GUIDE TO INSPECTING PASSIVE FIRE PROTECTION FOR FIRE RISK ASSESSORS

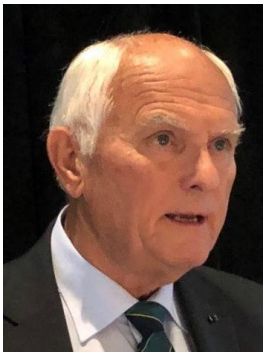
2nd Edition 2026

ASFP

GUIDE TO INSPECTING PASSIVE FIRE PROTECTION FOR FIRE RISK ASSESSORS

DATE	SECTION	AMENDMENT SUMMARY	SOURCE
2012		1st Edition published	NR
2026		2nd Edition published	NR
2026	4. Scope	Clarification that the guide only covers Type 1 Fire Risk Assessments (Common Parts, Non-Destructive). The four types of fire risk assessment are explained.	NR
2026	4. Scope	Updated Table 1 – Relevant legislation in England & Wales, Scotland and Northern Ireland.	NR
2026	5. Fire Risk Assessors (FRAs)	Updated text on role of Fire Risk Assessors. New text on Skills, Knowledge, Experience & Behaviour (SKEB). Reference to BS 8674:2025 Framework for competence of individual FRAs. Updated text on Accreditation/Certification of FRAs.	NR
2026	6.2	Updated text on Means of Escape.	NR
2026	6.3.1.2	Updated text on Regulation 38.	NR
2026	6.3.1.3	New text for Golden Thread legislation passed after 1st edition.	NR
2026	7. Procedure	General updating of procedures for evaluating PFP with new images.	NR
2026	7.2 Fire Doors	Emphasis placed on new legislation mandating frequent checks on fire doors. Nominal v. notional fire doors.	NR
2026	7.4.2.3 Penetrating services	Updated text to include four methods of maintaining integrity when ducts/dampers penetrate or are fixed into compartment walls and floors. ASFP warning on use of Tek screws.	NR
2026	7.5 External Wall Systems	New section on the need for the FRA to evaluate external wall systems following Grenfell Tower Fire in 2017. Reference to Fire Sector Confederation Guidance, PAS 9980 and Home Office fact sheets.	NR
2026	Annex A	Updated Check list to include more material on external walls.	NR
2026	Annex B	Updated text on evaluation of Wall and Ceiling linings including removal of national test methods and classes to support products.	NR
2026	Annex C	Updated text on Fire doors including removal of national test methods and classes to support products from 2029.	NR
2026	Annexes D to I	General updating from 1st Edition.	NR
2026	Annex I	New Annex on External Walls.	NR
2026	Annexes K to M	General updating from 1st Edition.	NR

Foreword



I am very pleased to welcome this essential guide to inspecting passive fire protection for fire risk assessors. It lays out clear, pragmatic guidance to enable the identification and inspection of all types of passive fire protection in the formation of a fire risk assessment, as required by legislation in the UK and Ireland.

This new version is significantly updated following the Grenfell Tower fire and the resulting new legislation affecting the scope of fire risk assessments and the role of fire risk assessors, particularly in respect of their competence to practice and the increased scope of the assessment.

This technical guidance document will act as a valuable tool for all those directly involved in the inspection and maintenance of passive fire protection in buildings.

My congratulations and thanks go to ASFP and Niall Rowan as technical author of this document and to all those who have assisted and supported in its production with both time and expertise.

Dennis Davis CBE QFSM
Competency Director at the Fire Sector Confederation

Contents

ASFP Guide to inspecting Passive Fire Protection for Fire Risk Assessors (2nd Edition)

1. Introduction

This guide has been produced to assist Fire Risk Assessors carry out inspection of Passive Fire Protection (PFP) as part of a Fire Risk Assessment under appropriate fire safety legislation which includes:

- Regulatory Reform (Fire Safety) Order 2005 as modified by the Fire Safety Act 2021 (England and Wales) and the Fire Safety (England) Regulations 2022.
- Fire (Scotland) Act 2005 supported by the Fire Safety (Scotland) Regulations 2006 and 2021
- Fire and Rescue Services (Northern Ireland) Order 2006 and Fire Safety Regulations (Northern Ireland) 2010

It provides assessors with appropriate guidance for them to be able to verify that the PFP supporting means of escape is adequate. The legislation referred to above is designed to save lives in the event of a fire but does not necessarily cover the issue of property protection. Building owners or insurers wishing to ensure that the building is capable of withstanding the spread of fire for a period longer than necessary to evacuate its occupants should contact the ASFP for further guidance.

2. How to use this document

The Fire Risk Assessor should ideally read this document in its entirety, but at least fully up to the annexes to obtain a basic understanding of PFP and its role in means of escape. Thereafter, it can be used as a reference source to assist the process.

- Clauses 3 – 5 contain background information including a brief explanation of the relevant regulations
- Clause 6 contains important information on how to decide what to check for life safety and on where to get information on in the location of installed PFP in the building.
- Clause 7 explains how to check each type of PFP.
- Further information on each type of construction is given in the annexes starting on page 38 but the main points to check are in clause 7.
- A checklist of what needs to be inspected for each type of PFP is given in Annex A. The checklist contains cross references to the relevant text in clause 7.

3. Background

Passive Fire Protection products are those ‘built-in’ to the fabric of a building to restrict the growth and spread of fire and smoke. They do this by controlling the flammability of wall and ceiling linings, by dividing the building into fire resisting compartments, by providing protection to the structure of the building to prevent its collapse and by providing protective routes for escape. PFP products include fire doors, fire resisting walls, floors and ceilings, fire resisting ducts and dampers, fire stopping, fire protection to structural members.

The supporting guidance documents that detail the inclusion of PFP in a building are usually referenced in Building Regulations. In the United Kingdom and Ireland, the PFP measures that need to be considered are given in the following documents:

- England & Wales – Approved Document B
- Scotland – Technical Handbook
- Northern Ireland – Technical Booklet E
- Ireland – Technical Guidance Document B

Much of the PFP included in the supporting guidance documents is designed to ensure that in the event of fire, the occupants can escape, fire will not spread easily within it or to other buildings, the fire and rescue service can attend safely, and it will not collapse prematurely. As part of undertaking a fire risk assessment, fire risk assessors will need to undertake an evaluation of PFP in a building. Whilst much of the information given in this guide relates to the regulations listed above, this is mostly given in terms of fire resistance using conventional failure criteria. In practice, smoke is one of the major causes of deaths in fire and consequently a competent risk assessor should concentrate on passive fire protection measures that restrict the spread of smoke within the building.

4. Scope

For the purposes of a fire risk assessment under the legislation, the main consideration is to reduce the likelihood of a fire occurring to as near zero as is practical and for the occupants to be able to escape if a fire occurs. Consequently, when considering passive fire protection, such a fire risk assessment only needs to verify that those measures supporting means of escape are satisfactory and do not compromise life safety. These would include the operation and condition of any fire doors and an evaluation of the condition of escape route walls and ceilings protecting escape routes including any penetrating services. Such an assessment would e.g. include evaluating the fire resisting construction in roof spaces but would not normally, for example, include a detailed survey of the fire protection to the structural steelwork of a building. An assessment of the external walls and flat front doors is also required following the changes to legislation after the Grenfell Tower fire. on 14th June 2017.

Whilst a full investigation of all PFP would be ideal; it is generally not necessary for a fire risk assessment under the current legislation. In addition, such investigations cannot be undertaken thoroughly without a detailed and in often invasive inspection. More invasive types of inspections are described in 'Fire safety in purpose-built blocks of flats' published by the Local Government Group but these are outside the scope of this document and the capability and expertise of most fire risk assessors undertaking routine risk assessments. For the purposes of this document, consideration is limited to **Type 1** fire risk assessments (see box). In addition, some buildings which use a 'defend in place' or 'stay put' principle may require a thorough detailed inspection. Should this be required, or if during a fire risk assessment significant issues or problems with the PFP are discovered, then the need for an appropriate professional site inspection should be included in the report of the fire risk assessment. Consideration should also be given to the applicability of maintaining a stay put approach if the PFP is significantly degraded.

The four main types of fire risk assessments for multi-occupied buildings

- **Type 1 (Common Parts, Non-Destructive):**
  This is the most common type and focuses on identifying potential fire hazards in the building's communal areas like hallways, stairwells, and escape routes. It doesn't involve accessing individual flats and is a visual inspection.
- **Type 2 (Common Parts, Destructive):**
  This type is similar to Type 1 but may involve some destructive methods (e.g., opening small sections of walls or ceilings) to examine hidden areas for risk of fire spread, often recommended after a Type 1 assessment identifies potential issues. A contractor must be on hand to assist in this type of assessment to gain access to e.g. hidden voids etc and to reinstate any products damaged by inspection.
- **Type 3 (Common Parts and Flats, Non-Destructive):**
  This assessment expands on Type 1 by including an examination of individual flats, but it remains non-destructive, meaning no physical alterations are made to the flats.
- **Type 4 (Common Parts and Flats, Destructive):**
  This is the most comprehensive type, involving both common parts and individual flats with the possibility of destructive methods to identify fire spread in hidden areas.

A summary of the applicable legislation is given in table 1 on the next page.

Table 1 – Relevant legislation in England & Wales, Scotland and Northern Ireland

Country	England & Wales	Wales	Scotland	N Ireland
Relevant Act	Regulatory Reform (Fire Safety) Order 2005. Fire Safety Act 2021 Fire Safety (England) Regulations 2022	Regulatory Reform (Fire Safety) Order 2005. Fire Safety Act 2021	Fire Safety (Scotland) Regulations 2005 & 2021, Fire Scotland Act 2005	Fire and Rescue Services (N. Ireland) Order 2006 & Fire Safety Regulations (N. Ireland) 2010
Person responsible	Responsible Person or Accountable Person	Responsible Person or Accountable Person	Duty holder	Appropriate Person
Person to do risk assessment	Responsible or Competent person	Responsible or Competent person	Responsible or Competent person	Responsible or Competent Person
People affected in building	Relevant persons	Relevant persons	Relevant Persons	Relevant Persons
Building Regulations	Building Regulations 2010	Building Regulations 2010	Building (Scotland) Regulations 2006	Building Regulations (N Ireland) 2012 amended 2022
Statutory or Supporting Guidance docs	Approved Document – B 2019 edition incorporating 2020, 2022 and 2025 amendments for 2026 and 2029	Approved Document – B 2006 edition incorporating 2010, 2016 and 2020 Amendments. Amendment Slip to Approved Document B effective Dec 2025	Technical Handbooks 2024	Technical Booklet E 2012 (amendment booklet 7, April 2022)
Regulation 38 or equivalent	Yes*	Yes. Appendix G of Approved Document B.	No**	No
CDM regulations or equivalent	2015	2015	2015	2015

*In England this is now replaced for certain relevant buildings (High Risk Buildings) by the Higher Risk (Keeping and Provision of information etc.) (England) Regulations 2024

** There is no direct equivalent of Regulation 38 in Scotland, the principles of fire safety and building regulations are covered under the Building (Scotland) Regulations 2004 and the Fire (Scotland) Act 2005.

5. Fire Risk Assessors (FRAs)

5.1. Liabilities of Responsible Person

Under current UK fire safety legislation fire risk assessments must be undertaken by dutyholders, who are generally the employer, landlord or person in control of the workplace premises. In England, Wales and Northern Ireland duty holders are called the 'Responsible Person' and in Scotland the 'Duty Holder'. Each must undertake a fire risk assessment and, where they consider such expertise not available in-house, they may employ a 'competent person', usually a consultant or company, to assist with the fire risk assessment. Where external professional fire risk assessors are employed, it is important that they are competent, as criminal liability will arise for the duty holders if the fire risk assessment is inadequate and people are placed at risk of death or serious injury as a result.

The dutyholder also must have in place a system for ensuring that the integrity of any PFP measures is not compromised when alterations are carried out on the building e.g. for the installation of new pipes, cables and other services. Records of these should be made available for inspection by the fire risk assessor.

Under England and Wales's legislation, there is no legal requirement to use a 'competent person', only that the risk assessment is 'suitable and sufficient'. This is something that has led to inappropriate individuals and companies undertaking risk assessments that are often inadequate. Consequently, ASFP recommends that only risk assessors that are accredited and certified under appropriate fire risk schemes

5.2. General

A competent fire risk assessor will need to have an understanding of the intent, objectives and requirements of the legislation. In terms of the PFP knowledge they will be expected to have knowledge of the design principles and the methods of construction of buildings constructed in accordance with appropriate standards and legislation. In particular, they will need to have knowledge of the relevant passive fire protection measures, particularly for means of escape and compartmentation of buildings. Fire Risk Assessors that possess a Level 2 or 3 certificate in Passive Fire Protection will have a head start in the understanding of the types of PFP, their specification and role in fire safety.

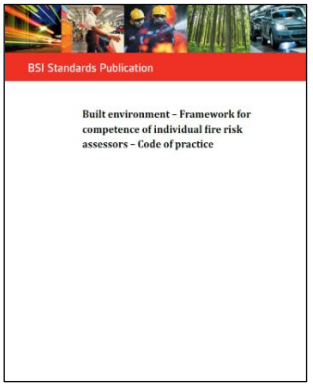
5.3. Skills, Knowledge, Experience & Behaviour

At the time of this revision the nationally recognised occupational standards Fire Risk Assessors are those established in BS 8674:2025 (Detailed later). Dutyholders need to ensure that the appointee is competent to address the specific needs of the premises in relation to all passive fire protection measures installed. It is therefore imperative that the risk assessor can demonstrate that they have the appropriate competences, in accordance with the Skills, Knowledge, Experience & Behaviour (SKEB) described, to undertake the work in question.

British Standard for developing a competency framework for Fire Risk Assessors **BS 8674:2025 Built environment – Framework for competence of individual fire risk assessors – Code of practice** was published in 2025.

The Standard establishes a clear and consistent framework for assessing the competence of individual fire risk assessors. Developed through wide industry collaboration and public consultation with alignment to **BS 8670-1:2024**, the Code of Practice sets out the SKEB expected of professionals working at three progressive levels:

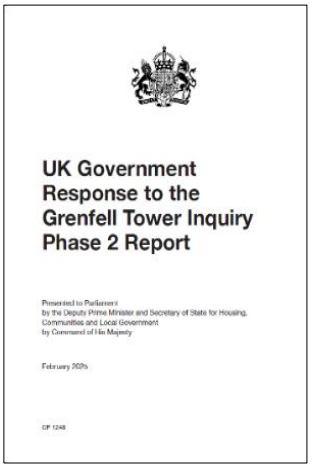
- **Foundation** – New entrants and those assessing simple premises, such as small offices or shops.
- **Intermediate** – Those assessors requiring greater experience, responsible for medium complexity buildings such as public venues or mid-rise residential properties.
- **Advanced** – Highly experienced professionals working on complex, high-risk buildings including hospitals, residential towers, and large public spaces.



This tiered structure is designed to prevent assessors from overstepping their capability and enables organisations to match the right level of expertise to the risk profile of the building.

For FRAs it provides a structured competency framework that they can use to demonstrate capability, a clear career progression route and to seek certification or professional recognition where such schemes are available.

5.4. Accreditation/certification of Fire Risk Assessors


UK Government Response to the Grenfell Tower Inquiry Phase 2 Report

Presented to Parliament by the Deputy Prime Minister and Secretary of State for Housing, Communities and Local Government by Command of His Majesty

February 2025

CP 1248

Further to the Grenfell Tower Fire Public Inquiry which included a recommendation that the government introduce mandatory accreditation of Fire Risk Assessors, MHCLG has responded with the intention of introducing mandatory accreditation as part of the UK Government Response to the Grenfell Tower Inquiry Phase 2 Report. In effect, this will make being a Fire Risk Assessor a regulated profession.

At the time of writing, public consultation, required prior to developing and introducing any new legislation to regulate Fire Risk Assessors is anticipated early in 2026.

In the interim the fire sector industry has developed minimum requirements for the various registers and schemes that can be quite confusing to end-users. These include vocational accreditation and qualification schemes.

Although many practicing Fire Risk Assessors may be proficient, to ensure dutyholders can have confidence and assurance in their competence, a Fire Risk Assessor should be clearly able to demonstrate personal competence through independent i.e. third-party, verification. Verification of this kind demands conformity to recognised professional standards, for example, by certification within a UKAS accredited scheme.

Transition and progression to improve demonstrable competence within the existing unregulated workforce, aided by the introduction of BS 8674:2025 which clarifies the competence standards expected with the related SKEB requirements, is now underway. Fire Professional Bodies are working with Awarding Organisations (usually training providers offering Regulated Qualifications) to provide training qualifications that are independently verified by national regulators such as Ofqual. These qualifications link to the Foundation, Intermediate and Advanced levels of competence and offer a progressive route towards whatever outcome is judged appropriate to meet the Grenfell Tower Inquiry recommendation.

The ASFP recommends that fire risk assessors are on one of the registers that use UKAS accredited third party certification of fire risk assessors to provide a guarantee of independent scrutiny and also a defined procedure for conferring certification.

6. What the Fire Risk Assessor needs to do

6.1. Structured and reasoned approach

The assessor must have a structured and reasoned approach to the assessment of PFP in a building. The aim is to ensure that the means of escape is not compromised by deficient PFP and that the spread of fire and smoke is restricted. It is not to ensure that e.g. all the fire resisting construction on escape routes and all compartmentation complies with Building Regulations; that is the function of building control although, the assessor should have a fundamental knowledge of recognised guidance documents.

COMPARTMENTATION V. ESCAPE ROUTES

Compartmentation involves dividing a building into fire-resistant sections to contain fire and smoke, allowing for safer evacuation. Escape routes are designated paths that lead occupants to safety, which must remain clear and accessible during an emergency

Definition and Purpose

Feature	Compartmentation	Escape Routes
Definition	Division of a building into fire-resistant sections	Designated paths for occupants to exit safely
Primary Purpose	Contain fire, smoke, and heat to protect lives and property	Provide safe and direct access to a place of safety

Key Characteristics

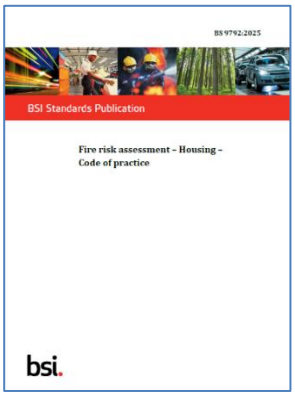
Characteristic	Compartmentation	Escape Routes
Construction	Uses fire-resistant walls, floors, and ceilings	Must be unobstructed and clearly marked
Fire Resistance	Designed to withstand fire for 30 to 120 minutes	Not necessarily fire resistant, but must be safe
Regulations	Governed by Building Regulations and fire safety laws	Must comply with fire safety regulations

Importance

Aspect	Compartmentation	Escape Routes
Life Safety	Provides time for evacuation and protects escape routes	Ensures quick and safe exit from the building
Property Protection	Limits fire damage to specific areas	Reduces risk of injury during evacuation
Firefighting Support	Aids firefighters by containing the fire	Allows for organized evacuation during emergencies

Fire Risk Assessors should note the publication of BS 9792:2025 which sets out recommendations and examples of documentation for competent fire risk assessors undertaking and recording fire risk assessments in housing, including:

- Houses in Multiple Occupation (HMOs).
- Blocks of flats and maisonettes (both purpose-built and converted).
- Specialised housing (e.g. supported or sheltered accommodation).
- Student accommodation falling into the above categories.
- Common areas in mixed-use buildings providing access to residential premises.



It replaces PAS 79-2:2020 from August 2025 with a new pro forma for the fire risk assessment, updated guidance including for those with disabilities and is now fully aligned with current UK legislation and British Standards.

6.2. Means of escape

The assessor needs to evaluate what is needed for occupants to escape in the event of a fire and then evaluate the PFP accordingly. This may not need to be as comprehensive as that given in AD-B and national equivalents.

To evaluate what is needed for occupants to be able to escape in the event of fire, the assessor needs to look at the occupancy and type of building. Is it a house of multiple occupancy (HMO), a hotel, an office, or a High-Risk Building (HRB), as defined in the Building Safety Act 2022 such as a tall block of flats? Each may rely on PFP to a greater or lesser extent and the fire risk assessor should consider the following as examples of how occupancy and other factors such as height need to be taken into account in the assessment of the PFP:

- An HMO will often be converted from an existing building which was not conceived to have several different families in it at one time. Consequently, the inherent fire resisting construction may not be as good as one would expect in, for example, a modern block of flats or an office building. Residents may be incapacitated through drink or drugs, and any visitors will also be unfamiliar with the layout of the building and the recommended escape routes. Many have defective fire alarms, there will be nobody on duty to raise the alarm, and experience has shown that these properties tend to have a higher risk of fire. On the other hand, the occupiers should be familiar with the layout of the building.

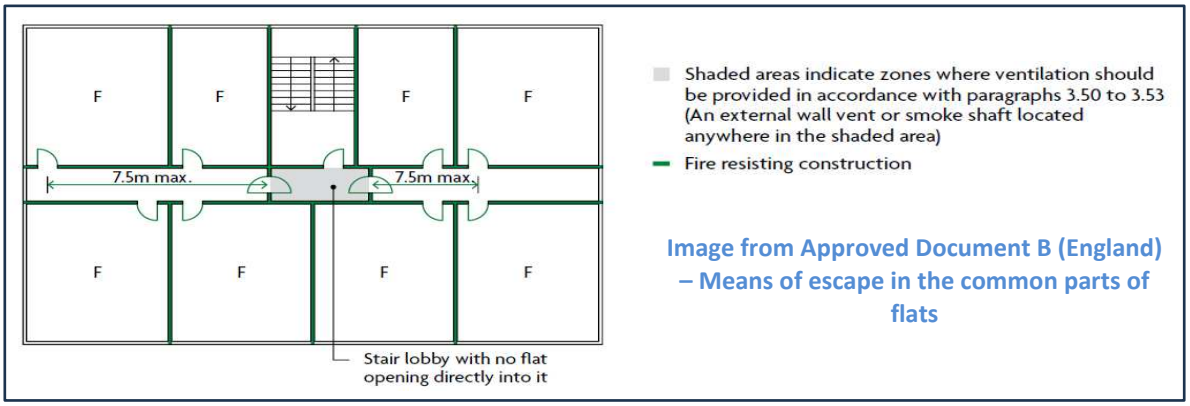
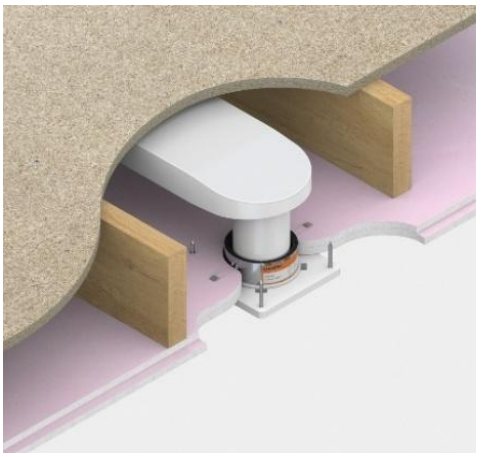


Image from Approved Document B (England) – Means of escape in the common parts of flats

- A hotel will usually have well specified PFP measures (although it too might also have been converted) with appropriate fire resisting construction and some active fire protection. There is also often somebody on duty at night to raise the alarm and assist with escape. On the other hand, residents may be incapacitated through drink or drugs and will be unfamiliar with the layout of the building and the recommended escape routes.

- A residential care home may have varying levels of PFP and may have been converted from an existing building. Residents are likely to have impaired awareness and movement. Such a building may require extensive fire safety management procedures to facilitate safe evacuation. The fire risk assessor will need to evaluate the fire resisting construction paying particular attention to restricting the movement of smoke including fire doors in individual bedrooms. As with blocks of flats, bathroom extract systems without need to be investigated to determine the extent to which they are communal and incorporate fire dampers.

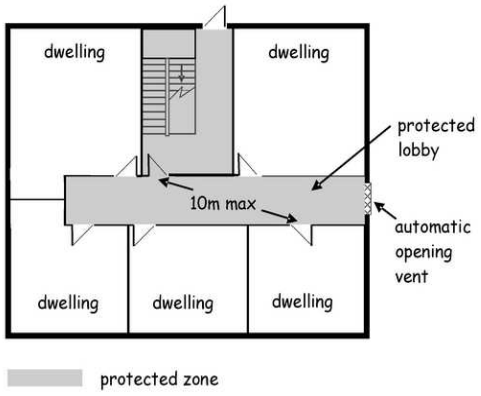


Fire cuff for plastic ducting in ceiling, right image courtesy of Quelfire Ltd

- An office may have a high occupancy and may, in exceptional circumstances, have a high fire load. It also may rely upon phased evacuation, which will put greater reliance on the building's PFP. On the other hand, it is not a sleeping risk, most businesses should have reasonable evacuation procedures, the occupiers should be familiar with the layout of the building and there may be active fire protection measures.

- A High Risk Building such as a tall block of flats over 18m may have a stay-put policy where fire resistance of an hour or more is usually required. In such circumstances, a fire risk assessor should look more thoroughly at the fire resisting construction and particularly at poorly sealed penetrations and imperfections of fit that should restrict smoke movement than e.g. in a single-story block where everyone can be evacuated quickly. The assessor may also need to investigate ventilation systems e.g. bathroom extract systems and the extent to which they are communal and incorporate fire dampers and/or shunt ducts. Flat front doors and the make-up of the external wall should also be included following changes to legislation after the Grenfell Tower Fire which require these to be included in any fire risk assessment. Flats converted from older buildings may be particularly deficient in this respect.

Typical ground floor – one escape route – storey height more than 7.5m but not more than 18m



From Scottish Building Standards Domestic Technical Handbook 2022

- **Following the Grenfell Tower fire there has been a strong focus on the performance of poorly designed and constructed external wall systems which can bypass internal compartmentation and spread fire up the outside of a building. The assessor will need to address this as applicable to the building type.**

In other words, the Risk assessor must concentrate on means of escape and evaluate the PFP that is there and see if it is adequate. The Risk Assessment needs to be balanced and pertinent, taking into account the occupation and purpose of the building, the safety fire strategy for the building (if there is one) and the extent to which fire resisting construction on escape routes and fire compartmentation contributes to that.

For most low-rise buildings, a period of 30 minutes fire resistance is probably sufficient for means of escape. For taller buildings e.g. blocks of flats over 18m or 6 storeys, 60 minutes may be required in certain areas. However, the assessor must be confident that this is adequate (according to occupancy, height of building etc.) and check with the fire strategy document (if there is one).

If the building was designed using BS 9999 2008 or 2017, Code of practice for fire safety in the design management and use of buildings, allows justification to reduce the fire resistance periods from those specified in AD-B and national equivalents.

If the assessor is not sure, then they should use the periods from AD-B (or national equivalents) as the default times. Further guidance to appropriate levels of fire resistance can be found in specific documents referenced in annex M.

6.3. Building layout

To be able to decide on the appropriate level of PFP and evaluate it, the assessor must familiarise himself with the building layout and escape routes. If a Fire Strategy document exists, this should provide the required information and should be considered with the building drawings.

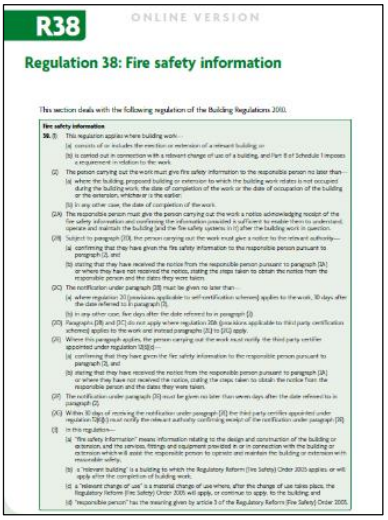
6.3.1. Modern buildings

6.3.1.1. Construction Design and Management (CDM) Regulations

For a building constructed after 1994 the Construction Design and Management (CDM) Regulations, Safety Plan should provide details of the fire safety provisions including the appropriate PFP included in the building.

6.3.1.2. Building Regulation 38 – (England & Wales only)

If a building was constructed after April 2007, Regulation 38 (formerly 16b) of the Building Regulations applies in England and Wales. This requires that sufficient fire safety information be provided for persons to operate and maintain the building in reasonable safety. An overview of what information is required in terms of PFP measures is provided in Regulation 38 section of Approved Document B Volume 1 & 2: Fire Safety. The information which should have been passed on by the main contractor in compliance with Regulation 38 is vital to ensure that the Fire Risk Assessor is able to carry out an appropriate and effective Fire Risk Assessment under the RRO.


R38 ONLINE VERSION

Regulation 38: Fire safety information

Regulation 38 requirements from England Approved Document B

Such information, whether arising from the CDM Regulations or Regulation 38 will include details of fire resisting construction on escape routes, fire compartmentation and other PFP information specified to satisfy AD-B and should include the fire test and assessment reports, classification documents and any third-party certification.

If the assessor can satisfactorily cross-check the plans with what they find in the building, then providing there are no other factors that increase risk e.g. a change of occupancy or use of the building since it was constructed, then this should prove sufficient. **However, the assessor must be mindful that the fire risk assessment is dynamic and not just an exercise to prove compliance with a plan drawing**.

6.3.1.3. Golden Thread Information (England only)

Since October 2024, the Regulation 38 requirement in England for high-risk residential buildings no longer applies and has been replaced by The Higher-Risk Buildings (Keeping and Provision of Information etc.) (England) Regulations 2024. The aim of this is to produce and keep a 'golden thread' of information throughout the construction and occupation of the building including every fire safety management measure, and a record where each of those measures is located.

Definition of a Higher Risk Building

Criteria	Details
Height	Buildings that are at least 18 meters (approximately 7 storeys) high.
Residential Units	Must contain at least 2 residential units.
Types of Buildings	Care homes – Hospitals – Hotels - Military barracks - Other similar high-rise residential buildings

Key Responsibilities for Accountable Persons (APs)

Responsibility	Details
Information	Must keep records of building compliance, fire safety management, and evacuation strategies.
Documentation	Are required to provide and share information to residents, relevant authorities, and other stakeholders.
Assessments	Must conduct regular assessments of building safety risks and maintain a "Golden Thread" of information.

The ASFP is working on a 'Golden Book' to create clear guidance on how the relevant information should be digitally created and stored including how to Design and Specify the correct PFP and record its installation.

6.3.2. Older buildings or those with no information

For older buildings, or those where the information is not available, it may be impossible to determine the escape routes and critical compartmentation other than by a survey of the building layout from which the assessor will have to decide on what level of PFP/fire resisting construction is appropriate. From this, the assessor will create a document that lists the escape routes and where fire resisting construction is required as a basis for checking the PFP as part of the risk assessment.

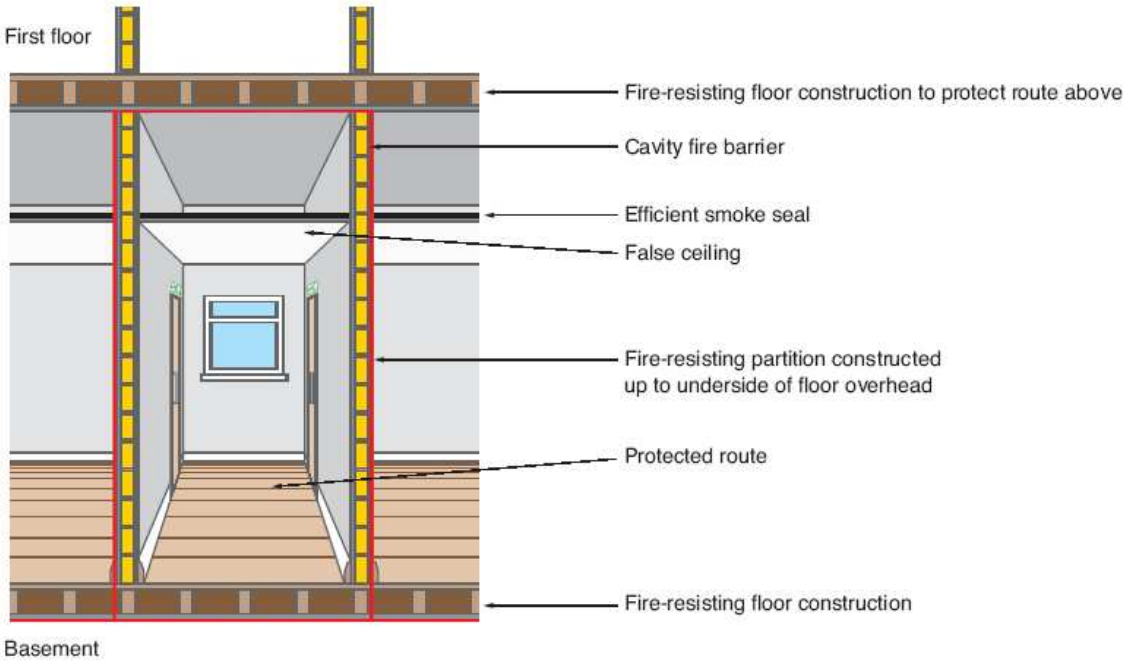
6.4. Evaluation of PFP in Escape routes

The type of construction and age of the building are crucial in evaluating the PFP of existing escape routes. In older buildings it is possible that the type of construction and materials used may not perform to current fire test standards. Changes of occupier and/or refurbishment may have led to the creation of cavities and voids allowing the potential for fire and smoke to spread unseen. Damage to or removal of cavity barriers, and breaches in fire resisting construction may also have occurred due to the installation of new services, e.g. information and communications technology systems cabling. The assessor should investigate fire resisting construction on escape routes and also note of any breaches in fire compartmentation where appropriate.

Following the Grenfell Tower Fire in 2017, the role of external walls in causing rapid fire spread externally and the role of fire doors in in preventing the passage of flame and smoke within the building has been the subject of extreme scrutiny. The FRA should pay particular attention to these items.

In more modern buildings it is likely that there will be fewer voids; cavity barriers should have been installed where appropriate and any breaches in fire resisting construction on escape routes and compartment walls floors etc. for the provision of services should have been adequately fire-stopped. Irrespective of this, the FRA should be alert for breaches in all fire resisting construction and inappropriate fire stopping and ensure that it is recorded and remedied as part of the risk assessment.

7. Procedure



A typical escape route is shown in the figure above

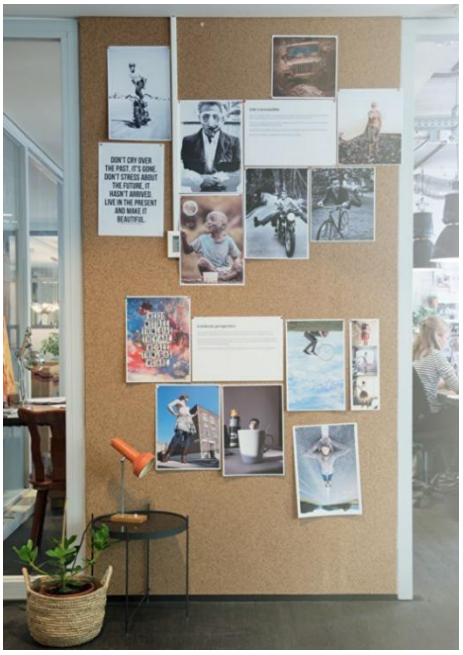
To evaluate the PFP associated with the means of escape, the fire risk assessor will need to examine:

- Lining materials for wall and ceilings on escape routes
- Fire doors – including flat front doors…
- Construction of walls, ceilings and floors forming escape routes
- Penetrating services in walls ceilings and floors forming escape routes e.g. ducts
- Make up of external walls
- Other items of PFP, but usually only in the course of examining the items above

These are considered below in appropriate detail. Further detailed guidance on each type of construction can be found in Annexes B to M.

Fire Risk Assessors should take care when inspecting buildings that they follow all relevant health and safety guidelines. In particular hazards associated with confined spaces, working at height, protection against dust (which may include asbestos) and vermin should be considered.

7.1. Lining materials for wall and ceilings on escape routes



Notice boards need to be managed to prevent excessive buildup of flammable materials

The surfaces of any walls and ceilings in escape routes should be inspected to see if the materials forming the linings are satisfactory and that any additions e.g. extensive areas of notice boards, posters, carpets etc. do not cause a hazard by aiding rapid fire spread along a corridor.

The materials and construction of the walls and ceilings themselves should be satisfactory as these should have been checked in the building control process. However, older buildings, or those where there have been recent changes e.g. after occupation will need to be checked.

Sometimes the walls may be made of or lined with inherently flammable materials e.g. untreated timber, and this would not be acceptable. If the wall linings are found not to be made of suitable materials (see annex B), consideration should be given to replacing them or adding a flame retardant or coating to upgrade their performance.

The main area of concern is the decorative materials on the surface of any linings. These include significant overpainting and the addition of significant amounts of combustible items e.g. notice boards, posters, carpet etc. in escape routes.

7.1.1. Extensive overpainting

Extensive overpainting in communal areas of flats has been responsible for several fire deaths in UK including Southwark (1991), Lambeth (1993), Birmingham (1995) and Glasgow (2002). A failure of the paint in an escalator shaft was also implicated in the fire at Kings Cross underground station in 1987.

In previous times the solution was to strip off all the old paint and redecorate. This process was impractical and expensive and consequently, the paint industry developed a solution which involved testing paint on a very poorly performing surface representing extensive overpainting.

Poor adhesion can lead to rapid flame spread

The assessor should look for excessive overpainting and in particular poor adhesion of the paint to the surfaces of escape routes. If this is apparent, then the risk assessment should recommend stripping back and redecorating or redecorating with a paint that has been shown to work on highly overpainted surfaces.

7.1.2. Addition of carpets and other significant wall hangings

Building users like to decorate plain walls with posters, paintings, carpets etc. In reasonable quantities e.g. 1 square meter of covering per 5 square metres of wall these do not pose a significant hazard. However, if they are present in large quantities or are highly flammable then they can cause rapid fire spread.

In the Stardust Disco fire in Dublin in 1981, rapid fire spread up and along walls was associated with ordinary carpet tiles stuck to the walls of the building. **If these types of items are present in significant quantities, the fire risk assessor should recommend removal or reduction in such material to a suitable level.** It may also be possible to flame retard wall hangings, but evidence of reaction to fire test performance would need to be obtained.

Flammable carpet tiles on walls of Stardust Disco Fire Dublin in 1981, in which 31 people lost their lives, contributed to fire spread.

Example of carpet wall hanging

7.1.3. Wallcoverings (wallpapers)

Most wallcoverings in the types of premises inspected by fire risk assessors will already have been fire tested by the manufacturer on a suitable substrate such as plaster skimmed plasterboard. The question usually only arises in cases where new wallcoverings have been added which may not have been tested, especially if they are heavy weight or have thick and/or heavily textured surfaces. These can assist rapid flame spread in an escape route. If the supporting test evidence for the reaction to fire performance cannot be found, and if the escape route is critical, the presence of such wall coverings should be noted and consideration given in the overall risk assessment. This may include a recommendation to replace it or to upgrade the performance by the addition of a fire retardant treatment. As with the addition of wall coverings, evidence of the application of a suitable flame retardant treatment would need to be obtained. Wallcoverings which have been overpainted should also be assessed because the paint may compromise the fire performance of the wall covering.

Further guidance on lining materials for wall and ceilings can be found in annex B.

7.1.4. Mounting of items that may affect fire resistance of walls

The mounting/hanging of televisions, speakers, cupboards etc. to flexible compartment walls or walls used for means of escape such as plasterboard walls can severely reduce their fire resistance, especially if recessed into the wall which entails removing one of the facing layers.

7.2. Fire doors

Fire doors are crucial in protecting the means of escape in any building. Not all doors protect against the same level of hazard and doors serving single direction means of escape and protected stairways are more critical than others in less demanding situations. Fire resisting doors are generally only required to resist the passage of flames; most have no restriction of the temperature rise on the unexposed face. The reasoning behind this is that no combustible materials will be resting against the unexposed face of fire doors because they are in constant use and consequently, there is no need to restrict the temperature rise by insulating the door. Legislation almost world-wide reflects this although there are some exceptions. Most personnel doors in the UK and Ireland in residential buildings are timber or composite and inherently have a fair degree of insulation in them, although often not enough to satisfy the insulation requirements of a fire test standard.

A very hot uninsulated steel personnel door in a narrow corridor will transfer a lot of heat and creates a hazard to occupants. A Fire Risk Assessor might consider whether an uninsulated door is acceptable in this position if e.g. vulnerable users or those with ambulatory difficulties might need to pass it when escaping a fire.

A pair of uninsulated fire doors being tested for fire resistance

Regulatory guidance recommends doors which satisfy integrity for 20, 30, 60 or 90 minutes. These times are a good basis for new build but are not 'carved in stone'. A risk assessor may consider that for some buildings, existing doors of a lower period of fire resistance are satisfactory or conversely, that doors of a higher performance may be needed to contain the risk. **The objective of a 'fire risk assessment' is not to ensure compliance with regulatory guidance, but to maintain tenable conditions for the occupants.**

The Fire Safety (England) Regulations 2022 made it a legal requirement from 23 January 2023 for responsible persons for all multi-occupied residential buildings in England with storeys over 11 metres in height to:

- undertake quarterly checks of all fire doors (including self-closing devices) in the common parts
- undertake – on a best endeavour basis – annual checks of all flat entrance doors (including self-closing devices) that lead onto a building's common parts

The Home Office has published a fact sheet on Fire Doors which details the checks that are needed. https://is.gd/P3iQzP

The Home Office has also published a guide for Responsible Persons to their fire safety responsibilities under the Fire Safety (England) Regulations 2022 which includes a simple procedure for checking fire doors. https://is.gd/qEgmAv

Flat front doors should be checked (in England) as part of Fire Safety (England) Act 2021. There should be records. A risk assessor should check them a) to see if checking has been done and b) as a way of locating fire doors.

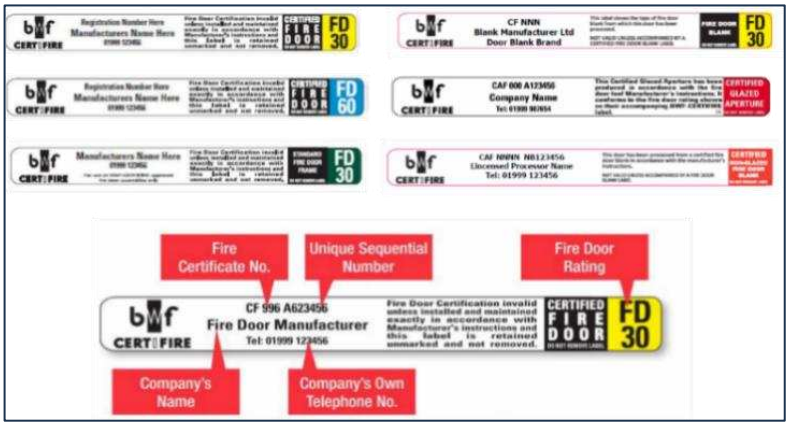
All fire doors in the building should be inspected. These should be easily identified as fire doors and marked accordingly.

7.2.1. Is the door a fire door?

Fire doors may have been replaced by non-fire doors because e.g. they have been damaged/worn by heavy traffic, they have become warped or e.g. in a block of flats, residents have simply replaced them for aesthetic reasons. If it is suspected that the doors are not original or are not fire doors, a check will need to be made to verify them. You should look for a label or plug from a third-party certification scheme such as the BM TRADA, BWF CERTIFIRE, KIWA/IFC Certification, Blue Sky Certification or BRE/LPCB schemes. Other schemes are also available.

The presence of labels/plugs from scheme providers is a reliable indication that the fire door has been certified. It will also indicate the period of fire resistance that the door should provide and because in all cases each label is numbered, they can be used to trace the door back to the manufacturer in the event of a problem or failure.

An alternative is the presence of a label on the hanging stile or the top of the door indicating that the door has been inspected by a 3rd party certificated inspector. There are several of these including Fire Door Inspection Scheme www.fdis.co.uk. Where there is a label indicating evidence of inspection, the appropriate record should be traced back by the FRA. Otherwise, the assessor will have to undertake their own survey. Guidance on this is given below.

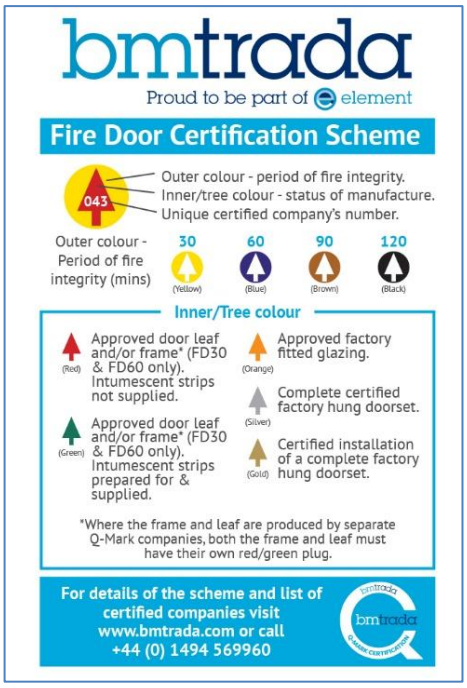


Door label from BWF FIRE DOOR public domain

Door label courtesy of UKTC

If a label is not apparent, then the door may be quite old. If it is of solid, heavy construction and if e.g. it is similar to others in the building in an area where fire doors have been used, it probably is a fire door. A rule of thumb is that a 44mm thick door may have a fire resistance of 30 minutes and a 54mm door may have a fire resistance of 60 minutes. However, in view of the standards of the day, it would probably not afford the same protection as its modern-day equivalent. **If there is any doubt, the only safe option is to recommend that a professional opinion on the door's performance be obtained which may recommend fitting a proven replacement.**

Old fire doors and non-fire doors can be upgraded, but unless the upgrading is something relatively simple like the addition of an intumescent strip, it needs special skills to do this often including taking the door apart and putting it back together again with extra intumescent protection within panels. Such upgrading is not recommended by the ASFP other than in exceptional circumstances where the historical integrity of the door must be retained, and then it should only carried out by a specialist in the field.



Door label from BM Trada

NOMINAL/NOTIONAL FIRE DOORS

It should be recognised that when risk assessing older buildings/fire doors, the standard of testing and construction at the time might reasonably include fire resisting doors that e.g. do not have intumescent strips fitted or have no or very old test evidence to back up their performance. The terms "nominal fire door" and "notional fire door" are terms that are used widely, often interchangeably and incorrectly within the UK sector to include such doors. This can lead to misunderstanding regarding the levels of protection that specific doors might offer.

The Fire Safety in Purpose Built Blocks of Flats guide provides a narrowly defined use of the term "notional fire door," referring specifically to a door that satisfied the fire resistance specification or test applicable at the time of the building's original construction. This definition is intended to support fire risk assessments in legacy buildings, particularly where full documentation or certification may not exist. However, it is crucial to recognise that this definition is highly contextual and does not equate to current standards of performance or compliance. It is not a blanket endorsement of such doors as fit for continued use without further scrutiny. The fire risk assessor must take the performance of the door in the context of fire safety measures within the rest of the building. The terms "nominal fire door" and "notional fire door" are not used in this guide.

ASFP has published an Advisory Note on this subject.

7.2.2. The importance of correct fitting of the door in the frame including door gaps

Worn hinges allow the door to drop

A fire door that has a large gap around the periphery between the leaf and the frame is unlikely to hold back a fire**. In fire tests the doors are hung with gaps of usually less than 3mm and they should not be significantly more than this in the building typically 3-4mm.** Large and/or variable gaps can arise due to movement of the frame in the building caused by general building movement or a failure to fix the frame properly to the wall or by warping of the door leaf e.g. due to environmental conditions. However, more usually, this is due to progressive failure of the ironmongery allowing the door to 'drop' thus increasing the gap around the door.

Gap gauges are widely available

A short video of how to check fire door gaps can be accessed here https://is.gd/8BQpvL

In addition, fire doors that drop on their hinges will eventually not close properly into the frame, so this is something that must be remedied. If the door has dropped remedial measures such as replacing of the hinges with better quality items (CE marked) must be recommended. An indication of developing wear on hinges is a black residue on the hinge and the floor beneath the hinge. If the doors are hung on floor pivots as is often the case with steel doors the same considerations apply.

7.2.3. The importance of suitable fire tested ironmongery e.g. self-closing devices, latches etc.

Fire door ironmongery is a potential minefield as the combinations of available ironmongery including hinges, latches, locks, bolts, door viewers, push plates etc. are almost infinite. Many are not compatible with each other or particular types of door leaf and frame. You should look for CE marking on the ironmongery. The presence of labels/plugs from these scheme providers is a good indication that the fire door and its ironmongery are compatible. **There are a lot of low cost imported ironmongery available from non-specialists of which the provenance cannot be determined. These should be treated with caution**

It is possible that the door could have been modified after it was installed and so you should use the following checks as a rule of thumb:

i. The door should be hung on a minimum of 3 hinges which are not damaged or worn, allowing the door to drop (photo above)
ii. If the door has a latch, it should operate correctly, it should be aligned with the striker plate, and the angle of the striker plate should be correct so that the door is closed properly by the door closer
iii. The door should be fitted with a self-closing device such as an overhead or frame fitted door closer. The use of rising butts, while once acceptable for older properties, is not acceptable now because they will not close a door from every angle or overcome latch resistance
iv. Any knobs, handles and pull levers should be fire resisting and securely fitted (through bolts are better than screws)
v. The door should be labelled as a fire door
vi. If the door has a letter plate, consideration should be given to fitting a device which can help prevent arson attack e.g. by items or flammable liquid being passed through the door.

7.2.4. The need for intumescent protection

a) Around the periphery of the door leaf or frame

Intumescent seal

Combined intumescent & brush smoke seal

Combined intumescent & blade smoke seal

Without intumescent protection to the periphery of a door leaf, the fire and smoke will simply pass around the perimeter of the door leaf. The FRA should check for the presence and the condition of intumescent seals at the top and both side edges. Seals may be located in the leaf or in the frame and occasionally behind the door lipping which will only be apparent if the door is labelled accordingly. For older buildings, it may be that the doors do not have intumescent strips, in which case only approximately 20 minutes fire resistance performance may be expected. Current recommendations would always be to include an intumescent strip which would usually afford 30 minutes' fire resistance. Metal doors are not usually fitted with intumescent strips.

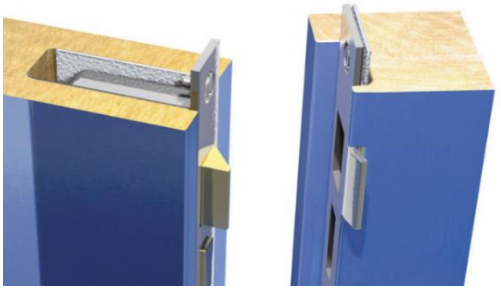
Intumescent seal in door frame

b) To ironmongery

Normal practice is to include intumescent protection at ironmongery positions e.g. in the form of intumescent pads for hinges and intumescent linings to locks, as otherwise excessive heat transfer by the ironmongery can cause premature failure and even for the leaf to fall from the frame. Ironmongery protection is especially important for 1 hour fire resisting timber doors.

Intumescent around lock case

Intumescent pads for fire door hinges

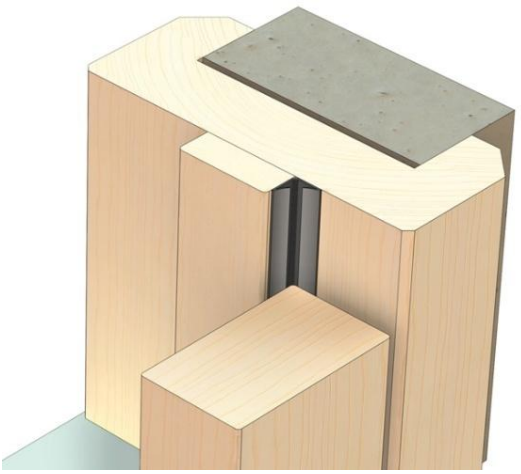


Intumescent kits for lock/latch and striker plate

7.2.5. The provision and condition of any smoke seals

Many fire doors are fitted with smoke seals to reduce the amount of smoke leakage through the door. These are very important to protect escape routes and in other situations e.g. the use of 'stay put' strategies in blocks of flats. The seals are usually a wiping polymer blade, a brush or sometimes a 'batwing type' in the rebate of the frame.

The assessor should check that the smoke seal is present, that it is in good condition (no missing/damaged blades etc.) and that it fills the gap between the frame and the door. Smoke seals should not be interrupted at ironmongery positions. Threshold gaps greater than 3mm should also be sealed.



Bat wing Intumescent seal in door frame

7.2.6. The ability to self-close

Almost all fire doors are required to be self-closing. Exceptions are those used for cupboards and to protect service risers etc. These are usually kept locked shut because they are not used for means of escape and locking them ensures they will work as fire doors. All other fire doors must be self-closing. **A fire door that does not self-close, or which is not locked shut is not a fire door. It is crucially important that fire doors close, solely by the action of the self-closing device from any angle and the Assessor should check every door.** In most cases, failure to close correctly e.g. to overcome the resistance of the latch can be rectified by proper adjustment of the door closer and/or striker plate.

7.2.7. Release of self-closing device

hold-open-door-closer

The ability of any door retention device to release correctly on the operation of the appropriate signal from the fire alarm and detection system needs to be regularly checked.

Many fire doors are held open by either an electromagnetic device or an acoustic/radio linked mechanical device operating on the door closer or the leaf. On activation of the fire alarm, these devices should release the door and it should fully shut as indicated above. The records of checks to verify that these devices release on operation of the fire alarm should be audited. If these cannot be verified, then a check should be made during the risk assessment.

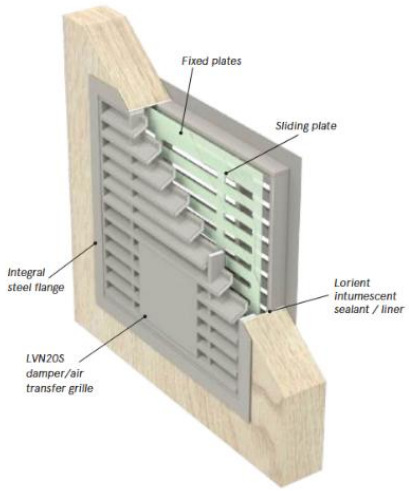
7.2.8. Emergency/panic escape doors

Doors used for means of escape (which may not necessarily be fire doors e.g. at the final exit of a building) must be able to be opened easily. The following checks should be made:

a) Only one hand movement such as turning a lever or pressing on a push pad or bar should be needed to open an emergency escape door
b) A panic escape door should be able to be opened by body contact alone
c) Exterior doors may be affected by the weather and not open easily
d) Check that the doors have adequate signage
e) **There should be no extra security ties.** A variety of CE marked electronic devices connected to the fire alarm are available for ensuring security of escape doors

Panic exit device

7.2.9. Air transfer grilles in fire doors



Intumescent air transfer grille with electro-mechanical actuator for use on escape routes. Image courtesy of Lorient

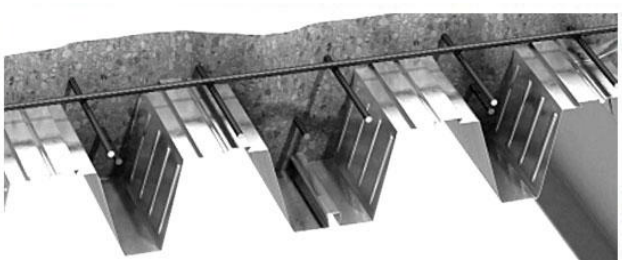
If a fire door protecting a means of escape is fitted with an air transfer grille then it needs to be a type linked to a suitable fire detection/alarm system. Thermally triggered dampers e.g. those operated by a fusible link and intumescent dampers are not suitable for these situations.
The fire risk assessor should check that the intumescent matrix is present and that the operation of any such air transfer grille has been regularly checked and recorded.

More guidance is given in annex C on fire doors.

7.3. Construction of fire resisting walls, ceilings and floors forming escape routes

7.3.1. Existing construction

For most buildings, it should not be necessary to extensively evaluate the fire resisting construction used in escape routes or in compartmentation as these should have been covered by the building control process. For example, in an office building, the number and construction of the floors (which will often be concrete) are unlikely to change. This contrasts with the situation with wall and ceiling linings and to a lesser extent fire doors and suspended ceilings which are likely be changed several times during the life of the building for aesthetic reasons.



Concrete/metal deck floor system

7.3.2. New construction

The only changes in fire resisting construction of walls and floors that are likely to occur are those where the internal layout has been changed e.g. by relocating, replacing or demolishing internal partitions (changes due to the inclusion of new services etc. are dealt with in 7.4). In this case the fire risk assessor needs to verify that the new construction is still suitable for use as an escape route in two regards:

7.3.2.1. Layout

The fire risk assessor needs to check that any modifications have not e.g. significantly increased travel distances or removed or relocated some of the fire doors. Changes in the construction and layout of internal walls may occur during the life of the building and may not be picked up by Building Control so it's very important that the Fire Risk Assessor evaluates these. For a new building, it should be easy to check any modifications against what was originally constructed using the CDM file, Regulation 38 information (England & Wales only) or Golden Thread information (England only) and the fire strategy document, if there is one. For both new and old buildings, the Assessor needs to satisfy himself that any changes result in a building that still provides adequate means of escape.

7.3.2.2. Types of new construction

a) Fire resistant walls and floors

Typical Fire resisting corridor with fire resisting glazing and doors

The assessor will need to check that the type of construction e.g. materials used in any replacement construction are suitably fire resisting. The new construction may be traditional 'deemed to satisfy' fire resisting construction (brick/block walls, plasterboard/stud partitions, etc.) or it could be for example a proprietary partitioning system which may include fire resisting glazing (picture left). In the latter case, the fire risk assessor should be able to obtain evidence that the system, including the glazing, is fire resistant. If evidence is not available, then the assessor needs to take this into account in the overall assessment. For example, if non-fire resisting construction has been used, the fire risk assessor will have to recommend replacement or other compensating measures.

If no evidence as to the level of fire resistance can be found, then the only way to verify this will be by invasive inspection e.g. by a third-party party inspection body. If this is not practical, then the assessor may need to consider the use of compensating measures in the assessment. Further guidance is given in annex D (walls and floors) and E (glazing).

Installing a raised access floor

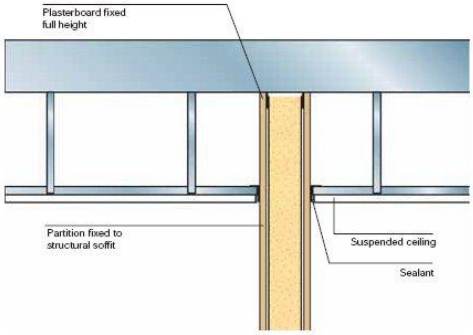
b) Fire-resisting ceilings

Suspended ceilings are often viewed by building occupiers as simply there for aesthetic reasons and it is essential that the fire risk assessor knows exactly the purpose of the installed system in the fire strategy of the building. This is particularly important because it is easy to downgrade a ceiling from the original intended fire rating e.g. by the fitting of untested downlighters, ceiling vents, loudspeakers etc.

The first essential of inspection, therefore, is to know exactly the intended performance of the ceiling system. Once this is known and drawings or installation data have been obtained, the inspection should show if the original plans have been adhered to. If this information is not available, then the assessor must assume that the ceiling is not fire resisting.

Typical suspended ceiling system

If the ceiling is not fire resisting then this may be significant. If it means that fire can spread via the ceiling void over compartment walls which have not been taken floor slab to floor slab, then the assessor should note this in the assessment and recommend inspection by a third party to verify if the ceiling is fire resisting or not or alternatively, to recommend replacement.



Vertical compartmentation taken up to underside of floor slab (correct)

A common fault found in existing ceilings is that hold-down clips are removed and not replaced when maintenance work has been conducted behind the ceiling. If tiles are a loose fit, the original design should be checked, since pressure increases during a fire condition can remove lightweight tiles. Damage to tiles is common and replacement with tiles from another manufacturer could lead to a premature failure in a fire. Tiles that are damaged should be replaced with ones of the correct type. Further guidance on the construction of ceilings is given in annex F.

7.3.3. Hidden spaces

In addition to checking the materials and construction of the walls, floor and ceilings in escape routes, it is crucially important that the assessor ensures that these extend above suspended ceilings to the floor slab (or equivalent) above and below the raised floors to the floor slab below. There are many instances where an 'out of sight – out of mind' mentality results in fire resisting construction being compromised because it is not extended from 'floor slab to floor slab'.

The assessor should also be aware of the criticality in sealing off hidden voids, especially in situations where e.g. modern methods of construction such as Posi joists are used. If fire gets into cavities with such joists they will fail very quickly.

Vertical compartmentation not extending up to floor slab above (incorrect)

Ceiling voids above bedrooms e.g. in care homes are particularly vulnerable in this respect with fire spread within the void. The Fire Risk Assessor should check above the ceilings on individual bedrooms and bathrooms where possible to ensure there are fire barriers at appropriate intervals.

7.3.4. Methodology

Compartment floor with a hole passing through to the laminate floor in the flat above (incorrect)

The assessor will need to walk round all fire resisting walls, ceilings and floors forming escape routes and evaluate the condition of the fire separating elements. They will also need to look above suspended ceilings abutting walls that bound escape routes – especially at corridor ends. It is unreasonable and impractical to lift more than a few ceiling tiles to examine such walls, but a selection from each escape route will give the assessor an idea of the condition of the fire resisting construction. Remote video equipment and/or the use of torches to illuminate any holes will assist. A torch or lamp placed on one side of a wall while the assessor looks at the other side for any light shining through is an indicator of the degree to which the wall is sealed against the passage of smoke.

The assessor should pay particular attention to walls above suspended ceilings at corridor ends (where there will usually be fire resisting doors) as the wall above the suspended ceiling may not extend fully to the floor slab above. In addition, its fire resistance may be compromised by services running through the wall that have not been adequately fire stopped – see 7.4.

For raised floors, it should be possible to lift some floor tiles near the edges of fire resisting walls and use a torch to look for the installation of suitable cavity barriers.

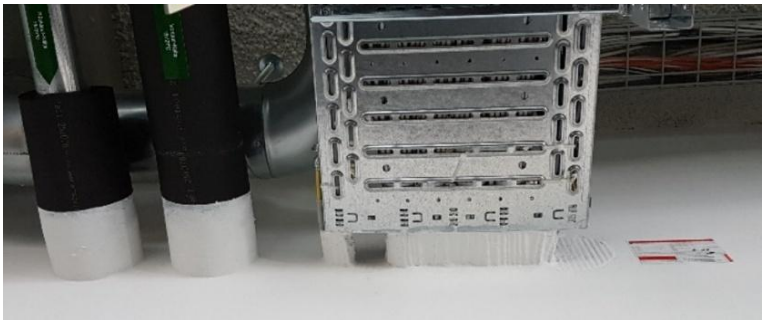
More guidance is given in annex D on walls and floors forming escape routes.

7.4. Penetrating services in walls, ceilings and floors forming escape routes

7.4.1. General

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

The provision of fire resisting walls, ceilings and floors forming escape routes is most commonly compromised by the installation of penetrating services (pipes, cables, air handling equipment etc.) through the wall or floor.



Installed cable and pipe penetration seals

In new buildings the building regulations address this by requiring the inclusion of suitable fire stopping. However, this is often compromised by:

- Use of poor-quality products. The ASFP recommends the use of third party certificated products
- Poor quality/lack of installation. The ASFP recommends the use of third party certificated contractors
- Addition, removal or modification of penetrating services after the building is completed without correct reinstatement of the fire stopping.

Because this usually occurs after the building control and handover process is complete it is often not picked up because it is out of sight. Only a regular inspection and maintenance regime will identify this. In some cases, it will be the fire risk assessor who will be the first person to discover and record this.

7.4.2. Methodology

The assessor should use the inspection methodology described in 7.3.4 above and logically, it should be undertaken simultaneously. Again, it is not practical or reasonable to inspect every installation, but a representative sample from each escape route should suffice. The assessor should look at the condition of the following items:

7.4.2.1. Penetrating services (cables and pipes)

The assessor will need to ensure that any services penetrating walls or floors abutting escape routes are adequately sealed where they penetrate the wall or floor. They should pay particular attention to penetration services above suspended ceilings where they might have been installed and not made good afterwards.

The presence of through holes or gaps is not acceptable and these must be made good with appropriate tested/certificated construction that is compatible with the existing seal.

Correctly installed cable penetrations

There are a variety of proprietary materials and products used to seal penetrations including intumescent collars and wraps, fire resisting mortars, coated mineral fibre batts, fire resisting pillows etc. The FRA is not expected to be an expert in all of these, but they should be aware of the limitations of the generic material types.

The assessor should be particularly vigilant if they discover the use of expanded foam used as a penetration sealing material (example in picture right). Most of these are tested as narrow linear gap seals and will not work in a large penetration seal. Further guidance is given in annex G including guidance on PU foams.

Incorrect use of PU 'foam' in a penetration seal

7.4.2.2. Support for penetrating services

Penetrating services will need to be supported either side of the wall or floor to ensure that in a fire any drooping or sagging of the service does not damage the penetration seal and thus breach fire resisting construction. Some types of penetration seal e.g. mineral fibre batt are more susceptible to damage by collapse of the service than others e.g. fire resisting mortars.

7.4.2.3. Penetrating services (ducts and dampers)

Where air handling ducts pass through fire separating elements the integrity of those elements is maintained by using one of four basic methods:

- Method 1: protection using thermally actuated fire dampers
- Method 2: protection using fire resistant enclosures
- Method 3: protection using fire-resisting ductwork
- Method 4: automatically actuated fire and smoke dampers triggered by smoke detectors.

The ASFP Blue Book EN does not allow for method 1 and has text advising against it.

The assessor should understand which method has been used to undertake the risk assessment. Where air handling systems pass through fire resisting construction on escape routes or compartment walls and floors forming escape routes, particular attention needs to be placed on the following:

Method 1: protection using thermally activated fire dampers

A fire damper is a device which is installed at the point where the duct penetrates the compartment wall or floor. The fire damper allows the ventilated air in normal conditions to pass through a duct, wall or partition. In a fire situation it closes automatically to prevent the passage of fire for a stipulated time period. Closing of fire dampers can be effected by fusible links (heat sensitive devices e.g. solders) which release a spring activated mechanism which closes the damper, or the fire damper itself may comprise an matrix of material coated with intumescent which swells up and closes the opening on heating.

Incorrect use of PU 'foam' in a penetration seal

The fire risk assessor should examine records to verify that operation of the damper has been checked on a regular basis. If these records cannot be obtained the operation of the fire dampers should be verified by the assessor or a more thorough specialist third party inspection undertaken.

Fire dampers should be provided with adequate means of access to allow inspection, testing and maintenance of both the damper and the actuating mechanism. If there is no access to fire dampers or it is very limited, the assessor should note this in the risk assessment and recommend that access be provided. They should also consider an invasive inspection by a third-party inspector.

In normal operating conditions, a fire resisting damper will be connected to duct work either side of the compartment line that the damper is there to protect. In the event of a fire, consideration should be given to the performance of the interface between the damper and the duct sections on either side. Self-drilling metal screws, such as Tek-screws should not be used to connect ductwork to fire resisting dampers. Whilst self-drilling metal screws are quick and easy to install, they will not allow a breakaway joint to work, and subsequent collapse of the duct could place undue forces onto the damper, pulling it out of the plane of the wall and therefore compromising the compartmentation.

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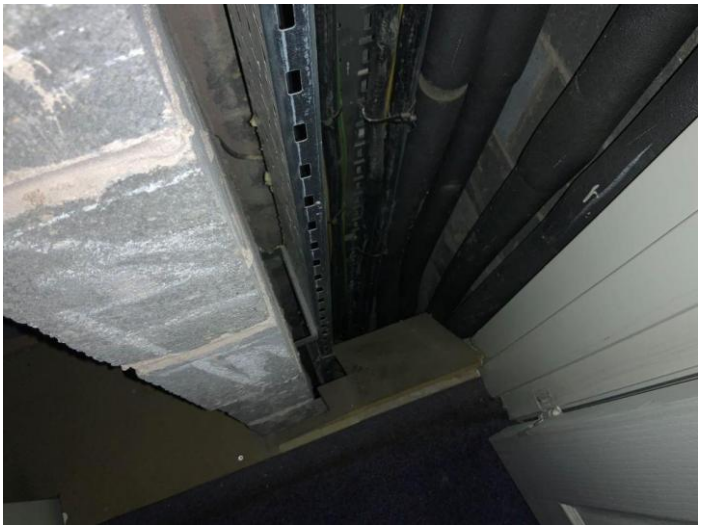
The ASFP has produced Advisory Note 39 on the (mis)use of Self drilling metal screws in damper installations.

The same considerations with regard to adequately sealing around penetrating cables and pipes listed in 7.4 also apply to fire dampers. Particular attention should be paid to the penetration seal surrounding the fire damper. Further guidance on fire dampers including the scope of applicability and maintenance requirements is given in annex H.

Method 2: Protection using fire resistant enclosures

Where fire protection of the air handling system penetrating fire resisting construction forming an escape route is provided by fire resistant enclosures e.g. a service duct or protected shaft, the assessor needs to verify the fire resistance of the construction. Such fire resisting enclosures may be made from traditional construction e.g. plasterboard shaft wall or they may be proprietary service ducts and shafts using e.g. calcium silicate, cement based or other fire resisting board materials.

A representative sample of protected shaft should be inspected where it is accessible and where it passes through compartment walls abutting escape routes using the methodology given in clause 7.3.4. If the assessor is not confident that the enclosure provides adequate separation they should note this in the risk assessment and consider a more thorough invasive inspection by a third-party inspector.



Riser shaft

Method 3: Protection using fire resistant ductwork

Steel ductwork systems for air movements around buildings are generally constructed to the HVCA guide DW/144 which covers construction standards in the manufacture of sheet metal ductwork. However, most general purpose ventilation ductwork systems constructed to this standard offer little or no protection against fire spread and cannot be used or converted into fire resisting ductwork unless the system has been tested against the appropriate standard.

There are a variety of proprietary tested and certificated fire resisting ducts which, provided they are adequately supported and sealed where they penetrate the element, obviate the need for fire dampers in fire resisting walls and floors forming escape routes. If fire resisting ductwork is used, the assessor will need to verify that it is fire resisting for the required period.

Image – Fire resisting ductwork courtesy of Firesafe Ductwork Ltd

If records of the installation of fire resisting ductwork cannot be found e.g. from the CDM file, the Regulation 38 information (England & Wales only) or the Golden Thread Information (England only), a representative sample of fire resisting ductwork should be inspected where it is accessible and where it passes through compartment walls and those abutting escape routes using the methodology given in clause 7.3.4.

The same sealing and supporting of fire resisting ducts where they pass through the separating element is especially important as these are often large and heavy items and a failure of the supports will significantly breach fire resisting construction. More information on ducts is given in annex I.

In this installation, the dampers are not in the plane of the wall, the duct is not protected, and it is unlikely that the dampers have been tested in a cellular beam.

It is also unlikely the cell beam has been tested with the flexible wall attached beneath it.

Method 4: Automatically actuated fire and smoke dampers triggered by smoke detectors

Where a fire damper is installed e.g. where a ductwork system serves more than one part of a sub-divided escape route or the use of the building involves a sleeping risk, the fire damper needs to be of the type that is activated by a smoke detector or suitable fire detection system. Thermally triggered fire dampers are not acceptable for these applications.

The consideration here for the Fire Risk Assessor is largely the same as for Method 1. However, where automatically actuated fire and smoke dampers have been used there should be comprehensive records of testing of the system. The same consideration with regard to Self-drilling metal screws, such as Tek-screws apply here as well.

More guidance is given in annex G on fire stopping and penetrations seals.

7.5. External Wall Systems

Grenfell Tower, London

If the building has an external wall system or façade, this can provide the potential for significant spread of fire up the face of the building. Several fires resulting in fatalities have been exacerbated by fire spread up the outside of the building, sometimes inside the rain screen cladding. These fires can then re-enter the building e.g. via windows. Consequently, when assessing buildings with any applied rainscreen or external cladding e.g. high-rise offices or blocks of flats, particular attention should be given to any rainscreen or other external cladding system that has been applied and to any façades that have been replaced.

Following the Grenfell Tower fire on 14th June 2017 there has been a strong focus on the performance of poorly designed and constructed external wall systems which can bypass internal compartmentation and spread fire up the outside of a building. The assessor will need to address this as applicable to the building type.

In England and Wales, the Fire Safety Act 2021 has clarified that where a building contains 2 or more sets of domestic premises the fire risk assessment should include an assessment of that building's external wall system.

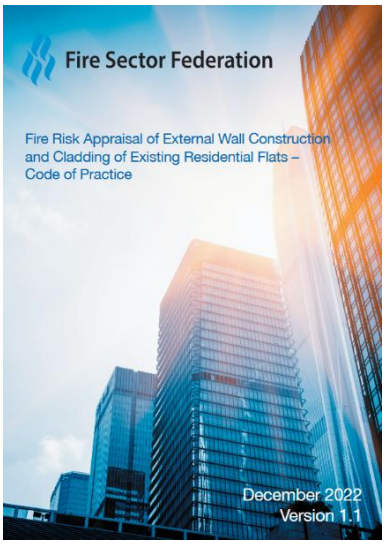
For most high-rise residential buildings, it is expected that responsible persons will already know what their external wall systems are comprised of, and what steps (informed by their building's fire risk assessment) they have already taken to mitigate this risk. For example, where the material of a building's external walls is masonry and there is no risk of external fire spread, a simple statement to that effect is all that is required.

Where this is not the case, or where a more in-depth external wall system assessment is required, the responsible person should arrange to have an assessment which is relevant to their building's circumstances undertaken. Once completed they should and share the relevant details of that assessment with the fire and rescue service, alongside the mitigating steps they have taken as a result of this assessment.

Horizontal cavity barrier in external wall – Image courtesy of Siderise Ltd

Fire Sector Confederation guide to Fire Risk Appraisal of External Walls

The Fire Sector Confederation has published a guide for a competent Fire Risk Assessor to undertake an initial external wall appraisal as part of the building's fire risk assessment to determine if a specialist PAS 9980 - *Fire risk appraisal of external wall construction and cladding of existing blocks of flats – Code of Practice* assessment (see box below) is required or not. https://is.gd/N40mun



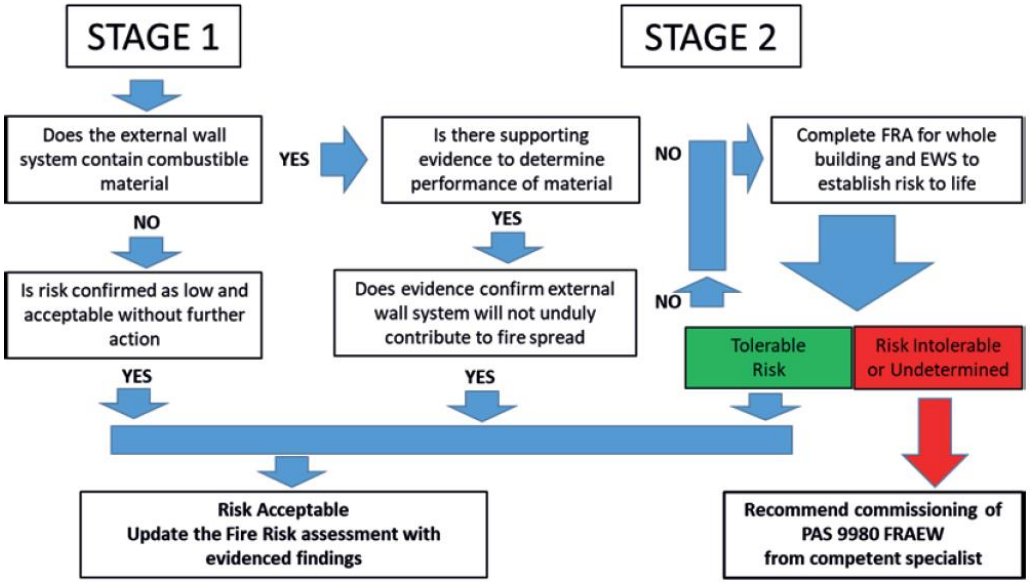
The FSC guidance is not intended to address all combinations of external wall systems and therefore fire risk assessors should seek additional support if the external wall system is beyond the scope of this document. The guidance applies to multi-occupied residential buildings **below** 18m. It does not apply to:

- Multi-occupied residential buildings over 18m.
- Hospitals or other premises with overnight patient accommodation.
- Care homes, hotels, hostels or prisons.

A two-step approach is used to determine if the external wall system major components are reaction to fire Euroclass A1 or A2. If so, then regardless of the construction, the external wall system should not unduly contribute to external fire spread and consequently does not need a PAS 9980 survey.

Should the assessor, not be able to determine the likely performance characteristics of the external wall system in a fire, an informed decision on the risk posed by the system becoming involved in a fire situation for the building in question, can also be made e.g. where the undetermined combustible material is isolated to a small section of the external wall system and it is located away from the means of escape and windows. In this case the risk could be regarded as low and so tolerable.

However, should the external wall system be of unknown combustibility and make up a large percentage of the external wall system, the risk should be considered high and consequently a recommendation for a specialist Fire Risk Assessment External Wall (FRAEW) in accordance with the principles outlined in PAS 9980 should be made. The FRAEW will then inform the risk assessment process and any remediation or compensatory measures required to reduce risk to as low as reasonably practicable.



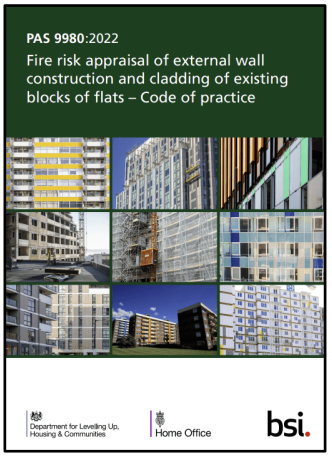
Two stage procedure from FSF guide

PAS 9980:2022 fire risk appraisal of external wall construction and cladding of existing blocks of flats – Code of practice

PAS 9980 was introduced to guide those specialists directly involved and **is intended for use by competent fire engineers** and other competent building professionals to advise on the fire risk of external walls of existing blocks of flats.

The expectation is that where the external wall system has been identified as complex or if the make-up of the system is unknown, or likely to propagate fire spread, only competent specialists should complete a PAS 9980 fire risk assessments of external wall systems (FRAEW). PAS 9980, is freely available, and recommends an explicit methodology for those buildings.

It is important to note that not all buildings require a PAS 9980 FRAEW. It states- 'It is for use in situations where external wall constructions of existing blocks of flats have not been shown to resist fire spread adequately or where required to inform the fire risk assessment. Where it is obvious to the fire risk assessor that the walls don't pose a risk of fire spread (such as buildings of traditional brick and masonry construction), there may be no need for a PAS 9980 assessment'.

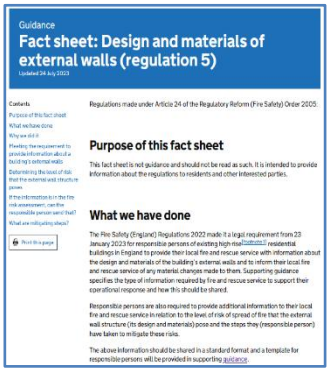


PAS 9980 image – BSi

The Fire Safety (England) Regulations 2022 made it a legal requirement from 23 January 2023 for responsible persons of existing high-rise residential buildings in England to provide their local fire and rescue service with information about the design and materials of the building's external walls and to inform their local fire and rescue service of any material changes made to them. Whilst it could be considered that a fire risk assessment could be considered sufficient for this purpose, that is not a record of the construction which is required by the regulations.

The Home Office has published a Fact Sheet on the Design and materials of external walls (regulation 5) https://www.gov.uk/government/publications/fire-safety-england-regulations-2022/fact-sheet-design-and-materials-of-external-walls-regulation-5

It gives guidance on the provision of fire safety information on external walls to the Fire and Rescue Services. A template is provided for this purpose reference from the fact sheet.


Guidance
Fact sheet: Design and materials of external walls (regulation 5)
Updated 24 July 2023
Contents
Purpose of this fact sheet
What we have done
Why we did it
Meeting the requirement to provide information about a building's external walls
Determining the level of risk that the external wall structure poses
If the information is in the fire risk assessment, can the responsible person send that?
What are misleading views?
Print this page
Regulations made under Article 24 of the Regulatory Reform (Fire Safety) Order 2005.
Purpose of this fact sheet
This fact sheet is not guidance and should not be read as such. It is intended to provide information about the regulations to residents and other interested parties.
What we have done
The Fire Safety (England) Regulations 2022 made it a legal requirement from 23 January 2023 for responsible persons of existing high-rise residential buildings in England to provide their local fire and rescue service with information about the design and materials of the building's external walls and to inform their local fire and rescue service of any material changes made to them. Supporting guidance specifies the type of information required by fire and rescue service to support their operational response and how this should be shared.
Responsible persons are also required to provide additional information to their local fire and rescue service in relation to the level of risk of spread of fire that the external wall structure (its design and materials) pose and the steps they (responsible person) have taken to mitigate these risks.
The above information should be shared in a standard format and a template for responsible persons will be provided in supporting guidance.

The Fire Risk Assessor needs to evaluate the external wall system appropriate to the building size, risk and the pertinent regulations. In many cases they will be able to make a reasonable judgement from the information supplied by the Responsible Person (or national equivalent) and a visual inspection e.g. which might show that the external walls are made of Euroclass A1 or A2 materials and so present a low risk of fire spread and consequently means of escape.

For low rise blocks of flats and other multi-occupied residential buildings below 18m, the FSF guidance can be used to steer the assessor as to whether a full PAS 9980 appraisal is needed. For very tall buildings and complex buildings we would expect a full PAS 9980 appraisal to be made by a competent fire engineer and referenced in the fire risk assessment.

More guidance is given in annex J on External Walls'.

7.6. Other items of Passive Fire Protection

While the assessor is inspecting the items above, they should be aware of other items of PFP installed in the building and take note of the condition of these to ensure that there are no obvious significant defects. While these other items (listed below) may not constitute means of escape, they have a role to play in the provision of life safety and for example, if the assessor uncovers substantial omissions, defects etc., they should note this in the risk assessment and call for a more thorough and if necessary invasive inspection by a specialist third party inspector.

7.6.1. Fire protection to the structure of the building

If the building is steel framed there will usually be fire protection applied to some or all elements of the steel structure. Steel will lose approximately half its strength when it is heated to approximately 550°C, a temperature quickly exceeded by most fires and so it is important to insulate the structure to prevent its collapse.

The steel is insulated by a number of proprietary products including intumescent or reactive coatings (which swell on heating to form as protective insulating char), plaster or cementitious based sprays, cladding systems made from fire resisting boards or mineral fibre products.

Intumescent/reactive coating on cellular beams

The fire risk assessor does not need to be an expert in such systems, or even to survey the building to evaluate the effectiveness of these products. However, they should, while inspecting the other items of PFP covered by this document, be aware of damage to or obvious omissions e.g. by removal of fire protection to structural steel work. If the assessor finds any obvious and significant defects, it should be noted in the assessment and call for a fuller and if necessary invasive third-party inspection be made.

Further information on fire protection to structural steelwork is given in Annex K.

7.6.2. Cavity barriers (excluding external walls)

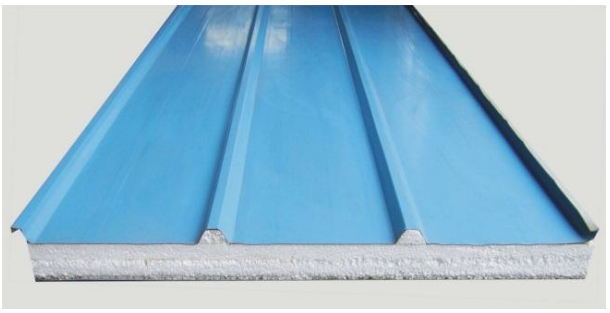
Cavity barriers are defined as a construction, other than a smoke curtain, provided to close a concealed space, such as that in a cavity wall or ceiling void or roof space, against penetration of smoke or flame, or provided to restrict the movement of smoke or flame within such a space. Cavity barriers require special attention from the designer because by their very nature they are usually hidden once installed and are therefore often impossible to inspect after installation, handover and subsequently through the life of the building. Failure of cavity barrier systems have been implicated in a number of fires in e.g. timber framed construction.

Cavity barrier between brick wall and internal structure

Recommendations on the provision of cavity barriers are given in AD B and the equivalent guidance for Scotland or Northern Ireland. In most applications they would be expected to have fire resistance of 30 minutes integrity and 15 minutes insulation, except in Scotland where certain applications have no insulation requirement.

The fire risk assessor does not need to be an expert in such systems, or even to survey the building to evaluate the effectiveness of these products (apart from those positioned in line with and protecting escape routes (see clause 7.3.4) and those in roof spaces. However, they should, while inspecting the other items of PFP covered by this document, be aware of damage to or obvious omissions of cavity barriers. If they find any obvious and significant defects, they should note this in the assessment and call for a fuller and if necessary invasive third-party inspection.

7.6.3. Sandwich panel construction (excluding external walls)



Typical sandwich panel construction

Many buildings have insulated core panels as exterior cladding or for internal structures and partitions. They normally consist of a central insulated core, sandwiched between an inner and outer metal skin with no air gap. The external surface is coated with a polymeric coating (usually PVC) to improve corrosion resistance and/or the aesthetic appeal of the panel. The central core can be made of various insulating materials, ranging from non-combustible mineral wool through to combustible polymeric foams. Many industries, including the food industry uses insulated core panels because it is relatively easy to make alterations to the panels e.g. for the provisions of services and for additional internal partitions to be erected with minimum disruption to business.

A number of fires in buildings where insulated panels have been used extensively in the fabric of the building have highlighted the particular dangers that may be associated with this form of construction. Many of the problems are due to alterations to the panel system by the occupier. The fire risk assessor should check for the following when inspecting buildings made from or incorporating sandwich panels.

- Installation of heating appliances, e.g. ovens against panels should be prohibited.
- Hot working in the vicinity of panels should be prohibited or supervised extensively.
- Storage of highly combustible materials against panels or allowing rubbish to collect against panel should be prohibited.
- Ad-hoc repairs or modifications to panels not in compliance with the manufacturer's instructions or recommendations should be prohibited. Particular attention should be given where openings have been made for doors, windows, and other penetrating services that these are effectively sealed and that the core is not exposed.

Sandwich panel construction building

- That any loads, such as storage and equipment, are only supported by panels which have been designed and installed to perform this function.
- Ensure that the panels are correctly secured to the structure or are designed to be independently structurally secure.

The use of combustible panels in areas of buildings with a high life risk, e.g. where large numbers of people are present and/or sleeping, should be carefully considered in the fire risk assessment.

More information can be found in annex K.

Annex A – Example checklist

The fire risk assessor will need to draw up a check list related to the PFP to be checked in the building being assessed. The list below identifies what needs to be checked for each type of construction. Guidance on how to check it is given in the clause number in the left-hand column.

Item & Ref	Description	Findings
Wall & Ceiling linings 7.1	Reasonable limitation of linings that might promote fire spread • Condition of overpainted walls • Presence of heavy weight/significantly textured wallcoverings • Presence of flammable items e.g. carpets • Records?	

Fire doors including Flat front doors 7.2	• Is it a fire door? Is it certificated?
	• Correct door gaps ~3-4mm?
	• Suitable ironmongery?
	  ○ Labelled (CE/UKCA marked)?
	  ○ 3 hinges
	  ○ Operation of lock, latch and striker
	  ○ Presence of self closing device
	  ○ Secure knobs handles etc, labelling
	• Presence and condition of intumescent/ smoke seals
	  ○ around periphery
	  ○ to glazing
	  ○ to ironmongery?
	  ○ To threshold if >3mm?
	• Automatic release of self closing device?
	• Panic exit devices?
	• Air transfer grilles – not thermally activated but linked to fire detection in escape routes?
	• Third party certificated products/installers?
	• Records?	

Walls, floors & ceilings on escape routes 7.3	• New construction/alteration
	  ○ Fire resisting construction?
	  ○ Changes to means of escape?
	  ○ Role of suspended ceilings?
	  ○ Extention of fire resisting construction 'floor slab to floor slab'?
	  ○ Holes/poor firestopping in hidden spaces?
	• Third party certificated products/installers?
	• Records?	

Penetrating services (cables & pipes) 7.4	• All penetrating cable and pipe services
	  ○ Suitably fire stopped?
	  ○ Suitably supported?
	  ○ Good condition/undamaged?
	• Third party certificated products/installers?
	• Records?	

Checklist continued…

Item & Ref	Description	Findings

Penetrating services (air handling eqpt)
7.4
	• All penetrating ducts and dampers
	  ○ Suitably fire stopped?
	  ○ Suitably supported?
	  ○ Good condition/undamaged?
	• Method of air handling understood
	  ○ Method 1 – Fire damper operation checked & linked to detection system?
	  ○ Method 2 – Fire resisting construction?
	  ○ Method 3 – Fire resisting ducts?
	  ○ Method 4
	• Third party certificated products/installers?
	• Records?	

External walls 7.5	• What is the build up of the external wall? Are there records of this? • Is the PAS 9980 report available? • Is the external wall constructed of materials of reaction to Fire class A1 or A2? If so, no further activity is required and this should be reported • If not sure, use the FSF guide to determine if a full PAS 9980 appraisal is required. • Records?	

Other PFP items
7.6
	• Fire protection to structural frame (where visible)
	  ○ Good condition?
	  ○ Records?
	• Cavity barriers (where visible)
	  ○ Present?
	  ○ Good condition?
	• Third party certificated products/installers?
	• Records?	

Sandwich panel construction
7.6.3
	• Fire resisting construction?
	  ○ Assessment of core material v. end-use?
	  ○ All repairs or modifications undertaken competently?
	  ○ Good condition?
	• Operational considerations
	  ○ No heating appliances adjacent to walls/floors/ceilings?
	  ○ No storage of highly combustible materials next to walls/floors.ceilings?
	• Any hot working to be extensively supervised
	• Records?	

Annex B – Wall & Ceiling linings

The materials used to line walls and ceilings can contribute significantly to the spread of flame across their surface. Most materials that are used as surface linings will fall into one of three classes of reaction to fire.

The following are common examples of acceptable materials for various situations:

Euroclass A1 or Euroclass A2-s3, d2 (Materials suitable for circulation spaces and escape routes)

- Such materials include brickwork, blockwork, concrete, ceramic tiles, plaster finishes, mineral wool, mineral fibre tiles or sheets with cement binding.

Euroclass B-s3, d2: Materials suitable for circulation spaces and escape routes

- As **Euroclass and Euroclass A2-s3, d2** above plus rendering on wood or metal lathes, wood-wool cement slabs and mineral fibre tiles or sheets with cement or resin binding.

Note: Additional finishes to these surfaces may be detrimental to the fire performance of the surface and if there is any doubt about this then consult the manufacturer of the finish.

Flame spread over painted surface

Euroclass C-s3, d2: Materials suitable for use in all rooms but not on escape routes

- As **Euroclass B-s3, d2** above plus timber, hardboard, blockboard, particle board, heavy flock wallpapers and thermosetting plastics will be suitable if flame-retardant treated to the relevant standard.

Euroclass D-s3, d2: Materials suitable for use in rooms of less than 30m²

- As **Euroclass C-s3, d2** above plus those that have not been flame-retardant treated and certain dense timber or plywood and standard glass-reinforced polyesters.

Appropriate testing procedures are detailed in BS EN 13501-1.

ASFP is producing an Advisory Note on this and the relationship with existing national tests to British Standards.

Withdrawal of national tests and classes from Statutory Guidance Documents

Depending on the devolved nation, the use of BS476 based tests and classifications either is or will no longer be treated as satisfactory evidence of reaction to fire performance. Only European test and classes can/will be able to be used. The changes have been brought about following the Grenfell Tower Fire in June 2017 and subsequent Public Inquiry which criticized some British Standard classes as not sufficiently evaluating the reaction to fire performance.

Fire risk assessors will be evaluating old buildings and the use of BS based tests and classes is still acceptable as it was at the time it was installed. However, replacement materials must satisfy European Tests and classes as defined in the appropriate Statutory Guidance document. The table below summarises the situation at publication of this guide (Autumn 2025).

Reaction to Fire	England	Wales	Scotland	Northern Ireland	Republic of Ireland
Status of BS 476 to satisfy Statutory guidance	BS476 cannot be used from 01/03/2025	Building Safety Bill to Senedd Summer 2025	Removed in 2024	Currently still using BS in 2013 Technical Booklet E	Removed for new buildings but still there for existing buildings

Annex C – Fire Doors

Removal of British Standard testing and classes

Withdrawal of national tests and classes from Statutory Guidance Documents

Depending on the devolved nation, the use of BS476 based tests and classifications will eventually no longer be treated as satisfactory evidence of fire resistance performance. Only European test and classes can/will be able to be used. The changes have been brought about following the Grenfell Tower Fire in June 2017 and subsequent Public Inquiry.

Fire risk assessors will be evaluating old buildings and the use of BS based tests and classes is still acceptable as it was at the time it was installed. However, replacement materials must satisfy European Tests and classes as defined in the appropriate Statutory Guidance document. The table below summarises the situation at publication of this guide (Autumn 2025).

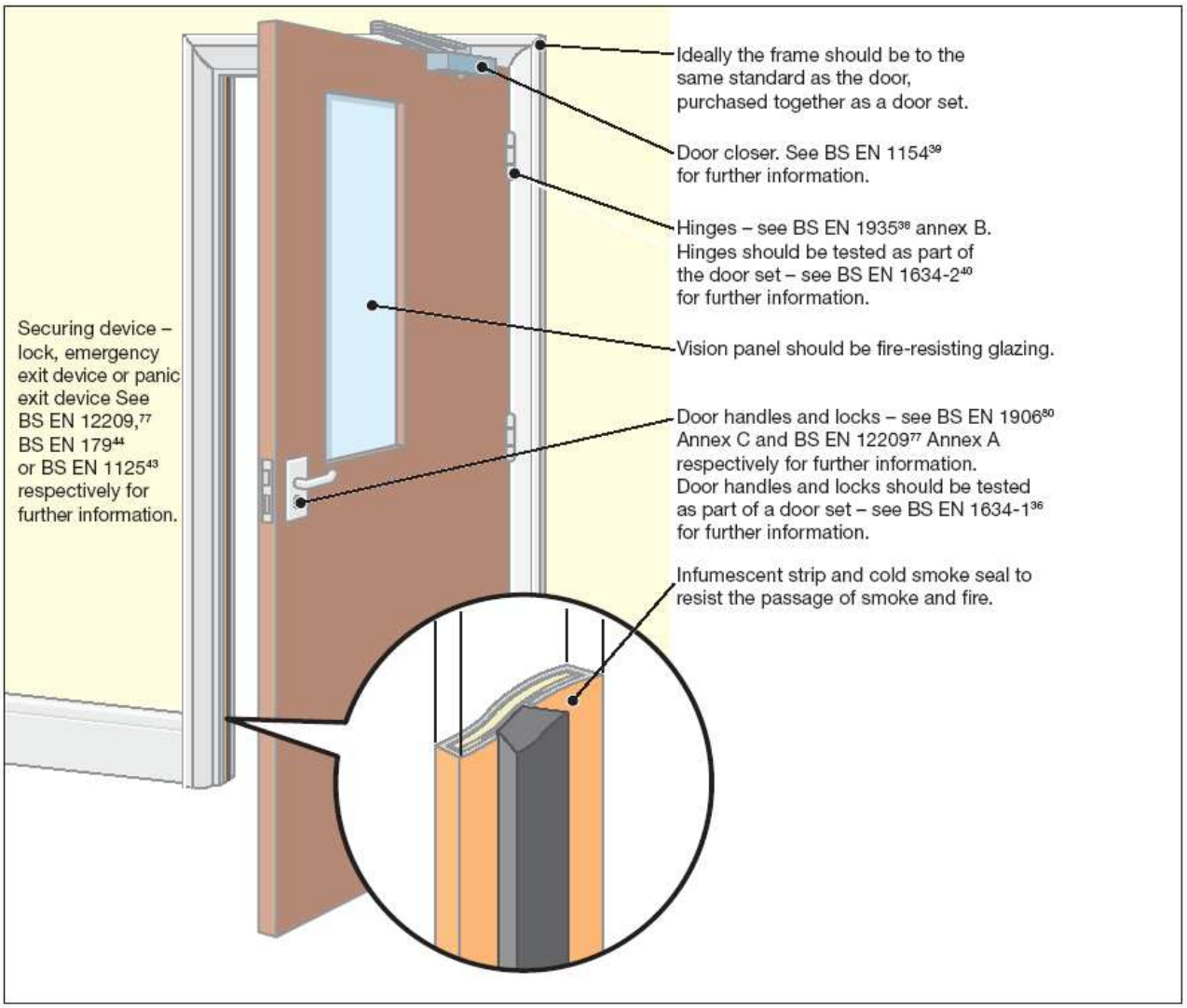
NOTE, THIS IS FOR ALL FIRE RESISTING ELEMENTS, NOT JUST FIRE DOORS.

Fire Resistance	England	Wales	Scotland	Northern Ireland	Republic of Ireland
Status of BS 476 to satisfy Statutory guidance	BS476 cannot be used from 01-09-2029	Building Safety Bill to Senedd Summer 2025	Subject to Cameron House Consultation Mar 2025	Currently still using BS in 2013 Technical Booklet E.	Removed for new buildings but still there for existing.

The British Woodworking Federation has published a guide to the transition of testing and certification of fire doors from BS to European Standards available here https://is.gd/dP0dE5

Requirements of a fire-resisting door

Fire-resisting doors are necessary in any doorway located in a fire-resisting structure and are rated by their performance when fire tested to an appropriate standard, usually BS 476: Part 22:1987 or EN 1634-1 +A1: 2018. The level of protection provided by the door is measured, primarily by determining the time taken for a fire to breach the integrity (E), of the door assembly, thus allowing the passage of hot gases and flame. It may be possible to upgrade the fire resistance of existing doors, however the skills required to do this are outside the expertise of many installers and it may be cheaper to replace them.



Timber fire doors

Timber fire-resisting doors normally require a nominally 3-4mm gap between the door leaf and the frame. However, slightly larger gaps may be necessary to ensure that the door closes flush into its frame when smoke seals are fitted. To maintain the fire resistance the gap is normally protected by installing an intumescent seal, in either the door or the frame. The intumescent seal expands in the early stages of a fire and enhances the protection given by the door. Additional smoke seals will restrict the spread of smoke at ambient temperatures. Doors fitted with smoke seals, either incorporated in the intumescent seal or fitted separately, have their classification code suffixed with an 'S' or S_a to BS 476: Part 31.1 and BS EN 1634-3, respectively. The principal fire-resisting door categories are:

Description of fire and smoke resistance	British Class	European Class
20 minutes fire resistance	FD20	E20
20 minutes fire resistance and smoke resistance at ambient temperature	FD20S	E20Sa
30 minutes fire resistance	FD30	E30
30 minutes fire resistance and smoke resistance at ambient temperature	FD30S	E30Sa
60 minutes fire resistance	FD60	E60
60 minutes fire resistance and smoke resistance at ambient temperature	FD60S	E60Sa

Metal fire doors

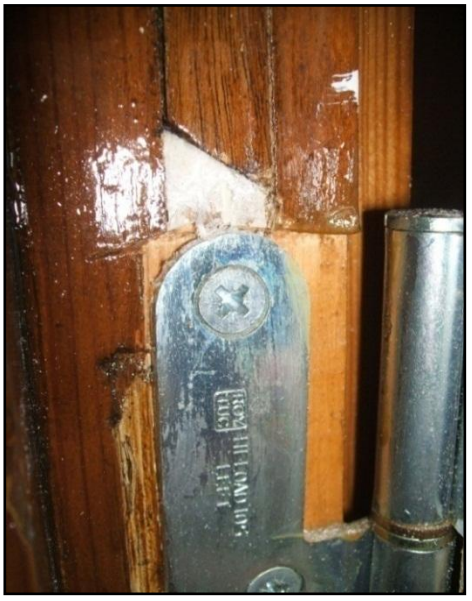
Although the majority of fire-resisting doors are made from timber, metal fire-resisting doors, which meet the appropriate standard, can often be used for the same purpose. However, there are situations where they are more appropriate. Most metal fire-resisting door manufacturers will require the use of bespoke frames and hardware for their door sets. Metal fire resisting doorsets are not usually fitted with intumescent strips.

Composite doors

A relative newcomer to the market of fire resisting doors, composite doors are made from a number of different materials in combination to provide a cost-effective solution. Materials include timber for framing, particle board for infill panels, glass reinforced polyester (GRP) for faces and edges, PVC for faces etc. Such doors do not have as long a history of fire testing and certification as timber and metal doors do and so the assessor must check whatever is supplied carefully.

Alternative door hanging

Although the most common method of hanging a door is to use single axis hinges, alternative methods are employed where the door is required to be double swing or mounted on pivots for other reasons such as finger trap protection and emergency access for normally inward opening doors. Floor mounted controlled door closing devices are the most common method regularly found with timber, glass and steel doors while transom mounted devices are commonly used with aluminium sections.



Replacement hinge is unsuitable and badly fitted to door

Self-closing devices

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

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

These devices are designed to hold open self-closing fire doors or allow them to swing free during normal use. In the event of a fire alarm the device will then release the door automatically, allowing the self-closing mechanism to close the door. Such devices are particularly useful in situations where self-closing doors on escape routes are used regularly by significant numbers of people or by people with impaired mobility who may have difficulty in opening the doors. Typical examples of such devices include:

- electro-magnetic devices complying with BS EN 1155 (low voltage) or BS 5839: Part 3 (mains voltage) fitted to the fire resisting door which release when the fire detection and warning system operates, allowing a separate self-closer to close the door. Where such devices are separate from the door closer, they should be fitted in a manner that avoids twisting of the door which may cause damage e.g. by causing warping and preferably on the same level as the closing device.
- electro-magnetic hold open devices within the controlled door closing device (complying with BS EN 1155) which cease to function on the operation of the fire detection and warning system; and
- 'free swing' controlled door closing devices, which operate by allowing the door leaf to work independently of the closing device in normal conditions. An electro-magnetic device within the spring mechanism linked to the fire detection and warning system ensures that the door resumes self-closing on the operation of the system.

Automatic door hold open/release devices fitted to doors protecting escape routes should only be installed in conjunction with an automatic fire detection and warning system incorporating smoke detectors, that is designed to protect the escape routes in the building. In all cases the automatic device should release the fire-resisting door allowing it to close effectively within its frame (latching securely if a latch is fitted) when any of the following conditions occur:

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

Acoustically activated door release mechanisms

An acoustically activated door release mechanism complying with BS EN 1155 may be installed in some cases. However, this type of hold open device is not suitable for use where:

- The premises do not have a fire alarm system
- The door is a fire door serving the only escape stair in the building (or the only escape stair serving part of the building);
- The initial fire alarm warning signal is intended to alert staff only
- The fire alarm sounders may be muted or the sound level reduced; or
- The fire alarm system incorporates a voice alarm.

This type of device could fail to operate where a single fire alarm sounder failure may result in a drop in sound pressure. It also will not operate in response to electrical mains failure or during an alarm fault or failure condition.

Door coordinators

Where pairs of doors with rebated meeting stiles are installed, it is critical that the correct closing order is maintained. Door coordinators to BS EN 1158 should be fitted and be fully operational in all cases where the doors are self-closing.

Installation and workmanship

The reliability and performance of correctly specified fire-resisting doors can be undermined by inadequate installation. It is important that installers with the necessary level of skill and knowledge are used. Certification schemes for installers of fire-resisting doors are available. Fire-resisting doors and shutters will require routine maintenance, particularly to power operation and release and closing mechanisms. Qualified Fire Door Inspectors are also available under the FDIS scheme.

Voids in a fire door

Door-fastening devices

Door fitted with emergency exit device

Any device that impedes people making good their escape, either by being unnecessarily complicated to manipulate or not being readily operable is not acceptable. However, it is recognised that in many cases the need for security will require some form of access control. Electronic devices must be connected to the fire alarm system, so they fail open in a fire emergency. Mechanical devices such as digital locks should be operated by lever handles, not knobs, and should be the only device requiring manipulation to open the door. In premises where there are members of the public present or others who are not familiar with the building, panic exit devices (i.e. push bars or touch bars) should be used on final exit doors. See BS EN 1125 for further information.

Premises that have limited numbers of staff or others who are familiar with the building and where panic is not likely may use emergency exit devices (i.e. push pads or lever handles with emergency escape locks). See BS EN 179 for further information. In some larger premises, when only staff are on the premises and there is a security issue, it may be acceptable to restrict the number of emergency exits immediately available, e.g. when only security staff are present at night, or prior to opening the premises in the morning. Staff should be made fully aware of any restrictions and the number of exits not immediately available should be limited.

Third Party Certification

In addition to the third-party certification scheme labels shown in 8.2.1 operated by BM TRADA and BWF CERTIFIRE, Kiwa/IFC Certification, UKTC, BRE/LPCB and Blue Sky Certification also offer schemes.

The scheme run by BM TRADA also used the labelling system shown right for doors installed prior to 1996.

B.W.F. Scheme for identification of fire resisting door leaves in accordance with BS 476 Part 8: 1972.

Fire Resistant Ratings	Intumescent Necessary	Intumescent Not Necessary Green Core
30/20 (White background)		
30/30 (Yellow background)		
60/60 (Blue background)		
With specified Intumescent In frames or doors 30/30	White Background Blue Core	

Remember — Red Core or Blue Core means Intumescent must be fitted in accordance with manufacturers instructions either in the door or frame. Green Core means you can carry on fixing as Intumescent has been fitted under lipping.
TRADA having similar coding system with a tree shape as centre core.

Further guidance on fire doors and fire resisting ironmongery can be found here:

ASFP Green book on Fire resisting doors (in course of preparation)
ASFP Advisory Note on Fire doors and the prohibition of national testing and classes to verify performance
https://asfp.org.uk/page/ASFPTechnicalDocuments

BS 8214:2016 Timber-based fire door assemblies. Code of practice contains guidance and recommendations for the specification, installation and maintenance of timber-based fire doors (up to 2 hours fire resistance), covering fire door assemblies and door leaves.

Door and Hardware Federation and the Guild of Architectural Ironmongers' Code of Practice – Hardware for Fire and Escape Doors https://is.gd/v7j2ue

The British Woodworking Federation Fire Door Alliance website contains useful information for fire risk assessors here: https://is.gd/dZoMVi

Appendix B of the fire risk assessments guides for each building type published by CLG https://is.gd/hB1U1h

The Association for Specialist Door Manufacturers website contains useful information for fire risk assessors here: https://is.gd/ipS5Km

They have also published a Best Practice Guide which can be downloaded from: https://is.gd/Lmvuo1

The Intumescent Fire Seals Association has published some Information sheets on the use of intumescent seals in doors and glazing system which can be downloaded from: http://www.ifsa.org.uk

Risk assessment guidance on intumescent seals here: https://is.gd/QcBViQ

Annex D – Construction of walls and floors forming escape routes

Fire-resisting walls

Common examples of types of wall construction that provide 30-minute fire resistance to escape routes if constructed to the above standards are:

- internal framed construction wall, non-load bearing, consisting of 72mm x 37mm timber studs at 600mm centres and faced with 12.5mm of plasterboard with all joints taped and filled
- internal framed construction, non-load bearing, consisting of channel section steel studs at 600mm centres faced with 12.5mm of plasterboard with all joints taped and filled; and
- masonry cavity wall consisting of solid bricks of clay, brick earth, shale, concrete or calcium silicate, with a minimum thickness of 90mm on each leaf.

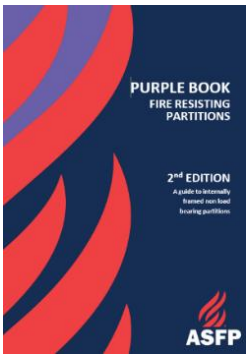
In many buildings proprietary internal partitions (usually, but not always plasterboard based) will be used. These are usually tested to British or European Standards as follows:

- Non-loadbearing walls and partitions – BS 476: Part 22 or EN 1364-1 1999
- Loadbearing walls and partitions – BS 476: Part 21 or EN 1365-1

It should be possible for the fire risk assessor to verify if these have been constructed correctly by reference to appropriate supporting information which should reside in the CDM file or Regulation 38 information (England and Wales only).

Further guidance on fire resisting partitions can be found below

ASFP Purple Book: Fire resisting partitions 2nd Edition, a guide to internally framed nonloadbearing partitions (right). This is currently being extensively revised and a 3rd edition is expected in spring 2026.



Siniat Drywall manual (left) which can be downloaded from: https://is.gd/3Lsqxy

British Gypsum White Book (right) which can be downloaded from: https://is.gd/Mh6OlF

Fire-resisting floors

In larger and/or modern buildings, the fire resistance of the floor is usually provided by a concrete floor on a steel or concrete framework. Older, smaller and timber framed buildings are likely to have timber joist floors, the fire resistance of which will depend on the existing floor construction as well as the type of ceiling finish beneath. In older buildings there may be a requirement to provide fire resistance between beams and joists.

A typical example of a 30-minute fire-resisting timber floor is tongue and groove softwood of not less than 15mm finished thickness on 37mm timber joists, with a ceiling below of one layer of plasterboard to a thickness of 12.5mm with joints taped and filled and backed by supporting timber.

The fire resistance of loadbearing floors is evaluated by testing to BS 476: Part 21: 1987 or EN 1365-2 1999. Any fire protection to floors will have been approved during the building control process and the assessor only needs to look for breaches or damage whilst checking for other items. If found, these it should be noted in the risk assessment and call for a more thorough third-party inspection.

There are other methods and products available which will achieve the required standard of fire resistance. If the FRA is unsure as to how the building is constructed, then the assessor should ask for an appropriate survey from an independent third-party inspection organisation.

Fire resisting floor supported on a steel frame

Annex E – Fire resistant glazing

The fire resistance of glazed screens, either as part of a partition or as a separate element is evaluated by testing to BS 476: Part 22: 1987 or EN 1364-1 1999.

Fire resistant glass types

Different types of Fire Resisting glass

Fire-resistant glass must only be used as part of a fire-resistant glazed system. Such a system includes the glass, together with the glazing seal, beads, bead fixings, the frame and the fixings of the frame to the surrounding structure. All these components must be compatible under fire conditions, and the full system must have been proven as an integrated assembly. It is never acceptable to mix-and-match components from different fire-resistant glazed systems.

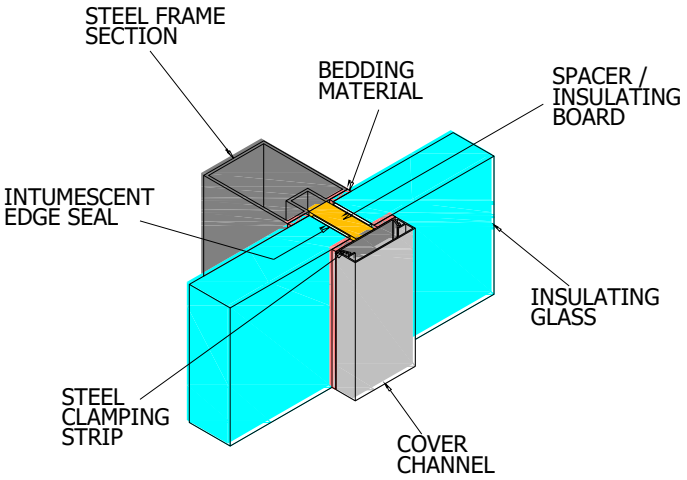
A variety of different technologies can be used for fire-resistant glass. For integrity performance, these include wired glass (where the wire mesh is within the body of the glass), modified toughened soda lime glass, glass ceramic, toughened borosilicate and fire-resistant plastic interlayer laminate (either clear or wired). Both integrity and integrity with insulation performance are provided by gel-filled units and special intumescent laminates.

In all cases, specific performance details should be obtained directly from the manufacturer, since performance differs from one glazed system to another.

Types of framing system

A variety of different framing systems are approved and include timber, steel, aluminium and composite frames which may involve a combination of materials (such as calcium silicate boards with metal covers). Each system must be separately approved, based on test evidence for that particular system.

So-called frameless, or butt-jointed, systems are also available where any framing is reduced to the minimum of top and bottom supporting cills. In these systems, the vertical joints typically contain a fire-rated seal compound. Similar systems are also available with vertical minimal width profiles used to cover the vertical joint, allowing decorative effects to be applied on the profile. In all cases, the application will be governed by the system approval, which will define the frame dimensions, overall assembly size, glazing details and applicable glass pane sizes. Substitutions of components in approved systems must not be made without appropriate approval e.g. an assessment by a UKAS accredited test laboratory or a fire consultant specialising in that type of construction.



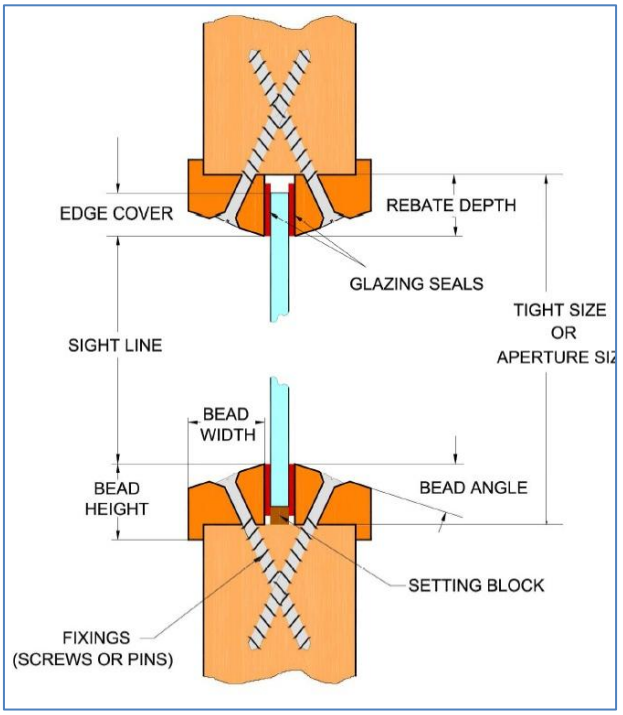
Typical components of a steel fire resisting glazed screen

Marking of the glass

A fire-resistant glass should be clearly marked with an indelible and permanent mark, which should, as a minimum, show the glass product name, the safety impact rating, if required, according to BS 6206: 1981: *Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings* and the. This applies, in particular, to clear fire-resistant glass types that cannot easily be distinguished from non-fire rated clear glass types.

This mark should be visible and legible after installation so that it can be readily checked, for example, during fire risk assessments. If this is not the case, then the supplier should be asked to confirm the product and its marking.

Note: The marking on the glass, however, should not necessarily be taken as applying to the fire performance of the system as a whole. The fire performance of the system has to be confirmed by reference to the original documentation provided on installation.



Section through glazing in a timber door

Further guidance on fire resisting glazing can be found here:

ASFP Clear Book on fire resistant glazing in course of preparation.

Glass and Glazing Federation (GGF) provide several guidance documents on fire resisting glass here: https://is.gd/I5Qw0h

GGF Guide to Best Practice in the Specification and Use of Fire-Resistant Glazed Systems which is available to download from: https://is.gd/w6Xioz

Annex F – Fire-resisting ceilings

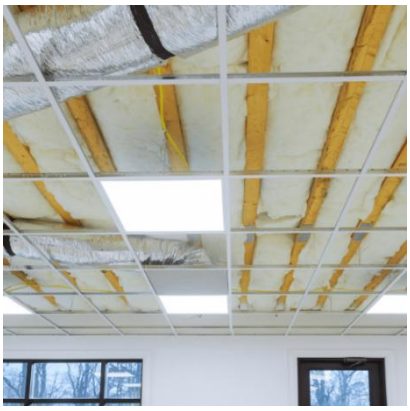
There are various types of fire-rated ceiling, and it is essential that the fire risk assessor understands the role of the ceiling in providing fire resistance (if any). Essentially there are three types of fire resisting suspended ceiling:

1. BS 476: Part 23 compliant: This test measures the contribution a suspended ceiling can make to the fire performance of steel beams. This test the least onerous of the BS 476: Parts 20 to 2 3 tests and is limited solely to evaluating the protection a suspended ceiling can provide.

Schematic of BS 476: Part 23 ceiling to evaluate ceiling protection to steel beams above

2. BS 476: Part 21 compliant: In the Part 21 test, a complete flooring system, including the suspended ceiling, is tested for integrity, insulation and loadbearing capacity. All parts of the construction contribute to this – suspended ceiling, steel or timber beams and the flooring. With the test carried out under a defined design load and with a positive pressure below the suspended ceiling of 18Pa, the Part 21 test is much more severe than that in Part 23. Some ceilings can achieve 60 minutes fire resistance.

3. BS 476: Part 22 compliant: The least tested part of the British Standard is Part 22, where the ceiling element is non-loadbearing and is required to provide an integrity and insulation performance independent from the supporting floor construction. The ceiling may act as a horizontal partition either suspended from a secondary structure or spanning a corridor to provide fire protection. In some instances, there are recommendations for protection in both directions. The ceiling should protect services in the ceiling void from fire in the room or corridor; equally, fire resistance may be needed to safeguard the corridor from burning electrical cables and other services located behind the suspended ceiling.



Typical suspended ceiling with removable ceiling tiles

The correct rating for a suspended ceiling is particularly relevant when considering areas of public access, such as retail premises that may be refitted for aesthetic reasons, to understand the original intention of the suspended ceiling. Should a system tested to Part 21 of BS 476, for example, be replaced with one of a lesser fire rating, such as a Part 23 system, the whole fire strategy may be compromised. Similarly, the removal of an old ceiling system without replacement, due to a change in use of the building, may also materially compromise the fire performance. Ceilings are part of the in-built structural fire protection plans in many instances and must be considered as such when refurbishments or changes of use are planned for buildings.

There are other methods and products available which will achieve the required standard of fire resistance. If the FRA is unsure as to how the building is constructed, then an appropriate survey from an independent third-party inspection organisation should be requested.

Further guidance on suspended ceilings can be found here:

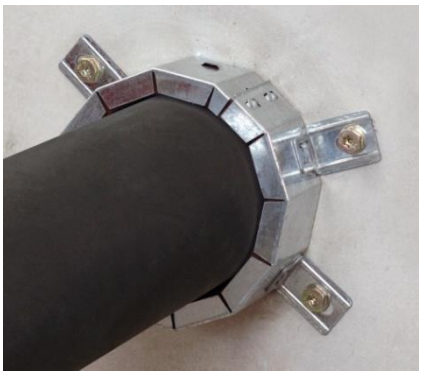
British Gypsum White Book (right) which can be downloaded from: https://is.gd/SeeYhf

Annex G – Fire stopping and penetration seals

Mechanical and electrical services, by necessity, breach fire resisting construction on escape routes and compartment walls and floors will allow the passage of smoke and flame if not adequately fire stopped.

There is a wide range of products that are designed for use as fire-stopping and penetration seals. These include products based upon mineral wool; high and low pressure intumescent, mortars, pillows filled with fire-resistant materials, plugs and blocks, elastomers, putties, foams and mastics.

Evaluation of the fire resistance of fire stopping and penetration seals has traditionally been undertaken by using ad-hoc procedures based on BS 476: Part 22: 1987 as there was no dedicated British Standard for these. Increasingly, manufacturers are using the European standard EN 1366-3 for penetration seals and EN 1366-4 for linear gap seals. The European standards are more rigorous and contain a wealth of guidance on how to test these products.



Caption - correctly installed pipe penetration

This product should *only* be used to seal linear gaps between walls and walls/ floors/ceilings. It cannot be used to seal pipe or cable penetrations unless tested for that end-use

The crucial issues for fire stopping are poor installation and/or the breaching of fire resisting construction on escape routes and fire compartmentation after installation and handover. Unlike e.g. a fire door where any defective remedial work will normally be readily apparent and easily inspected, defects in fire stopping and penetration sealing often remain out of sight and consequently often out of mind. The fire risk assessor in checking for the presence and condition of penetration seals in walls forming escape routes will be able to at least perform a 'first-aid' check on service penetrations. However, to evaluate the condition of fire stopping, inspection other than in areas that are readily accessible, is unlikely to be option and/or too invasive.

The best solution for ensuring fire stopping is installed properly is to use third party certificated contractors who are required to use trained staff whose competence has been evaluated, whose records are subject to audit by the certification body and whose work is subject to random inspection by qualified inspectors.

However, if in the course of 'first-aid' inspection of fire stopping, the assessor discovers significant failings, an appropriate survey from an independent third-party inspection organisation should be requested.

Further guidance on fire stopping and penetration seals can be found here:

The ASFP has published a number of technical documents on elements on firestopping pertaining to risk assessors all available from https://asfp.org.uk/page/ASFPTechnicalDocuments

- Red Book – Firestopping: linear joint seals, penetration seals and small cavity barriers
- Technical Guidance Document 17: Code of practice for the installation and inspection of fire stopping systems in buildings: Linear joint seals, penetration seals, small cavity barriers
- Advisory Note 1: Safe use of horizontal firestopping
- Advisory Note 0.5: On the unsuitability of polyurethane foams for use in penetrations seals and another of guidance for fire stopping combustible pipes up to 40mm in diameter

The Intumescent Fire Seals Association has published some Information Sheets & Risk Assessment Communiqués on the use of intumescent seals penetration seals which can be downloaded from: https://is.gd/XcESeH

Annex H – Fire dampers

Fire dampers have a vital role to play in the provision of life safety in buildings. The following is offered to assist fire risk assessors when undertaking assessments.

Suitability of fire dampers

Fire dampers activated by fusible links are not generally suitable for protecting escape routes unless they are a fire and smoke damper (60-minute ES classification when tested to BS EN 1366-2).

Fire dampers are not generally suitable for extract ductwork serving kitchens because of the likely build-up of grease which can affect their activation.

Fire dampers should be situated within the thickness of the fire separating element and be securely fixed. It is also necessary to ensure that, in a fire, expansion of the ductwork would not push the fire damper through the structure.

Fire dampers should be tested to BS EN 1366-2:1999 and be classified to BS EN 13501-3:2005. They should have an E classification equal to, or greater than, 60 minutes. Intumescent fire dampers may be tested to ISO 10294-5. Fire and smoke dampers should also be tested to BS EN 1366-2:1999 and be classified to BS EN 13501-3:2005. They should have an ES classification equal to, or greater than, 60 minutes.

Fire damper

Fire dampers tested using ad-hoc procedures based on BS476 may only be used for 'fan-off' situations. One cannot get an E or ES classification for a damper tested to BS 476, so dampers for sleeping risk areas and escape routes should be tested to BS EN 1366-2.

Maintenance of fire dampers (BS 9999)

Guidance on the maintenance of fire dampers can be found in:

1. BS 9999 2017 Code of practice for fire safety in the design, management and use of buildings as follows:

Annex W (normative): Routine inspection and maintenance of ventilation and air conditioning ductwork states: All fire dampers should be tested by a competent person on completion of the installation and at regular intervals not exceeding 2 years, and to be repaired or replaced immediately if found to be faulty. Spring-operated fire dampers should be tested annually and fire dampers situated in dust-laden and similar atmospheres should be tested much more frequently, at periods suited to the degree of pollution.

Annex V (normative): Routine inspection and maintenance of fire safety installations. This requires smoke control systems and their components (SHEVS) to be tested as often as weekly, however these are outside the scope of this publication which concentrates on PFP.

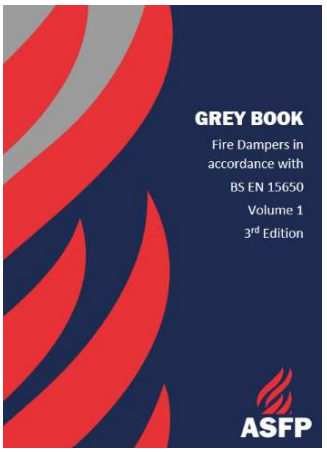
2. BS EN 15650 Annex D

This includes a table of recommended inspections which should be carried out every 3 months.

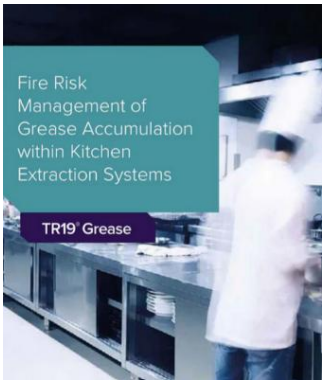
Further guidance on fire resisting dampers

The ASFP has published a number of technical documents on fire resisting ducts pertaining to risk assessors all available from https://asfp.org.uk/page/ASFPTechnicalDocuments

- ASFP Grey Book – Fire dampers (European standards) 2nd edition
- TGD20: Fire test standards and the Construction Products Regulation in relation to fire resisting ventilation and smoke control ductwork (in conjunction with BESA and ADCAS)



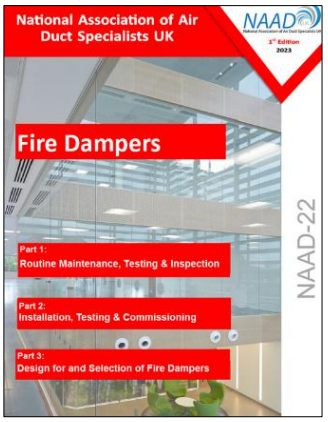
BESA has a number of publications on fire dampers (and ducts) that compliment ASFP documents including:



- TR19 - Grease Specification for Fire Risk Management of Grease Accumulation Within Kitchen Extraction Systems
- DW144 – Specification for Sheet Metal Ductwork
- DW145: Installation and Maintenance of Fire Dampers: A Guide to Good Practice

NAADUK has one relevant publication:

- NAD 22: Fire Dampers including part 1 Routine Maintenance and Inspection here: https://is.gd/omRCSM



Annex I – Ducts

Fire resisting ducts

Fire resisting ductwork may need to pass through fire resisting construction on escape routes and compartment walls or floors that will have prescribed fire resistance periods in terms of load-bearing capacity, integrity and insulation, for durations of 30 to 240 minutes. It is a requirement that where these walls/floors are penetrated by ducts or other building services, the fire performance criteria for the penetrated wall or floor are maintained, such that fire in one compartment may not spread to other areas. The periods of integrity and insulation, and leakage where required, should in all cases be at least equal to those required for the penetrated element of construction. In certain circumstances, controlling authorities may waive the insulation requirement or allow a reduced period of insulation, for example, in some car parks, where enforcers consider that there is not a possibility of combustible materials being in close proximity of the ductwork. The fire risk assessor will need to verify if this approach has been followed.

The fire resistance of ducts is evaluated by testing to BS 476: Part 24 or BS EN 1366 parts 1, or 5, or 8, or 9. From 1 July 2013, all ducts have to be CE marked and classified to BS EN 13501, part 3 or part 4. The test evaluates the ability of a representative duct assembly to resist the spread of fire from one compartment to another. The performance of the duct assembly is measured in terms of its ability to withstand exposure to high temperatures, by evaluating it against criteria for the fire containment (integrity), the thermal transmittance (insulation) and the leakage rate. Two ducts are tested, one where the fire is outside (Duct A), and one where the fire is inside (Duct B). Both ducts should be tested in horizontal and vertical orientations to cover all end-uses.

Support and sealing

Because the primary reason for providing fire-resisting ductwork is to maintain the fire resistance of a compartment wall or floor, it is critical that the correct method of sealing any gaps around the ductwork is used where it passes through – particularly on fire resisting construction on escape routes. This detail is one of the most common reasons for the failure of the ductwork systems in fire. Maintenance of separation is usually achieved in one of two ways:

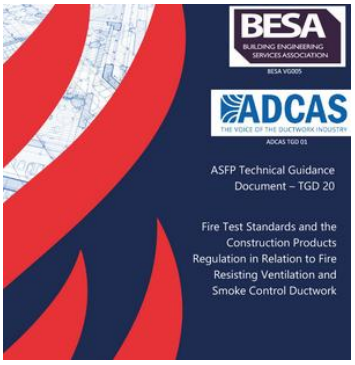
i. For fire resisting ductwork a penetration seal is fitted between the duct and the wall or floor. The penetration seal and the ductwork are considered as one integral system and must be the same as that tested or assessed in accordance with the appropriate standard. It is not possible to use a fire resisting duct with a sealing system that has not been tested or assessed, and it is critical that this also takes into account the type of wall of floor the ducts is to penetrate.

ii. For non-fire resisting ductwork a fire damper must be fitted in the plane of the wall or floor. The damper and associated penetration seal must be installed to a procedure substantiated by test. Note that the damper must be mounted in the wall or floor and must be supported/ restrained independently of the ductwork (see annex H on dampers above).

Further guidance on fire resisting ducts can be found here:

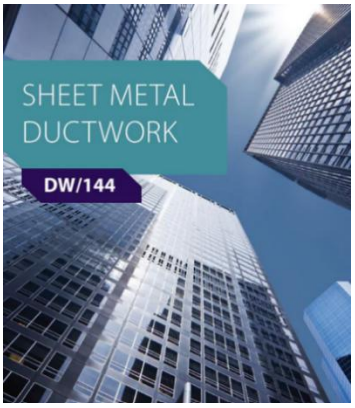
The ASFP has published a number of technical documents on elements on firestopping pertaining to risk assessors all available from https://asfp.org.uk/page/ASFPTechnicalDocuments

- ASFP Blue Book – Fire Resisting Ductwork tested to BS 476: Part 24: 3rd edition
- ASFP Blue Book – EU, Fire Resisting Ductwork classified according to BS EN 13501 Parts 3 and 4, 2nd edition
- TGD20: Fire test standards and the Construction Products Regulation in relation to fire resisting ventilation and smoke control ductwork (in conjunction with BESA and ADCAS)



BESA have a number of publications on fire dampers (and ducts) that compliment ASFP documents including:

- DW144 – Specification for Sheet Metal Ductwork



Annex J – External Walls

There is a huge variety of external wall systems used on buildings in the UK and around the World varying from traditional brick and block construction to timber frames, structural framing solutions (SFS), Structurally Insulated Panel Systems (SIPS), curtain walling and other forms of façade.

To provide guidance on them all is outside the scope of this publication. However, listed below are some technical documents from trade associations that have expertise in this area.

The ASFP is forming a new Technical Task Group (TG14) to address the many and varied issues with facades that have arisen since the Grenfell Tower fire in 2017. Albeit many of the documents referred to date from before the fire, the guidance is valid nonetheless.

- Council for Window and Cladding Technology (CWCT) technical documents guides https://is.gd/4fFRZH and technical notes https://is.gd/ZoxCG2
    - TN113 - Fire performance of facades – Introduction
    - TN114 - Fire performance of facades - Use of combustible material
    - TN116 – Fire performance of facades – Application to built-up walls.
- Metal Cladding and Roofing Manufacturers Association general guidance documents https://is.gd/hgQrYC
    - GD36 cavity barriers for ventilated rainscreen façades https://is.gd/PJcbjN
- Structural Timer Association (STA) technical documents https://is.gd/hJyaid gives access to several Advice Notes and other documents including Cavity Barriers Best Practice and a suite of fire mitigation papers.

Annex K – Fire protection to structural steel

Section B3, Internal fire spread (structure), of the Building Regulations, states that: 'The building shall be designed and constructed so that, in the event of fire, its stability will be maintained for a reasonable period". Structural steel fire protection is required to preserve the stability of the building in the event of a fire. There are three generic types of fire protection for structural steelwork:

a) Intumescent (reactive) coatings

Intumescent coatings (paints) are specially formulated to swell up and form a protective insulating char in the event of a fire. They are usually spray applied as a thin film and are often available with a range of topcoats in different colours so that the designer can achieve appropriate aesthetic needs as well as those of fire protection on visible steel. Unfortunately, this means that intumescents are visibly identical to normal paint and so it is crucially important that records of the installation are maintained.

Intumescent (reactive) coating on cellular beams

b) Cementitious products

Cementitious products based on gypsum or Portland cement binders are normally applied by low pressure spray techniques to the profile of the steel section to be protected. These materials contain low density aggregates and rheological aids to help the application characteristics. Fire protection is provided to the steel by these materials in two ways, the first being the 'cooling effect' as the trapped moisture (physically and chemically bound) evaporates as the temperature of the surrounding fire increases. Secondly once all the moisture has turned to steam the product then behaves as a thermal insulation material.

Spray protection to structural steel

c) Board and casing systems

Board and casing systems use materials such as ceramic wool, mineral wool, gypsum-based boards, calcium silicate and vermiculite to provide fire protection to steel. These products provide fire protection in the same way as cementitious products and are dry fixed around the steel using clip, pin, noggin, adhesive and screw systems.

Evaluation of fire protection to structural steel involves fire testing a number of loaded and unloaded sections of varying sizes and then using a number of assessment techniques to predict the amount (thicknesses) of fire protection needed to cover all the different shapes, sizes and section factors (ratio of perimeter area to cross section) encountered in buildings. Traditionally this has been undertaken by testing to BS 476: Part 21 1987 and then using assessment methodologies used in the ASFP Yellow Book. Increasingly, manufacturers are using the European standards EN 13381-8 (reactive products) and EN 13381-4 (non-reactive products) which include both the test and assessment methods. Guidance on the use of these is also included in the ASFP Yellow Book.

Board fire protection to steel

Cellular Beams

Cellular Beams or beams with holes in them to allow the passage of services are increasingly being used for architectural (aesthetic and space saving) reasons. Such beams require a more detailed evaluation of their fire protection due to their different mode of failure under load. A new European standard is being developed (EN 13381-9) and guidance on this is also included in the ASFP Yellow Book.

If the fire risk assessor discovers significant damage or omission of fire protection or has reason to suspect that non-fire resistant materials have been used, the assessor should call for a more thorough and possibly invasive inspection by a third party inspector.

Further guidance on fire protection to structural steelwork can be found here:

The ASFP has published a number of technical documents on elements on structural steelwork here: https://asfp.org.uk/page/ASFPTechnicalDocuments

- ASFP Yellow Book – Fire protection for structural steel in buildings – 6th Edition
- TGD 11 – Code of practice for onsite use of Intumescent coatings for fire protection of structural steelwork
- TGD 14 – Code of practice installation and inspection of board systems for the fire protection of structural steelwork
- TGD 15 – Code of practice for sprayed nonreactive coatings for fire protection of structural steelwork
- TGD 16 – Code of Practice for off-site applied thin film intumescent coatings for the fire protection of structural steelwork

Annex L - Sandwich panels

Mineral wool cored sandwich panel

Insulated core panels are often used as exterior cladding or for internal structures and partitions in buildings. They normally consist of a central insulated core, sandwiched between an inner and outer metal skin with no air gap. The external surface is coated with a polymeric coating (usually PVC) to improve weather resistance and/or the aesthetic appeal of the panel. The central core can be made of various insulation materials, ranging from non-combustible mineral wool through to highly combustible polymeric foams.

Differing fire hazards are associated with common types of insulation, when the panels are subjected to certain temperatures. Typical examples are:

- Mineral wool which is **Euroclass A1** and will not contribute at any stage of a fire. Production of smoke and toxic gases is minimal.
- Glass wool, also **Euroclass A1**. Production of smoke and toxic gases is minimal. However, it does melt between 800 and 900C so it is usually only suitable for lower period of fire resistance than mineral wool.
- Modified phenolic will produce surface char and little smoke or gaseous combustion products, at temperatures above 230°C.
- Polyisocyanurate (PIR)/polyurethane (PUR) will char and will generate smoke and gaseous combustion products, at temperatures above 430°C PIR and 300°C PUR.
- Expanded polystyrene (EPS) will melt and will generate smoke and gaseous combustion products, at temperatures above 430°C.

Insulation charring can lead to panel delamination/collapse, and the gaseous combustion products can quickly fill areas with toxic gases such as carbon monoxide and styrene. A number of fires in buildings where insulated panels have been used extensively in the fabric of the building have highlighted the particular dangers that may be associated with this form of construction, i.e. where the fabric of the building can contribute to the fire hazards. In a fire the following may occur:

Tall buildings in warehousing/food factories constructed from sandwich panels

- Early buckling and falling away of the facing materials
- Burning of the combustible insulating material
- Production of large quantities of dense, toxic smoke
- Rapid heat generation
- Early loss of structural strength can result if the system has not been properly designed, and this can lead to the collapse of the wall, partition or ceiling
- There may be cavities in older buildings where the panels are used as an internal envelope, enabling fire to spread unnoticed.

Further guidance on sandwich panels can be found here:

MCMRA has produced a number of guidance documents here: https://is.gd/hgQrYC

Annex M – References and Regulatory Documents

Building regulation and fire safety legislation in the United Kingdom

England & Wales

The Building Regulations 2010 and its subsidiary legislation regulate new building work or material alterations to existing buildings. Guidance on fire safety is given in Approved Document B.

The Regulatory Reform (Fire Safety) Order (the 'Order') 2005 regulates fire safety of buildings in use. Further information is available at https://is.gd/8vzZs4

- Regulation 38 (formerly 16b) of the Building Regulations 2010 requires that where building work involves the erection or extension of a relevant building, or a relevant change of use, then fire safety information shall be given to the responsible person at the completion of the project, or when the building or extension is first occupied.
- 'Fire safety information' means information relating to the design and construction of the building or extension, and the services, fitting and equipment provided in or in connection with the building or extension, which will assist the responsible person to operate and maintain the building with reasonable safety.
- 'Relevant building' is to which the Order applies or will apply after the work is completed.
- 'Responsible person' has the meaning given in Article 3 of the Order.

An overview of what information is required in terms of PFP measures is provided in Regulation 38 section of Approved Document B Volume 1 & 2: Fire Safety.

Golden Thread

Since October 2024, the Regulation 38 requirement in England for high-risk residential buildings is to produce and keep a 'golden thread' of information throughout the construction and occupation of the building including every fire safety management measure, and a record where each of those measures is located. Further information is given here: https://is.gd/irpeWG

Scotland

In Scotland the Building (Scotland) Regulations 2004 (Scottish Statutory Instrument 2004 No. 406,), regulate new buildings or alterations. The Fire (Scotland) Act 2005 regulates fire safety of buildings in use. Guidance is contained in the Scottish Technical Handbooks which can be downloaded from: https://is.gd/RUuZf5

Northern Ireland

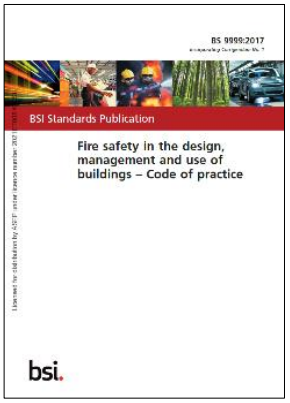
In Northern Ireland the Building Regulations (Northern Ireland) 2000 (Statutory Rule 2000 No. 389, (as amended)) regulate new building work or material alterations to existing buildings. Guidance on achieving these requirements is contained in Technical Booklet E. Further information is available at https://is.gd/BWyPcr

Technical Booklets can be downloaded from https://is.gd/NLc9Nq

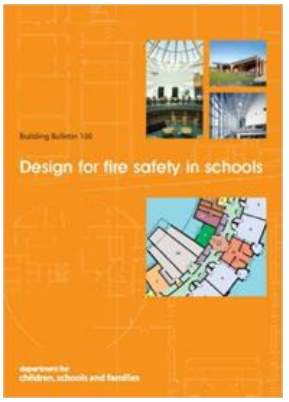
Supporting Documents

- Risk Assessment Guides for buildings in different types of occupation available from: https://is.gd/hB1U1h
- Department of Health HTM 05 Series, available from https://bit.ly/4f2hqq7 including
  - HTM_05-01 Managing healthcare fire safety
  - HTM_05-02_2015 Guidance in support of (Fire safety in the design of healthcare premises)
  - HTM_05-03_Part_A_Final General fire safety
  - HTM_05-03_Part_J Guidance on fire engineering of healthcare
  - HTM_05-03_Part_M_Final Guidance on the fire safety of atria

- BS 9999: 2017 Code of practice for fire safety in the design, management and use of buildings
- BS 9991: 2024 Fire safety in the design, management and use of residential buildings. Code of practice



- University Health and Safety Association Guidance on the Preparation of a Generic Fire Design Guide. http://is.gd/QLE7Fr
- Local Government Group - Fire safety in purpose-built blocks of flats available from: https://is.gd/t9F217
- The Department for Children, Schools and Families have published Building Bulletin 100 – *Designing &managing against the risk of fire in schools*. http://is.gd/EHwYC9



Insurers Requirements

Insurers' requirements for the protection of property may be higher than those required for life safety. Business continuity is also a consideration which can lead to higher specification of passive fire protection.

Useful information can be found at www.riscauthority.co.uk including free downloads of relevant documentation including:

- Insurers' version of England Approved Document B https://bit.ly/3YLCRpR
- BDM2 - Fire protection of buildings - Core Document – Compartmentation https://bit.ly/4e4YR37
- BDM6 - Fire protection of buildings - Core Document - Protection of openings and service penetrations from fire https://bit.ly/3UvpsQ8
  a) 'Essential principles'
  b) 'Design Guide for the protection of buildings – Protection of openings and service penetrations from fire'

Construction design and management regulations (CDM) 2015

The Construction Design and Management Regulations (CDM) require all concerned in the process from design inception to completion of the building to prepare a file (the CDM file) containing details of all the work undertaken and materials used where safety is concerned. The CDM file can be an invaluable source of information on all aspects of fire safety work in the construction of the building that may be used by the occupant when preparing maintenance plans, modifications to the building or Fire Risk Assessments.

Details are given in: https://is.gd/ZD8DPu

Universities Safety & Health Association (USHA)

USHA has published a guide to Generis Fire design which can be accessed here: https://is.gd/5SUqnH

ASFP

The Association for Specialist Fire Protection (ASFP) is the leading representative body for the passive fire protection sector. It was formed in 1976 in recognition of a need to bring together passive fire protection manufacturers, contractors and testing/certification bodies to encourage, develop and give guidance on essential standards in passive fire protection.

The ASFP serves and represents the needs of its members and the wider passive fire protection industry, by raising standards and competence through training, testing, certification and quality of installation and maintenance. It aims to advance knowledge and guidance on all aspects of 'built-in' fire protection; provide technical support and impartial advice; lead regulatory and behavioural change as an independent authority; and improve competence and quality through training.

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