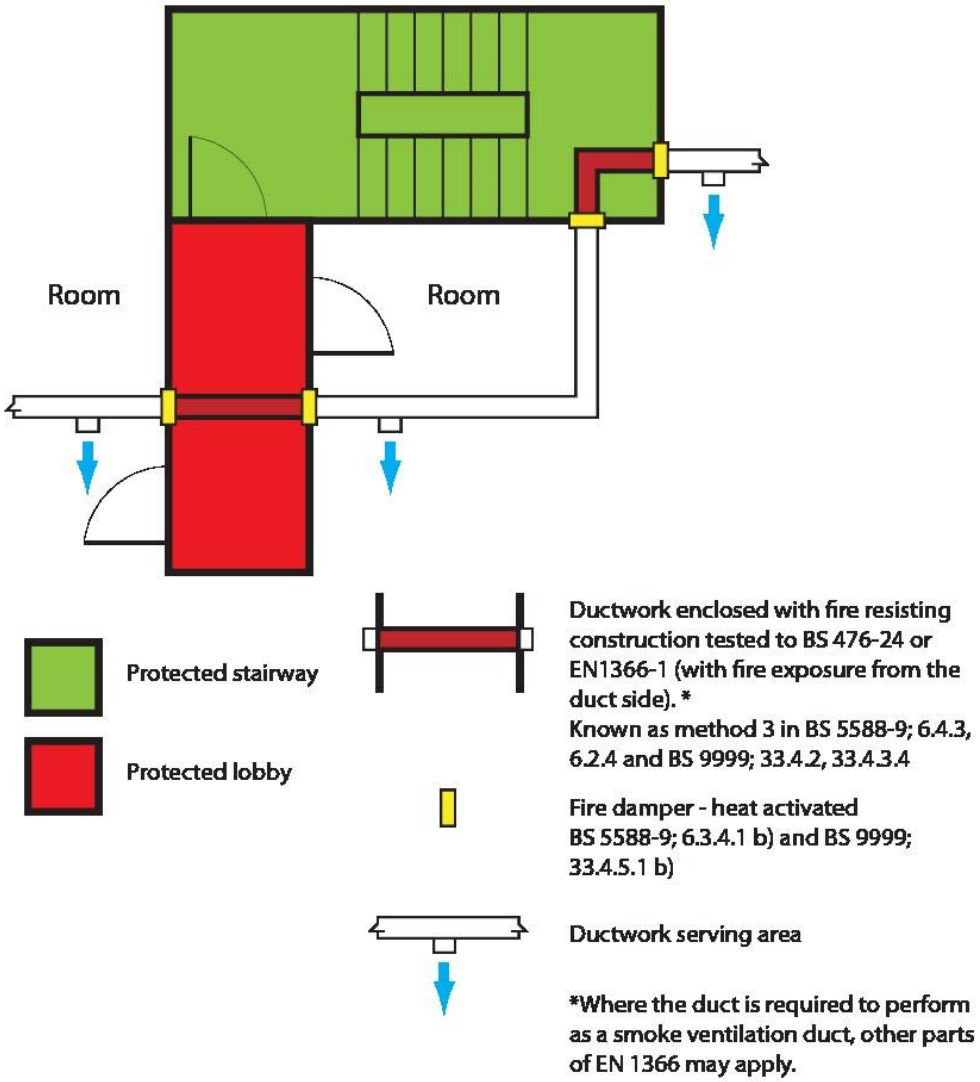

Figure 2 - Protected ductwork solution - Method 3 - Ductwork passing through protected routes without serving the route (Method 3 in BS 5588-9; 6.4.3 and BS 9999; 33.4.3)

Option 2 – ES leakage rated fire dampers

ES classified leakage rated fire dampers would be suitable. Such dampers should achieve an ES classification to BS EN 13501-3 when tested to BS EN 1366-2. See Figure 3.

It is important the ES dampers are installed in accordance with the fire damper manufacturer's tested details, as the opening into which the damper is fixed is also a leakage path for smoke.

The ES classification confirms that the fire damper has a reduced smoke leakage value, both at ambient room temperature and during a fire.

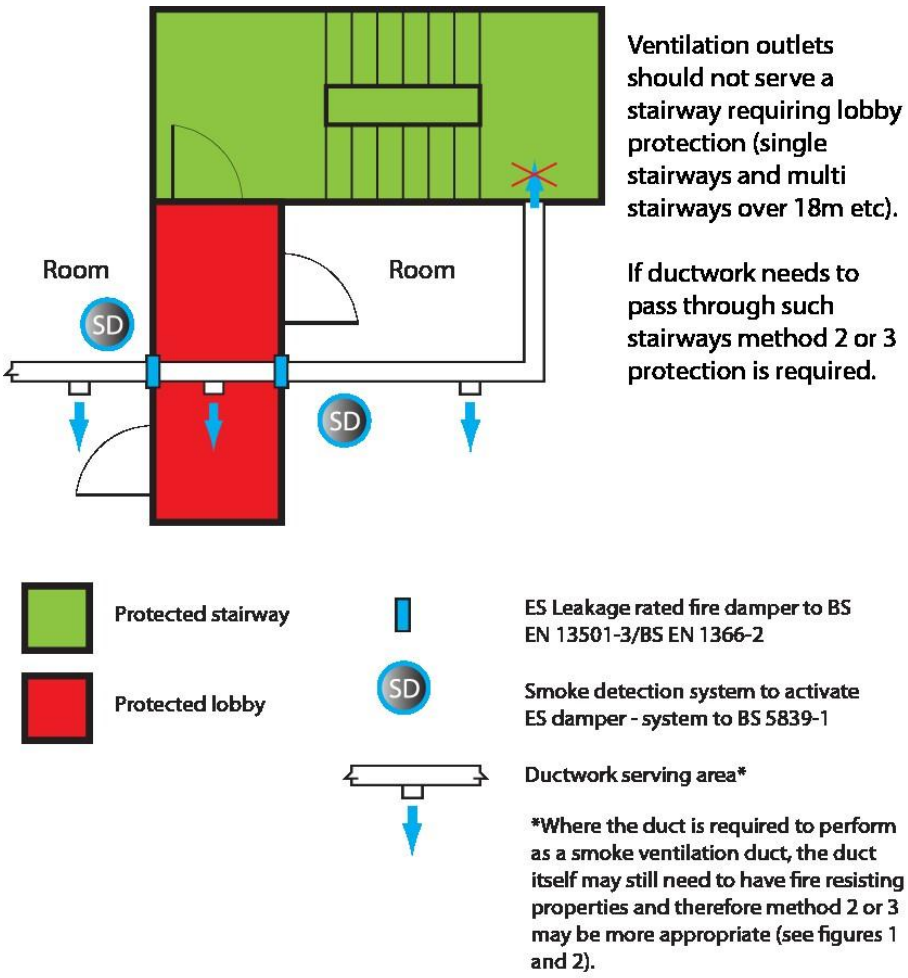

Figure 3 - ES Damper solution - Ductwork passing through protected routes is able to serve the protected routes

Sources:

Approved Document B 2006; paragraphs 5.46 - 5.53 (re: enclosed ductwork and ES dampers)
BS 5588-9:1999 paragraphs 6.4.3 (re: enclosed ductwork)
BS 9999:2008 paragraphs 33.4.2 – 33.4.3.4(re: enclosed ductwork)

Ductwork Insulation near fire dampers

2. **Q.** Where fire dampers are installed, does the specification of externally applied ductwork acoustic/thermal insulation matter?

   A. Yes. Any insulation within 500mm of a fire damper should be either a **non combustible material** or a **material of limited combustibility**.

A material can be considered as being of limited combustibility if its reaction to fire performance meets the requirements of Table 1 below reproduced from Table A7 of Approved Document B. The fire performance of such materials may be demonstrated by testing to either British Standards or European Standards.

Table 1: Definitions of materials of limited combustibility	
Performance determined using British Standards	**Performance determined using European Standards**
a) Any **non-combustible** material listed in Table 2 (below). b) Any material of density 300 kg/m^3 or more, which when tested to BS 476-11: 1982, does not flame and the rise in the temperature of the furnace thermocouple is not more than 20^{O}C. c) Any material with a non-combustible core at least 8mm thick having combustible facings (on one or both sides) not more than 0.5mm thick. Where a flame spread rating is specified, these materials must also meet the appropriate test requirements.	a) Any material listed in Table 2. b) Any material/product classified as Class A2-s3, d2 or better in accordance with BS EN 13501-1: 2002 *Fire classification of construction products and building elements, Part 1 – Classification using data from reaction to fire tests.*

Table 2 below has been reproduced from Table A6 of AD-B.

Table 2: Definitions of non-combustible materials	
Performance determined using British Standards	**Performance determined using European Standards**
a) Any material which when tested to BS 476-11: 1982, does not flame nor cause any rise in the temperature on either the centre (specimen) or furnace thermocouples. b) Totally inorganic materials such as concrete, fired clay, ceramics, metals, plaster and masonry containing not more than 1% by weight or volume of organic material. (Use in buildings of combustible metals such as magnesium/aluminium alloys should be assessed in each individual case). c) Concrete bricks or blocks meeting BS EN 771-1: 2003. d) Products classified as non-combustible under BS 476-4: 1970.	a) Any material classified as Class A1 in accordance with BS EN 13501-1: 2002 *Fire classification of construction products and building elements, Part 1 – Classification using data from reaction to fire tests.* b) Products made from one or more of the materials considered as Class A1 without the need for testing as defined in Commission Decision 2003/424/EC of 6th June 2003 amending Decision 96/603/EC establishing the list of products belonging to Class A1 “No contribution to fire” provided for in the Decision 94/611/EC implementing Article of the Council Directive 89/106/EEC on construction products. None of the materials shall contain more than 1% by weight or volume (whichever is the more onerous) of homogeneously distributed organic material.

Sources:

Requirement for material covering ducts to be non-combustible or of limited combustibility:

- BS 5588: Part 9; paragraph 6.5.2 b) 3
- ASFP Grey Book Volume 1: Volume 1: Fire dampers (European standards) E (integrity) & ES (integrity and leakage) classified; paragraph 11.3.
- HVAC DW145: Guide to good practice for the installation of fire and smoke dampers; E1 item 18 of design consideration check list.
- Approved Document B 2006; paragraph 10.14 (referencing BS 5588: Part 9)

Definitions of non-combustible or of limited combustibility:

- Approved Document B 2006

Ductwork Insulation near fire dampers – class 0?

3. **Q.** Can I use acoustic/thermal insulation which is class 0 within 500mm of a fire damper?

   A. No. class 0 (or the European equivalent - Euroclass B-s3, d2) are entirely different classifications to **non combustible** or **limited combustibility**. They use different tests which are less onerous.

   Insulation within 500mm of a fire damper needs to be a **non combustible material** or **a material of limited combustibility**, See answer to the question above.

   Sources:

   Approved Document B 2006; Appendix A Item 13 (definition of class 0).
   BS 5588-9:1999 paragraphs 6.5.2 b) 3) (proximity of insulation to fire dampers)

Fixing of fire dampers to walls or concrete floors

4. **Q.** Do I really need to 'fix' the fire damper to a masonry (brick or block-work) wall or concrete floor, the fire damper is riveted to the rigid metal ventilation ductwork?

   A. The fire damper is there to protect the fire separating element and not the duct work. We would always advise you to follow the tested installation method recommended by your chosen fire damper manufacturer.

   Generally this means the damper must be fastened to the wall in line with both the HEVAC frame specification and the manufacturer's installation instructions. Generally in line with guidance the connection with the duct should be made with aluminium rivets or perhaps plastic fasteners that will allow the duct to fall away from the damper in the event of a fire and reduce the risk of the fire damper being dragged from the wall leaving gaps for the fire to get through.

   Alternatively use another tested method suitable for masonry walls.

   Sources:

   Approved Document B 2006 paragraph 10.11
   Fire damper manufacturers literature and tested details - various

5. **Q.** The fire dampers are supplied with the associated supplied HEVAC installation frame and we intend to use fire resisting/ablative coated batts and sealant to fire stop the gap between the damper installation frame and block work or masonry wall. Is this adequate?

   A. If the dampers have been supplied with HEVAC frame, generally they should be Built in (mortared) and wired back to studs or anchors in to the structure. This

should follow the fire damper manufacturer's instructions. The frame/wall connection should not be sealed with ablative batts.

The fire damper shall be tested in association with a specific supporting construction. If an E or ES classification is required (see Approved Document B paragraph 5.48 and also question 1 and Figure 2 above), the mixing of installation method and gap sealing is not allowed as an assessment may not be made on the result as it is dependent on leakage through the fire damper, during the test, not just the penetration seal.

Individual fire damper manufacturers may have tested different types of frames/ assemblies for use with batt infill and these methods shall be followed to ensure that classifications are maintained. It is also important that the ablative coated batt infill and intumescent sealants used are the same specification as tested by the fire damper manufacturer.

Sources:

Approved Document B 2006 paragraph 10.11
Fire damper manufacturers literature and tested details - various

Fixing of fire dampers to timber floors

6. **Q.** I have a situation where ductwork passes though a timber floor which is a fire resisting compartment floor, I consulted a number of fire damper manufacturers but have not been able to find any fire tested fixing details for a timber floors. What would you advise?

   A. It would be advised to use the services of a laboratory or qualified fire engineer to assess and approve the installation.

   Fire damper manufacturers may wish to consider that a market exists for a product which has successfully passed a fire resistance test in timber floors.

Sources:

Approved Document B 2006 paragraph 10.11

Fixing of fire dampers to dry lined partitions

7. **Q.** I have been informed by building control that I need to fix fire dampers to the plasterboard partitions. However this seems to be difficult to achieve practically. Can you advise how the HEVAC frames supplied with the fire dampers can be fixed to the partitions?

   A. If the dampers have been supplied with HEVAC frame, generally these are not suitable for use in dry lined partitions. Fire damper manufacturer's generally have other tested installation methods for dry lined partitions. These either utilise a cleat that allows the fire damper to be suspended from the ceiling structure and allows the wall to be built to completely encase the fire damper, or a they utilise a flange that allows the fire damper to be fastened back to the tracks and studs

that have been used to safely line out the hole in the partition. In the latter case, a detail will be given on how to make good on the other side of the partition.

Sources:

Approved Document B 2006 paragraph 10.11
Fire damper manufacturers literature and tested details - various

8. **Q.** Is it necessary to securely fix the fire damper to the dry lined partition as the dampers are securely fixed to the metal ductwork and I intended to fire stop the gap between the HEVAC frame and the plasterboard with Rockwool or intumescent paste?

   A. The fire damper is there to protect the fire separating element, not the duct work. Generally, in line with guidance, the connection of the fire damper with the duct should be made with aluminium rivets or perhaps plastic fasteners that will allow the duct to fall away from the damper in the event of a fire and reduce the risk of the fire damper being dragged from the wall leaving gaps for the fire to get through.

   The fire damper shall be tested in association with a specific supporting construction. For dry linings, this would generally be a cleat or flange arrangement not an HEVAC frame. If an E or ES classification is required (see Approved Document B paragraph 5.48 and also question 1 and Figure 2 above), the mixing of installation method and gap sealing is not allowed as an assessment may not be made on the result as it is dependent on leakage through the fire damper, during the test, not just the penetration seal.

   Individual fire damper manufacturers may have tested different types of frames/ assemblies for use with batt infill and these methods shall be followed to ensure that classifications are maintained. It is also very important that the ablative coated batt infill and intumescent sealants used are the same specification as tested by the fire damper manufacturer.

   Sources:

   Approved Document B 2006 paragraph 10.11
   Fire damper manufacturers literature and tested details – various

9. **Q.** What would you advise regarding maintenance of fire dampers?

   A. ASFP would recommend following the guidance in BS 5588-12 or BS 9999 Annex V and W.