Fire Door Inspections in University & College Buildings

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GOLDEN THREAD Passive Fire Protection

FIRE DELAY

Background

Having identified that there were no recognised or adopted ‘cradle to grave’ standardised systems for inspecting and managing fire doors in University and College buildings, a King’s College London working group was formed in April 2024 to adapt an existing BIM4housing Reference Document for the inspection of fire doors in Residential Buildings, which had itself been adapted from a previous NAHFO written and NFCC approved Reference Document on how to inspect fire doors in Healthcare Buildings.

The intention of this new adaptation is to share best practice on fire door inspection in University and College buildings to a wide audience.

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How to use this document

Fire safety advisors, fire door inspectors and other fire industry professionals will hopefully find the whole document of interest, but it is also intended to be largely read and used by a cross-section of those whose involvement with fire doors may only be brief and incidental. For that reason the information is split into 5 distinct 'easy to access and read' sections:

Section 1 covers new fire doors and 'Type 1' fire door inspections in university and college buildings; so this section is likely to be of most interest to those involved in new build and major refurbishment projects involving the installation of new fire doors and particularly for those with the responsibility of providing and receiving new fire doors in a compliant state.

Section 2 deals with different options and approaches for 'Type 2' inspections of existing fire doors, often where very little written information regarding their specification, performance or fire compliance is available or exists.

Section 3 deals with the ongoing, functional 'Type 3' inspections of fire doors where they are known to be fire compliant to a suitable and sufficient standard for their location and usage, having already been either 'Type 1' or 'Type 2' inspected.

Section 4 outlines doors that require special consideration; namely, Heritage, Roller Shutter, Steel, Final Exit and High Security Doors.

Section 5 deals with creating and sustaining a robust Fire Door Management System for achieving and maintaining long term fire door compliance.

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0.1 Introduction:

Passive fire protection is an integral and important component of fire protection and fire safety in buildings. Effective fire compartmentation is required to preserve life and protect buildings, their contents and other assets. Fire and smoke resisting doors in fire walls play a critical role in controlling and restricting fire, heat and smoke spreading from its source uninhibited. They are also critical in achieving the required degree of containment and thereby ensuring the fire evacuation strategy of a building can be achieved with life safety risk, damage and disruption minimised.

Image courtesy of Golden Thread Fire Delay

0.2 Fire doors are the most frequently used and often abused element in a fire compartment and the ways in which they are inspected can be manifold and complex, influenced by a number of factors including the age, usage and criticality of the doors, combined with the height, function and fire evacuation strategy of the building. It is very important that these protection elements are understood and correctly inspected and maintained if buildings are to perform as expected should fire break out. By their very nature they are 'passive' until there is a fire, and only then will their fire performance in-situ be demonstrated.

0.3 Their method of inspection can be classified into three generic types:

Type 1: A prescriptive one, including invasive elements, that would typically take place soon after the doors have been installed to see if they are as specified and intended to meet Building Regulation and other required standards. This would normally methodically compare what has been installed with the door's specification details and the manufacturer's sponsored UKAS or equivalent evidence of performance to confirm compliance or raise any issues.

Type 2: A robust but potentially pragmatic and flexible one, which could be purely visual or may contain an invasive element, carried out on existing fire doors in occupied university and college buildings where there is often no evidence of performance and where no, or little, information exists. This type of inspection is to comply with the Regulatory Reform (Fire Safety) Order 2005 (hereafter referred to as the FSO); assessing if the condition of each fire door is suitable and sufficient in terms of meeting and maintaining the requirements of both the building's fire risk assessment and its fire evacuation strategy to protect relevant people and ensure safe evacuation or protection in the event of a fire.

Type 3: Undertaken on fire doors that have already been Type 1 or Type 2 inspected, where the doors are known to meet / have met the standard of fire compliance required and where an audit trail exists. This type of inspection is intended to ensure that suitably compliant fire doors are maintained to a recognised, functional standard, to comply with the FSO, under Articles 17 & 38, which require that fire doors and other life safety components are systematically managed and maintained in an efficient and effective way to minimise life safety risk.

The 3 generic types of inspection procedures are outlined in this document.

Measuring the diameter of screws using dial calipers during a Type 1 inspection.

Image courtesy of Assured Fire Safety Consultancy

0.4 Provision of plans, schedules and information:

Irrespective of what type of inspection is carried out, there should be a full set of floor plans in place, showing the location and intended rating of fire compartmentation and of all fire doors, together with a fire door schedule for each building. In older buildings, existing plans may not be easily available and determining compartmentation boundaries and their required levels of fire resistance may need to be clarified.

All fire doorsets* or assemblies* (*please see 'Glossary of Terms' for definitions) should physically have a unique identifying number and fire door schedules should, where possible, include the door manufacturer's name and reference to the relevant Primary Test Evidence or Global Fire Resistance Assessment (GFRA) Report to which it should comply, along with other relevant information to meet the requirements of Regulation 38 of the Building Regulations and to effectively manage and maintain the doors in compliance with the Fire Safety (England) Regulations and Articles 17 and 38 of the FSO.

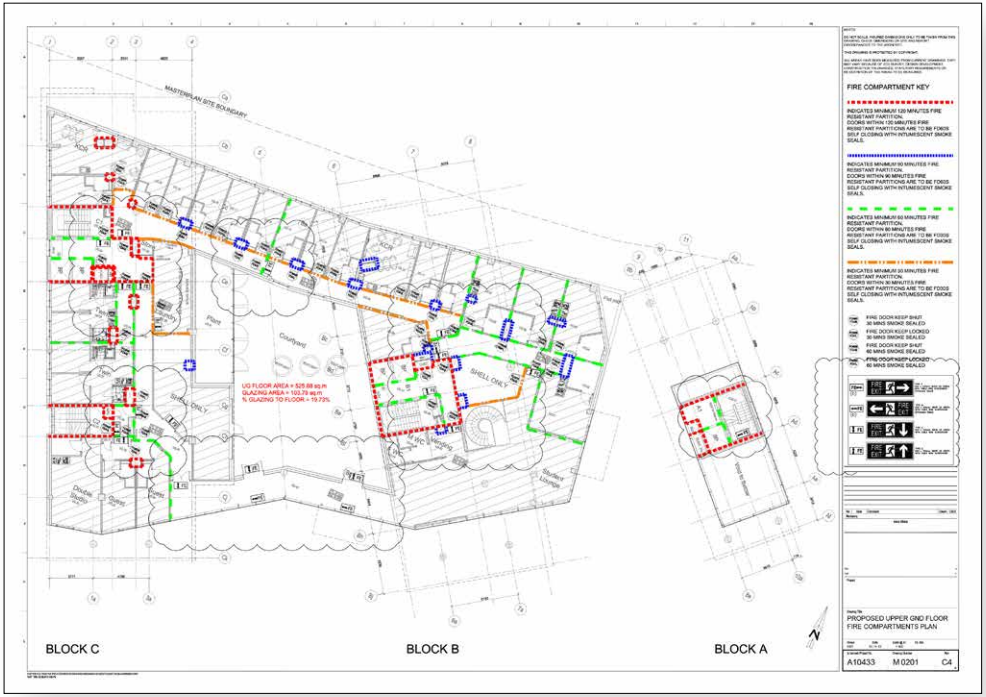


Image courtesy of Golden Thread Fire Delay

A golden thread of information should be in place for a fire doorset from 'cradle to grave'.

Image courtesy of Golden Thread Fire Delay

0.5 As per Dame Judith Hackitt's recommendations in her independent report following the Grenfell Tower fire *(please see the 'recommended reading' section)*, all fire door inspections should be electronically recorded using software. Systems such as Bolster and Onetrace, that have the flexibility to accommodate the 3 inspection Types outlined in this document, should be considered to provide a 'golden thread' of information that can be used as the foundations of a robust electronic audit trail for managing remediation and future ongoing inspections. It will assist their maintenance in a suitably compliant state in keeping with statutory requirements and ensure they do not unknowingly deviate from Primary Test Evidence, GFRA, or product-specific BS EN testing and that independent Third Party audited certification, covering their fire compliance, remains valid.

0.6 This document provides risk-based guidance for accountable persons, duty holders and others with responsibilities for suitably compliant fire doors and generally safeguarding university and college buildings, students and all other relevant people from fire.

Image courtesy of Golden Thread Fire Delay

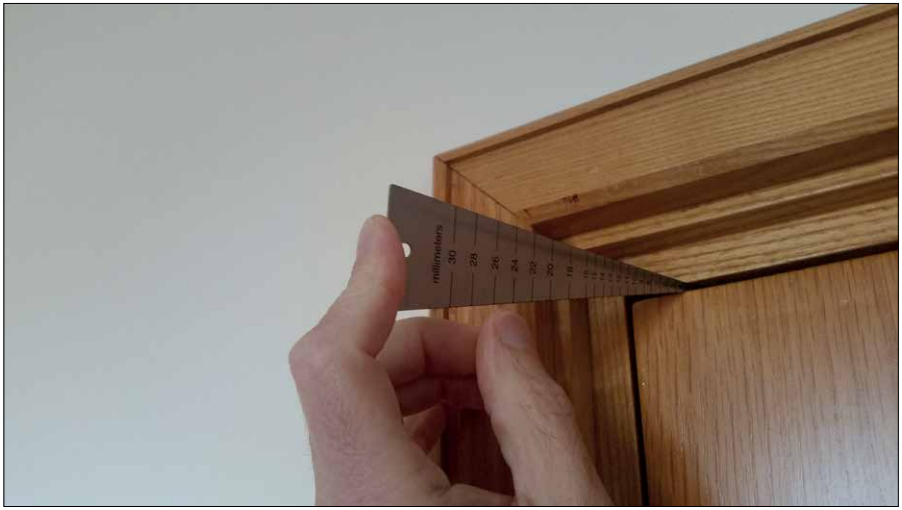
Section 1; Type 1 Compliance Inspections of New Fire Doors

1.1 If the fire door, as a doorset, is manufactured and installed under United Kingdom Accreditation Service (UKAS) Third Party Certification Schemes, then, as stated in Approved Document B (ADB), Volume 1 Dwellings, 2019 edition, *"independent schemes of certification and accreditation of installers can provide confidence that the required level of performance for a system, product, component or structure can be achieved".*

This is because under such schemes, both the manufacturer and installer should systematically have a percentage of their doorsets subjected to audits and inspections by the Certification Body, based on standardised comprehensive inspection procedures. However, ADB goes on to say, *"a building control body should establish before the start of the building work that a scheme is adequate for the purposes of the Building Regulations"* and under the Building Safety Act 2022 all duty holders also have a responsibility to ensure that fire doorsets, or door assemblies, are designed, manufactured, procured and installed competently. It is therefore necessary for those responsible for delivering fire compliance to ensure that those organisations and individuals within the fire doorset or door assembly supply chain have the capability, QA systems, robust inspection and handover procedures in place to deliver 'as tested' fire compliant doors.

The door manufacturer's latest design drawings and installation details are normally used by the inspector as a reference as to how the door should have been made and installed. The inspection of each element should be both detailed and robust and doors manufactured and installed under Third Party schemes should have stickers or plugs to identify its rating and who manufactured and installed it so that full traceability is possible.

1.2 It may be prudent for those responsible for the building handover, preferably at an early stage in the installation process, to do spot checks to verify that everything is to the Scheme standard. This could include invasive checks that would be difficult to conduct later, such as the interface between the frame and wall (i.e. surrounding substrate). It would also be appropriate to ensure that a complete electronic 'audit trail' has been compiled, including, for each door type, valid test evidence or GFRA in the manufacturer's current scope of approval, together with a UKAS or equivalent Certificate of Conformity for the installation, in a format easily accessed and user friendly, providing a 'golden thread' of information necessary for ongoing 'Type 3' inspections.



Checking the top edge of a door leaf during a Type 1 inspection.

Image courtesy of Golden Thread Fire Delay

1.3 If the door installers are not in an adequate Third Party certification scheme and also if the door has not been purchased as a doorset but assembled on site from various components (when choice and procurement of individual components and fire test compatibility can be an issue), then inspections to a similar standard will be required by someone with the competence to do so. This should be agreed and arranged at the procurement / pre-tender stage so that they can commence during the build contract, as checking purely at handover is often too late to deal with many potential non-compliance issues.

1.4 Establishing Competence:

The FSO identifies competent persons as *those with sufficient training and experience or knowledge and other qualities* to enable them to fulfil their role and responsibilities.

Fire door inspection competence needs to be appropriate to the complexity of role, level of responsibility and associated life safety risk in university and college buildings; therefore relevant Third Party accreditation is strongly recommended for any company or individual undertaking Type 1 and Type 2 inspections, together with relevant Professional Indemnity cover.

When appointing an inspector, it would be appropriate to consider their competence and experience in fire door testing, manufacturing or installing. They should also have a thorough understanding of fire doors in the context of the FSO, Fire Safety (England) Regulations, Building Safety Act, Building Regulations, British Standards and Approved Codes of Practice.

The Association of Specialist Fire Protection (ASFP) is creating a formal passive fire protection competency pathway for the industry to improve skills and knowledge to meet the competency requirements of the Building Safety Act 2022. It will be enshrined in the BS 8670 competency frameworks and based on the evaluation of individuals' skills, knowledge, experience and behaviour (SKEB) throughout the industry.

1.5 The following provides typical details of what the 'Type 1' inspection process should include for internal timber fire resisting doorsets:

1.6 Unique identification details for each doorset:

Name of manufacturer:

Information provided – fire doorset test, assessment, installation details:

Fire rating, classification and any other performance characteristics *(relevant to its location):*

Intended smoke seal requirement *(relevant to its location):*

UKAS (or equal) approved label(s) or plug(s) giving information & traceability of manufacturer(s):

UKAS (or equal) approved label or plug confirming the door has been installed under a 3rd party accredited scheme and date of installation:

Any other identification or specification information:

Please note that identifying and assessing details, including fire test data and compatibility with a door leaf's GFRA, can be both time consuming and problematic when the door's various components have been procured separately and installed as a 'fire door assembly' rather than a 'fire doorset', which is defined in this document as a single unit supplied from one source, as a complete, warranted, entity.

Image courtesy of Golden Thread Fire Delay

It is good practice for those carrying out 'Type 1' inspections, especially in the absence of an existing label, to affix uniquely numbered, dated, identification stickers and / or chips as proof that a competent inspection on the door has taken place, who inspected it and to help locate and identify individual doors referenced on drawings and / or fire door schedules.

1.7 The following checks on representative samples of various components making up the fire doorset or assembly, based on BRE/LPCB Scheme LPS 1197, will compare what is specified with what is installed and note any variations (non-conformities) which will be assessed as being 'major' (A) or 'minor' (I) with any observation notes (O) given for information:

1.8 Door Frame; there will be a requirement to check and record:

The width and thickness of frame members, that it is free from knots and shakes, is straight grained and has an apparent low moisture content:

The material it is made from; *N.B. timber door leaves should not be fitted in steel frames without fire test evidence, as steel and wood behave differently in a fire with steel expanding and wood shrinking. Also timber architraves must not be fitted to steel door frames, because in a fire the architrave on the unexposed side could flame due to heat transfer from the steel frame.*

Door stop thickness and width:

That it has been installed to correctly align with the surrounding wall and door leaf. It should not stand proud of the surrounding wall at any point unless detailed in GFRA or primary test evidence:

That the frame and stop are both securely fixed, with no visual damage, cracking or twisting:

The spacing, diameter, length, penetration and material type of frame fixings into the wall, including distance to wall edge; fixed within the fire compartmentation line, with no frame back exposure. Frame fixings must be fire rated and of adequate length *(as detailed in the test data)* to provide restraint and support in fire conditions, e.g. the deflection of fire rated partitions may expose fixings through intense heat and block walls will create heat, potentially reducing the performance of plastic plug type fixings:

The gap between frame and wall *(removing architrave if applicable)* to ensure the seal is as per the manufacturer's test evidence, instructions, GFRA approved or BS 8214:2016 compliant if bespoke details are not known:

This is to ensure that gaps between the back of frame and wall will not lead to integrity failure by either burn through or excess bending of frame fixings:

That non-combustible packing has been used and / or that packing has been correctly fire sealed:

That architraves are installed *(if required)* in accordance with test or GFRA approvals.

The gap between the frame and wall has been left unsealed.

Image courtesy of Golden Thread Fire Delay

1.9 Door Leaf; check and record:

Thickness, width and height – leaf 1:

Thickness, width and height – leaf 2 if applicable:

Composition of leaf including skin and core material *(matching the test or GFRA?):*

Lipping thickness:

Evidence of leaf cracking *(core fractures)* or other damage that may have occurred during transit or installation:

That the leaf isn't twisted and is aligned into the frame *(and matching leaf if applicable).* Typically fire test reports will state that *door leaves must not be proud of each other or from the door frame by more than 1 or 2mm:*

That facing materials are within test or GFRA approvals:

Also check that the leaf has not been modified in any way outside the scope of evidence, e.g. reduced in size or cut to insert a vision panel.

Image courtesy of Golden Thread Fire Delay

A 30 minute timber fire door is normally approx. 44mm thick.

The thickness of a 60 minute door is normally 54mm.

Vermiculite cored GRP faced fire doors are always 40mm thick whether they are 30 minute or 240 minute rated.

1.10 Gaps and Seals:

Check and record door gaps and if uniform *(should be within 2-4 mm):*

Top:

Hanging:

Closing:

Meeting:

Bottom *(maximum 10mm for non-smoke control doors):*

Check for seal and record type / manufacturer and if same for top and vertical edges. Check if they match the type and size in the original fire test or listed in the GFRA (otherwise the door performance can be compromised):

Functionality of smoke seal if applicable:

Condition and fixing of seals:

Threshold *(bottom)* smoke seal if applicable; on smoke control doors, which should be identified with suffix's 'S'; the maximum gap should not exceed 4mm as per the other leaf edges:

Checking if gaps are uniform and within tolerance.

Images courtesy of Golden Thread Fire Delay

A door leaf bottom edge, fitted with a drop down seal.

1.11 Hinges:

Number:

Position of all hinges:

Make and type *(ball bearing, bush bearing, lift off etc.):*

Size, BS EN 1935 approved, Grade and CE marking (or UKCA marking when applicable):

Intumescent hinge protection if required / other packing *(potential non-compliance):*

Hinges are holding the door secure and upright:

Correct number, type and size of screws *(i.e. all hinge blade fixing holes have manufacturer's supplied or approved screws, tightly fastened, in place):*

Image courtesy of Golden Thread Fire Delay

An example of missing intumescent protection to essential ironmongery.

Image courtesy of Assured Fire Safety Consultancy

1.12 Locks, Latches, Handles and Bolts:

Manufacturer, product reference and CE (UKCA) marking; evidence of BS 476:22 or BS EN1634.1 approved products compatible to the door fire test:

N.B. If it is an escape route door, the hardware will also have to provide escape egress in accordance with EN 179, EN 1125 or EN 13637

Size of latch:

Size of strike plate:

Intumescent protection around casing, under lock forend or frame strike plate as required by the Primary Test or GFRA:

Check depth of lock mortice as this is a regular failure point when locks are installed on site:

Self latching function of latch bolt *(if applicable):*

Dead locking action of dead bolt *(if applicable):*

Functionality of handle:

Height of handle, i.e. approx. 1 metre from floor *(for Part M compliance):*

Details and functionality of bolts fitted to passive leaves if applicable:

Check that intumescing protection is installed to any integral bolts *(e.g. flush bolt forends and keeps)* in accordance with the test or GFRA:

If applicable, ensure that the fitting of more than one locking device on the doorset has not compromised test evidence or of its function in an emergency:

1.13 Closer:

Check the device has been installed in accordance with the manufacturer's instructions including that all supplied fixings are in place, it is installed in the correct location with correct arm geometry and the arm anchor clevis is securely installed directly to the frame head member. ** Please see adjoining image*

It needs to be confirmed that any surface mounted closing device is fitted in the correct application in accordance with CE/UKCA certification and fire test evidence. A closing device may be suitable for pull-side installation but not suitable for push side installation or may be suitable when the body is fitted to the door leaf but not suitable when fitted to the frame. It is not uncommon to find a fixed power size 3 door closing device fitted to the push side of a door leaf (app 66 with parallel arm fitting) when, by doing so, they become a size 2 closing device and incapable of holding a door leaf shut in a fire situation.

Record and check:

Type:

Manufacturer, product reference, CE (UKCA) marking, BS EN 1154 or BS EN 1155 approved to door fire rating; *N.B. some are not compatible with large vision panels in doorsets:*

The manufacturer's intumescing protection kit has been installed to the device body and slide track for integral devices:

** are the door closer screws of sufficient length to secure it to the door frame as well as the architrave?*

No evidence of oil leakage:
That the door leaf completely and reliably self closes from a maximum possible opening angle and approximately 75mm ajar and that the latch bolt (where fitted) engages fully into the frame strike plate from both (assuming all) opening positions or holds an unlatched door in the fully closed position:

Opening force, *for Part M compliance if required.*

Closing speed:

Details of hold-open device if applicable:

Will the door close automatically in the event of a fire or power failure?

1.14 Other Ironmongery and additions if applicable:

Door-co-ordinator

Check function and for CE (UKCA) mark; they should be tested to comply with BS EN 1158:

Letter box:

Dimensions:

If the aperture was cut by the door manufacturer or someone else:

Make and product reference:

Door manufacturer evidence of fire test and compatibility:

Evidence of intumescent & its performance:

Door Viewers (spy glass): Check height restrictions, compatibility with the door and intumescent requirements.

Image courtesy of Golden Thread Fire Delay

Air transfer ventilation grille:

Dimensions:

If the aperture was cut by the door manufacturer or someone else: (I.D. label?):

Type of closing device *(heat activated? Electromechanical / linked to fire detection and alarm system?)* and if suitable (compliant) for location? *(please also see Section 2 point 2.16)*

Make, product reference and evidence of fire performance:

Aperture size *(within the fire door manufacturer's fire certification dimensions?)* and its location relative to the door perimeter or glazing aperture:

Intumescing aperture liner system used:

If manufacturer's louvre grilles are fitted:

1.15 Vision Panels *(if applicable)*; record:

Any impact damage, glass pane fractures, glass pane delamination:

If BS 476:22 or BS EN 1634-1 space marks are visible to denote fire test evidence or BS EN 12600:2002 for impact resistance:

If the aperture was cut by the fire door manufacturer or someone else (I.D. label?). *If not factory fitted, check that the glazing system has been installed in accordance with the manufacturer's tested specifications, as any other product may compromise the fire resistance performance of the doorset or assembly:*

Width and height *(within the manufacturer's fire certification dimensions?)*:

Type and make of glass, identity marks:

Insulated or integrity only:

Part M compliant:

Glazing detail / beading firmly fixed, intumescent gasket:

Images courtesy of Golden Thread Fire Delay

An example of an aperture not cut in a factory under QA controls.

Images courtesy of Golden Thread Fire Delay

1.16 Push plates, kick plates and other surface coverings:

Check and record dimensions including maximum height, method of fixing, proximity to door edge *(so not to compromise self-closing action or the door face to frame stop gap).*

If it is factory fitted or retro fitted? *(if so, fire test evidence?)*

1.17 Door signage:

All fire door signage should comply with BS 5499-10: 2014:

Appropriate signage is determined by fire door location, use and whether it is being controlled by a hold-open device:

- Those to be closed when not in use should state "fire door keep shut"
- Those to be kept locked when not in use should state "fire door – keep locked shut"
- Those held open by a device should state "automatic fire door keep clear" etc.

Signs should be affixed to both sides of communal doors and applied to both leaves on double leaf doors.

Where only one leaf is fixed closed then a combination of FDKS and FDKL may be required.

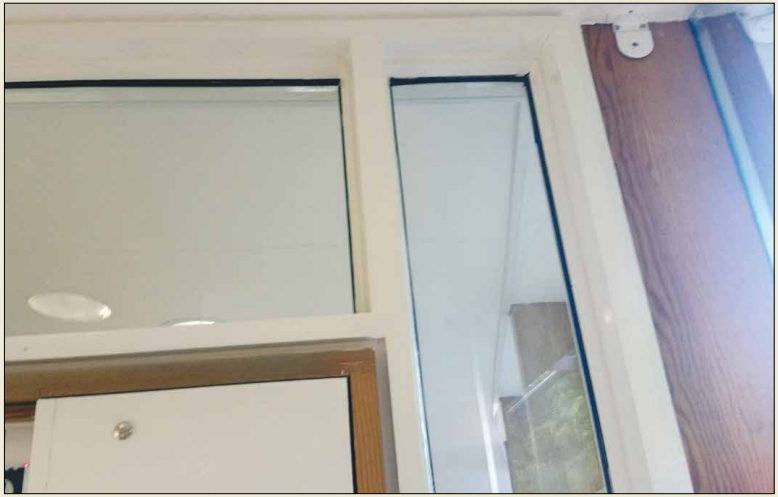
1.18 Condition and suitability of supporting wall:

Regarding the testing of fire doors; huge numbers have been installed in fire rated plasterboard walls; however, some fire door manufacturers have not had their doors tested in drywall construction and rely on assessments. With assessments no longer being accepted by many organisations, it is critical that for future projects they ensure AT DESIGN OR TENDER STAGE that there is certification to support their unique building project installation details. Although this may not be within the scope of the doorsets inspection, it would be relevant to investigate to what extent there is evidence that the dry-lined walls in which they sit have been installed in compliance with the plasterboard manufacturers guidance.

1.19 Not all fire doors have been tested with over-panels, glazed screens or even as double door sets. Panels and door assemblies should typically be installed separately in the support wall and independently fire tested. Test evidence should be checked for the limitations of the door leaf.

Panel make-up:

Panel dimensions:



An example of a doorset with glazed overpanel and side panels.

Image courtesy of Golden Thread Fire Delay

Panel fixing method:

Evidence of fire test to BS 476:22 or BS EN 1634-1?

Interface details:

Independent or shared frame members:

Panels align with the door leaf or leaves in the vertical plane:

1.20 Automatic Door Releases and Controls (if applicable)**:**

Many new fire doorsets, particularly in large public buildings, are held open and controlled by automatic devices. Although fundamental to the compliant door operation, interfacing to the fire alarm system will not normally be audited under the door's certification scheme but undertaken by a specialist door control company or fire alarm service provider.

Image courtesy of Golden Thread Fire Delay

Those responsible for the new door installation and building's fire safety must ensure the system is functional and compliant with both the device manufacturer's instructions and the GFRA.

Automatic control devices must have sufficient power for the weight and width of the doors and those inspecting must ensure that the doors fully close into position so the intumescent and cold smoke seals are fully aligned and effective.

Approved Document B Vol 2 (Section 1, clause 1.7) also advises compliance with the 7273 range of British Standards for the actuation of systems. In the case of automatic release mechanisms for fire doors, BS 7273-4 should be used alongside a suitable fire risk assessment to choose appropriate hardware for each door location.

Where door leaves are (to be) held open by point magnets, the contact pad to the door should always be fitted first to ensure that when they are aligned, the door plate will not be less than 50mm to edges or vision panels, in compliance with the test or GFRA. *It should be noted that some glazed doors do not permit the use of hold open devices.* It is also good practice to fit the device to a similar height as the closer to minimise the risk of the door twisting over time, although when floor springs are used it is normally recommended that the hold open device is positioned at a low level to also minimise the possibility of door leaves twisting.

1.21 Where communal doors have access controls installed and the door's electric locking devices are intended to fail unlocked on power loss, including activation of the override switch in the access control box (ACB) by the emergency services or on fire alarm activation, the correct function and release of the doors to allow escape must be verified by regular, documented testing. There is a need to check that the electric locking device installed is suitable for use on an escape route door and capable of releasing when the door leaf is under a side load (refer to code of practice 'fire and escape door hardware' published by GAI / DHF and referenced in ADB).

A local manual release, in accordance with BS 7273-4 or EN 13637, may be required to enable the doors to be released when the fire alarm has not activated. If added later and the door is a fire door, the installation should be in accordance with the door's fire test evidence.

Please note that there is a need to check that any hold-open or locking mechanisms do not re-energise when the alarm is silenced, which will require an assessment of the design, specification and suitability of the alarm system.

In terms of safety features and requirements such as sensors, safety switches, safety barriers and finger trap protection, those responsible for specifying, procuring, inspecting and managing automatic opening, power operated doorsets or assemblies, must be competent and knowledgeable of the requirements of BS 7036-0:2014 and BS EN 16005;2012.

Image courtesy of Golden Thread Fire Delay

Section 2; Type 2 Compliance Inspections of Existing Fire Doors

2.1 Type 2 Inspections are undertaken on existing fire doors, sometimes referred to as 'notional' fire doors, where there are no BS / EN fire test product labels or suitable information in the building's O & M manuals or Health & Safety files. Such inspections play a vital role in managers of university and college buildings assessing their existing fire doors in terms of fire compliance and understanding if those falling below the required performance level have the potential to be remediated to a standard that will support the building's fire strategy, or need to be replaced.

The notional fire performance of a door should not be ignored or thought worthless, as when the door was installed, potentially before certification schemes existed, there may have been no evidence of performance required to confirm that it had been designed, procured, manufactured and installed competently.

2.2 The inspections should be undertaken by competent persons (please see Section 1, 1.4), who in addition to knowing how to inspect a new door should also be thoroughly familiar with industry Approved Repair Techniques on existing doors, relevant and traceable to BS EN tested details. The inspections should be recorded, preferably electronically, within a report clearly distinguishing 'compliant' from 'non-compliant' doors, based on a suitable inspection criterion, detailing the necessary work required to make doors, with the potential to do so, compliant.

Competently assessing older doors is an important skill in the support of responsible spending, but critically the level of inspection needs to be suitable and sufficient for the type and use of building and location (risk rating) of doors. Because the standard of inspection may be audited or questioned by other stakeholders, a written set of inspection criterion, outlining how the doors should and have been inspected, is advised.

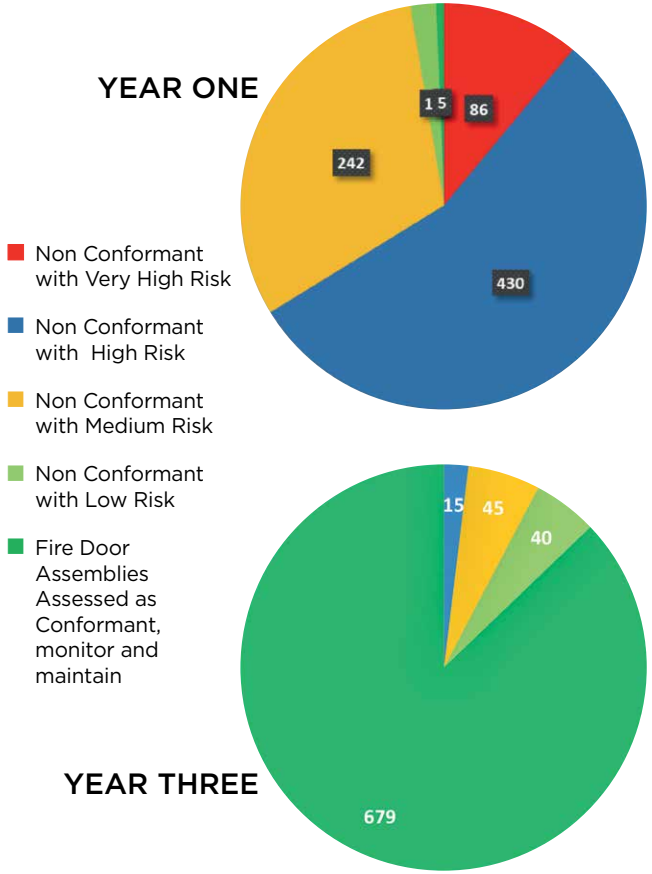
Checking a double door meeting gap with dial calipers during a Type 2 inspection.

Image courtesy of Golden Thread Fire Delay

This type of inspection is likely to be the most onerous with regards to the research needed, as the inspector may become directly accountable for the fire door performance assessment. Relevant professional Indemnity insurance is therefore recommended and evidence should be obtained by those responsible for the building before such inspections take place.

Following a Type 2 inspection, FRA's may consider active fire protection measures in place, such as water mist systems, that could reduce the risk and therefore the required compliance levels of doors. This would be in keeping with Government guidance, Building a Safer Future, December 2018, which states (in para 2.21) that: *"Buildings should be considered in a holistic manner and mitigation measures should be layered appropriately based on the use of the building and the risks posed"*

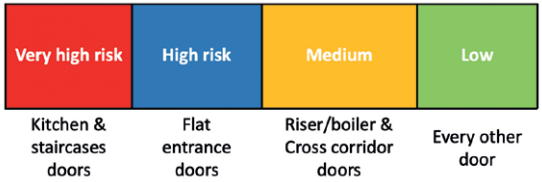
2.3 An up to date set of fire strategy drawings for the building is essential to ensure that fire door inspections are only carried out on doors required to have fire and smoke resisting properties or facilitate Means of Escape.



2.4 In the absence of information on the actual doors being inspected, those undertaking Type 2 inspection evaluations should consider the condition of the doors in respect of what they are protecting (criticality factor) and therefore what level of compliance is suitable and sufficient and which doors should be given priority in terms of remediation or replacement.

This needs to be expertly assessed by a fire safety advisor responsible for the building. For example, occupants with mobility issues may not be able to comply with the evacuation strategy and need to remain inside the building in a place of relative safety until given adequate assistance.

By doing so a fire door 'action priority' report can be established, leading to cost-effective, measured fire door improvement to reduce risk from year one; not only actual risk from fire for people, the building's fabric and activities but also in terms of protecting the university / college and its management. It provides documents that can be shared with external auditors to demonstrate consideration of FSO Articles 17 and 38, as part of a coherent fire door management system with a commitment to actual year on year improvement.



2.5 The limitations of remediating existing doors without previous certification or known fire performance needs to be fully understood, and careful consideration should be given to the extent it is acceptable and even economically sensible to remediate doors such as those manufactured prior to the existence of intumescent seals. Those seeking to do so should also be conscious that asbestos was widely used in fire door manufacture prior to 1980. *Before any proposed fire door remedials take place on older doors it may also be advisable to discuss the proposed actions with other interested parties and stakeholders such as insurers and fire & rescue, to ensure they are happy with the proposals rather than the doors not being replaced.*

2.6 It is good practice for those carrying out 'Type 2' inspections, especially in the absence of an installer's label, to affix uniquely numbered, dated, identification stickers to advise that a competent inspection on the door has taken place, who inspected them and to help locate and identify individual doors referenced on drawings and / or fire door schedules.

Those undertaking Type 2 inspections should issue an inspection report that can be used as the foundations of a robust audit trail for potentially managing remediation and future ongoing inspections and maintenance in keeping with statutory requirements.

A familiar sight of an old fire door assembly beyond its expected life with no potential for remediation to a certifiable standard.
Image courtesy of Golden Thread Fire Delay

2.7 On doors in high risk locations it may be appropriate to carry out robust invasive inspections, but as a minimum the following checks should be considered.

2.8 Door Frames:

A visual inspection, checking that it is securely fixed and aligned, noting:

- Frame cross section size
- Timber species and density
- Loose or damaged doorstops and their sectional size
- Fire-sealing gaps, including those between the frame and surrounding substrate, voids, service penetrations and other imperfections
- Any surface damage
- If metallic, whether it is made from steel or aluminium

Reasons for failing the frame could include:

- Frame member cross section size is too small
- If it is suspected or proven to be made of softwood or other material that cannot provide 60 minutes fire integrity where this rating is required
- Excessive structural damage or distortion is evident
- There is no evidence that the frame and leaf materials are compatible
- Excessive rebates and voids left by removal of, or poorly fitted, concealed door closers and other redundant hardware
- Previous repairs being to a poor standard and beyond cost-effective remediation
- Excessive misalignment that cannot be adjusted

A non-compliant door frame due to repeated impact damage.

Image courtesy of Golden Thread Fire Delay

2.9 Door Leaves:

Although a 'Type 2' inspection may only be a visual check, it is useful to ascertain the core material as this may help to determine how and to what extent it can be maintained. This can be ascertained if it has labels or identification plugs to provide specification traceability, otherwise it may be expedient to remove ironmongery such as the lock casing in order to do so.

Door leaf thickness; will often help to determine if the door is a fire door and if its rating is as assumed and required. A 30 minute timber door is normally approximately 44mm thick – a 60 minute door being approximately 54mm. This is not always the case, for example some European based manufacturers use 38mm cores for 30 minute and 62mm cores for 60 minute and hygienic faced vermiculite-cored fire doors tend to be 40mm thick irrespective of fire rating, but doors should not be assumed to have ratings if they are not to the guide thicknesses and no information on the doors exist.

Damage to leaves and frames: depending on the severity and location of damage, it may be possible to complete a repair to notional and identified 30 minute integrity door assemblies to a sufficient standard if they are carried out using Approved Repair Techniques, traceable to BS EN tested and approved data. Useful guidance can be found in documents published by the Architectural and Specialist Door Manufacturers Association (ASDMA), Fire Protection Association (FPA) and other industry bodies.

Publications that provide useful generic guidance on remediation and maintenance standards include BS 8214:2016 *'Timber based fire door assemblies. Code of practice'* and BS 9999:2017 *'Fire safety in the design, management and use of buildings. Code of practice'.*

Removal of lock casing to identify the door leaf core construct.

Image courtesy of Golden Thread Fire Delay

Other issues that could lead to door leaf failure include:

- Distortion/ misalignment of more than 1mm (please see below)
- Over-planed door edges resulting in thin vertical edge lipping *of less than 6mm*
- Damage such as splitting and delamination that is beyond repair
- Any evident alterations or unsuitable repairs
- Asbestos discovered as part of the door construction. It is normally accepted that a door containing asbestos should not be remediated due to safety and cost factors
- The door leaf is too small, i.e. door leaf to frame gap is too large to allow sufficient, cost effective adjustment or remedial works
- Cost of repair is substantial in relation to replacing with a new door leaf. Clearly this is a combined commercial / risk based decision to be made once all information is known

It is necessary for the door leaf to be closely aligned to the frame or 'leaf to leaf' in double doors; typically fire tests will require that leaves must not be proud of each other, or the door frame twisted by more than 1 mm, otherwise the door's fire integrity could be seriously compromised.

If the door leaf needs to be replaced, then the next decision is whether to replace the leaf only or to replace both leaf and frame. That decision needs to be made taking into account a number of factors including the type and size of building, evacuation strategy of the building, criticality of the door in terms of life safety, the condition of the existing door frame and *(especially relevant for 60 minute doors)* if the quality, type of material and density of the frame is known. In a double leaf or leaf and a half door, unless the damaged door leaf can be replaced with an exact same leaf from the same door manufacturer then a full new doorset or assembly should be installed.

An extreme example of a door leaf in need of replacement.

Image courtesy of Golden Thread Fire Delay

2.10 Gaps and Seals:

Gaps and seals around a door are critical as to how effectively the fire door will function when required and this will be a main consideration when assessing fire doors with very little or no existing information.

Recommended door leaf to frame gaps are 3mm +/-1mm. This is the typical gap allowed for a fire door to function and which manufacturers use in seal arrangements for both cold or ambient smoke leakage performance and intumescent seals in fire tests. Brush seals, tested to BS476-31.1 are available for larger gaps *(up to 7mm)*, but care needs to be taken in their use as such a large gap will affect fire integrity performance and should therefore be limited to doors in low-risk locations.

Ambient / cold smoke seals can be created by 'fins' or 'brushes' and can be either frame or door edge mounted. There are advantages and disadvantages to the use of both in either location, so their selection should be carefully considered.

An existing door in a building may not have the seals that you would expect to find on a new door and a view will have to be taken as to their suitability. One solution may be to replace door lipping complete with intumescent cold smoke seal as necessary. Any such change would need to be done in accordance with an Approved Repair Technique.

Critically, smoke seals must come into contact with the door edge if fitted in the frame, or with the frame if fitted to the leaf, and create a cold smoke seal at the meeting edge in double leaf doors. Excessive interruption of a smoke seal at hinges or other ironmongery positions can seriously reduce its effectiveness.

If a cold smoke brush or fin has been painted, then these must be replaced as their capability will be compromised; however, an intumescent seal without a cold smoke appendage CAN be painted over, if unavoidable, with up to 5 conventional coats of paint or lacquer, or 0.5mm thickness, whichever is greater.

Be aware of concealed intumescing seals behind door edge lippings. These can be found in older timber doors and also in new hygienic vermiculite-cored ones and may have been successfully tested to BS 476:22 or BS EN 1634-1.

Image courtesy of Golden Thread Fire Delay

Excessive threshold (bottom edge) gaps should be recorded and remediated. The maximum acceptable gap for a fire door is generally 10mm (refer to the primary test or fire resistance assessment report if possible), but on a fire door required to have smoke seal capability the gap should be 3mm and with a 1mm tolerance not exceed 4mm. This can often be resolved by re-lipping the door bottom edge, installing a threshold plate to the floor and / or fitting a flexible seal. Internal or external drop-down seals may be the best practical solution when the problem is exacerbated or caused by the floor being uneven.

Conversely there will be a need to ensure that a fitted threshold seal is not preventing the door leaf from effectively closing and /or fitting correctly against its rebate stop.

In existing, occupied buildings, a threshold gap not exceeding 4mm is not always achievable due to uneven floor levels and other issues. In these circumstances, the door location, room / area size, fire growth rate (FGR) and other factors such as design and ceiling height can be used by those responsible for the fire safety of the building to decide whether the excessive threshold gap of an existing fire and smoke control door is appropriate and can be risk managed.

In existing, occupied buildings, a threshold gap not exceeding 4mm is not always achievable due to uneven floor levels and other issues.

Images courtesy of Assured Fire Safety Consultancy

Any unsealed or incorrectly sealed gaps between rear of frame and wall may considerably reduce the fire resistance of the compartmentation and should be filled to the door leaf manufacturer's fire test detail where available, with evidence of performance including compatibility and type of packers and correct depth to width ratio, which for intumescent sealants tends to be 1:1. The use of polyurethane foam without unambiguous test evidence should be treated with suspicion. In the absence of manufacturer's information it is recommended to follow guidance given in BS 8214:2016.

Such gaps will often be hidden by architrave and a decision will need to be made whether or not to investigate the gap for compliance. There are three suggested options:

1. There is confidence *(reputable evidence?)* of the gap being correctly sealed so no action required.
2. There is no evidence or confidence of compliant gaps, so 10% of architraves are removed for inspection, which will be extended if a number are found non-compliant.
3. There is no evidence or confidence, but the location is assessed as being 'low risk' and therefore potential non-compliance is not thought to be significant.

Any unsealed or incorrectly sealed gaps between rear of frame and wall may considerably reduce fire resistance.

Image courtesy of Golden Thread Fire Delay

2.11 Hinges:

It is normal to expect a minimum of 3 hinges on a fire door up to 2.1 metres in height, not only because that is how it is likely to have been tested, but for practical reasons, i.e. the weight of the door needing a middle hinge to support the top hinge (which bears most of the weight) and to prevent it from deflecting when exposed to high temperatures. But it is not uncommon to find only 2, in which case it will have to be assessed whether it is allowable 'as is', whether the door leaf or door set should be completely replaced or if it is possible to fit 3 new hinges. **The absence of a 3rd hinge on a 60 minute door is unlikely, not least due to its weight, but should not be tolerated.**

A hinge which has sediment buildup and grime due to lack of maintenance.

Image courtesy of Sharon McClure

A common hinge configuration on fire doors, to support the weight and replicate a manufacturer's fire tested detail, is 2 near the top and 1 near the bottom, but 3, equidistant, may also be as tested and is acceptable when the door is not overly large or heavy and is not showing signs of dropping due to excess weight being applied to the top hinge.

Relatively new 60 minute timber doors are likely to need intumescent protection behind the hinge for the door to achieve a satisfactory fire test, but this will not always be the case and is unlikely to occur on doors in excess of 25 years old complete with original hinges. Fitting intumescent pads behind the hinge may be a good way to equalise the gaps between the door leaf and frame and fitting them behind new hinges on an existing door is seen as good practice, but there is no legal requirement for them to be retrofitted on doors not tested with them, providing the door is assessed as being suitably compliant and functional.

An old practice, which unfortunately still exists, is to use plastic and combustible card as hinge packing; always check for its presence and always specify its removal if discovered.

Visual checks:

- Check for hinge grade – modern fire-rated hinges are tested to BS EN 1935 and minimum requirements are grade 11 for a 30 minute door with a maximum weight of 80kg and grade 13 for a 60 minute door weighing 120kg. They should also be CE or UKCA marked *(applicable to fire rated hinges, door closers and some locking devices post June 2013).* On older doors the equivalents are BS 7352 class 8 for a 30 minute door and class 9 for 60 minutes
- Some FD30 doors are tested with grade 13 hinges and those with existing grade 13 hinges should be 'like for like' replaced where no door information exists
- Ensure that the hinges bear the weight of the door leaf in the frame and allow the door leaf to swing freely
- Look for gaps at each hinge knuckle joint or upward movement of hinge knuckle pins. These are indicators of excess wear
- Look for hinge blade distortion local to the knuckle. This indicates the door weight and / or usage are incompatible with the hinge grade or requires an additional hinge
- There should be no missing screws or excessive wear *(indicated by carbon deposits / metal fragments)* on hinge knuckles and pivot pins
- Check that no part of the hinge extends across the thickness of a 44mm door more than 12mm from the non-pivoting face and 18mm for a 54mm door to inhibit heat transfer

It is good practice to replace hinges showing signs of wear before they fail, not only to ensure and demonstrate planned maintenance that will prevent compliance issues but also to ensure that hinge failure does not cause undue damage to other fire door components, in particular the door leaf. It should be noted that lubricant on hinges is not always a sign of wear. Maintenance guidance for hinges will often state that leakage will not affect their functionality and can be removed to maintain the cleanliness of the hinge without the hinge requiring replacement.

Compliant hinges on older doors were tested to BS 7352; class 8 for a 30 minute door and class 9 for 60 minutes.

Image courtesy of Golden Thread Fire Delay

2.12 Pivot Systems:

On unlatched double swing doors, normally created by a floor spring pivot system, there is the need to ensure that the vertical edges do not taper and create uneven gaps, or have become misaligned, often an indication of excessive pivot wear or movement, which in the extreme will lead to leaf drop, increasing the likelihood of doors not self-closing.

Double swing action via a transom concealed closer and pivot assembly, often used where reduced ligature points are required or for a retrospective installation, have similar traits and should be similarly inspected.

For both generic types there is also the need to check that the pivot assemblies and transom closer housing have a 2mm thick intumescing liner installed throughout the top and bottom pivot recess, which would probably have been required for the doors to pass their fire integrity test. Intrusive work is likely to be necessary for these inspections.

Image shows a pivot assembly and transom closer housing with a 2mm thick intumescing liner.

Image courtesy of Golden Thread Fire Delay

2.13 Closing Devices:

Check:

- CE or UKCA mark (as applicable to age of door) and Model Reference – suitability for rating, door type and location of door
- The closer is correctly attached to the door leaf & frame
- For any damage and leaking oil
- That powered (electromagnetic) closing devices will close in the event of a power failure, alarm activation or alarm system fault *(as detailed in 1.21 above)*

Image courtesy of Paul Bray

- For obvious damage to the pivot arm and that all fixings are present and tight
- That the closer arm shoe is securely attached to the door frame, through the architrave thickness and into the door frame head
- That the door closes fully into the frame and if a double leaf double acting door it closes in the fully aligned position in any order of closing from all opening positions
- That the closing speed is suitable for its environment
- If rebated double leaf door sets are fitted, for the presence of a suitable co-ordination device and that it functions correctly to ensure that the leaves close in the correct sequence to maintain the fire integrity of the complete assembly

Please note: where a compartment or room has heat detection only, electromagnetic 'hold open' devices, electromagnetic self-closing devices and battery powered devices should not be fitted to its fire door(s) if they are suffixed with an 'S' or 'E' and the door(s) provide a means of escape or protect a means of escape.

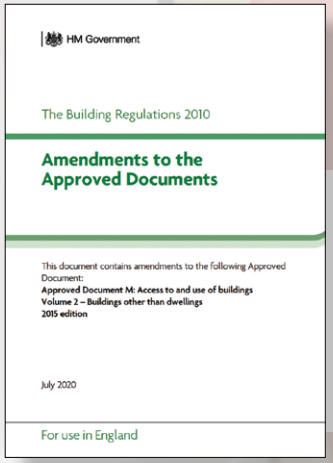
Electromagnetic devices designed and manufactured with integral smoke detection ARE permitted.

- The opening force for Part M and Equality Act 2010 (still commonly referred to as 'DDA') compliance for accessibility - i*f relevant to the door location:*

Open the door to check for an opening force of less than 30 Newtons (N) pressure between 0 and 30 degrees and below 22.5 N between 30 and 60 degrees. This requires use of a calibrated Pesola gauge or similar.

Using a Pesola Gauge to measure the opening force of a door.

Image courtesy of Golden Thread Fire Delay


HM Government

The Building Regulations 2010

Amendments to the Approved Documents

This document contains amendments to the following Approved Document:
Approved Document M: Access to and use of buildings
Volume 2 – Buildings other than dwellings
2015 edition

July 2020

For use in England

Approved Document M also includes guidance on:

- Effective clear widths
- Size and location of vision panels
- Positioning & minimum dimensions of operating door hardware

2.14 Locks, Latches, Handles and Bolts:

.... need inspecting to ensure they function as required and intended. All locks on fire-resisting doors should be fire tested and compatible with the door's fire test evidence. The retro-fitting of code locks and other types of locks can compromise fire test compatibility and their specification should be investigated and assessed.

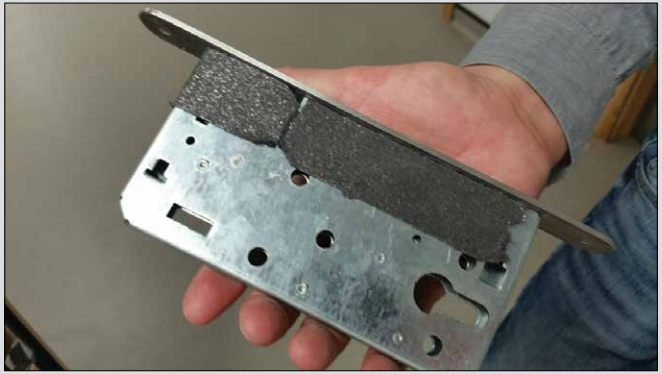
Any locking hardware fitted to a door defined as an escape door should be checked to ensure it does not inhibit the ability of relevant persons to safely escape. Generally, hardware used on locked doors on escape routes needs to be fit for purpose and comply with EN 179, EN 1125 or EN 13637 subject to the risk, type and number of occupants that may need to egress through the doors.

Intumescent protection may be required between the lock and the door leaf and the frame strike plate to reinstate fire performance, especially on 60 minute doors and this should also be investigated.

The functionality of the handle should be inspected; also the height of the handle for Part M compliance, i.e. approximately 1 metre floor height.

Check that handles are fitted correctly, are suitable for use on the fire door and securely attached, preferably with bolt-through fixings when the door is an escape door.

Image courtesy of Golden Thread Fire Delay



Intumescent lock protection should be bespoke to the lock and not created badly and inadequately using hinge pads.

Image left: courtesy of Lorient UK

2.15 Vision Panels:

Glazing in older fire doors will often be Georgian wired glass and although some can provide up to 60 minutes integrity, it should not be assumed that they have ANY fire rating without evidence of performance. A pragmatic view of existing glazing providing up to 30 minutes integrity may be allowable in the short term for low-risk locations if the glazing system appears to be factory fitted, is free from damage, is securely fixed and does not have any of the glazing bead missing or damaged, but it should be recorded as a potential 'weak spot' to be addressed. Any obvious signs of non-conformance such as ad-hoc mastic around glazing should not be tolerated and necessitates replacement.

All single sheets *(i.e. not laminated panes)* of fire-rated glass give an 'integrity only' rating and extra care should be taken when assessing glazing in areas where thermal and / or acoustic insulation is also a requirement, particularly refuge areas. In such locations there may be a need to fit an intumescent laminate glazing system to provide the required insulation and acoustic properties.

It should also be inspected in terms of Part M and Part K compliance.

Image courtesy of Nigel Dale

2.16 Air Transfer Louvres, Letter Boxes and other apertures:
Where louvres, letter boxes or other apertures are installed, it is normally necessary to confirm the presence of a suitable intumescent insert within the body of the component and an intumescent liner to the aperture formed in the door. Where restricted smoke spread is required, it is necessary to check for an automatic closing device that will activate (close) with the fire and smoke detection and alarm system **and to recommend the fitting of one in the locations where they are absent, i.e. fire escape routes, in compliance with Approved Document B.**

2.17 Push Plates, Kick Plates and other surface coverings – should also be visually inspected to ensure they are in good condition and functional. Ones that are suspected of being retrofitted to hide integrity issues should be removed for investigation. Assess if metallic plates are within size restrictions of the door leaf area or exceeding 900mm from the bottom edge; GFRA's typically state that metal plates should cover no greater than 20% of the door leaf area if mechanically fixed and 30% if bonded.

Image courtesy of Golden Thread Fire Delay

2.18 Signs:

All fire door signage should comply with BS 5499:10:2014:

Inspections should check:

- That wording is logical for door use
- The sign is in a prominent place and easy to read
- It is in good condition

A fire strategy audit will often identify doors having the appearance of being internal fire resisting doors (and they may have been manufactured as such) that do not sit within required fire walls. Such doors do not have to be maintained as fire doors and to avoid confusion it is sensible to designate them as being a 'non-fire-rated door' with an NFD sign.

Images courtesy of Golden Thread Fire Delay

2.19 Adjoining Panels, Door Heads and Thresholds:
A doorset or fire door assembly may fail if the structure into which it adjoins or is installed will not provide the required and intended period of fire resistance. Inspections should therefore examine what surrounds the door to record potential or obvious weak spots that may or will allow the overall fire compartmentation to fail. An assessment should also be made of whether the adjoining panels contain fire rated insulated glass and / or should be insulating.

The surrounding structure of a fire doorset also needs to be expertly assessed.

Image courtesy of Golden Thread Fire Delay

2.20 Magnetic Locks:
Where fire doors have been fitted with magnetic locks, either at the time of installation or retrospectively, the building's Responsible Person should be aware that such locking devices may be unsuitable. These devices are usually fixed to the door frame head and near to the door leaf top edge. In a fire situation there is a risk that this type of metallic device may cause significant heat transfer to the door assembly and contribute to failure of the intended fire resistance performance. They should only be installed when evidence of fire resistance is known or the introduction of the device in terms of the door's fire resistance has been expertly fire risk assessed.

The actuation of the release mechanism must be checked for reliability and that it has been installed in accordance with BS 7273-4. Any locked door on an escape route that requires power to be removed to allow escape must also be fitted with a manual release mechanism, usually a green 'break glass' unit (GBGU) to allow persons to override the doors to allow escape. The emergency release must be fitted on the side approached by persons making their escape. If escape is in both directions then a GBGU must be installed on both sides of the door.

Image courtesy of Golden Thread Fire Delay

Section 3; Type 3 Ongoing, Functional Fire Door Inspections

3.1 These are intended to manage and maintain compliant fire resisting doors to a satisfactory standard, meeting the legal requirements and responsibilities of the Fire Safety Act 2021, Regulation 10 of the Fire Safety (England) Regulations 2022, the Building Safety Act 2022 (BSA) and Articles 17 and 38 of the FSO.

3.2 There are several factors that will help determine a satisfactory standard, a suitable system and the frequency of inspection, not least the usage and importance of the doors in terms of overall fire containment and the size and classification of the building, as explained below.

Guidance can be found in BS 9999 and BS 8214.

Gaps between the door leaf and the frame are not so small as to be likely to bind, or so large as to prevent effective fire and smoke sealing (BS 9999:2017 Annex I.6.2 C).

Image courtesy of Golden Thread Fire Delay

3.3 BS 9999:2017 under Annex I, gives the following specific guidance for routine fire door inspection and maintenance:

I.2.5 Fire door automatic release mechanisms

"All doors that are held open by automatic release mechanisms should be released daily"

I.4.7 Automatic opening doors

"The operation of fail-safe mechanisms should be tested once a month, either by "breaking out" the doorset or by simulating failure of the mains power supply, as appropriate. The results of the test should be recorded. Any doors that are found to be faulty should be repaired or replaced"

I.4.8 Doors on hold open devices

"The operation of hold open devices should be tested once a month by simulating failure of the mains power supply or operation of the fire alarm system. The results of the test should be recorded. Any doors that are found to be faulty should be repaired or replaced"

I.4.9 Emergency and panic escape doors

"The operation of all emergency and panic escape devices, especially on external doors not used for other purposes, should be checked once a month for ease of operation and opening of the door. Weather conditions can affect the door and frame relationship, and therefore the ease of operation of escape devices"

I.6.2 Fire doors

"All fire doors should be inspected every six months. In particular, it should be ensured that:

a) *Heat-activated seals and smoke seals are undamaged*

b) *Door leaves are not structurally damaged or excessively bowed or deformed*

c) *Gaps between the door leaf and the frame are not so small as to be likely to bind, or so large as to prevent effective fire and smoke sealing*

d) *Hanging devices, securing devices, self-closing devices and automatic release mechanisms are operating correctly"*

3.4 It should be borne in mind that BS 9999 is a guidance document, not mandatory, and does not consider the CRITICALITY of the door in terms of location, its FREQUENCY OF USE or its LIKELIHOOD OF IMPACT DAMAGE. **These are all important factors which should be considered when determining inspection frequency of fire resisting doors in university and college buildings that are not governed by mandatory checks:**

3.5 Criticality:
How important the fire door is to the occupants should be considered in line with any PEEPS and other fire safety factors relevant to the building. Depending on the size, use and contents of the building, it may also be appropriate to assess the criticality of the doors in terms of teaching continuity and property protection.

3.6 Frequency of use:
Service riser cupboard doors, for example, may be critical to the overall fire containment in a building, but providing they were initially installed correctly or have been subsequently inspected and upgraded to a satisfactory standard, their infrequent use may mean they only require a small number of checks to take place once a year or arguably even less frequently.

In contrast a stairwell door that is also 'containment critical' but potentially opened and closed numerous times a day may need to be inspected on a weekly or even daily basis.

Doors that are used frequently are more likely to be susceptible to general damage or wear. There are three levels of usage in this example, however this may be varied where manufacturer's guidance is available or robustness of door is established:

High - typically cross corridor doors, stairwell doors and other doors likely to be opened regularly (more than 100 times in 24 hours)

Medium - typically cleaning cupboard or caretaker room doors, likely to be opened between 1 and 10 times per day (24 hours)

Low - typically service and plant room doors likely to be opened less than 10 times per month

3.7 Likelihood of impact damage:
Doors which are frequently used for access by bins, cylinder carts etc. are more likely to suffer impact damage. Doors identified with a high likelihood of impact damage should be inspected more frequently than those with a lower likelihood.

Factoring in these issues may lead to adopting the following matrix or similar:

- This matrix is provided as a guide only and needs to be tailored to an individual university or college building, including halls of residence under 11 metres in height, in terms of what is suitable and sufficient. In some buildings, it may be appropriate for high usage doors to be checked weekly, or even daily, rather than monthly, for medium usage doors to be checked monthly and low usage doors 6 monthly

- Increase inspection frequency for doors with a high likelihood and history of impact damage; conversely, reduce for those with lower likelihood

- Doors in areas or rooms that have been assessed as having a high likelihood of fire break-out should be inspected accordingly

	Low (daily) Usage <10x per month	**Med (daily) Usage** 10-100x in 24hr	**High (daily) Usage** >100x in 24hr
Low Risk	12 monthly	12 monthly	6 monthly
Medium Risk	12 monthly	6 monthly	3 monthly
High Risk	6 monthly	3 monthly	Monthly

Courtesy of Mazin Daoud

3.8 Practical Considerations:

- **A Type 3 inspection is intended to maintain functional use on a fire door that has already been robustly (Type 1 or Type 2) inspected in terms of performance by those competent to do so. As such it may be appropriate for these functional inspections to be carried out by caretakers or maintenance personnel who would not be expected to be experts in fire door compliance. It may be equally appropriate for an accredited inspector to perform spot checks on some doors, especially in high-risk locations, in order to ensure fire compliance is maintained and in doing so 'audit the process'**
- To have inspections on doors at different time intervals in the same part of a property can lead to confusion. This can be minimised by having a colour coded system so that doors with one colour sticker are checked monthly, another colour 3 monthly and so on. Such information should also be recorded on door schedules and floor plans
- The closing speeds on doors held back by electronic solenoid devices needs particular attention as they are typically designed to release on alarm activation or loss of power and their sudden release can be a safety risk if there is a violent closing speed. It is good practice to release them at night, not only to close fire compartments but also to release door leaf tension, which is liable to cause warping if they are permanently held at just the top or bottom of the leaf
- It should be noted that industry standards for closing speeds of internal fire doors are flexible to allow for one that is suitable for the environment. Without any instructions being given, the closing speed for doors are typically set at 7 seconds
- Doors with drop down seals should have the device added to the PPM schedule
- Those conducting Type 3 inspections should be proactive in ensuring that fire doors are not being routinely wedged open. If so, in locations where they are permitted, consideration should be given to the installation of a suitable hold open device that will release on fire alarm activation in accordance with BS 7273-4
- They should also be vigilant to identify any new items affixed to a door that may affect its fire rating and / or operation

3.9 Student accommodation over 11 metres in height:

Specific mandatory fire door inspection requirements apply to fire doors in buildings over 11 metres in height and those defined as 'high-rise residential buildings' and the requirements are outlined in the Fire Safety (England) Regulations 2022, which took effect on 23rd January 2023 to supplement and amend fire safety responsibilities and duties imposed by the FSO.

The Regulations state:

All fire doors in communal areas of the building must be checked at least every three months.

In checking these doors, you must ensure that the doors are effectively self-closing (or, in the case of cupboard and riser doors, are kept locked shut). Self-closing doors should fully close into their frames when the doors are opened at any angle and released … overcoming the resistance of any latch or friction with the floor.

You should also check that doors, frames and any glazing are undamaged and that any intumescent strips and smoke seals (where provided) are also undamaged.

Defects in the doors, frames and self-closing devices should be rectified as soon as reasonably practicable.

Regarding flat entrance doors, the Regulations state:

You must use best endeavours to undertake checks of all flat entrance fire doors at periods not exceeding 12 months.

You must keep a record of the steps taken to comply with this requirement, including, in any case where access to a flat was not granted for this purpose during any 12-month period, the steps taken to try to gain access.

In addition to the checks made to communal doors it says that you should also check *that glazing has not, obviously, been replaced with glazing that might not be fire resisting.* **It also states that not only should defects be rectified asap but also** *depending on the risks identified.*

Please note that depending on a Halls of Residence layout, a student room door may or may not be defined as a 'flat entrance door'.

3.10 The fixing of hooks to the back of a flat entrance door doesn't affect its fire integrity providing it fails to breach the complete width of the door leaf; however, adding weight and obstructions to the leaf with coats could affect its closing performance. From a 'Means of Escape' viewpoint, residents should be dissuaded from such practices and a 'zero tolerance' approach should be considered. The making good of redundant holes left by hooks can be achieved using an Approved Repair Technique, typically intumescent mastic.

Flat entrance door vision panels should not be obstructed or be in contact with coats or other items. Similarly, staff should be educated not to cover their office door vision panels with paper, blinds and other materials that prevents seeing potential hazards on the other side of the door.

Drilling a hole through the door frame for a cable is likely to make the certification of the doorset invalid. Although it can probably be risk managed in most residential building locations, this issue should be clarified in writing by the fire door manufacturer and conveyed to residents. Under the Fire Safety England Regulations there is a legal requirement for student engagement, making them aware of such issues in writing.

Students and staff should be educated not to decorate doors with combustible materials that cover signage and vision panels.

Students placing hooks for hanging clothes can lead to leaf, frame and seals damage.

Images courtesy of Nick Tovey

4.1 Special Doors Require Competent Inspections:

It has been stated above that fire door inspections should only be carried out by those competent to do so and this is particularly true for fire doors that have special safety and working features such as:

4.2 Heritage Doors:

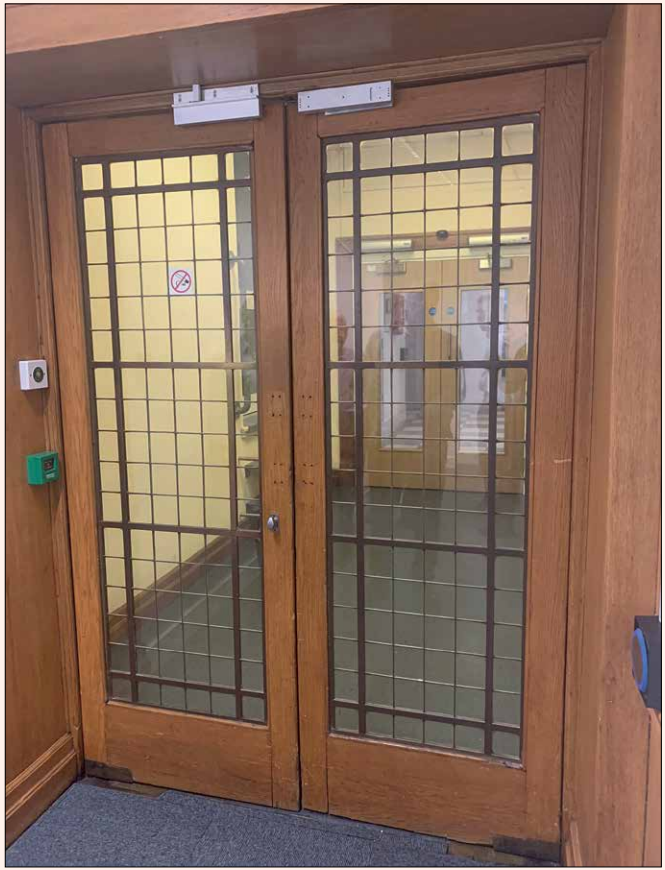
A listed or 'heritage' building is one that has been identified as having historical or architectural features, typically meaning that it cannot be altered, extended, or demolished without permission from a local planning authority. The rule of thumb when fitting or replacing doors in such buildings is to always seek advice before making any significant changes.

There is a likelihood that some, if not the majority, of internal fire doors within these buildings do not meet any current British Standard test, or take the appearance of a standard fire door. Although the safest and best default position for the door inspector may be to recommend the installation of a new fully Third Party certified doorset, this will often not be affordable or practicable and their non-compliances will require risk managing.

Repairing a heritage door will normally be cheaper than replacing one, providing the level of remediation is to a satisfactory level and the limitations of the repair are fully understood by those responsible for the fire safety of the building. Remedial works can be completed in compliance with guidance on fire safety and some may be able to provide a nominal FD30S fire standard with special consideration to door structure and decoration.

It needs considering and assessing that such doors, especially on riser cupboards and protecting plant rooms, may have been lined with asbestos type materials at some point to achieve a notional fire rating. This should be discounted as a protection. Intumescent coatings may also have been applied, with some intended to achieve a BS476-22 rating although typically no accredited oversight of application quality may limit actual fire performance.

Image courtesy of Golden Thread Fire Delay



Glazing in heritage doors could be fire-rated copperlight or Georgian wired and needs to be expertly assessed.

It may also be necessary to improve / upgrade the surrounding structure, including side panels and over panels, recognising that the materials they are made from and therefore their fire performance may not always be identifiable.

Although there may be major limitations in terms of guaranteed 'as tested' fire performance, improvements can be made that may be suitable and sufficient for each door, considering individual locations and the level of risk they protect. This will include the use of intumescent materials on the edge of doors and effective smoke seals around the doors; also by the introduction of CE or UKCA marked accessories as recommended in English Heritage and IFE guidance.

Active fire protection measures should be considered to support the retention of heritage doors, including suppression systems, which can protect escape routes on the opposing face by cooling the area directly in front of the door.

A heritage copperlight glazed door in tandem with a new certified fire doorset.

Image courtesy of Golden Thread Fire Delay

4.3 Roller Shutter Doors are available from 30 minutes to 240 minutes INTEGRITY ONLY, i.e. they are normally not insulated or effective for smoke control.

All new fire shutters must be tested and compliant to BS EN 16034:2014 & CE (UKCA) marked to BS EN 13241-1:2003.

They should be fitted with an automatic self-closing device. Typically these are released by a heat detector such as a fusible link, a solenoid activated by a heat / smoke detector or by the fire alarm system being activated, to provide a controlled descent. **They should also have a manual means of opening the shutter to avoid anyone becoming trapped inside the room where the roller shutter is the only means of escape.**

Installation, maintenance and inspection of at least some of the components should only be carried out by qualified, UKAS Third Party accredited steel roller shutter engineers.

There is a need to maintain clearance of items from the immediate vicinity to help prevent heat transfer and not hamper the shutter from fully closing.

Image courtesy of Golden Thread Fire Delay

4.4 Steel Fire Doors:

Normally provided as a doorset or kit for installation on site by the manufacturer or their approved installers as part of a 'supply and fit' contract complete with Third Party certification, so they normally meet performance standards when new. Unlike timber doors they do not normally require intumescent strips as they expand and wedge into the frame when exposed to heat but will require cold smoke seals in locations where there is a need to contain smoke.

Type 3 inspections are required to ensure:

- hinges are screwed tightly to the door and frame
- door closers are securely fixed and functional
- there is no leaf damage to affect fire integrity
- locks and latches are in place and functioning
- cold smoke seals, if required, are in good condition

Image courtesy of Metador

4.5 Final Exit Escape Doors:
Exterior emergency final exit doors, or 'fire escape' doors, that lead to ultimate safety away from the building, are also often referred to as fire doors, but this can be confusing as there is normally no requirement for them to be tested, or expected, to provide fire integrity or fire resistance. Their main purpose is to open immediately, easily and provide fast and safe egress, in the direction of escape *(outwards)* for persons to reach an external place of safety. They must have clear signage appropriate for their use, typically 'FIRE EXIT KEEP CLEAR'.

There should be close correlation with the building's Fire Risk Assessment, specifically room geometry, occupancy numbers and type; for example providing sufficient frame width and ironmongery specification for wheelchair egress.

Their main issue may be in terms of security – in particular to what extent they allow means of escape, because in normal circumstances the majority of these doors are not used and have to be adequately secure to prevent unwanted entrance into, or exit out of, the building. Care is required to ensure that both security and fire evacuation functions are compatible. BS 9999:2017 gives advice on locking, stating that locks, latches and bolts should not be fitted unless they are simple fastenings, the operation of which should be *"readily apparent without the use of a key and without having to manipulate more than one mechanism".*

Although they are clearly intended to be a low usage door, it must be recognised that their function in an emergency situation is critical; however, their design, specification and installation can be woefully lacking and in existing buildings a Type 2 inspection is often required and strongly recommended to ensure they are not being routinely checked in an ongoing state of non-compliance.

Image courtesy of Nigel Dale

With regard to the testing of door release units, clause 21.1 of BS 7273-4 recommends a weekly test for interfaces, and that this should preferably be by activation of the fire alarm.

*BS 9999:2017 states that *"the operation of all emergency and panic escape devices, especially on external doors not used for other purposes, should be checked once a month for ease of operation and opening of the door. Weather conditions can affect the door and frame relationship and therefore the ease of operation of escape devices".*

In accordance with the requirements of Approved Document 7 and the FSO, any emergency or panic escape hardware will need to be fit for purpose and proven to be suitable for the application in which it is used. Generally this will require CE/UKCA certification and performance testing in accordance with EN 179/EN 1125 subject to applicable risk. The main entrances will also be escape doors and must also be considered and regularly checked for correct function.

Any locking device installed on escape route doors must be appropriate to the risk, based upon the type and number of occupants that need to exit through the door.

Image courtesy of Assa Abloy

It should also be recognised that the natural escape route for occupants in a building will often be back out through the door which they used to enter the building; therefore the function of any locking devices on entrances should also be checked regularly to ensure it is adequate and will reliably operate or release to allow escape.

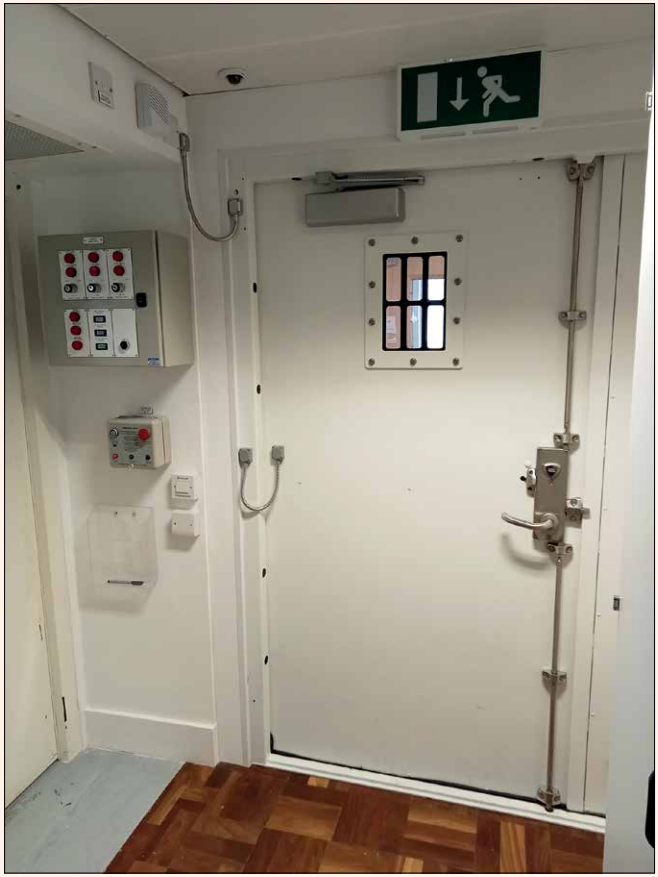
All escape locking hardware must be proven and reliable, and therefore requires performance testing in accordance with EN 179, EN 1125 and when applicable EN 13637.

In Halls of Residence where doors are electrically controlled with access control or door entry systems, further information can be found in the SBD *'Homes'* guidance document as to suitability of the electrical arrangements. BS 7273-4 will also apply where doors are intended to be fail unlocked.

4.6 High Security Doors:

Some areas and rooms such as explosives stores, vaults, and licenced research areas have doors installed that are designed to withstand various levels of physical intrusion attack sustained for defined periods of time. Such doors undergo fire testing too. The security rating of high security doors is separate to their fire rating, and physical weight and strength should not be assumed as an indicator of good fire prevention performance.

High security doors normally have an information plaque on them identifying the maker, the security rating, and the fire rating. As with all fire doors, the door should be maintained in good condition with any original fire controlling design elements in place.



Please note, the identity of who provided this image has been withheld, at their request, to conceal the doors' location.

A Summary of why 3 Types of Fire Door Inspections are recommended in University & College Buildings.

At the core of this Reference Document is the fundamental recommendation that 3 types of fire door inspections are implemented:

1

Type 1 inspections are recommended for new fire door installations because under the Building Regulations, Regulation 7 and Building Safety Act 2022, all duty holders have a responsibility to ensure that fire doorsets, or door assemblies, are designed, manufactured, procured and installed competently. It is therefore necessary for those responsible for delivering fire and statutory compliance to ensure that those organisations and individuals within the supply chain have the capability, QA systems, robust inspection and handover procedures in place to deliver 'as tested' or expertly assessed fully compliant fire doors. Someone within the supply chain therefore should take responsibility for signing off the doors as being compliant and this requires the correct level of expertise; inspecting each newly installed door, comparing what has been installed with the manufacturer's information and confirming that the installed door has replicated what was intended. This includes the correct specification choice of ironmongery from a safety as well as fire safety perspective.

2

Type 2 Inspections are recommended on existing fire doors; sometimes referred to as 'notional' fire doors when there are no BS / EN fire test product labels or complete information in the building's O & M manuals or Health & Safety files. Such inspections are necessary so that building managers can competently assess their existing fire doors in terms of fire compliance and any non-conforming limitations, understanding if those falling below the required performance level have the potential to be remediated to a standard that will support the building's fire strategy or need to be replaced. This meets the needs of the Regulatory Reform (Fire Safety) Order 2005 (FSO), which requires that fire safety measures are 'suitable and sufficient' to protect 'Relevant Persons' in the event of a fire. A Type 2 inspection, recorded electronically, will also provide a 'golden thread of information', if one didn't previously exist, to assist in the creation of a Building Safety Case Report in Higher Risk Residential Buildings.

3

Type 3 Inspections are recommended to provide ongoing checks for fire doors that have already been either Type 1 or Type 2 inspected. They are intended to manage and maintain suitably compliant fire resisting doors to a satisfactory standard, meeting the legal requirements and responsibilities of the Fire Safety Act 2021, the Fire Safety (England) Regulations 2022, the Building Safety Act 2022 (BSA) and Articles 17 and 38 of the FSO.

Section 5; Creating a Robust Fire Door Management System

5.1 Applying the 3 Types of inspections is a key element to achieving a fire door compliant building, as part of a holistic and robust Fire Door Management System. The following list of recommended actions is provided as useful guidance on how such a system might be implemented:

5.2 Decide on budget and timescale. This is potentially a major exercise, likely requiring both a high level of commitment and resource. It should be noted that an accurate cost is unlikely to be determined prior to the action plan being defined due to a lack of initial information. This is the first step which will impact on everything below.

5.3 Decide on the key players and their roles in terms of creating and delivering the system; probably involving both internal and external personnel. Before this can be undertaken, a decision must be made on how competence of the key players (company, individual or both) will be determined (accreditation / certification route?).

5.4 Agree a targeted action plan; Acknowledging budget, access and other practical issues, it would be reasonable to adopt a pragmatic approach for establishing a time frame in which to complete the required works. Any approach taken should be underpinned by the risk assessment process. Discussing the proposed plan with Enforcing Authorities such as Fire & Rescue Services and insurers is advised to ensure they are satisfied with the time scales and strategy. Once agreed and adopted, it should be reviewed at regular intervals by senior management to monitor progress and where necessary amend time frames for completion; for example due to a change of risk level and / or building use.

5.5 Create a unique set of Fire Door Protocols for the organisation, which would outline all of the required actions, responsibilities and details, and be used to communicate and share those actions with others. Everything stems from this so it needs to be carefully considered, written and agreed by senior managers. Key elements will include how information is to be stored, shared and updated; managed by an overview process/committee for ensuring actions are delivered.

5.6 Implement an audit of fire door procurement systems and the introduction of Type 1 inspections for all new doorsets or assemblies. The importance of these actions cannot be over-emphasised as they will have an immediate impact on both compliance and future maintenance costs.

5.7 Create a fire door schedule on a building-by-building basis, comparing the condition of the doorsets with their importance (criticality). Each existing fire door will be Type 2 inspected, not only comparing its condition with regulatory requirements but also the importance of the door in terms of what it's protecting (criticality factor) and therefore what level of compliance is suitable and sufficient. By doing so a fire door 'action priority' can be established, commencing cost-effective, measured fire door improvement to significantly reduce risk from year one; not only actual risk of fire, but also in terms of protecting the organisation and its management, as it provides documents that can be shared with external auditors in compliance with FSO Articles 17 and 38, The Building Safety Act and the Fire Safety (England) Regulations, showing a coherent fire door management system with a commitment to actual year on year improvement.

5.8 Carry out an audit of functional fire door inspections and PPM activities to ensure that those doors being Type 1 and Type 2 inspected are then being handed over to a system that can effectively manage and maintain the doorsets in terms of both working efficiency and compliance.

5.9 Carry out fire compartment surveys for each building. Clearly the doors cannot be treated in isolation as they only form one component of the overall fire compartmentation; however, the majority of passive fire compartment issues will be 'one off' remediation or replacement costs that do not require ongoing PPM. Any external intervention to follow, e.g. the retro-fitting of cables, should pick up structural re-instatement to a compliant standard within the scope of the project.

5.10 Identify and satisfy fire door training needs. The majority of which is likely to be fire door awareness training. Training should be suitable and sufficient for various stakeholders including all staff who might access the building and halls of residence tenants (awareness of responsibilities to report damaged doors and not tamper with their flat entrance door).

Relevant Glossary of Terms

The following definitions are provided both to assist in the understanding of this document and also for general information and guidance:

ACB: access control box.

Air Transfer Grille (fire and smoke): a device that will allow the passage of air in normal use, but when activated will contain both 'cold', i.e. ambient smoke and hot gases – usually activated by heat and an electrical interface with the detection and alarm system.

AHJ: Authority having jurisdiction.

ALARP: As Low As Reasonably Practicable; a key concept in fire safety and in particular fire risk assessment, based on the Law of Diminishing Returns, whereby risks are reduced until a point is reached where the cost to reduce the risk further would be disproportionate to the benefit achieved.

Aperture: an opening in a door created for a vision panel, ventilation grille or letter box.

Architrave: a decorative moulding that conceals the gap between the edge of the frame and the surrounding structure (substrate).

ART: Approved Repair Technique.

ASET: Available Safe Egress Time.

ASFP: Association for Specialist Fire Protection.

Automatic Door Release Mechanism: a device that will automatically release either a locking mechanism on an exit route or a hold-open device to a door or roller shutter. It should operate on the actuation of the fire warning or detection system, or on failure of the power supply and be able to be manually overridden.

Beading: the moulding that frames and retains a door's vision panel.

Bottom Edge Gap: please see 'Threshold Gap'.

BRE: the Building Research Establishment; a former government national laboratory, now part of a charitable organisation called the BRE Trust.

CERTIFIRE: an independent third-party certification scheme, operated by Warrington Fire, that audits performance, quality, reliability and traceability of products and systems.

Compartment (fire): part of a building, comprising one or more rooms, spaces or storeys, constructed to prevent the spread of fire and its effects to, or from, another part of the same building, or an adjoining building. *(A roof space above the top storey of a compartment may be included in that compartment).*

Compartment Wall: a fire-resisting wall used to separate one fire compartment from another; typically designed and intended to have a minimum period of fire resistance of 60 minutes *(or 30 minutes in single-storey buildings).*

Core (of door): the internal composition of a door leaf.

Doorstop (timber): a rectangular or square length of wood that prevents the door from closing beyond its jamb.

Emergency Exit Device: a locking system, which should conform to BS EN 179, operated by either a lever handle or a push / pull pad on the inside of the door for opening an escape door.

Escape Door: any door that leads to or across an escape route and which a person must pass through in order to reach a place of safety.

Escutcheon: a general term for a decorative plate.

Final Exit: the termination of an escape route from a building, intended to give direct access to a place of ultimate safety outside the building.

Fire (resisting) door: a door or shutter provided for the passage of persons, air or objects, which, together with its frame and furniture, is intended when closed to resist the passage of fire and/or gaseous products of combustion and is capable of meeting specified performance criteria to those ends. It may have one or more leaves, and the term can sometimes include a cover, hatch, or other form of protection to an opening in a fire-resisting wall, floor, fire barrier or ceiling, or in a structure surrounding a protected shaft.

Fire Door Assembly: a fire door, including door leaf, door frame and ironmongery, assembled from individually fire tested components, supplied from more than one source.

Fire Doorset (or 'door set'): a door assembly, tested as a single unit and supplied, from one source, as a complete, warranted, entity.

Fire Hazard Room: a room or other area which, because of its function and/or contents, presents a greater hazard of fire occurring and developing than elsewhere.

Fire Integrity: the extent over a given time that a component, such as a fire door, can withstand and prevent fire as well as smoke from breaching the barrier. The letter for denoting integrity in fire test documents is "E".

Fire Resistance (of a fire door): the ability of a door to fulfil, for a stated period of time, the required fire integrity and thermal insulation as expected in a standard fire resistance test.

Fire Stop (or 'firestop'): a seal provided to close an imperfection of fit or design tolerance between elements or components, to restrict the passage of fire and smoke.

Fire Safety Order (or 'FSO'): an abbreviation of The Regulatory Reform (Fire Safety) Order 2005, which is also commonly referred to as the RRO.

Flush Bolt: a sliding bolt let into the face or edge of a door, so as not to be proud of the leaf.

Forend (face plate): the visible part of a latch or lock mechanism once it has been morticed into the door, through which the latch or bolt protrudes.

GAI: Guild of Architectural Ironmongers.

GBGU: Green Break Glass Emergency Door Release.

Global Fire Resistance Assessment (GFRA): a comprehensive document produced by a UKAS or equivalent approved organisation using established methodology, to determine the limits of manufacture and design and extend the scope of application in order to satisfy fire resistance performance based on various fire tests carried out, typically to BS 476-22 or BS EN 1634-1.

Golden Thread of Information (for fire doors): an accurate, linked record of a fire door's specification, fire test evidence and certification and all the information required to ensure traceability and that it has been installed to comply with Regulation 7 of the Building Regulations, The Building Safety Act and can be maintained to comply with the Fire Safety (England) Regulations, Regulation 38 of the Building Regulations and Articles 17 and 38 of the FSO.

Intumescent Material: a product that swells as a reaction to fire (heat).

Jamb: the side-post or lining of a doorway or other aperture.

LPCB: the Loss Prevention Certification Board; sometimes referred to as the Loss Prevention Council; part of the BRE Trust.

Linings/Casings: other names for an internal door frame.

Lippings: material used to create the door edge, covering and protecting the core.

Panic Exit Device: a bolt and latch system, which should conform to BS EN 1125, operated by either a cross bar or touch bar on the inside of the door for opening a final exit door.

PBSA: Purpose Built Student Accommodation.

PEEPS: Personal Emergency Evacuation Plans; that is intended, in the event of a fire evacuation, to ensure persons who require assistance can escape safely.

Pesola Gauge: a spring scale that measures 'push and pull' opening force on a fire door, measured in Newtons.

Primary Test Evidence: a report based on a physical fire test of a manufacturer's doorset carried out by an independent 3rd party accredited test house.

Protected Stairway: a stairway discharging through a final exit to a place of safety (including any exit route between the foot of the stairway and the final exit) that should be adequately enclosed in fire-resisting construction.

RRO: please see 'Fire Safety Order'.

Rebated doors: a double doorset, with door leaves having machined edges to create a partial overlap where the leaves meet.

Refuge: an area designed and intended as a place of temporary safety within a building. This may be an adjoining compartment, sub-compartment or lobby, capable of holding all those threatened for a given period, from which there may be potential for further unassisted escape should that become necessary.

SBD: Secured by Design.

Smoke Seal Door: an internal door strategically located in premises to effectively restrict the passage and spread of smoke, including ambient, cold smoke and noxious fumes to other areas of the building.

Stile: the sides of a door leaf, with the hanging stile being the hinge side, the leading stile (as in 'leading edge') on the opening side and the meeting stile being where double or leaf and a half doors meet.

Strike plate: a metal plate fixed to a door jamb with a hole for the bolt of the door. This protects the jamb against friction from the bolt and increases security in the case of a jamb being made of a softer material such as wood.

Sub-compartments: areas into which the building can be divided to reduce travel distance and which are designed and intended to provide 30 minutes' resistance to fire.

Sub-compartment wall: a fire-resisting wall used to separate one sub-compartment from another, having a designed and intended minimum period of fire resistance of 30 minutes.

Threshold Gap (door): the gap between the bottom of the door and the floor. Sometimes also referred to as the 'bottom edge gap'.

Transom: a horizontal structural beam or bar, or a crosspiece separating a door from a window above it.

UKAS: United Kingdom Accreditation Service.

References & Recommended Further Reading

Approved Document 7 - '*Materials and Workmanship'*

Approved Document B (Fire Safety) – *'Volume 1 – Dwellings'* 2019

Approved Document E - '*Resistance to the passage of sound'* 2015

Approved Document M – *'Access to and use of buildings Volume 1 – Dwellings'* 2015

ARMA *'Advice Note, Fire Safety in Flats'* – revised October 2019

ASDMA *'Best Practice Guide to Timber Fire Doors'*

ASFP *'Guide to Passive Fire Protection for Fire Risk Assessors'*

ASFP *'Ensuring Best Practice for Passive Fire Protection in Buildings'*

BRE GBG 86 *'Installing Fire Doors and Doorsets'* 2017

BS 476-22:1987 *'Fire Tests on Building Materials and Structures Part 22: Methods for Determination of the Fire Resistance of Non-Load bearing Elements of Construction'*

BS 476-31.1:1983 *'Fire tests on building materials and structures. Methods for measuring smoke penetrating through doorsets and shutter assemblies. Method of measurement under ambient temperature conditions'*

BS 5499-10:2014 *'Guidance for the selection and use of safety signs and fire safety notices'*

BS 5839-3:1988 *'Electrically powered hold open devices for swing doors'*

BS 7036-0:2014 *'Power operated pedestrian doorsets. Safety in use. Code of practice for risk assessment and risk reduction'*

BS 7273-4:2015 *'Code of practice for the operation of fire protection measures – part 4: Actuation of release mechanisms for doors'*

BS 7352:1990 *'Specification for strength and durability performance of metal hinges for side hanging applications and dimensional requirements for template drilled hinges'*

BS 8214:2016 *'Timber Based Fire Door Assemblies. Code of Practice'*

BS 9999:2017 *'Fire safety in the design, management and use of buildings'*

BS EN 179:2008 *'Building hardware- Emergency exit devices operated by a lever handle or push pad for use on escape routes. Requirements and test methods'*

BS EN 1125:2008 *'Building hardware – Panic Exit devices operated by a horizontal bar, for use on escape routes. Requirements and test method.'*

BS EN 1154:1997 *'Building hardware. Controlled door closing devices. Requirements and test methods'*

BS EN 1155:1997 *'Electrically powered hold open devices for swing doors'*

BS EN 1634-1:2014 + A1:2018 *'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'*

BS EN 1935:2002 *'Building Hardware. Single –axis hinges. Requirements and test methods'*

BS EN 12600:2002 *'Glass in building. Pendulum Test. Impact test method and classification for flat glass'*

BS EN 13241-1:2003 *'Industrial, commercial and garage doors and gates'*

BS EN 13501-1:2018 *'Fire classification of construction products and building elements Classification using data from reaction to fire tests'*

BS EN 13637:2015 *'Building Hardware – Electrically controlled exit systems for use on escape routes – Requirements and test methods'*

BS EN 16005:2012 *'Power operated doorsets. Safety in use. Requirements and test methods'*

BS EN 16034:2014 *'Industrial and commercial doors product standard'*

Building Regulations, Regulation 7

Building Regulations, Regulation 38

Building Safety Act 2022

BWF-Certifire *'Fire Doors and Doorsets Practice Guide'*

Competence Steering Group for Building a Safer Future *'Setting the Bar; a new competence regime for building a safer future'* October 2020

Construction Products Regulation 2011

DHF *'Code of Practice for Fire Resisting Metal Doorsets'*

DHF *'Verifying Fire Performance of Doors and Shutters'*

DHF/ GAI *'Code of Practice; Hardware for Fire & Escape Doors'*

Door and Shutters Manufacturer's Association *'Code of Practice for Fire Resisting Roller Shutters'*

Equality Act 2010 Gov.UK

English Heritage Technical Guidance Note; *'Timber panelled doors and fire; upgrading the fire resistance performance of timber panelled doors and frames'*

Fire Protection Association *'Building Protection: Guide to fire doors'* 2015

Dame Judith Hackitt 'Building a Safer Future; *Independent Review of Building Regulations & Fire Safety'* Final Report 2018

Fire Safety Act 2021

Fire Safety (England) Regulations 2022

Home Office '*A guide for persons with duties under the Regulatory Reform (Fire Safety) Order 2005 (as amended) and the Fire Safety (England) Regulations 2022'*

Home Office *'Fire Safety in Purpose Built Blocks of Flats'* 2011

Home Office *'Fire Safety in Purpose Built Blocks of Flats'* 2023

IFE Special Interest Group for Heritage Buildings; *'Guide to the fire resistance of Historic timber panel doors'*

LPCB Redbook

LPCB LPS 1197 *issue 4.2* 2014

LPCB LPS 1271 *issue 2.3* 2018

MHCLG *'Building a Safer Future: an Implementation Plan'* 2018

Passive Fire Protection Forum (PFPF) *'Guide to Undertaking Technical Assessments of the Fire Performance of Construction Products based on Fire Test Evidence'* 2019

Regulatory Reform (Fire Safety) Order 2005

Secured by Design *'Homes'* 2023

There are currently 3 other related Reference Documents, available both in electronic and hard copy format:

RD1-2 **Fire Door Inspections in Healthcare Buildings**

RD2-1 **Fire Damper, Firestopping & Cavity Barrier Inspections in Healthcare Buildings**

RD3-1 **Fire Door Inspections in Residential Buildings**

To obtain copies, please email info@goldenthreadfiredelay.com or visit www.goldenthreadfiredelay.com , enter the 'Resources' section and click on 'NFCC Approved Reference Documents'.

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It is recognised and should be noted that there are different regulations and fire safety provisions, covering England, Wales, Scotland, Northern Ireland and the Isle of Man and this is likely to increase in line with further devolution. Because the majority of regulations have stemmed from U.K. regulations, which still mainly apply for England, we have based this document on regulations applicable to England unless there is anything significant to fire doors covered in regulations elsewhere. We have done so in order not to get bogged down in regulations, as they are not the main focus of this document, but we would welcome and support adaptations being created for other parts of the United Kingdom as soon as this can be arranged.