

Fire Door Inspections
in Healthcare Buildings

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Passive Fire Protection

FIRE DELAY

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Background

The National Association of Healthcare Fire Officers (NAHFO) is an organisation that acts as a national voice for all those associated with healthcare fire safety.

Having identified that there was no recognised or adopted ‘cradle to grave’ standardised systems for inspecting and managing fire doors in healthcare buildings, a NAHFO London Working Group was formed in 2019 to write a paper intended to assist in the development of systems for doing so. Having agreed on a final version of the paper in 2020, the words have been used as the basis of this Reference Document with the intention of sharing healthcare building fire door inspection best practice to a wider audience.

The First Edition was published in January 2021, the Second Edition was published in May 2022 and this edition was published in June 2025 following substantial changes overseen by a NAHFO Working Group consisting of Mark Ainge, Karen Byard, Mazin Daoud, Alan Oliver and Phil Williams.

Foreword

The National Fire Chiefs Council (NFCC) has always promoted the critical role that fire doors play in protecting us when we are asleep and when we are at our most vulnerable. Recent tragic events have yet again reinforced the important role that fire doors have in saving lives and protecting property, which is especially important in healthcare premises when doors are correctly designed into the fire strategy. Healthcare premises are buildings where we expect people to be safe and protected from fire and this guide will help ensure that fire doors play a key role in that expectation.

This guide will assist in ensuring that fire doors are correctly specified, procured, installed and well maintained throughout the life-cycle of the installation. It represents a positive step forward in fire door design and maintenance and will assist both NFCC and NAHFO to continue to help healthcare landlords comply with regulation and crucially assist in keeping some of the most vulnerable people in our community safe from harm.

Mark Andrews
NFCC Lead Officer; Higher Risk Accommodation. 29.10.2020.



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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 healthcare 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, Automatic Sliding, Hygienic, Steel, Roller Shutter, Lead-lined, Heritage, Post-formed, Seclusion Room, Hazard Room and Final Exit Doors.

Section 5 deals with creating and sustaining a robust Fire Compartment Management System for achieving and maintaining long term fire compartmentation compliance in a Hospital Trust or other healthcare organisation.

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0.1 Introduction:

0.2 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; often paramount in healthcare premises due to the dependent nature of occupants and the importance of its activities.

0.3 Fire and smoke resisting doors in fire walls, compartments and sub-compartments 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 and disruption minimised.



Image courtesy of Golden Thread Fire Delay

0.4 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 size, function and fire evacuation strategy of the building. It is very important that these protection measures 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.



Image courtesy of Lorient UK

Fire doors are complex assemblies that have to comply with a range of technical standards.

0.5 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, Healthcare 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 invasive elements, carried out on existing fire doors in occupied 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 a paper 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 Door Services

0.6 Please note that the definition of 'healthcare building' in this document is "any building used by the NHS and other healthcare providers" rather than the narrower Firecode definition of "a hospital, treatment centre, health centre, clinic, surgery, walk-in centre or other building where patients are provided with medical care by a clinician".



A warehouse leased by an NHS Trust during the epidemic for storing Covid-19 PPE.

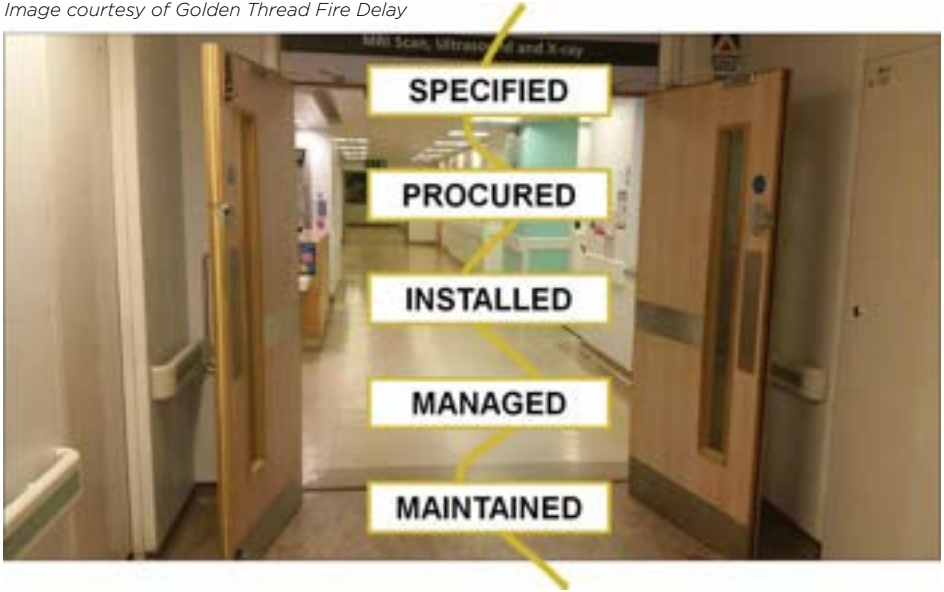
Image courtesy of Golden Thread Fire Delay

0.7 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. This should be in line with guidance on fire safety protocols in HTM 05-01 'Managing healthcare fire safety'. In older buildings, existing plans will often be out of date and determining compartmentation boundaries and their required levels of fire resistance may need to be clarified.

All fire door sets 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 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'.

0.8 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, and the software should have the flexibility to accommodate the 3 inspection types outlined in this document. This can potentially 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 help 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.

0.9 This document provides risk-based guidance for those duty holders and other relevant persons with fire safety roles and responsibilities as outlined in the Fire Safety Act 2021.

Section 1; Type 1 Compliance Inspections of New Fire Doors

1.1 The fire door, as a doorset, should be manufactured and installed under UKAS Third Party Certification Schemes and procured in line with Firecode HTM 05-02 Table C1 (please see page 27) and any special requirements for its location. As stated in 'Approved Document B (ADB), Volume 2, Buildings other than dwellings' (2019 edition with 2020 and 2022 amendments), *"Third party 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 have a responsibility to ensure that fire doorsets, or assemblies, are designed, manufactured, procured and installed competently. Those responsible for delivering fire compliance must ensure that organisations and individuals within the supply chain have the capability, QA systems, 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.

Companies installing, inspecting, maintaining and repairing in certification schemes can typically issue a uniquely numbered Third Party Certificate of Conformity.



Image courtesy of Golden Thread Fire Delay

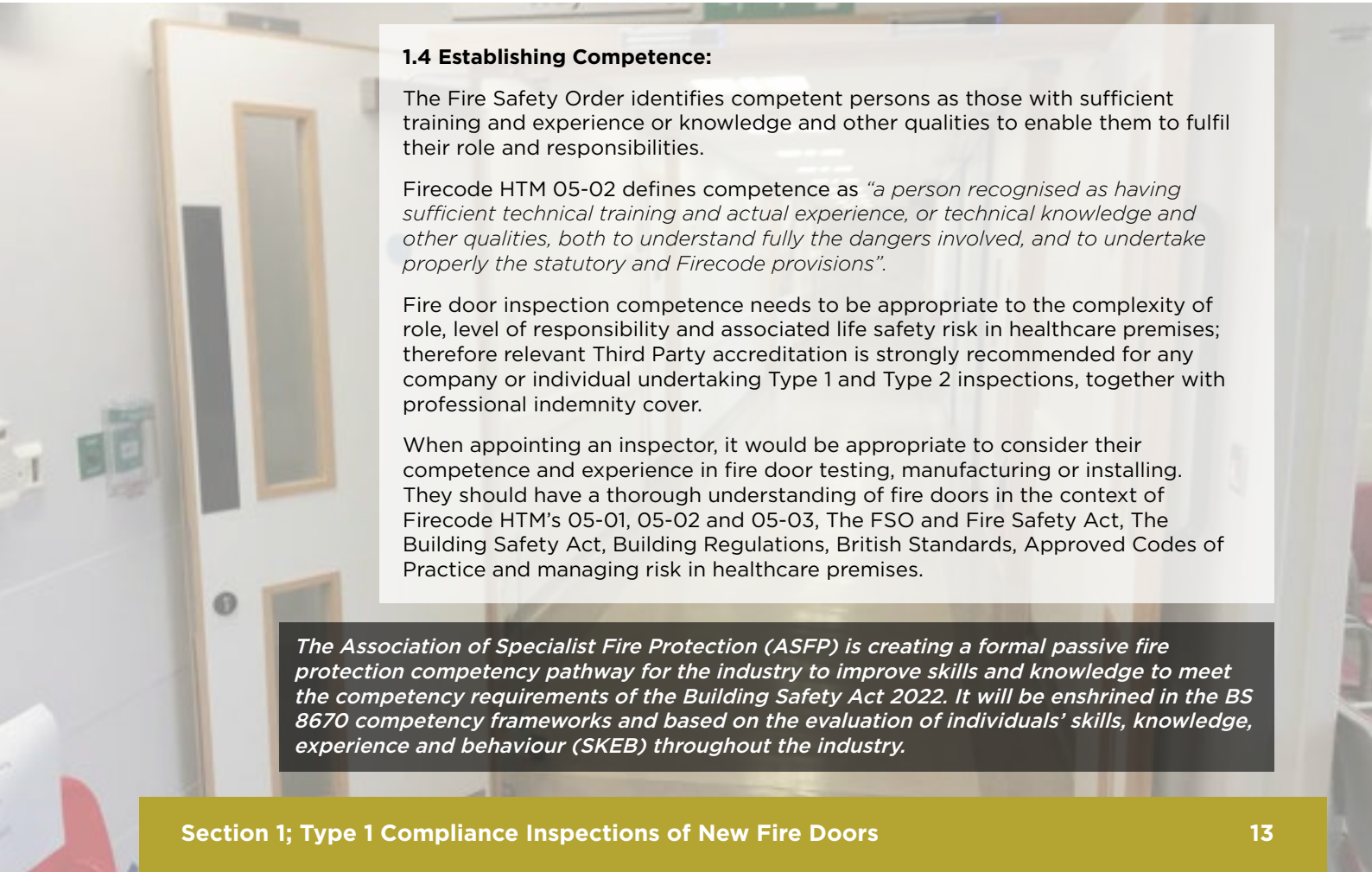
1.2 It may be prudent for those responsible for the building handover, preferably at an early stage in the installation process, to do spot checks to verify that everything is to the Scheme standard. This could include invasive checks that would be difficult to conduct later, such as the interface between 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.

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 (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 the majority of potential non-compliance issues.



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

Image courtesy of Golden Thread Fire Delay



1.4 Establishing Competence:

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

Firecode HTM 05-02 defines competence as *"a person recognised as having sufficient technical training and actual experience, or technical knowledge and other qualities, both to understand fully the dangers involved, and to undertake properly the statutory and Firecode provisions".*

Fire door inspection competence needs to be appropriate to the complexity of role, level of responsibility and associated life safety risk in healthcare premises; therefore relevant Third Party accreditation is strongly recommended for any company or individual undertaking Type 1 and Type 2 inspections, together with 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 have a thorough understanding of fire doors in the context of Firecode HTM's 05-01, 05-02 and 05-03, The FSO and Fire Safety Act, The Building Safety Act, Building Regulations, British Standards, Approved Codes of Practice and managing risk in healthcare premises.

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 details of what the 'Type 1' inspection process should include, based on BRE /LPCB LPS 1197 inspections of 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:

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.

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 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 correctly installed to align with the door leaf:

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:

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:

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.



Image courtesy of Golden Thread Fire Delay

Depending on location, an additional check may be required on door width to ensure a minimum clearance of 1550mm to permit bed evacuation in compliance with Firecode 05-02 *(p 14 figure 1)*

If it is an anti-barricade door in a mental health environment there is also a need to check that the anti-barricade device is engaged to ensure that the door is only single action in its normal state.

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:



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.

Image courtesy of Golden Thread Fire Delay

Please note, in some locations such as hospital corridors, where the priority is to maintain two-way traffic and bed movement with minimal narrowing of the corridor, the door leaves may have been manufactured to a size that falls outside of the manufacturers test data, meaning that no Third Party certification can be given. Door manufacturers can typically only certify door leaves up to 1100mm in width and 'oversized' leaves without evidence of performance need to be identified, recorded and risk managed accordingly.

1.10 Gaps and Seals:

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

Top:

Hanging:

Closing:

Meeting:

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

Check for seal (S) and record type / manufacturer and if same for top and vertical edges:

Functionality of smoke seal if applicable:

Condition and fixing of seals:

N.B. fire doors in a pressure differential area requiring air movement may not have smoke seals fitted.

In mental health environments the intumescent/ cold smoke seals may be fixed in a series of shorter lengths to reduce ligature risk. This is often not a tested detail and should be documented as a derogation. There will be a need to check that they are all fixed securely, aligned together and butted tightly to each other, with no visible gaps that may permit fire or smoke to enter the adjoining compartment / room.

Threshold (bottom) smoke seal if applicable; on smoke control doors, which should be identified with the suffix 'S'. The maximum gap should be 3mm with a 1mm tolerance as per the other leaf edges:

Face-fixed drop down seals are not advocated on anti-barricade doors due to the potential for patients to tamper with them and preventing the seal from retracting, which could hinder the door from opening.



Checking if gaps are uniform and within tolerance using a practical fire door inspection gauge.

Image courtesy of Golden Thread Fire Delay

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 in place):

Anti- ligature hinges may be full length and double action; there should not be more than a 3mm gap above the hinge. N.B. anti-tamper steel screws not supplied by the hinge manufacturer MAY be used.



Image courtesy of Golden Thread Fire Delay



An example of missing intumescent protection to essential ironmongery.

Image courtesy of Assured Fire Door Services

1.12 Locks, Latches, Handles and Bolts:

Manufacturer, product reference and CE (UKCA) marking; evidence of BS 476:22 or BS EN 1634.1 approved products compatible to the door fire test:

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:

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 bolts) 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. Also record and check:

Type:

Manufacturer, product reference, CE (UKCA) marking, BS EN 1154 or BS EN 1155 approved to door fire rating:

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

No evidence of oil leakage:

From maximum possible opening angle and 75mm ajar, function to ensure that the latch bolt engages fully into the frame strike plate from both positions:

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?

Please note, BS EN 1154 specifies that the average closing time for fire doors should be between 3 and 25 seconds from a 90 degree open position (see also point 3.9)

Door closers in a mental health environment are often fitted into the transom head of the door frame and integrate with the double action hinge. There is a need to check for fire test compatibility, compliance with the manufacturer's global certification of conformity and that it is anti-ligature.



Please see Section 2 point 2.13 for more Closer information.

Image courtesy of Golden Thread Fire Delay

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 (rare in healthcare premises but not unknown):

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:

Air transfer ventilation grille:

Dimensions:

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

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:

Image courtesy of Golden Thread Fire Delay



Is the closing device heat activated or electro-mechanical, and is it suitable for it's location?

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 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:

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:



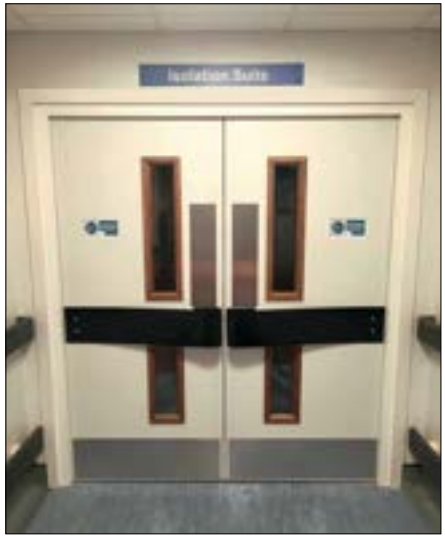
Image courtesy of Golden Thread Fire Delay

In mental health units there is a need to check that glazing in doors in all locations is both fire-rated and laminated; also a need to inspect the glazed elements in 'openable viewing glazing', to ensure they have appropriate fire resistance in addition to any security requirements.

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?)*



New doorset complete with PVC-u surface covering, 6mm 'tear drop' bumpers, push plates and kick plates; all designed to withstand high impact and reduce maintenance costs.

Image courtesy of Gerda Security Products Ltd

1.17 Door signage:



HTM 05-02 states that:
"all fire doors, including each leaf of double doors, should be provided with an identification disc (except in mental health accommodation). The disc should be a minimum of 45 mm in diameter, clearly indicating the fire-resisting standard of the door (for example FD30s, FD60s etc)".

In mental health environments the same discs are typically used but are routered into the door face and secured with contact adhesive.

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 Trusts, 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.

1.19 Side Panels, Flush Overpanels or Transom Panels (denote which):

Not all fire doors have been tested with over-panels and glazed screens. 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.

Record:
Panel make-up, dimensions, fixing method and interface details:

Evidence of fire test to BS 476:22 or BS EN 1634-1?
Independent or shared frame members:

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

Type and make of glass with identity marks (needs to be consistent with the door it is surrounding):



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

Image courtesy of Golden Thread Fire Delay

1.20 Automatic Door Releases and Controls:

Many new fire doorsets or assemblies 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 both functional and compliant with both the device manufacturer's instructions and the GFRA, typically as recommended and outlined on page 12 of HTM 05-03 Part B, given below:

Automatic door releases and door control systems:

4.39 For fire doors to be held open on automatic door releases, all of the following criteria should be satisfied:

a. the door release mechanism should conform to both BS 5839-3 and BS EN 1155 and be fail-safe (that is, in the event of a fault or loss of power the mechanism should release automatically);

b. all doors fitted with automatic door releases should be linked to the alarm and detection system to support the fire strategy

c. all automatic door releases within a compartment/ sub-compartment should be triggered by all of the following:

(i) the actuation of any automatic fire detector within the compartment/sub-compartment;

(ii) the actuation of any manual fire alarm call point within the compartment/sub-compartment

d. automatic door releases must be provided with a ready means of manual operation from a position at the door

4.40 As a minimum, automatic door releases should be arranged to automatically close doors, both within and forming the boundary of alarm zones where the "evacuate" and "alert" signals are sounded.

4.41 Doors to staircases should not be held open by means of hold open devices.

Access control systems:

4.42 Where required, access control systems should automatically release (unlock) doors forming exits from alarm zones where the "evacuate" signal is sounded.

4.44 The alarm and detection system must be linked to any security locks that normally prohibit access to defined areas or the exterior. The mode of operation should be configured so that security locks are only activated to areas required for use as part of the progressive evacuation process. For example, inadvertent operation of security locks to the exterior may divert essential resources to manage containment when they are needed to manage fire safety.

It should be noted that in mental healthcare buildings the failsafe requirement will often be to lock rather than unlock. This may also apply to fire doors in other buildings providing security such as those protecting paediatrics, maternity, mortuaries and pharmacies. ***In such locations fire and security strategies will have to be considered together;*** *potentially with the fire alarm not being linked to the access control and local release systems being in place that follow the means of escape route.*

Staff must have an easy means to override the locked door, such as it being suited with the rest of the locks or having a key operated green break-glass facility. It may be appropriate to have a minute delay built into the cause and effect, which allows time to move service users before the doors close.

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.

In addition, reference should be made to NHS Estates Facilities Alert/2015/006 regarding closure force; issued as a result of a doorset closing violently and a patient sustaining a serious head injury, which contributed to their death.

1.21 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.

In mental health environments, closers need to be fitted at low level to reduce ligature risk.

Where doors have access controls installed and the 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.

Please note that there is a need to check that any hold-open or lock 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 power operated doors should also be knowledgeable of and refer to BS 7036-0:2014 and BS EN 16005;2012.



Electric locking devices installed on escape route doors need to suitably fail-safe.

Image courtesy of Golden Thread Fire Delay

Table C1 Location of fire doors

Location of door	Minimum period of fire resistance in terms of integrity (minutes) when tested to BS 476-22[1]	Minimum period of fire resistance in terms of integrity (minutes) when tested to European standards[2]
Sub-compartment wall	FD30S	E30 S_a
Fire hazard rooms	FD30S	E30 S_a
In a compartment wall	FD30S – Single-storey healthcare buildings	E30 S_a
	FD30S – Storeys above ground in healthcare buildings fitted with sprinklers	E30 S_a
	FD60S – elsewhere	E60 S_a
To a protected shaft containing a stairway or escalator:		
a. accessed from a hospital street	FD30S	E30 S_a
b. elsewhere	FD30S to each of the two sets of doors to the lobby	E30 S_a
To a protected shaft containing a lift[3]:		
a. accessed from a hospital street	FD30	E30
b. elsewhere	FD30S to the doors from the circulation space to the lobby	E30 S_a
	FD30 from the lift car to the lobby	E30
To a protected shaft containing chutes, ducts and pipes	FD60S	E60 S_a
Within a cavity barrier	FD30*	E30

1.22: Table C1 on page 73 of HTM 05-02, 2015 edition, provides guidance on the rating and smoke seal requirements of new doors in healthcare buildings based on their locations.

From Firecode HTM 05-02 2015, see Appendix C, page 73.

Notes: *1. To BS 476-22 (or BS 476-8 subject to paragraph 5 in Appendix A of Approved Document B).*

2. The national classifications do not automatically equate with the equivalent classifications in the European column; therefore, products cannot typically assume a European class unless they have been tested accordingly.

*Unless pressurisation techniques complying with BS EN 12101-6:2005 are used, all these doors (except those marked *) should also either:*
(a) have a leakage rate not exceeding 3 m^3/m/hour (head and jambs only) when tested at 25 Pa under BS 476-31.1; or
(b) meet the additional classification requirement of S_a when tested to BS EN 1634-3.

3. Lift doors to be tested to BS EN 81-58.

Section 2; Type 2 Compliance Inspections of Existing Fire Doors

2.1 Type 2 Inspections are undertaken on existing fire doors. They are sometimes referred to as 'notional' fire doors when little or no information currently exists or is readily available. Such inspections play a vital role in a hospital Trust or healthcare organisation assessing its 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 an acceptable certifiable standard, or need to be replaced.

The stated fire performance of a door, given by its affixed sign, should not be ignored or thought worthless, as when the door was installed, potentially before certification schemes existed, it may have been the only evidence of performance required to confirm that it had been designed, procured, manufactured and installed competently.

2.2 They need to be carried out by competent persons *(please see Section 1, 1.4)*, who in addition to knowing how to inspect a new door in healthcare environments should also be thoroughly familiar with industry approved repair methods on existing doors. The inspection should be recorded, preferably electronically, with a pass / fail criterion.

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 protocols, 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. Professional Indemnity insurance is therefore recommended and evidence should be obtained by the Trust or healthcare organisation 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 would 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 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.

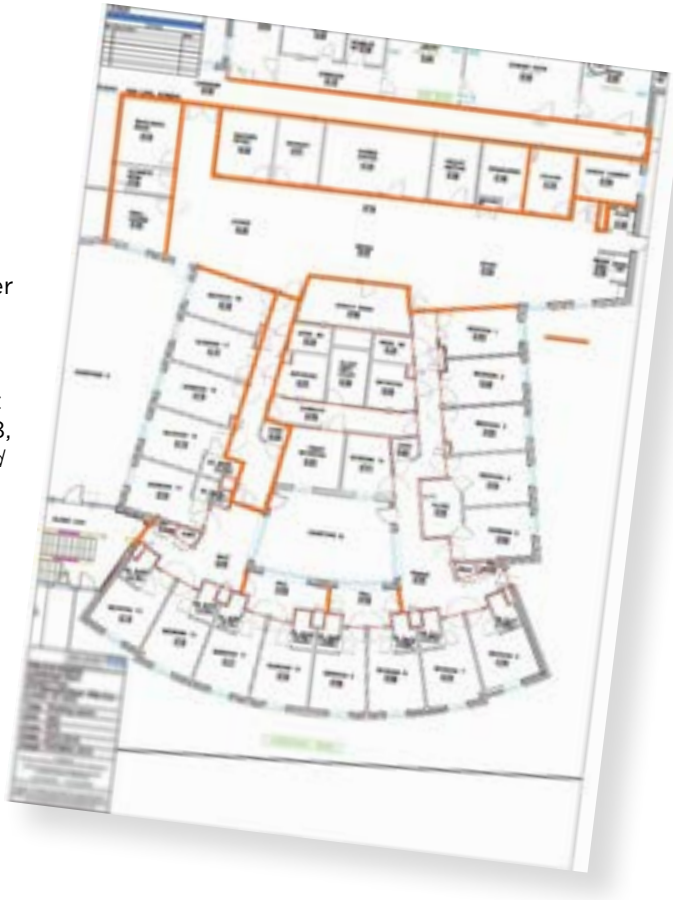
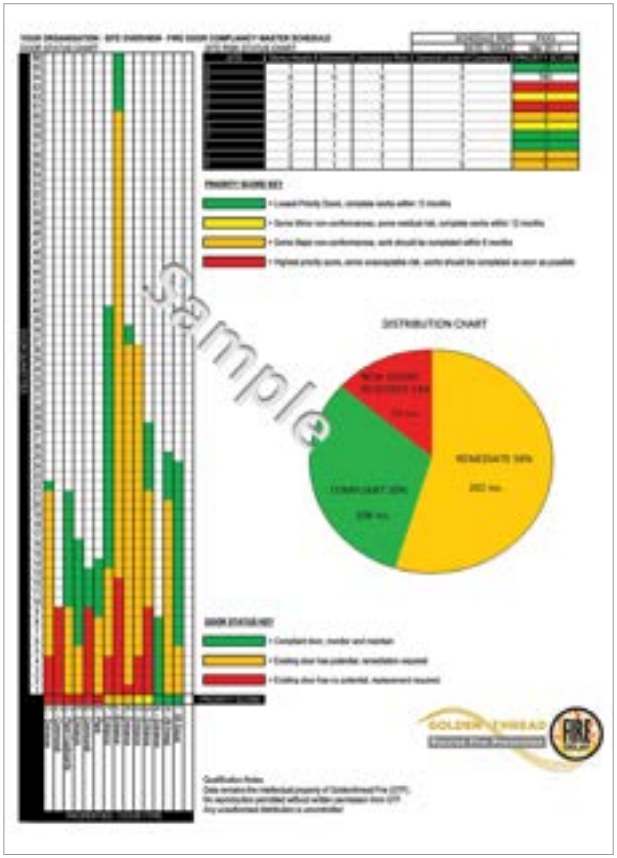


Image courtesy of Golden Thread Fire Delay



2.4 In the absence of information on the actual doors being inspected, those undertaking Type 2 inspection evaluations should not only be comparing its condition in compliance with Firecode 05-02 2015 as given in Appendix C, page 73 ***(Please see page 27 of this document)***, but also the importance of the doors in terms 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 'sanitary accommodation' rooms in mental healthcare settings may be deemed as hazard rooms due to patients having the propensity of using such rooms as a location for starting a fire.

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 Trust or organisation 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.

Image courtesy of Golden Thread Fire Delay

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 with rebates 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.

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 under schemes such as LPS 1197 can issue a Third Party Certificate of Inspection, that can be used as the foundations of a robust 'paper trail' for potentially managing certified remediation and future ongoing inspections in keeping with statutory requirements.

Under LPS 1197 it is also possible to 'evidence pass' notional fire door assemblies and provide a 3rd Party certificate of conformity within the limits of their repair.



A familiar sight of an old doorset beyond its intended life with no potential for remediation.

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 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 can often be repaired to a competent standard if they are carried out in accordance with approved repair methods, tested and provided by such bodies as the Architectural and Specialist Door Manufacturers Association (ASDMA) or equivalent industry guidelines as in BS 8214:2016, so door leaf holes and edge damage should be noted. They could constitute a door failure depending on severity and location of a defect.



Image courtesy of Golden Thread Fire Delay

Other issues that could lead to door leaf failure include:

- Distortion/ misalignment of more than 3mm *(please see below)*
- Over scribing (planing) of door edges resulting in thin vertical edge lippings of less than 6mm
- Damage such as splitting and delamination that is beyond repair
- Any evident alterations or repairs not in accordance with recognised standards
- 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
- 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 - 2mm, otherwise the door's fire integrity could be seriously compromised.

It is not recommended to replace a door leaf in isolation unless full traceability exists and an exact replica can be sourced from the manufacturer.



Door edge protection that has been retrospectively fitted can be hiding a number of compliance issues that could seriously affect fire integrity.

Image courtesy of Mark Ainge

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 and should be limited to doors in low risk locations.



Images courtesy of Golden Thread Fire Delay

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.

A door in an existing 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 install a new fire tested door edge complete with intumescent cold smoke seal.

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. Interrupting a smoke seal at hinges or other ironmongery positions on 60 minute doors can seriously reduce its effectiveness and may not be how they were tested.



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.

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 GFRA if possible), but on a fire door required to have smoke seal capability, the gap should be 3mm with a 1mm tolerance. This can often be resolved by installing extra lipping or fitting internal or external drop down seals, which 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 drop down seal is not preventing the door leaf from effectively closing and /or fitting tightly against its doorstop *(please see comment under point 3.9 on page 54).*

The table on this page, where dependency of patient, room size and fire growth rate (FGR), in addition to a number of other possible factors such as design and ceiling height are considered, can be used by those responsible for the fire safety of the building as an aid in deciding whether the threshold gap of existing fire and smoke control doors is appropriate:

	Room size				
	Small less than 9m²		**Med** less than 16m²		**Large**
Very high dependency					
Dependent	Fast FGR	Med FGR	Fast FGR	Med FGR	
Independent	Fast FGR	Med FGR			

Amber = 3mm gap Green = up to 10mm gap

Courtesy of Mazin Daoud



Firecode requires bottom edge (threshold) gaps not to exceed 3mm but in existing buildings there can be a pragmatic view.

Image courtesy of Assured Fire Door Services

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 GFRA fire test detail where available, with evidence of performance including 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



Image courtesy of Steve Curtis

2.11 Hinges:



Fire doors with only two hinges need to be assessed in terms of what is suitable and sufficient.

Image courtesy of Golden Thread Fire Delay

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.**

If a door has a hold open device attached to it then it must have 3 hinges and the 3rd hinge needs to be in a position that supports the door to prevent warping.

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 20 years old complete with original hinges. Fitting intumescent pads behind the hinge is 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 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 marked (applicable to fire rated hinges, door closers and some locking devices post June 2013) with UKCA marking being phased in 'post Brexit'. 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 to the top of 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 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
- Ensure they are anti-ligature and in compliance with HBN 03-01 (if applicable)

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.



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 doors are not fitted with door stops and typically rely on brush or fin appendages to create a smoke seal. Door leaves on hold back devices should be released during inspection to check for effective smoke seal capability, and those with ineffective seals need to be assessed to determine to what extent smoke containment is suitable and sufficient for their location and if the leakages can be sufficiently risk managed or remediation is required.

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.



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 (UKCA) mark (as applicable to age of door) and Model Reference – suitability for rating 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
- For obvious damage to the pivot arm and terminal fixings
- 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
- 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, sub-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.



Image courtesy of Golden Thread Fire Delay

- 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



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:

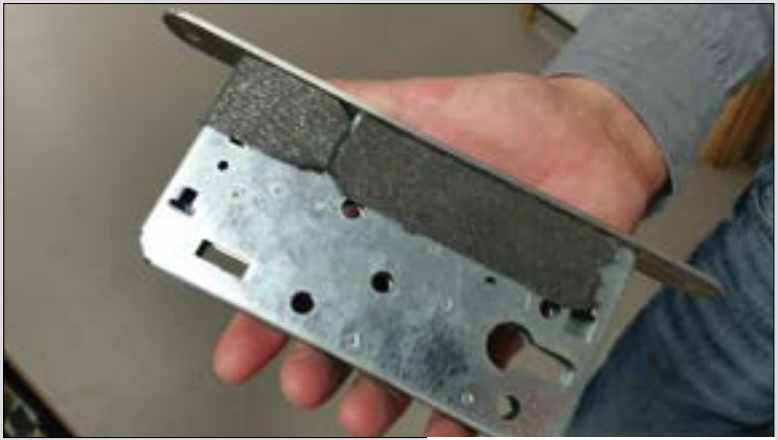
…. need inspecting to ensure they function as required and intended. All locks should be fire tested and compatible with the door's fire test evidence; the retro-fitting of code locks and other types of locks can compromise fire test compatibility and their specification should be investigated and assessed.

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 any post COVID-19 retrofitted hygiene handles have the required fire test evidence for use on a fire 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 right 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, sits in the frame without movement 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.



Image courtesy of Golden Thread Fire Delay

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 temperature 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 noted that *"only glazing that provides a minimum period of fire resistance of 30 minutes (integrity and insulation) may be provided on circulation spaces that give a single direction of escape".* Firecode HTM 05-02 3.32.

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

In mental health care units, vision panels can sometimes be changed for reasons such as privacy or impact resistance and there may be a need to check for both fire test compatibility and the manufacturer's global certification of conformity to ensure that glazing in doors in all locations is both fire-rated & laminated.

2.16 Air Transfer Louvres, Letter Boxes and other apertures:

Where louvres, letter boxes, door viewer / spy holes 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 a smoke seal is required, it is necessary to check for an automatic closing device that will activate (close) with the fire detection and alarm system **and to recommend the fitting of one in the locations where they are absent.**

2.17 Push Plates, Kick Plates and other surface coverings – will also be visually inspected to ensure they are in good condition and functional. Ones that are suspected of being retrofitted to hide 'issues' should be removed for investigation. Assess if larger screw fixed metallic panels are within size restrictions, this is typically no greater than 40% of the door area or up to 900mm from the bottom edge.



Push Plates and other surface coverings that are suspected of being retrofitted to hide 'issues' should be removed for investigation.

Image courtesy of Golden Thread Fire Delay

2.18 Signs:

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





N.B. Signs do not have to be put on the inside of a cupboard (but you can if you want!)

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

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

Appropriate signage is determined by fire door location, use and whether or not 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.

2.19 Adjoining Panels, Door Heads and Thresholds:
A doorset 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 insulated glass and / or should be insulated.

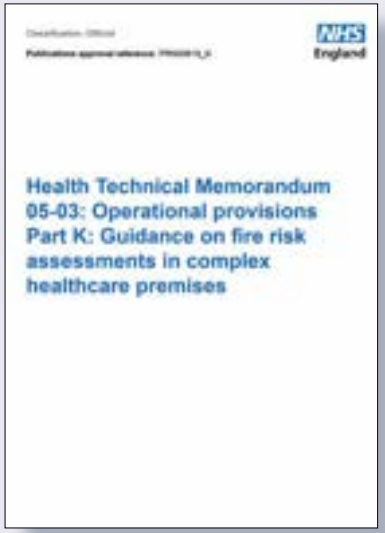
2.20 Doors competently inspected and remediated under schemes such as LPS 1197 can have Third Party Certificates of Conformity issued as evidence that the doors are 'as tested' or have been remediated 'to the limitations of their repair'.



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

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 of Articles 17 and 38 of the FSO.

3.2 There are a number of 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.

Guidance for healthcare buildings can be found in Firecode HTM 05-03 part K, BS 9999 and BS 8214.

3.3 HTM 05-03 part K provides the following information and guidance on PPM checks related to fire doors:

7.53 Once the fire door has been assessed to ascertain that it is appropriate for its use, the periodic visual check/testing, such as daily, weekly and monthly checks during the year, does not need to be carried out by a fire risk assessor. It is acceptable for inspections to be carried out by estates personnel or Fire Wardens who have received suitable instruction and who are not expected to be experts in fire door compliance.

7.54 The daily fire door checks should ensure that all fire doors are not obstructed and can open freely and fully close. This could be carried out by local staff (for example, fire marshals). No additional training would be required for this and there is no requirement to record this. The weekly check should test any hold-open devices, electronically controlled locking mechanisms and other devices interfaced with the fire-alarm control panel. The monthly check should make sure that all fire doors are in good working order and closing correctly, and that the frames and seals are intact. These principles apply to any fire door regardless of its type or construction (for example, steel fire doors, sliding fire doors and roller shutter doors that have a fire-resisting function).

3.4 Although not directly applicable to healthcare premises in scope, BS 9999:2017 is referred to in various HTM's and 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.

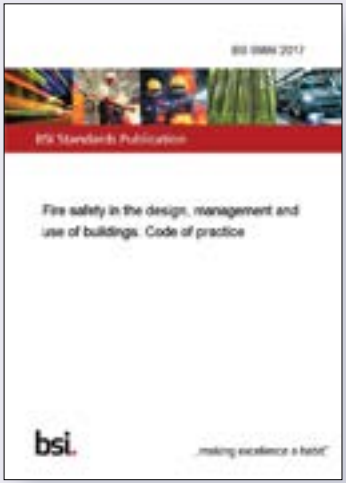
I.6.2 Fire doors

"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"*

3.5 It should be borne in mind that both HTM 05-03 part K and BS 9999 are guidance documents, not mandatory, and they do 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 healthcare buildings:

3.6 Criticality:

How important the fire door is to the occupants should be considered in line with HTM 05 series, any PEEPS and aligned to the dependency of the patients in the area of, or immediately adjacent to the door(s).

Occupant dependency: the categorisation of occupants on the basis of their likely need for assistance to make their safe evacuation in an emergency. The following categories are referred to in the Health Technical Memorandums:

- ***Independent:*** *occupants will be defined as being independent:*
  - *if their mobility is not impaired in any way and they are able to physically leave the premises without staff assistance; or*
  - *if they experience some mobility impairment and rely on another person to offer minimal assistance. This would include being sufficiently able to negotiate stairs unaided or with minimal assistance, as well as being able to comprehend the emergency wayfinding signage around the facility*
- ***Dependent:*** *all occupants except those classified as "independent" or "very high dependency"*
- ***Very high dependency:*** *those whose clinical treatment and/or condition creates a high dependency on staff. This will include those in critical care areas, operating theatres, coronary care etc. and those for whom evacuation would prove potentially life-threatening*

The size and design of the room being protected is also a factor; for example low ceiling heights could greatly increase fire growth rate as could the room's fire load.

In addition, there are likely be areas of a healthcare building that are critical in terms of maintaining treatment continuity, for example an MRI scanner or an imaging department. Although not necessarily critical for immediate life safety, the loss of such equipment and resources may be prejudicial to diagnosis or treatment and as such should be identified, by an Emergency Planning Officer, Compliance Manager or others and the appropriate level of criticality recognised.

3.7 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 several hundred 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 ward entrances, cross corridor doors, stairwell doors and other doors likely to be opened regularly (more than 100 times in 24 hours)

Medium - typically ward kitchens, consulting rooms and cleaning cupboard doors likely to be opened between 10 and 100 times per day (24 hours)

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



Low use door.



High use door.

Images courtesy of Golden Thread Fire Delay

3.8 Likelihood of impact damage:

Doors, which are frequently used for access by beds, trollies, bins, cylinder carts etc. are more likely to suffer impact damage.

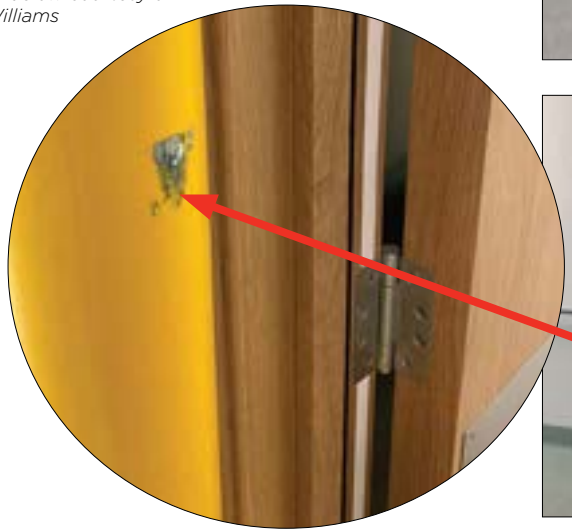
Doors identified with a high likelihood of impact damage should be inspected more frequently than those with a lower likelihood.

Image top right courtesy of Golden Thread Fire Delay

Additional protection measures should also be considered.

Images below courtesy of Sam Williams







Fire door inspection matrix:

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 building in terms of what is suitable and sufficient. In some buildings, it may be appropriate for high usage doors to be checked weekly 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 low likelihood
- Doors in areas with critical treatment continuity risk and very high dependency should be assessed accordingly

	Low (daily) Usage <10x in 24hr	**Med (daily) Usage** 10-100x in 24hr	**High (daily) Usage** >100x in 24hr
Independent	**12 monthly**	**12 monthly**	**6 monthly**
Dependent	**12 monthly**	**6 monthly**	**3 monthly**
Very High Dependency	**6 monthly**	**3 monthly**	**Monthly**

Courtesy of Mazin Daoud

Examples:

- Riser door in ITU, Very High Dependency, low usage = 6 monthly PPM
- Clinical waste store in medical ward, Dependent, medium usage = 6 monthly, adjusted for impact damage in 1 above = 3 monthly PPM
- Linen cupboard in medical ward, Dependent, low usage = 12 monthly PPM
- Cross corridor doors in corridor adjacent to ITU on magnetic hold open device, Very High dependency, high usage = monthly, adjusted as in 2 above = 3 monthly PPM
- Plant room on roof, Independent, low usage = 12 monthly PPM
- Main entrance to A&E Resus, very High Dependency, high usage = 1 month PPM

3.9 Practical Considerations:

- **A Type 3 inspection is intended to maintain functional use on a fire door that has already been robustly 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 estates personnel or fire wardens 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 inspectors complete inspections at different time intervals in the same part of the hospital 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
- Special fire door inspection provisions will need to be made for acute mental health units and other areas where HBN 03-01 applies
- Areas where there is a Pressure Differential System should be checked when the system is switched off to ensure the doors will be functional and compliant in an emergency situation
- Those conducting Type 3 inspections should be proactive in ensuring that fire doors are not being routinely wedged open

A Summary of why 3 Types of Fire Door Inspections are recommended in Healthcare Buildings.

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

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.

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.

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 in line with HTM 05-03 Part K (2024 edition).

The 3 inspection Types can be a key component in fulfilling the recommendations of developing fire safety protocols as stated in Health Technical Memorandum 05-01: Managing Healthcare Fire Safety (second edition) – please see Section 5.

Section 4; Fire Doors that Require Special Consideration

4.1 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 Automatic Sliding Door Systems:

Inspection requirements on such doors typically include checking:

- the condition and function of the top track, including roller bearings
- the condition and function of the bottom cam rollers
- the condition and function of ambient cold smoke seals when applicable
- that belt drives are in good condition and set at the correct tension
- that end stops are correctly set and secure
- the battery is fully charging and the battery backup activates on power failure
- the micro braking distances and other inherent safety devices, including self-sensing impact detectors, presence sensors, safety photocells, overload cut out switches and door mounted safety edge strips
- their fire performance

Sliding doors on escape routes should be inspected to ensure they comply with HTM 05-02, which in Appendix C states that:

Sliding doors are acceptable on escape routes provided they convert to outward-opening doors when subjected to reasonable pressure from any direction. In the case of powered sliding doors, they should in addition be provided with a monitoring system to ensure that they fail-safe to the fully open position in the event of a power failure.

Sliding doors MUST not be used as final exits.

As stated in section 1.20 above, it should be noted that in mental healthcare buildings the failsafe requirement will often be to lock rather than unlock.



Image courtesy of Dortek

4.3 Hygienic Doors:

Hygienic doors are often sliding doors but can also be hinged. They are typically located in critical fire safety areas such as theatres, recovery suites and ICU where high hygiene levels are required to aid infection control. Such doorsets will often have a vermiculite core and a hygienic GRP face finish – 40mm thick irrespective of fire rating, with a concealed intumescent strip to aid cleaning, or could have a timber core and steel face finish. Some hygienic fire rated sliding doors are hermetic with a plastic laminate finish and the smoke seal built into the composite gasket to create the hermetic seal, so it is vitally important that inspections include checking the seal.

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. **It is recommended that inspectors are Third Party certificated to assess steel pivot doors.**

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 functioning correctly
- cold smoke seals, if required, are in good condition



Image courtesy of Metador

4.5 Roller Shutter Doors:

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.**



Image courtesy of Golden Thread Fire Delay

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.

4.6 Lead-lined Doors:

Lead-lined doorsets are typically specified within X-ray theatres, CT scan rooms and any other areas requiring radiation protection. Lead is a highly effective material for blocking and attenuating radiation. A PVC Postformed lead-lined doorset is designed to endure high-traffic environments and withstand the challenging demands of healthcare settings, providing both fire and radiation protection.

The fire and radiation protection performance of a doorset depends on various components, including leaf and frame intumescent seals, hardware intumescent, glazing systems, and door closers. For instance, during a fire, intumescent seals can expand up to 40 times their original size, sealing voids and fissures around the doorset and prolonging the doorsets performance.

When inspecting a doorset providing radiation protection, there is a need to ensure the following:

- Gaps and tolerances around the doorset comply with the manufacturer's certification
- All intumescent components are properly fitted to hardware and the item of hardware is correctly secured into place
- The door leaf/leaves open to their maximum opening angle and close fully without being impeded
- The door closer closes the door leaf/leaves in a smooth and controlled manner and latches efficiently without slamming
- There is no visual damage to the doorset
- If there is a glazing system, check that it is secure and no visual signs of damage
- Check that the doorset has a method of identifying its fire rating
- Check for damage to any integrated signage or lighting unit
- Check for Test or Global Assessment for all items including vision panels and warning lights



Image courtesy of Specialist Door Solutions

4.7 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 the Trust or organisation 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.



Image courtesy of Golden Thread Fire Delay

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.



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

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, reviewed by the Trust's Fire Safety Officer / Responsible Person, to support the retention of heritage doors, including water mist systems, which can protect escape routes on the opposing face by cooling the area directly in front of the door. Other compensatory measures may be required, including reviewing the fire strategy of the building, to mitigate risk and support life safety.

4.8 PVC Wrapped Postformed Doors:

PVC wrapped postformed doorsets are ideal for high-traffic healthcare environments due to their durability and fire-resistant properties. They feature a durable PVC facing, postformed around the door leaf, and are available with ratings of FD30, FD30s, FD60 and FD60s; allowing them to perform extremely well across all healthcare environments, with both fire safety and compliance in mind.

To ensure the doorset remains compliant and functions as intended, there is a need to check the following:

- Verify that the specified fire door has the appropriate fire test evidence and third-party certification
- Ensure the doorset is installed in line with the manufacturer's fitting instructions by qualified installers
- Ensure it is inspected and maintained regularly to sustain its performance
- Ensure all undertaken maintenance and repairs are approved by either the manufacturer or an authorised third-party scheme member



Image courtesy of Specialist Door Solutions

4.9 Seclusion Room Doors:

Seclusion is the involuntary confinement of a patient alone in a room or area from which the patient is physically prevented from leaving. Seclusion may be used for the management of violent or self-destructive behaviour.

The door needs to be robust enough to satisfy its functional use and should be inspected as a complete assembly / set; for example with equal scrutiny of the door frame in terms of impact performance and fire rating. The fire rating may vary, based on property height, location of the door in the fire evacuation strategy and building construction, but should provide a minimum of 30 minutes and more likely 60 minutes integrity, subject to wall construction and assessed requirement. It is logical for it to have the same standard of fire door performance as other doors in the unit.

The glazing should be a minimum of 12mm laminated and etched to identify fire-rating, with metal surrounds rather than wooden beading to the vision panels to provide robust impact resistance.

Their design should consider the need for anti- barricade measures, anti-ligature protection, locks, whether it should open outwards and the need for viewing holes / lenses. General guidance is given in HBN 03-01 p21 and HBN-03-01-supplement-1-vf3.pdf (segregation, seclusion suites references p68); referring also to 'HTM 05-03: Operational provisions Part K: Guidance on fire risk assessments in complex healthcare premises'.

Steel seclusion room doors will not require intumescent seals as the metal will expand in a fire situation and seal any gaps, but there is a need to check for cold smoke seals, which should be cut and installed in small pieces to remove anti ligature risk (please see 1.10 gaps and seals).

They should be checked for deformation of the door leaf skins following severe patient impact to ensure their fire-resisting and smoke seal performance has not been impaired.



Image courtesy of Golden Thread Fire Delay

4.10 Fire Hazard Room Doors:

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

HTM 05-02 (Firecode); 5.40 outlines the need to identify and segregate fire hazard rooms by at least 30 minutes' fire-resisting construction "to protect escape routes with fire-resisting walls, ceilings and doors (protected corridors)".

As stated in 5.41: *"The list is not exhaustive, and the onus rests with the designer to assess the fire risk associated with all rooms to determine the need to enclose in fire-resisting construction".*

It should be noted that although Firecode calls for hazard rooms to be enclosed in 30 minutes' fire-resisting construction (integrity and insulation), a standard fire door is tested to provide integrity only; therefore designers and fire risk assessors should assess if a fire door needs to also provide heat transfer insulation performance, based on its location and life safety requirements.



Image courtesy of Golden Thread Fire Delay

	**Door locations that should be kept locked shut:** Chemical stores, Cleaner's cupboards, Clothes storage rooms and cupboards, Disposal rooms and cupboards, Hub rooms, Lift motor rooms, Staff changing and locker rooms, Other storerooms.
	**Door locations that should typically be fitted with appropriately designed free-swing self-closing devices:** Ward kitchens, Relative's overnight stay rooms.
	**Door locations that should typically be fitted with self-closing devices:** Linen stores, Staff on-call rooms, Communal bathrooms in mental health premises.
	**Door locations where closing devices should typically not be fitted:** Bedrooms provided specifically for patients with mental health needs and learning disabilities.

In terms of inspection, the key features may be to determine whether or not the door needs to comply with Firecode, Table 6 in HTM 05-02 (Firecode); 5.41.

N.B. A free swing door closer allows a fire door to operate as if it had no closer installed and it can be held open at any position. On activation of the fire alarm, the door will automatically close irrespective of the position the door was left in. This closer should be professionally installed & interfaced with the building's fire alarm system.

However, no kitchen should be fitted with any hold open device unless a Trust's commissioned Fire Risk Assessment has been completed by a qualified assessor, including analysis of the automatic fire detection system prior to being professionally installed & interfaced with the building's fire alarm system. It should NOT be linked to a heat detection system. The best option and default position is a high-quality fire door set with a high-quality overhead door closer – providing low friction, sensible closing speeds and low opening forces.

This diagram is based on HTM 05-02 (Firecode); 5.41 Table 6
Courtesy of Karen Byard and Golden Thread Fire Delay

4.11 Flat Entrance Composite Doors: Composite Doors may be found in some buildings owned by a Trust for residential or other uses, and the following information is therefore provided for reference:

In recent years a large number of flat entrance doors have been made from composite materials; typically the door frame made from PVCu with internal reinforcement and the door leaf being timber based, sometimes solid and sometimes with foam infill, with the external faces and edges covered with GRP or thermoplastic material. They will, or should, have been supplied as a complete doorset, with every component having been fitted in the factory and not added from another source by the installer. In older blocks of flats, they may be found as replacements for original timber doors and sometimes installed by leaseholders.

After the Grenfell Tower fire in 2017, a composite flat entrance door installed at Grenfell Tower achieved only 15 minutes' fire resistance when tested. The door was manufactured by Manse Masterdor (a company that no longer exists), and a number of the company's composite flat entrance doors, although designed to provide 30 minutes' fire resistance, failed to do so when tested.

This led to tests of a range of manufacturers' composite fire doors on behalf of the Government. It was found that, depending on the manufacturer and the model of door, the fire resistance of these doors ranged from eight minutes to over 30 minutes. Common points of failure were letterboxes and glazing (due to manufacturing defects, such as in the means of securing the glazing). Where the point of failure was the letterbox, remedial work can often be carried out by the manufacturer or a specialist contractor on site. This might also be possible in the case of the glazing. In case of doubt, advice of the manufacturer should be sought.



Image courtesy of Golden Thread Fire Delay

A further issue is that the fire resistance of many composite doors can be different according to whether the door was tested from what would be the "common parts side" or the "flat side". Originally, the doors were only tested from the "flat side".

If it can be confirmed (e.g. from documentation or liaison with the manufacturer/supplier) that the doors were manufactured after late 2018, there should not be an issue, as the composite door industry doors are now tested from both sides. In the case of doors manufactured before 2018, you should seek further information regarding their likely fire resistance. The Government have published the results of their tests on specific manufacturers' products, and information can be sought from the manufacturer or supplier of the doors. In the case of these "legacy" doors, it is sometimes acceptable for adequate fire resistance to be provided from the "flat side" if it is assessed that a fire coming from the common parts is unlikely.

The inspector must identify the complete doorset to assess fire resistance and smoke spread capability, with all smoke seals verified for suitability including at the perimeter, the threshold and the letter plate. This is likely to require the manufacturer's product data being provided. Any composite flat entrance door without evidence of suitable fire performance needs to be replaced with fire-resisting doorsets to ensure adequate protection.

Unlike timber doors there is little scope for repair other than like for like replacement of components such as hinges or the self-closing devices to the same specification and evidence of performance. The manufacturer's data sheet must be consulted regarding leaf to frame and threshold gaps.



Unlike timber doors there is little scope for repair.

Image courtesy of Golden Thread Fire Delay

4.12 Final Exit 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".*

Firecode 05-02 3.59 states that *"Automatic final exit doors should be freely openable by hand under any condition, including power failure; otherwise, adjacent non-automatic outward-opening doors must be provided".*

It is however commonplace to have more than one locking mechanism on Final Exit doors in mental health in-patient facilities. These would normally take the form of a keyed mortice type lock with a magnetic swipe or key operated release *(ideally the latter key should be the same as for the Fire Call Points - key operated in mental health units).* Keys are carried by staff at all times and as any evacuation is wholly facilitated by ward staff who are familiar with their own environment, the requirement for 'simple and ease of egress' is of less relevance.



Image courtesy of Drutex S.A.

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.

Once their compliance has been expertly determined, they should be inspected regularly, a minimum of every 6 months *, but this is often not the case. A common reason for not doing so is that they are often linked to an alarm system so that special arrangements may have to be made. Another issue is that their hardware and function may be unfamiliar and those inspecting internal fire doors may not be competent to inspect external doors.

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".*

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.

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 accordance with the requirements of Approved Doc 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 risk applicable. The main entrances will also be escape doors and must also be considered and regularly checked for correct function.



Image courtesy of Golden Thread Fire Delay

Section 5; Creating a Robust Fire Compartment Management System

5.1 Applying the 3 Types of inspections outlined in this Reference Document is a key element to achieving a fire compliant healthcare building, as part of a holistic and robust Fire Compartment 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 implemented due to a lack of initial information.

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.

5.4 Agree a targeted action plan. Acknowledging budget, access and other practical issues, it would be reasonable to adopt a pragmatic approach to establish 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.

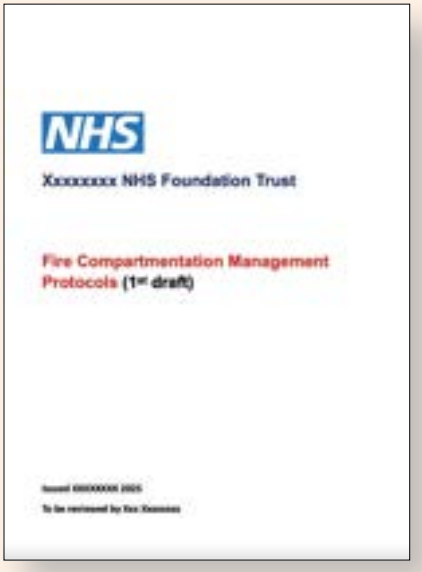
5.5 Create a unique set of Fire Compartment Protocols for the Trust or organisation, which would outline all of the required actions, responsibilities and details, and be used to communicate and share those actions with others. Everything stems from this, so it needs to be carefully considered, written 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 component procurement systems and the introduction of Type 1 inspections for all new buildings or refurbishments. This should include ensuring that installation companies provide comprehensive O&M manuals with a golden thread of information to meet the requirements of Building Regulation 38.
The importance of these actions cannot be overemphasised as they are likely to have an immediate impact on both compliance and future maintenance costs.

5.7 Create fire component schedules on a building-by-building basis, comparing their condition with their importance (criticality). Each identified component should be Type 2 inspected, not only comparing its condition with Firecode requirements but also the importance of the compartmentation in terms of what it's protecting (criticality factor of 1-4) and therefore what level of compliance is suitable and sufficient. By doing so a fire compartment 'action priority' schedule can be established, commencing cost-effective, measured fire compliance improvement, to significantly reduce risk from year one. This would encompass not only actual risk of fire for people, the hospital's fabric and activities, but also protection of the Trust or organisation and its management, as it provides documents that can be shared with external auditors in compliance with FSO Articles 17 and 38, showing a coherent fire compartment management system with a commitment to actual year on year improvement.

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

5.9 Identify and satisfy fire compartment training needs. The majority of which is likely to be fire compartment awareness training, which can be quickly delivered and easily refreshed by those competent to do so.



Fire Compartmentation Management Protocols fulfil the recommendations of HTM 05-01: Managing healthcare fire safety.

Image courtesy of Golden Thread Fire Delay

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:

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.

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.

Bolster Software: a building surveying and inspection system.

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; in

healthcare premises 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.

Escutcheon: a general term for a decorative plate.

Evidenced Pass: a fire resisting door that has been competently and expertly inspected using a risk-based approach and certified under a 3rd Party Scheme, detailing its acceptable known or likely limitations

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

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.

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 and can be maintained to comply with Regulation 38 of the Building Regulations and Articles 17 & 38 of the FSO.

Healthcare Building (Firecode definition): a hospital, treatment centre, health centre, clinic, surgery, walk-in centre or other building where patients are provided with medical care by a clinician.

Healthcare Building (broader definition used in this document): any building used by the NHS and other healthcare providers.

IHEEM: Institute of Healthcare Engineering and Estate Management.

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.

Ligature Point: in the context of mental healthcare setting, an anchorage point used to facilitate a suicide attempt.

LPS: Loss Prevention Standard (as in LPS 1197).

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

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

Nominal or Notional Fire Door: an assumed fire resisting door assembly or doorset where little or no information including certification currently exists or is readily available but the door closely matches or has a number of features that identify it as an intended fire resisting door.

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.

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 & 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.

Progressive Horizontal Evacuation: the evacuation of patients, staff and other relevant persons away from a fire into a fire and smoke-free compartment or sub-compartment, of relative immediate safety, typically on the same level of the premises.

Protected Stairway: a stairway discharging through a final exit to a place of safety (including any exit route between the foot of the stairway & 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.

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: The UK's National Accreditation Body, responsible for determining, in the public interest, the technical competence and integrity of organisations offering conformity assessment services such as testing, calibration, inspection and certification.

References & Recommended Further Reading

Approved Document B (Fire Safety) – volume 2 – buildings other than dwellings 2019

Approved Document E: Resistance to the passage of sound 2015

Approved Document M – Access to and use of buildings volume 2 – buildings other than dwellings 2015

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 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 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

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 & Shutters'*

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

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

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

Equality Act 2010 Gov.UK

Firecode HTM 05-01 2013

Firecode HTM 05-02 2015

Firecode HTM 05-03 parts A (2013) and B (2006)

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

Fire Safety Act 2021

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

Health Building Note 03-01 Adult Acute Mental Health Units

Health Technical Memorandum 05-03: Operational provisions Part K: Guidance on fire risk assessments in complex healthcare premises 2024

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

The Institute of Healthcare Engineering & Estate Management (IHEEM) FSTP Guidance Document No. 2 *'Fire Door PPM'*

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

NHS Estates and Facilities Alert/2015/OO6

Regulatory Reform (Fire Safety) Order 2005

RISCAuthority FPA *'Building Regulations 2010. Approved Document B: Fire safety (Volume 2 – Buildings other than dwelling houses) Incorporating Insurers' Requirements for Property Protection'* 2015

There are currently 7 other related Reference Documents. 3 are available both in electronic and hard copy format and 4 in electronic format only:

RD2-1 **Fire Damper, Firestopping & Cavity Barrier Inspections in Healthcare Buildings**
(available in both formats)



RD3-1 **Fire Door Inspections in Residential Buildings**
(available in both formats)

RD4-1 **Fire Damper, Firestopping & Cavity Barrier Inspections in Residential Buildings**
(electronic format only)



RD5-3 **Systems for Inspecting & Managing Fire Doors**
(electronic format only)



RD6-1 **Fire Damper, Firestopping & Cavity Barrier Inspections**
(electronic format only)



RD7-1 **Fire Door Inspections in University & College Buildings**
(available in both formats)

RD8-1 **Fire Damper, Firestopping & Cavity Barrier Inspections in University & College Buildings**
(electronic format only)



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It is recognised and should be noted that there are different regulations and healthcare 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 module 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 adaptations being created for other parts of the United Kingdom as soon as this can be arranged.

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