

Technical Note



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Re: Fire door inspection: basic protocols –
CONSIDERATIONS FOR THE RESPONSIBLE PERSON

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Introduction

This Tenos technical note discusses some key points for consideration when procuring, inspecting, and maintaining fire doors. It is envisaged that this general guidance will be of use to building operators, those providing facilities management services, or others with a general responsibility for fire safety at their premises.

Where more detailed guidance is required, reference should always be made to the fire door manufacturer/supplier's certification documentation.

Your responsibility – the Regulatory Reform (Fire Safety) Order 2005

The Regulatory Reform (Fire Safety) Order (FSO) is the principal legislation governing fire safety in virtually all operational premises in England and Wales. The FSO primarily applies to non-domestic premises, but also covers common provisions in multi-tenancy buildings (e.g. the common corridors of blocks of flats).

The FSO places a number of duties upon the person or organisation in control of the premises (the 'Responsible Person') such as carrying out a fire risk assessment, and ensuring that necessary general fire precautions are provided and maintained. Regarding maintenance, Article 17 of the FSO states:

(1) Where necessary in order to safeguard the safety of relevant persons the responsible person must ensure that the premises and any facilities, equipment and devices provided in respect of the premises under this Order... are subject to a suitable system of maintenance and are maintained in an efficient state, in efficient working order and in good repair

In assessing the adequacy of fire protective measures there are no absolute requirements. The necessity and suitability of the fire protective measures must be derived from the assessment of fire risk; where the risk is a function of the combination of the likelihood of the occurrence of fire and its consequences. This will normally make an assessment of compliance with the FSO a matter of experience and judgement.

Passive fire protection

Passive fire protection (i.e. fire-resisting walls, doors, floors, structural elements, etc.) is a key component of the range of fire protection measures employed in the design of virtually all buildings to: protect escape routes; limit the spread of fire; and facilitate phased or progressive evacuation strategies in buildings such as hospitals or care homes.

Fire doors

Fire doors are often the weakest point along a given line of fire resistance as they of course inherently comprise an opening which relies upon a good fit between the frame and the leaf to be adequately sealed when the door is closed, as well as a range of fixtures and fittings which themselves rely on appropriate assembly and sealing, often by heat-reactive material (e.g. intumescent strips or beading around glazed panels or behind hinges, locks, etc.).

Furthermore – and arguably most importantly – owing to their continued day-to-day use, fire doors are an element of the passive fire protection strategy especially vulnerable to 'wear and tear'.

Hence, given their number of components and frequent day-to-day use, fire doors in particular require regular inspection and maintenance in order to remain effective in limiting the spread of fire and smoke.

Fire door inspection and maintenance

Use of in-house resource versus outsourcing

There is no requirement under the FSO for the Responsible Person to appoint an independent third party to carry out fire door inspection/ maintenance. However, the person carrying out fire door maintenance should be a 'Competent Person' as defined by the FSO.

The FSO requires that the Competent Person has the appropriate experience and skills to carry out the work. The FSO does not require a Competent Person carrying out maintenance work on fire doors to be trained, accredited or certified by a third party (although the Responsible Person may choose to base its assessment of someone's competence to do the work on the basis of such training, accreditation or certification).

Therefore, providing that they have the necessary knowledge and skill, a Competent Person could be an employee of the Responsible Person. The table below summarises the pros and cons of both in-house and outsourced fire door inspection/ maintenance.

Approach	Comments
In-house	Benefits
	Consistency and ability to implement and manage an inspection and maintenance regime that reflects the fire strategy, fire safety management plan and fire risk assessment.
	The most critical doors can be prioritised and there is a focus on what each door is actually required to do.
	No potential conflict of interest in terms of the Competent Person being incentivised by the quantum of repair/replacement work resulting from inspection.
	Reduced cost.
	Drawbacks
Greater onus on the Responsible Person to demonstrate competency of the employee carrying out the work.	
Places a not insignificant additional workload on employees that may detract from their other day-to-day duties.	
Liability from inadequate work rests with the Responsible Person.	
Outsource	Benefits
	Transfer of liability for inadequate work to the contractor. (Note that this does not absolve the Responsible Person of their ultimate responsibility for maintaining the fire safety provisions – it only provides a possible recourse for remedial works; although outsourcing in good faith may be seen as a mitigating factor in the event of any enforcement action under the Fire Safety Order.)
	Less onus on Responsible Person to define competency.
	Drawbacks
	Out-sourcing does not guarantee that work will be carried out competently.
	Increased risk of unnecessary work being carried due to agency carrying out inspection and/or repair/replacement work benefitting from the quantum or 'significant items' identified.
Notwithstanding the above, even if the contractor carrying out the inspection does not benefit from the work arising from the inspection, there is a greater risk of unnecessary work resulting if the inspector has received training/instruction or is audited by his/her accreditation/certification body to report any/all deviation from a fully certified doorset as requiring repair or replacement.	
Risk of work not being prioritised to reflect strategic importance.	

Required training, qualifications & assessing competency of individuals

Inspection

1. Any inspection of a fire door must be proportionate to the fire safety function required of the door, which will determine the assessment criteria for that doorset. Understanding, for instance, what a fire door into a protected escape stair is required to do that a fire door onto a hazard room (e.g. electrical services riser) is not, and vice versa, is fundamental to any assessment.
2. Hence, and particularly in large and complex buildings, there may be a number of different 'types' of fire door serving different strategic purposes. Certain issues will be common to all 'types' of fire door (e.g. basic mechanical condition of the door leaf) but other issues will be specific to the function of the door (e.g. the presence or otherwise of cold smoke seals).
3. For each 'type' of fire door an inspection proforma can be developed to reflect the required performance in terms of its contribution to the building fire strategy.
4. Third-party training and accreditation/certification for 'fire door inspectors' is available. This can provide someone with the basic understanding and skills but often (usually) this is provided in a manner which does not take account of strategic performance requirements (as discussed above). Quite often, the training is provided by organisations with an interest in product certification and the persons who undergo the training are focussed on the minute detail of achieving a doorset that is fully in accordance with the product certification of its constituent parts. In the field, these inspectors may then condemn fire door installations where the deviations from fully certified details have no strategic significance – i.e. a fire door which may be fit for its practical purpose despite minor deviations from its certified details may be crudely flagged as inadequate as a result of these deviations. This binary approach to fire doors and other fire protection measures is not consistent with risk-based approach embodied by the Fire Safety Order.
5. Therefore, whilst a third party accredited or certified fire door inspector may be assessed as entirely competent to advise on whether a fire door meets the requirements of its product certification, this does not necessarily mean that the same person would be competent enough to determine issues of strategic importance and be able to advise on priorities, practicalities and reasonableness.
6. Hence, training for an in-house inspector needs to combine both the basics of fire door performance and its contribution to the strategic fire safety requirements.

Ability to repair

1. Fundamentally, the 'Competent Person' performing the inspection determines the requirements for repair or replacement.
2. Once this requirement is established from the inspection, then an experienced joiner who works in a professional capacity on installation, repair, refurbishment and replacement of doors should be capable of carrying out the work without specific training, accreditation or certification as a fire door 'repairer' or 'installer'.

Common fire door issues and key components

Useful guidance on inspecting passive fire protection, including fire doors, is available from several organisations, such as the Association for Specialist Fire Protection¹ and the British Woodworking Foundation².

Some of the key items to consider as part of a fire door inspection are:

Strategic purpose (see above) -

- Protecting means of escape?
- Enclosing a hazard room?
- Within a compartment line?
- What are the resulting performance requirements (period of fire resistance, smoke seals, etc.)?

The door leaf -

- Condition
- Fit
- Material
- Thickness
- Manufacturer product/certification markings
- Evidence of damage or remedial works (e.g. new lippings, etc.)

The frame -

- Gap formed with the door leaf
- Material used
- Seal with the wall/ structural opening (it may be necessary to remove the architrave to inspect)

Hinges and ironmongery -

- Manufacturer product/certification markings
- Number of hinges
- Fixings (all screws present, etc.)
- Intumescent packing (if required)
- Damage/ openings from removed hardware

Intumescent strips and smoke seals -

- Required (see above)?
- Condition
- Fit

Glazing -

- Condition
- Manufacturer/ product markings
- Beading and fixings
- Intumescent seals

Self-closing and hold-open devices -

- Effective from a partially open position?
- Condition
- Fixing to door and frame
- Door selector operation (double leaf doors)
- Hold-open device releases as required?

Damage / wear and tear

In a typical building with properly procured and installed fire doors, the most common inspection finding over time will likely be that minor damage and/or wear and tear has affected the performance or operation of the doors.

Guidance on repairs, and the extent of repairs which can be carried out

What can be added to a door to improve its robustness but without affecting its certification?

In buildings with heavily trafficked routes such as hospital corridors or retail storage areas, it is often desirable to modify doors to improve their resilience to wear and tear and continuous impact.

The fact of the matter is that if anything is added to a door that is not permitted by its certification document then the door will then be outside of its certification. The real question that needs to be answered is 'what can be added to a door to improve its robustness but without affecting the fire performance which is needed from it?'

In that respect, there are some key principles in that any applied reinforcement to timber fire doors should not (unless certified):

- wrap around the edge of the door in a manner which increases the gap size or interferes with the intumescent strip or smoke seal;
- significantly affect any required self-closing function;
- wrap around the edge of the door using materials with a high heat conductivity i.e. metal;
- affect the (fire-induced) thermal distortion characteristics of the door; or
- result in significant penetration of the door and/or frame by additional metallic fixings.

By corollary, reinforcement which avoids the above would generally be acceptable without certification being necessary.

Pushing suppliers over quality

Unfortunately, Employer's Requirements (ERs) are generally mute on standards of robustness for fire doors.

In years gone by, timber fire doors were reasonably robust and included elements such as solid timber cores. However, over the last 25 years, significant financial pressures on the construction industry as a whole have resulted in a trend towards fire door manufacturers seeking to make doors out of the cheapest materials possible, with designs pared down to 'just pass' the fire test - the attitude being "there's no point in achieving 70 minutes when you only need to get 60". This approach is reinforced by there being no requirement in the fire test standards for a margin of safety to be demonstrated, or for tests to have statistical relevance: i.e. to repeat successful tests.

Therefore, many fire doors are now made out of a raft of low density chipboard with thin veneer facings and lippings glued to the chipboard. Fire doors of this type are much more susceptible to mechanical damage and wear & tear.

A consideration when forming Employer's Requirements in future (for both new schemes or when procuring replacement doors in an existing building) could be that fire doors are demonstrated to meet, for instance, the requirements for passing robustness tests (e.g. 'hard body' and 'soft body' impact tests called up by schemes such as Secured by Design³).

Replacing timber fire doors with metal doors

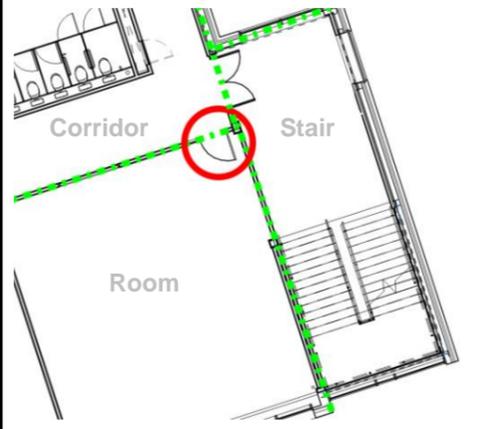
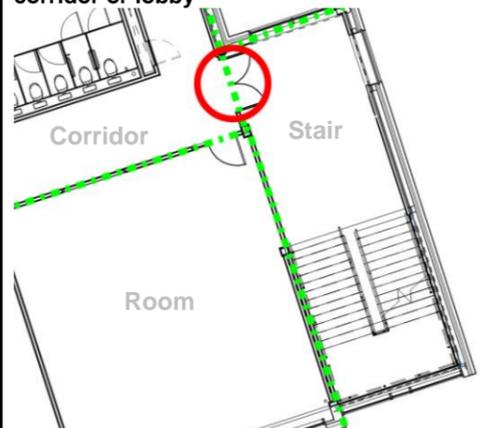
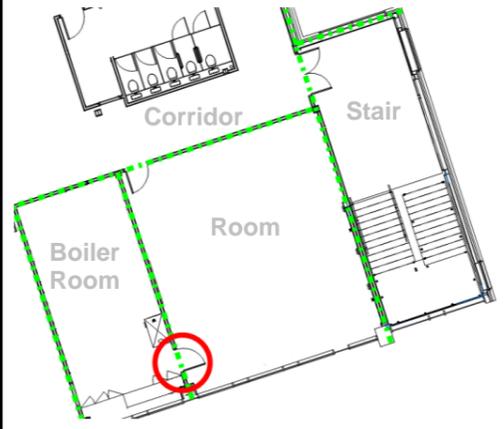
Where a higher degree of mechanical strength is required, or a door is required in harsher environmental conditions (such as externally, or into an area such as a waste processing plant), a steel door may be the most appropriate option to provide a greater degree of resilience.

Steel fire doors in steel frames with smoke seals (they do not require intumescent seals) are available, and such a replacement should not normally be an issue in respect of impact on the fire strategy.

However, it should be noted that steel doors are often equally as susceptible as timber doors to the effects of being in heavily trafficked areas, in that – although less prone to material damage – they suffer a greater degree of warping as a result of continuous impact.

What level of damage is acceptable?

The amount of damage which is 'acceptable' depends on the performance required by the door in a strategic context which, in turn, influences the priority for assessment of the damage. For instance:

Location	Comments
<p>Doors from accommodation to a protected escape route (e.g. a corridor, lobby or stair)</p> 	<p>These doors are probably amongst the most critical as they are the 'first line of defence' between a potential fire and the safe escape route for occupants.</p> <p>Therefore, any damage to these doors should not significantly impair the ability of the door to function as a barrier to both fire (heat) and smoke.</p> <p>As such, damage to these doors in terms of an 'acceptable' level would typically be limited to scratches, scuffs, minor dents and localised loss of frame material forward of the intumescent strip position and not exceeding the depth of the rebate for the intumescent seal.</p>
<p>Doors into a protected stair from a protected corridor or lobby</p> 	<p>These doors are a 'second line of defence' and are between areas clear of significant ignition hazard and fire load (i.e. the corridor or lobby) and a further protected escape route (i.e. the stair itself).</p> <p>Therefore, in a strategic and prioritisation context, any damage to these doors is most important in respect of ensuring that it does not affect the ability of the door to act as a barrier to smoke spread. As such, a greater tolerance to structural damage to these doors would be appropriate as the fire performance would be of lesser importance than ensuing that gap sizes, smoke seals and self-closing function were maintained.</p> <p>Hence, cracks, fissures and significant amounts of missing door facing or frame material would be strategically less important to prioritise for action provided that the door was in sufficient mechanical order to be easily openable, self-close reliably and maintain an adequate smoke seal.</p>
<p>Doors into a place of special fire hazard</p> 	<p>These doors form a barrier between areas with a significant ignition hazard and/or significant fire load (e.g. a central boiler room) and the wider building. The strategic objective in this case is to limit what could be a rapid rate of fire spread/ growth in the early stages of a fire, such that it doesn't unduly threaten the rest of the building during the escape phase.</p> <p>Therefore, where such doors are not also opening into a protected escape route, any damage to these doors is most important in respect of ensuring that it does not affect the ability of the door to act as a barrier to fire, rather than to significant smoke spread. As such, smoke seals and self-closing devices are not mandated by standard fire safety guidance in these cases, and a greater tolerance to gap sizes around the door would be appropriate. However, contrary to nearly all other instances of fire doors, an ability for the door to be locked for the purposes of fire safety would be expected.</p> <p>Cracks, fissures and significant amounts of missing door facing or frame material would, in this case, be strategically significant; as well as the mechanical resilience of the door itself.</p>

When replacing old doors, should you also replace the frames?

If timber fire doors are being replaced with timber fire doors into the existing timber frames then the existing fire door frames should not need to be replaced if they are in reasonable condition and are within the range of applicability covered by the certification for the replacement door leaf.

Existing fire door frames on older buildings are often constructed from higher quality materials and would normally achieve a better standard of construction than the permissible frame materials in the certification criterion of a new fire door.

Testing / certification**Is it worth completing any additional testing to increase your range of 'certified' doors?**

We would not normally recommend that fire testing is carried out by anyone other than the suppliers of 'standard' repair solutions or fire doors.

Where there are significant advantages of providing a project-specific remediation solution which needs to be demonstrated then there may be circumstances where the Responsible Person could benefit from carrying out the necessary fire resistance test directly with a UKAS-accredited test laboratory.

Approach to doors without certification information

For existing buildings, it is usual for fire doors to exist with no record on file as to their manufacture, supply or rating.

However, for the reasons stated above, replacing such doors simply because of lack of certification documentation would be throwing the baby out with the bath water if the doors can be otherwise suitably assessed against the strategic performance criteria required.

Where good quality existing fire doors are in sound mechanical condition then it is usually feasible to carry out upgrading works, as necessary, to seals and ironmongery.

This is more cost effective – not to mention environmentally friendly – than replacing the door with a new alternative which is likely to be less robust in the long term and cost more to maintain.

Importance of a Fire Strategy

For the reasons highlighted and discussed above, a current building fire strategy is essential in terms of evaluating risk and identifying priorities for large and complex buildings.

Such a document can:

- ▀ inform the operator of the likely original design intent (and hence the function of the various fire safety components);
- ▀ provide a strategic framework against which the impact of subsequent works may be designed and assessed;
- ▀ provide a framework against which the standard of delivery (i.e. construction and installation) of previous and current projects may be assessed; and
- ▀ assist the Responsible Person in complying with their duties under the Regulatory Reform (Fire Safety) Order 2005.

References

1. *Guide to inspecting Passive Fire Protection for Fire Risk Assessors*. Association for Specialist Fire Protection. 2011
2. *Fire Doors and the Regulatory Reform (Fire Safety) Order*. BWF Certifire fact card. British Woodworking Federation. August 2012
3. www.securedbydesign.com/industry-advice-and-guides/