

NAPFIS DATA SHEET

PASSIVE FIRE PROTECTION – BUILDING REGULATIONS a general overview.

England, Wales, Scotland and Northern Ireland

Every building must be designed and constructed in such a way that in the event of an outbreak of fire within the building, the unseen spread of fire and smoke within concealed spaces in its structure and fabric is Inhibited. Technical Guidance Handbook 2: 2.4 Scotland

Fire protection within buildings is one of the key elements that are considered in the design and development process of construction. Fire is one of the biggest risks that cannot only completely destroy a building, but also businesses, public organisations and of course lives.

Most buildings are designed in compartment units; rooms that all have an access to a way out that leads to safety in the case of a fire. In fire safety design terms these 'rooms' are called compartments. Each compartment is specified with a rating that signifies how long it should contain a fire, meaning that providing that room is sealed, the fire will not spread outside into the escape routes and other areas of the building. The concept behind this idea is:

- 1. To hold back fire for the appropriate amount of time for all occupants to escape and;*
- 2. To offer enough time for the fire authorities to arrive, and;*
- 3. To reduce the spread of fire to make the premises as safe as possible for the fire fighter to enter if necessary.*

Document B states:

9.1 The spread of fire within a building can be restricted by subdividing it into compartments separated from one another by walls and/or floors of fire-resisting construction. The object is twofold:
a. to prevent rapid fire spread which could trap occupants of the building; and

b to reduce the chance of fires becoming large, on the basis that large fires are more dangerous not only to occupants and fire service personnel, but to people in the vicinity of the building. Compartmentation is complementary to provisions made in Sections 2-6 for the protection of escape routes, and to provisions made in Sections 13 -15 against the spread of fire between buildings.

The problem faced by all building types is that for them to be functional these compartments must not be breached. Walls, ceilings and floors have a multiple of holes made for electrical, plumbing and computer services. Fire doors and fire rated glazing are installed when appropriate, ensuring fire rating is maintained.



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All of these elements are required to have fire-stopping systems included to ensure the fire integrity of each room (compartment) is maintained. The main guidance for these requirements is from the Building Regulations. Below are the main quotes concerning Fire-stopping instruction:

Building Regulations: England and Wales.

The section 'Guidance' in Document B3 states:

In the Secretary of State's view the requirements of B3 will be met:

- a. if the loadbearing elements of structure of the building are capable of withstanding the effects of fire for an appropriate period without loss of stability;
- b. if the building is sub-divided by elements of fire-resisting construction into compartments
- c. if any openings in fire-separating elements (see Appendix E) are suitably protected in order to maintain the integrity of the element (i.e. the continuity of the fire separation); and
- d. if any hidden voids in the construction are sealed and subdivided to inhibit the unseen spread of fire and products of combustion, in order to reduce the risk of structural failure, and the spread of fire, in so far as they pose a threat to the safety of people in and around the building.

Section 11: Protection of openings and fire-stopping

11.2 If a fire separating element is to be effective, then every joint, or imperfection of fit, or opening to allow services to pass through the element, should be adequately protected by sealing or fire-stopping so that the fire resistance of the element is not impaired.



B3 continues:

Fire-stopping

11.12 In addition to any other provisions in this document:

- a. joints between fire separating elements should be fire-stopped;
and
- b. all openings for pipes, ducts, conduits or cables to pass through any part of a fire separating element should be:
 1. kept as few as possible
 2. kept as small as practicable; and
 3. fire-stopped (which in the case of a pipe or duct should allow thermal movement).

In Scotland the Technical Guidance Document states:

Every building, which is divided into more than one area of different occupation, must be designed and constructed in such a way that in the event of an outbreak of fire within the building, fire and smoke are inhibited from spreading beyond the area of occupation where the fire originated.

2.4.0 Introduction

Fire and smoke spread in concealed spaces is particularly hazardous because fire can spread quickly throughout a building and remain undetected by the occupants of the building or by fire service personnel. Ventilated cavities generally promote more rapid fire spread around the building than unventilated cavities due to the plentiful supply of replacement air. Buildings containing sleeping accommodation pose an even greater risk to life safety and demand a higher level of fire precautions. For these reasons, it is important to control the size of cavities and the type of material in the cavity.

Fire-stopping

Fire-stopping may be necessary to close an imperfection of fit or design tolerance between construction elements and components, service openings and ventilation ducts. Proprietary fire-stopping products, including intumescent products, should be tested to demonstrate their ability to maintain the appropriate fire resistance duration under the conditions appropriate to their end use.

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A chimney or flue-pipe should be constructed so that, in the event of a fire, the fire resistance duration of the separating wall or separating floor is maintained.

A service opening (other than a ventilating duct) which penetrates a separating wall or separating floor should be fire-stopped providing at least the appropriate fire resistance duration for the wall or floor.

This may be provided by:

- a casing which has at least the appropriate fire resistance from the outside; or
- a casing which has at least half the appropriate fire resistance from each side; or
- an automatic heat activated sealing device that will maintain the appropriate fire resistance in respect of integrity for the wall or floor regardless of the opening size.

Fire stopping of the following services passing through a separating wall or separating floor need not be provided for:

- a pipe or a cable with a bore, or diameter, of not more than 40 mm; or
- not more than four 40 mm diameter pipes or cables that are at least 40 mm apart and at least 100 mm from any other pipe; or
- more than four 40 mm diameter pipes or cables that are at least 100 mm apart; or
- a pipe which has a bore of not more than 160 mm and is of iron, steel or copper, or of a material capable of withstanding 800° C without allowing flames or hot material to pass through the wall of the pipe; or
- a branch pipe of a bore of not more than 110 mm connected to a vertical drainage or water service pipe, constructed from aluminium, aluminium alloy, or uPVC to BS 4514: 1983 (1998).

Where a pipe connects to another pipe which attracts a more demanding fire resistance duration, and is within 1 m from the separating wall or separating floor, the pipe should be fire stopped to the more demanding guidance.

A ventilating duct passing through a separating wall or separating floor should be fire-stopped in accordance with BS 5588: Part 9: 1999. Section 6 of BS 5588: Part 9: 1999 provides guidance on design and construction including fire resisting enclosures, fire resisting ductwork and the use and activation of fire dampers.