

Fire Safety Guidance Note: **GN92** Fire Resisting Separation (including advice on fire doors and self-closing devices)

Rev 3, 01 May 2022

Contents

1	Introduction	2
2	Fire Resisting Separation	3
3	Fire-resisting doors.....	5
4	Bibliography.....	11

Explanatory Note:

The London Fire Commissioner (the Commissioner) is the fire and rescue authority for London. The Commissioner is responsible for enforcing the Regulatory Reform (Fire Safety) Order 2005 (as amended) in London.

This Guidance Note provides fire safety advice in respect of Fire Resisting Separation including fire doors and fixings supporting fire compartmentation.

This Note is one of a series produced by the Commissioner to provide advice on various aspects of fire safety. If you require any further guidance on the advice given or require advice on another topic please visit your local Fire Safety Office, telephone 020 8555 1200 and ask for the nearest Fire Safety Office, or visit our web site at <http://www.london-fire.gov.uk>.

1 Introduction

- 1.1 This document has been prepared by the Fire Safety Regulation Department, London Fire Brigade (LFB).
- 1.2 The purpose of this Guidance Note is to provide information to the general public, designers, building managers, the Responsible Person and others. This guidance has been written with the aim of improving knowledge and giving understanding to the term, 'fire separation' and the materials and items that are used to achieve this. In the following paragraphs, the reader can acquire information with regard to construction and the need to achieve fire resistance for a building.
- 1.3 Items such as floors, walls and doors are referred to alongside surface finishes and glazing. Each of these elements may comprise the fire resisting fabric of the building where it needs to be in place and which are there to provide protection to building occupants in the event of fire. It must be remembered that not all floors, walls, doors and glazing are required to be fire resistant.
- 1.4 References are made in the text and the Bibliography to 'Standards and guidance' which will provide a higher degree of interpretation and knowledge should the reader require further information.
- 1.5 In many cases, LFB asks for an element of structure to have a minimum period of fire resistance. This minimum period is usually of at least 30 minutes to protect means of escape routes. Sometimes, a period of 60 minutes or more will be required when separating areas of high fire risk from low risk, separating basements from the remainder of the building, or separating two or more differing occupancy groups (types). Some other areas, such as a firefighting shaft, will require a higher level of fire resistance than the stated minimum as referenced in current guidance documents such as Approved Document B (ADB), British Standard (BS) 9999: Fire safety in the design, management and use of buildings. Code of practice and BS 9991: Fire safety in the design, management and use of residential buildings. Code of practice

NOTE : The periods of fire resistance quoted in this guidance note are when tested in accordance with the relevant part of BS 476.

NOTE : Fire resistance can be defined as: The ability of a component or a building to satisfied, for a stated period of time, some or all of the appropriate criteria given in the relevant standard.

2 Fire Resisting Separation

General

- 2.1 The materials from which premises are constructed may determine the speed with which a fire may spread with the potential for it to affect the escape routes that people will use. A fire starting in a building constructed mainly from materials that may promote rapid fire spread may accelerate a fire more quickly than one where fire-resisting construction materials have been used.
- 2.2 If materials of limited combustibility are used and the internal partitions are made from fire-resisting materials that have been built and maintained correctly, the fire will be contained for a longer period. This will allow more time for the occupants to escape as through the requirements of relevant guidance, some walls and floors will be fire-resisting and there are limitations on the surface finishes to certain walls and ceilings.
- 2.3 Consideration will need to be given as to whether the standard of fire resistance and surface finishing in the escape routes is satisfactory, has been affected by wear and tear or alterations and whether any improvements are necessary. The following paragraphs give basic information on how fire-resisting construction can provide 30 minutes protection to escape routes. This is the standard recommended for most situations. However, in certain situation this can be a longer period of time.
- 2.4 An 'element of structure' is a construction that normally performs an important function within a building e.g. a load bearing wall, ceiling, separating wall etc. When a requirement or recommendation is made for an existing 'element of structure' to be made fire resisting, the materials should be applied to the 'risk' side(s), e.g., if a cupboard under the stairs is to be made fire resisting, the interior of the cupboard should be lined with fire resisting materials.

Fire-resisting construction

- 2.5 The fire resistance of a wall or floor is dependent on the quality of construction and materials used. Walls that are required to be fire resisting must extend from floor to ceiling and be imperforate. Suitable materials for this would be brick, blockwork or studwork partitioning with a 12.5mm thickness of Portland cement plaster, or fire resisting plasterboard on each face of the studwork with joints taped, filled and provided with a plaster finish to cover exposed nail or screw heads and jointing material.
- 2.6 There are other methods and products available which will achieve the required standard of fire resistance and may be more appropriate for the existing construction in a premises. If there is any doubt about how a building is constructed, further advice should be sought from a competent person or alternatively the Association for Specialist Fire Protection (ASFP) who have produced guidance on passive fire protection. <https://asfp.associationhouse.org.uk/default.php?cmd=213>

Fire-resisting floors and ceilings

- 2.7 The fire resistance of floors will depend on the existing floor construction as well as the type of ceiling finish beneath. If the fire resistance of a floor needs upgrading it may not be desirable to apply additional fire resistance to the underside of an existing ornate ceiling. In older buildings there may be a requirement to provide fire resistance between beams and joists. A typical example of a 30-minute fire-resisting timber floor is tongue and groove softwood of not less than 15mm finished thickness on 37mm timber joists, with a ceiling below of one layer of plasterboard to a thickness of 12.5mm with joints taped and filled and backed by supporting timber.

- 2.8 An alternative method of fire resistance is often chosen when an existing ornate lath and plaster ceiling is to be maintained. For this to be effective, it is essential for the existing ceiling to be 15 or 22mm plaster on striated (rough) wood or reed lath, and to be in sound condition. To assist in preventing ignition sources from entering the area between the ceiling and the floor above, boarding should be applied to the floor. It should be 3.2mm standard hardboard Type S to BS EN 13501-1: Fire classification of construction products and building elements. Classification using data from reaction to fire tests (or 4mm plywood) nailed at not more than 150mm centres on the line of joints. The joints are to coincide with the line of joists. Alternatively a suitable fire resisting material may be positioned below the floor boards instead of the hardboard above.
- 2.9 There are other, equally valid, methods and products available for upgrading floors and ceilings; ask the advice of a competent person and ensure that the product is installed in accordance with instructions from the manufacturer or supplier.

Fire-resisting glazing

- 2.10 The most common type of fire-resisting glazing is 6mm Georgian wired glazing, which is easily identifiable. Clear fire-resisting glazing is available and can quickly be identified by a mark etched into the glass, usually in the corner of the glazed panel, to confirm its fire-resisting standard. Although this is not compulsory, the marking of glass is supported by the Glass and Glazing Federation. Please note that some glazing marking is visible only when a light is shone directly on it, e.g., by a torch. The markings are found in the corner of the glass or may be hidden behind the beading in which case written evidence would need to be provided to demonstrate that it was to the appropriate standard.
- 2.11 Fire resisting glass is categorised as 'insulating' or 'non-insulating'. Approved Document B of the Building Regulations limits the use of 'non-insulating' glazing in certain locations. Fire resisting glazing must also meet the requirements for safety when used in critical locations as defined in Approved Document 'N' (impact resistance) of the Building Regulations.
- 2.12 The glazing should have been installed in accordance with the manufacturer's instructions and to the appropriate standard to ensure that its fire-resisting properties are maintained. The performance of glazed systems in terms of fire resistance and external fire exposure should, wherever possible, be confirmed by test evidence.
- 2.13 The Glass and Glazing Federation may also be of assistance. Their address is:

40 Rushworth Street,
London
SE1 0RB

(Tel: 020 7939 9100)

Website: <http://www.ggf.org.uk/>

Fire separation of voids

- 2.14 A common problem encountered with fire separation is fire-resisting partitions which do not provide separation from floor to ceiling level. This may result in unseen fire spread and a loss of vital protection to the escape routes. It is important therefore to carefully check all such partitions have been installed correctly. For example;
- Care Homes, which utilise Progressive Horizontal Evacuation (PHE) as an evacuation strategy, where the separation for the strategy does not extend in to, and form part of, the roof void.

- Converted office to flats projects where the compartmentation has not been completed properly or compartment lines do not match up.

CLASP and SCOLA type construction

- 2.15 CLASP (Consortium of Local Authorities Special Programme) and SCOLA (Second Consortium of Local Authorities) are total or systematic methods of construction that were developed to provide consistent building quality.
- 2.16 They consist of a metal frame upon which structural panels are fixed. This results in hidden voids through which fire may spread. It is important that cavity barriers that restrict the spread of fire are installed appropriately, especially to walls and floors that need to be fire-resisting to the manufacturers instructions.

Breaching fire separation

- 2.17 To ensure effective protection against fire, walls and floors providing fire separation must form a complete barrier, with an equivalent level of fire resistance provided to any openings such as doors, ventilation ducts, pipe passages or refuse chutes.
- 2.18 The passing of services such as heating pipes or electrical cables through fire-resisting partitions leaves gaps through which fire and smoke may spread. This should be rectified by suitable fire stopping and there are many proprietary products available to suit particular types of construction. Such products should be installed by competent contractors and be installed in a manner which reflects any test certification. . Guidance is available on this and Approved Document B has details of this. <https://www.gov.uk/government/publications/fire-safety-approved-document-b>
- 2.19 In addition, the ASFP have produced guidance on fire stopping that is available from the link in paragraph 2.6 above.

Décor and surface finishes of walls, ceilings and escape routes

- 2.20 The materials used to line walls and ceilings can contribute significantly to the spread of flame across their surface. Most materials that are used as surface linings will fall into one of three classes of surface spread of flame as noted in ADB. There are other, equally valid, methods and products available for upgrading floors and walls. You should ask the advice of a competent person and ensure that the product is installed in accordance with instructions from the manufacturer or supplier.

Further details about internal linings and classifications are available in Approved Document B. Appropriate testing procedures are detailed in BS 476-7: Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products and where appropriate BS EN 13501-1 Fire classification of construction products and building elements. Classification using data from reaction to fire tests. Further guidance on types of fire-resisting construction has been published by the Building Research Establishment.

3 Fire-resisting doors

Requirements of a fire-resisting door

- 3.1 Effective fire-resisting doors are vital to ensure that the escape route is suitably protected so that occupants can evacuate to a place of safety. Correctly specified and well-fitted doors will hold back fire and smoke, preventing escape routes becoming unusable, as well as preventing the fire

spreading from one area to another. Fire-resisting doors are necessary in any doorway located in a fire-resisting structure. Most internal doors are constructed of timber. These will give some limited protection against fire spread, but only a purpose-built fire-resisting door that has been tested to an approved standard will provide the necessary protection.

3.2 The common term 'Fire Door' usually means one of two door uses:

Doors on escape routes or Final Exit doors:

In order to allow persons to evacuate from buildings in the event of a fire, doors on the means of escape routes must satisfy certain criteria to allow persons to easily pass through them. Generally, this means that the doors must be unobstructed and easily opened without the use of a key.

Fire Resisting Doors:

Protected escape routes i.e. staircases and certain corridors are constructed from fire resisting material to allow persons to escape without being obstructed by fire, heat and smoke and therefore doors within these escape routes may also have to be fire rated and fitted with self-closing devices.

3.3 Any door in a fire resisting wall should comprise of a fire resisting doorset.

- a) This means a door and its frame fitted as one complete unit conforming to the recommendations of BS 476-22: Fire tests on building materials and structures. Method for determination of the fire resistance of non-loadbearing elements of construction and BS 476-31.1: Fire tests on building materials and structures. Methods for measuring smoke penetration through doorsets and shutter assemblies. Method of measurement under ambient temperature conditions.
- b) The door, or frame, should be fitted with an intumescent strip and cold smoke seal, normally on all sides. The gap at the base of the door should not exceed 6mm and the gap to the frame or between door leaves between 2 and 4mm. (See Note below)
- c) The door fixings and furniture are to be suitably fire resisting and the self closing mechanism is to conform to BS EN 1154: Building hardware. Controlled door closing devices. Requirements and test methods.

3.4 All fire-resisting doors are rated by their performance when tested to an appropriate standard. The level of protection provided by the door is measured, primarily by determining the time taken for a fire to breach the of the door assembly, together with its resistance to the passage of hot gases and flame. Tests are conducted to BS 476 parts 22 and 31.1 or to BS EN 1634-1: Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware. Fire resistance test for door and shutter assemblies and openable windows. All fire doorsets should be classified in accordance with BS EN 13501-2: Fire classification of construction products and building elements. Classification using data from fire resistance tests, excluding ventilation services

3.5 Fire doors should be installed in accordance with the fire test data as detailed for the testing process. Modifications to the door can, unless completed by an authorised specialist and noted as such, invalidate the test certification supplied with the door.

3.6 Note: This information is taken from the ASDMA Best Practice Guide to fire doors, paragraph 14.11 which references BS 4787-1: Internal and external wood doorsets, door leaves and frames — Specification for dimensional requirements and BS 8214: Timber-based fire door assemblies – Code of practice – clause 9.5.2.

- 3.7 It may be possible to upgrade the fire resistance of existing doors. Further information is available from the Building Research Establishment or Timber Research and Development Association (TRADA).

Doors on escape routes/final exit doors – general principles

Automatic Sliding Doors

- 3.8 Where automatic sliding doors are to be installed, whether operated electrically or pneumatically, the fail safe arrangements should be either:-
- a) that the doors fail safe in the open position, or
 - b) that the door may fail safe in the closed position if the doors have provision for pivoting outwards in the direction of the means of escape, or there is a door in the immediate vicinity that has that facility. The pivoting sliding doors should display a notice "In emergency push to open" in conspicuous plain letters.

Mechanical Revolving Doors

- 3.9 In general, revolving doors are not acceptable for means of escape purposes, thus installations using revolving doors must include suitable pass doors of a conventional pattern. Each bypass door should be considered as a single unit of exit width for exit calculations

The door should be connected to the fire alarm system so that upon an evacuation signal in any part of the building it stops rotating. Preferably, the doors should stop with each leaf in contact with an edge of the enclosure. This will avoid the edge of a free-swinging door causing an obstruction hazard.

Each door leaf should be clearly indicated on each side "In an emergency push to open" in white plain letters of adequate size on a green background. Suitable push rails should be provided on each side of the door.

The spring loading on the articulated door leaves should not exceed the normal loading of an average self-closing device.

When fully opened against the core, each leaf should be automatically held in that position until released manually. When released, each leaf should return to its normal position at a safe, controlled speed.

Emergency stop switches should be positioned on each side of the enclosure.

The electrical supply to the doors should be arranged so that when stopped, either as a result of a deliberate action (e.g. fire alarm) or as a result of a power failure, the doors can only be restarted by the manual operation of a switch. The switch should be sited to give the operator a clear view of the doors, with instructions that the doors should not be restarted with persons in the enclosure.

Swing Leaf Doors

- 3.10 Doors and gates forming part of an escape route should be hung to open in the direction of escape, clear of any steps, landings or the public way where :-

- more than 60 persons may require to escape from office or shop accommodation;

Where an outward opening door cannot be provided, e.g., because it would obstruct a public right of way, the inward opening door should be kept locked in the open position whilst the premises are in use.

In special circumstances where the fire hazard is considered to warrant it, exit doors may be required to open in the direction of escape irrespective of the number of occupants (e.g., spraying booths and premises licensed for entertainments purposes).

Sliding Doors

- 3.11 Sliding doors may be permitted on parts of routes of escape which would normally be used by staff such as in factories, warehouses or similar premises where a particular use may necessitate the provision of such doors. They should be marked "Slide to open" and be provided with a direction arrow indicating the direction of opening.

Rolling Steel Shutters, Iron Doors and Collapsible Gates

- 3.12 Rolling steel shutters, iron doors and collapsible gates on escape routes should be kept in the open position during the time the building is occupied and an appropriate notice fixed adjacent to each such shutter.

Wicket Doors

- 3.13 Full size wicket doors should be provided in large sliding doors and in large rolling shutters on escape routes and such doors should be clearly defined and be permanently marked as a fire exit using the appropriate signage. Where a wicket door is not of standard size it may not be suitable for the number of persons that may need to escape.

Glazing in fire-resisting doors

- 3.14 Although glazing provides additional safety in everyday use and can enhance the appearance of fire-resisting doors, it should never reduce the fire resistance of the door. The opening provided in the door for the fire-resisting glazing unit(s) and the fitting of the beading are critical, and should only be entrusted to a competent person. In nearly all cases the door and glazing should be purchased from a reputable supplier who can provide documentary evidence that the door continues to achieve the required rating.

Fire-resisting door furniture

Hinges

- 3.15 To ensure compliance with their rated fire performance, fire-resisting doors need to be hung with the correct number, size and quality of hinges. Hinges, in common with other hardware, must be of suitable quality and strength for the purpose for which they are intended. Thus hinges and the screws used to attach them to fire doors and frames should be made of iron, steel or brass and not of aluminium, plastic or an alloy with a melting point of less than 800 degrees centigrade.
- 3.16 Fire doors are normally of such a weight that they need to be fitted with three hinges per door. For extra large or unusually heavy doors four hinges should be used; hinges should be at least 100mm long. The hinges should be fixed as indicated in BS 4787-1: Internal and external wood doorsets, door leaves and frames. Specification for dimensional requirements. Also, BS EN 1935: Building hardware. Single-axis hinges. Requirements and test methods is the appropriate standard is a reference to be used.
- 3.17 Screws and bolts used in the fitting of any item of hardware to fire doors should be of iron, steel or high melting point alloy and of sufficient strength to carry the load, even under fire conditions, but not so long or placed that heat can be conducted through the thickness of the door.

Alternative door mountings

- 3.18 Although the most common method of hanging a door is to use single axis hinges, alternative methods are employed where the door is required to be double swing or mounted on pivots for other reasons. Floor mounted controlled door closing devices are the most common method regularly found with timber, glass and steel doors while transom mounted devices are commonly used with aluminium sections. In each case reference should be made to the fire test report for details as to compliance with the composition of the door assembly including the door mounting conditions.

Self-closing devices

- 3.19 All fire-resisting doors, other than those to locked cupboards and service ducts, should be fitted with an appropriately controlled self closing device that will effectively close the door from any angle. In certain circumstances, concealed, jamb-mounted closing devices may be specified and in these cases should be capable of closing the door from any angle and against any latch fitted to the door; spring hinges are unlikely to be suitable. Further information is available in BS EN 1154: Building hardware. Controlled door closing devices. Requirements and test methods. Rising butt hinges are not suitable for use as a self-closing device due to their inability to close and latch the door from any angle.

Signage

- 3.20 Except in the case of doors to hotel bedrooms and doors to and within dwellings (including flats and maisonettes), fire resisting doors should be marked with a permanent notice 'Fire door keep shut' which should comply with the Health & Safety (Safety Signs & Signals) Regulations 1996. Fire doors that are kept locked should be provided on the outer side with a sign that states 'Fire Door keep locked'. Other signs for automatic doors are available and should be placed on the appropriate doors.

Letterplates

- 3.21 Letterplates can be fitted in fire doors and should be installed in the door and tested as required. Where a letter plate is fitted into a door it should be fitted together with an intumescent liner, as the use of intumescent liners significantly inhibits the spread of fire through the letter plate aperture of the door leaf. Only letterplates that have achieved the appropriate fire resistance period when tested in situ in a fire door should be used. They may be able to be retrofitted, but specialist advice should be sought.

Door viewers

- 3.22 In a door required to be fire-resisting, the incorporation of a door viewer device is satisfactory provided that it is fitted into a drilling that perforates and extends across the whole thickness of the door leaf. The presence of a viewer creates a weakness in a fire door and it must be shown by test that both the viewer itself and its installation do not result in early loss of integrity. (See Note)

Note: This information is taken from the ASDMA Best Practice Guide to fire doors, paragraph 19.3

Automatic door hold-open/release devices for self-closing fire doors

- 3.23 These devices are designed to hold open self closing fire doors or allow them to swing free during normal use. In the event of a fire alarm the device will then release the door automatically, allowing the self-closing mechanism to close the door. Such devices are particularly useful in situations where self-closing doors on escape routes are used regularly by significant numbers of

people, or by people with impaired mobility who may have difficulty in opening the doors. Typical examples of such devices include:

- electro-magnetic devices fitted to the fire resisting door which release when the fire detection and warning system operates, allowing a separate self-closer to close the door;
- electro-magnetic devices within the controlled door closing device which function on the operation of the fire detection and warning system; and
- 'free swing' controlled door closing devices, which operate by allowing the door leaf to work independently of the closing device in normal conditions. An electro-magnetic device within the spring mechanism linked to the fire detection and warning system ensures that the door closes on the operation of the system.
- 'Dorguard' type devices that are acoustic (listen for the sound of a fire alarm)

3.24 The standard for these devices is BS 7273 – 4 Code of practice for the operation of fire protection measures. Actuation of release mechanisms for doors.

Note: Free swing devices may not be suitable in some situations, such as corridors, where draughts are a problem and the doors are likely to swing uncontrolled, causing possible difficulty or injury to certain people e.g. those with certain disabilities, the elderly and frail, or young children. Automatic door hold open/release devices fitted to doors protecting escape routes should only be installed in conjunction with an automatic fire detection and warning system incorporating smoke detectors, that is designed to protect the escape routes in the building.

3.25 In all cases the automatic device should release the fire-resisting door allowing it to close effectively within its frame when any of the following conditions occur:

- the detection of smoke by an automatic detector;
- the actuation of the fire detection and alarm system by manual means e.g. operation of break glass call point;
- any failure of the fire detection and alarm system; or any electrical power failure.

3.26 Other devices, including self-contained devices which perform a similar function, that are not connected directly to a fire alarm system and are not therefore able to meet the above criteria are available and may be acceptable where a site specific risk assessment can show that they are appropriate. Such devices are unlikely to be suitable for use on doors protecting single stairways or other critical means of escape. In all cases where a door hold open device is used it should be possible to close the door manually.

3.27 A site specific risk assessment should be undertaken before any type of automatic door hold open/release device is installed. If you are unsure about the suitability of such devices in your premises, you should seek the advice of a competent person. Further guidance about automatic door hold open/release devices is given in BS EN 1155: Building hardware. Electrically powered hold-open devices for swing doors. Requirements and test methods or BS 5839-3: Fire detection and alarm systems for buildings. Specification for automatic release mechanisms for certain fire protection equipment.

Door co-ordinators (door selectors)

3.28 Where pairs of doors with rebated meeting stiles are installed it is critical that the correct closing order is maintained. Door coordinators to BS EN 1158: Building hardware. Door coordinator

devices. Requirements and test methods, should be fitted and fully operational in all cases where the doors are self-closing.

Installation and workmanship

- 3.29 The reliability and performance of correctly specified fire-resisting doors can be undermined by inadequate installation. It is important that installers with the necessary level of skill and knowledge are used. Accreditation schemes for installers of fire-resisting doors are available. Fire-resisting doors and shutters will require routine maintenance, particularly to power operation and release and closing mechanisms. Poor installation and modification may invalidate the test certificate.
- 3.30 Further information is available on fire-resisting doors in BS 8214: Timber-based fire door assemblies. Code of practice. For further guidance on the selection and maintenance of door furniture suitable for use on timber fire resisting and escape doors refer to The Building Hardware Industry Federation (BHIF) Code of Practice – Hardware for Timber Fire and Escape Doors.

4 Bibliography

Detailed guidance on the various standards referred to in this guidance note may be obtained from the following bibliography. You can also obtain fire safety advice on other subjects by visiting our website at www.london-fire.gov.uk.

The publications can be obtained from the following addresses:-

AVAILABLE FROM	TITLE
Timber Research and Development Association Stocking Lane Hughendon Valley Bucks HP14 4ND Telephone: 01494 569600 Fax: 01494 565487 Web: www.trada.co.uk	Timber Research and Development Wood Information Sheet 1-32 : Fire Resisting Doorsets by Upgrading
Building Research Establishment Fire Research Station Bucknalls Lane Garston, Watford Herts. WD2 7JR Telephone: 1923 664000 Fax: 1923 664910 Web: www.bre.co.uk	Building Research Establishment Increasing the Fire Resistance of Existing Timber Floors 'Building Research Establishment Digest 220, Timber framed doors'.
British Standards Institution (Sales) 389 Chiswick High Road London W4 4AL Telephone: 020 8996 9001	BS 476-7: Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products

<p>Fax: 020 8996 7001</p> <p>Web: www.bsi.org.uk</p>	<p>BS 476 -20: Fire tests on building materials and structures. Method for determination of the fire resistance of elements of construction (general principles)</p> <p>BS 476 -21: Fire tests on building materials and structures. Methods for determination of the fire resistance of loadbearing elements of construction</p> <p>BS 476-22: Fire tests on building materials and structures. Method for determination of the fire resistance of non-loadbearing elements of construction</p> <p>BS 476-23: Fire tests on building materials and structures. Methods for determination of the contribution of components to the fire resistance of a structure</p> <p>BS 476-31.1: Fire tests on building materials and structures. Methods for measuring smoke penetration through doorsets and shutter assemblies. Method of measurement under ambient temperature conditions.</p> <p>BS 9999: Fire safety in the design, management and use of buildings. Code of practice</p> <p>BS 9991: Fire safety in the design, management and use of residential buildings. Code of practice</p> <p>BS 13501-1: Fire classification of construction products and building elements. Classification using data from reaction to fire tests</p>
--	--

	<p>BS 13501-2: Fire classification of construction products and building elements. Classification using data from fire resistance tests, excluding ventilation services</p> <p>BS 8214: Timber-based fire door assemblies. Code of practice</p> <p>BS 4787-1: Internal and external wood doorsets, door leaves and frames.</p> <p>BS EN 1935: Building hardware. Single-axis hinges.</p> <p>BS 7273-4: Code of practice for the operation of fire protection measures. Actuation of release mechanisms for doors</p> <p>PD 6512: Part 3: Guide to The Performance of Glass</p> <p>BS EN 1155: Building hardware. Electrically powered hold-open devices for swing doors. Requirements and test methods</p> <p>BS 5839-3: Fire detection and alarm systems for buildings. Specification for automatic release mechanisms for certain fire protection equipment.</p> <p>BS EN 1158: Building hardware. Door coordinator devices. Requirements and test methods</p>
<p>The Stationery Office (Mail, Telephone, Fax & Internet Orders)</p> <p>TSO Orders/Post Cash Dept PO Box 29 Norwich NR3 1GN</p> <p>Telephone: 0870 600 5522</p>	<p>Building Regulations- Approved Document B and Approved Document N</p> <p>Fire safety risk assessment offices and shops ISBN-13: 978 1 85112 815 0</p> <p>Fire safety risk assessment factories and warehouses ISBN-13: 9778 1 85112 816 7</p>

<p>Fax orders: 0870 600 5533 Web: www.tso.co.uk</p>	<p>Fire safety risk assessment premises providing sleeping accommodation ISBN-13: 978 1 85112 818 1</p> <p>Fire safety risk assessment residential care premises ISBN-13:978 1 85112 818 1</p> <p>Fire safety risk assessment educational premises ISBN-13: 978 1 85112 819 8</p> <p>Fire safety risk assessment small and medium places of assembly ISBN-13: 978 1 85112 820 4</p> <p>Fire safety risk assessment large places of assembly ISBN-13: 978 1 85112 821 1</p> <p>Fire safety risk assessment theatres and cinemas ISBN-13: 978 1 85112 822 8</p> <p>Fire safety risk assessment outdoor events ISBN-13: 978 1 85112 823 5</p> <p>Fire safety risk assessment healthcare premises ISBN-13: 978 1 85112 824 2</p> <p>Fire safety risk assessment the transport network ISBN-13: 978 1 85112 825 9</p> <p>Fire safety risk assessment animal premises and stables ISBN 978 1 85112 884 6</p> <p>Fire safety – Means of Escape for Disabled people ISBN 978 1 85112 873 7</p>
<p>ASDMA https://www.asdma.com/knowledge-centre/</p> <p>ASFP https://asfp.associationhouse.org.uk/default.php?cmd=213</p> <p>Glass and Glazing Federation</p>	<p>Best Practice Guide to Timber Fire Doors Free Download</p> <p>ASFP Publications</p> <p>Glazing information</p>

<p>http://www.ggf.org.uk/</p> <p>The Building Hardware Industry Federation (BHIF)</p> <p>https://www.thenbs.com</p>	<p>Code of Practice – Hardware for Timber Fire and Escape Doors.</p>
---	--

The above publications are current at the time of preparation of this Guidance Note (see date in footer).

Making London the Safest Global City