Passive Fire Protection
and ensuring correct installation

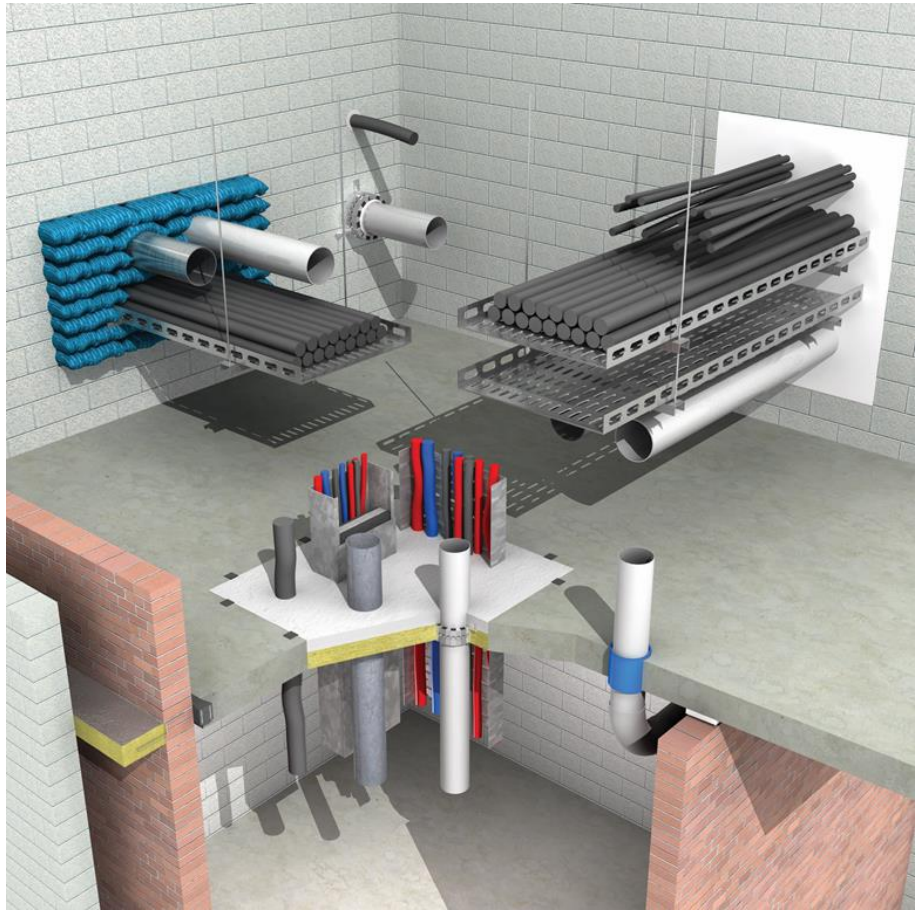
Niall Rowan
Technical and Regulatory Affairs Officer
Association for Specialist Fire Protection

ASFP

- Worked in fire testing for 39 years…
- Joined Warrington Fire Research Centre in 1993
- 1995 drafted 12 CEN European fire resistance test methods
- 2000 Operations manager Warrington Fire Research Centre
- 2005 President of EGOLF
- 2009 Technical Officer for ASFP www.asfp.org.uk
- 2014 Chairman of UK national committee of fire resistance
- England and Wales - Building Regs Advisory Committee (BRAC)
- 2017 CEO of ASFP
- 2021 Technical & Regulatory Affairs for ASFP.

Contents

- Who is the ASFP?
- Passive Fire Protection
- The installation issue
- Fire rated foams – myth and reality
- BSA and FSA (brief)
- Ensuring best practice
    - Third party certification of products & contractors
- Summary



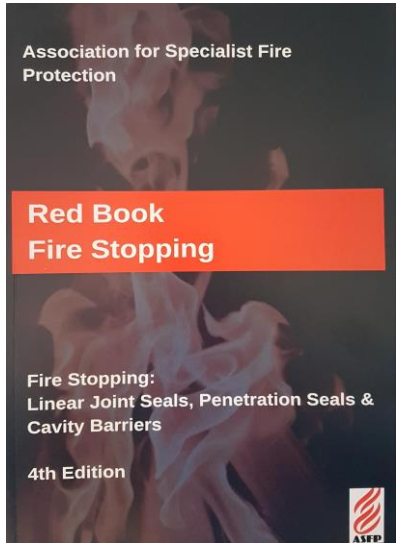
Who is the ASFP?

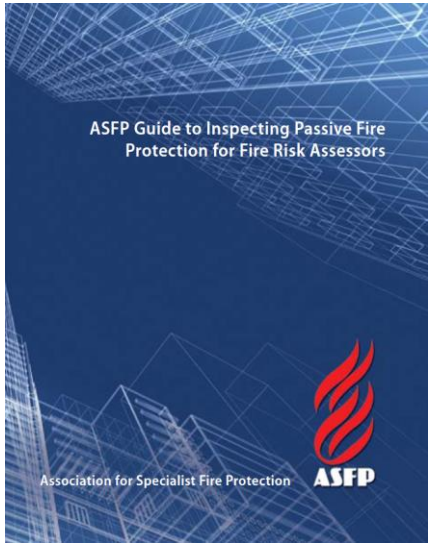
Originally formed in 1975 in recognition of a need to bring together Passive Fire Protection:

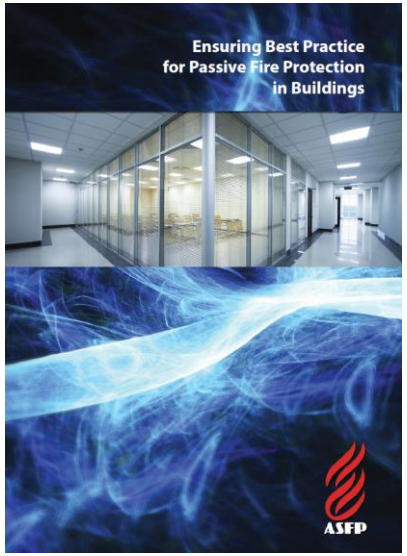
- Manufacturers
- Installation contractors
- Testing/certification bodies
- To encourage, develop and give guidance on essential standards in PFP.

ASFP Resources

1. ‘Colour’ Books – referred to in UK statutory guidance
2. Guide to Passive Fire Protection for Fire Risk Assessors
3. Best Practice Guide to Passive Fire Protection
4. On-site Guide to fire-stopping







5. ASFP Library of YouTube videos
6. Webinar program

Firestopping

13,672 views

27 0 SHARE

ASFP FOUNDATION COURSE IN PASSIVE FIRE PROTECTION

LEVEL 3 CERTIFICATE IN PASSIVE FIRE PROTECTION
LEVEL 2 CERTIFICATE IN PASSIVE FIRE PROTECTION

ASFP

The Institution of Fire Engineers

Ofqual Office of Qualifications and Examinations Regulation

Level 3 Course

Target audience:

- Managers/supervisors/Technical sales staff
- Designers
- Fire risk assessors/Site inspectors

Format:

- 7 days spread over several weeks
- Additional reading up to 300 hrs
- 3 hours examination (IFE)
- ~ ‘A’ level or NVQ at Level 3
- **Leads to TiFireE IFE qualification**

Level 2 Course

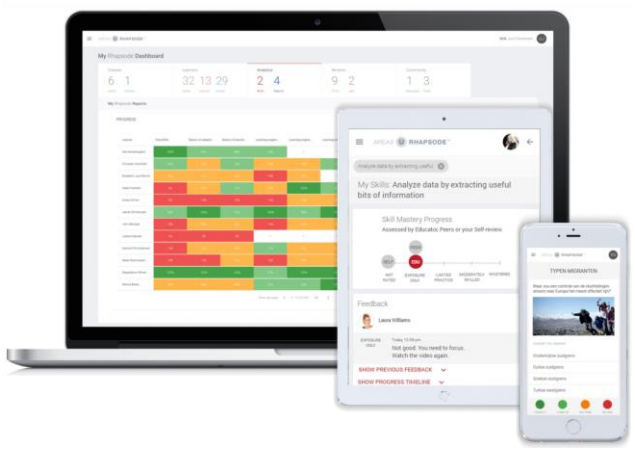
Target Audience:

- Senior site operatives
- Team leaders
- Site supervisors

Format:

- 4 days of classroom style
- Additional UP TO 180 hours
- 1.5 hours examination (IFE)

Now available on line



ASFP Introduction to Passive Fire Protection

Target Audience:

- Site operatives
- New entrants to industry

Format:

- 8 modules
- ½ day of online learning.
- Basic intro to PFP and how it relates to Fire Strategy
- Learners will understand how different PFP works

Passive Fire Protection

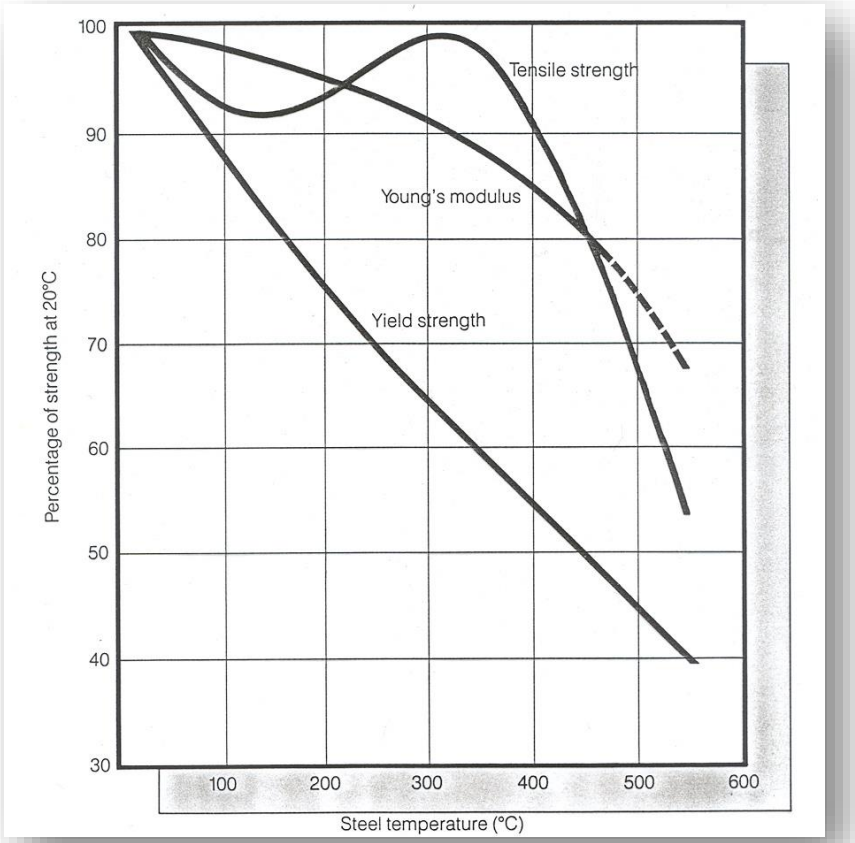
What is it?

“Built-in measures that protect the structure of the building and subdivide it into areas to limit the spread of fire and smoke.”

Structural Fire Protection

To maintain the stability of the structure during the period of the fire and ensure that it does not collapse

Structural steel loses about half its strength at about 500^{O}C.

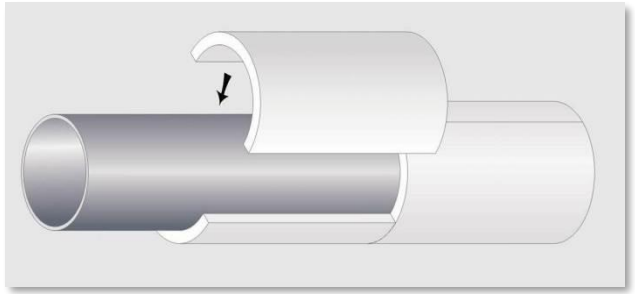


Non-reactive coatings

- Spray or troweled on
- Thick
- Inert
- Sometimes hidden

Non-reactive board/casings

- Mechanically fixed
- Thick (10-50mm)
- Sometimes hidden



Reactive coatings

- Spray or brushed
- Thin (1-4mm)

Compartmentation

- From Building Regulations 2010 – Provision B3
- Compartmentation to resist spread of fire, enable escape, gives Fire & Rescue Services time

Internal fire spread (structure)

B3.—(1) The building shall be designed and constructed so that, in the event of fire, its stability will be maintained for a reasonable period.

(2) A wall common to two or more buildings shall be designed and constructed so that it adequately resists the spread of fire between those buildings. For the purposes of this sub-paragraph a house in a terrace and a semi-detached house are each to be treated as a separate building.

(3) Where reasonably necessary to inhibit the spread of fire within the building, measures shall be taken, to an extent appropriate to the size and intended use of the building, comprising either or both of the following—

(a) sub-division of the building with fire-resisting construction;

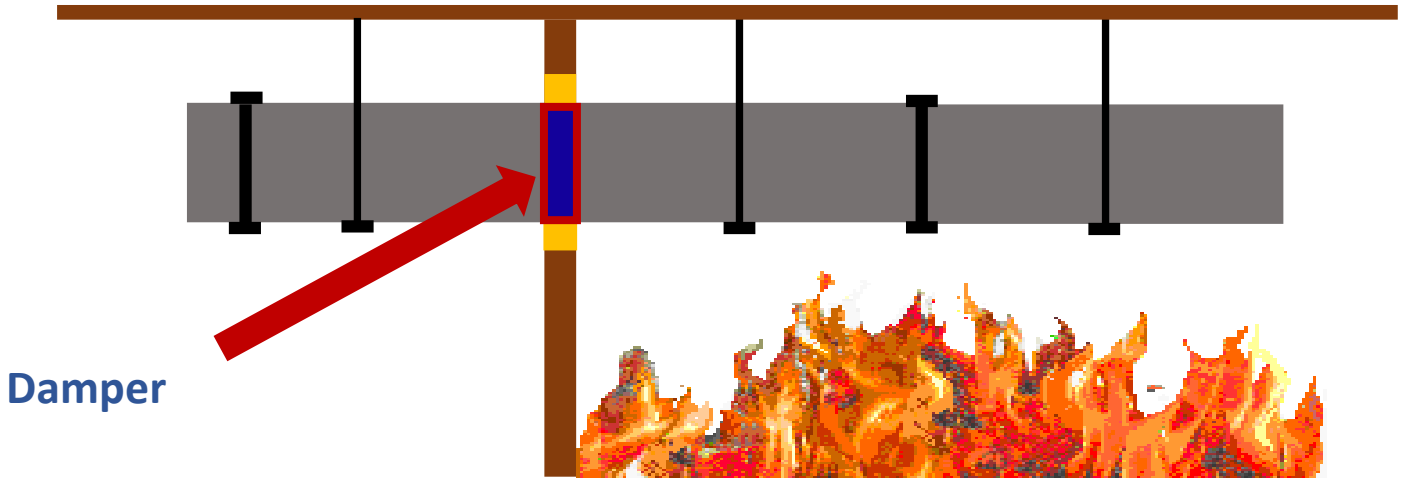
(b) installation of suitable automatic fire suppression systems.

(4) The building shall be designed and constructed so that the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited.

PFP – what is it?

The role of fire dampers

Regardless of the type of barrier in which the damper is to be mounted, the damper should be fixed either within or directly adjacent to the fire barrier and be supported independently of the connecting ductwork.



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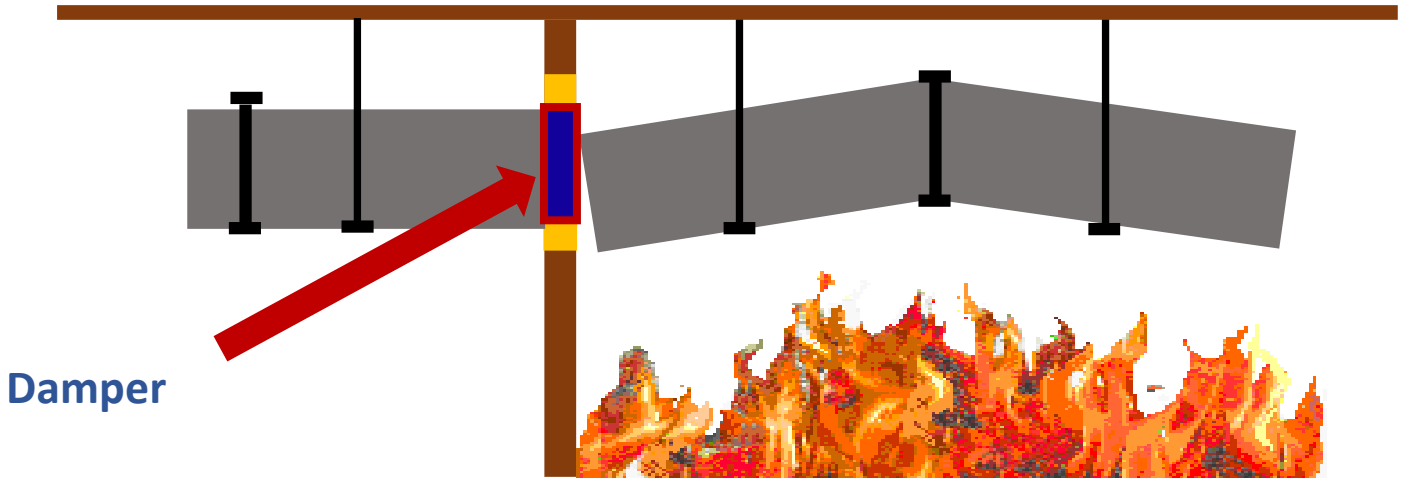
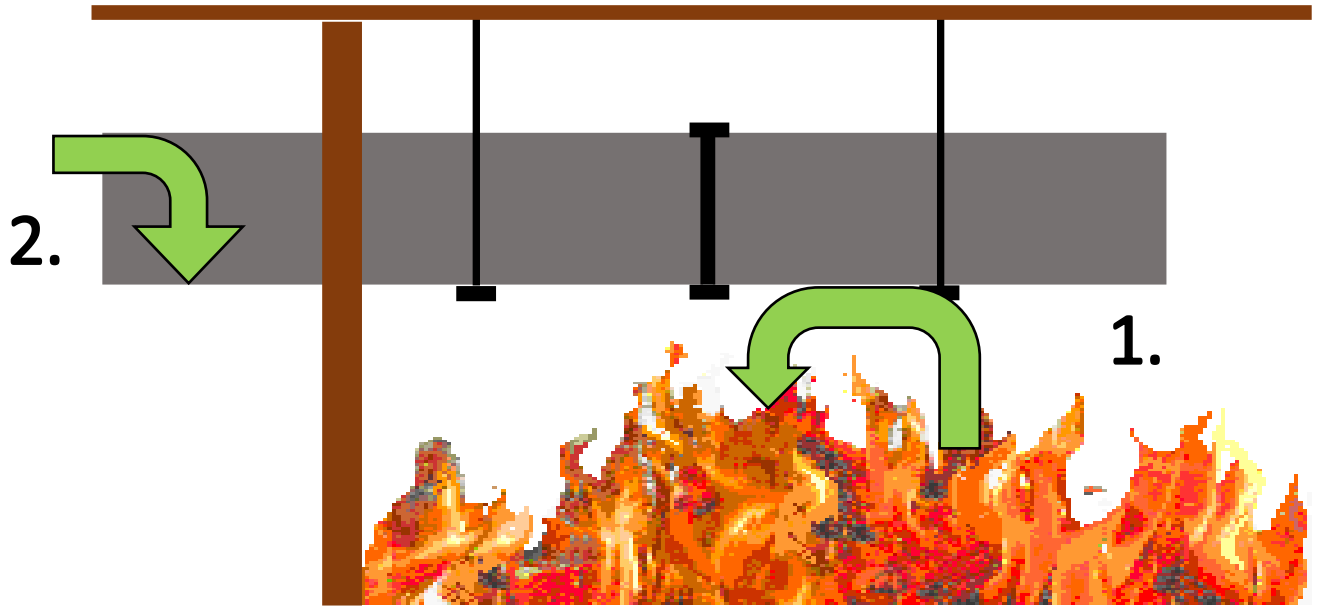


i.e. if the ductwork were to fail from either side of the damper it would continue to act as an integral element of the barrier it is protecting.

The Role of Fire resisting ductwork

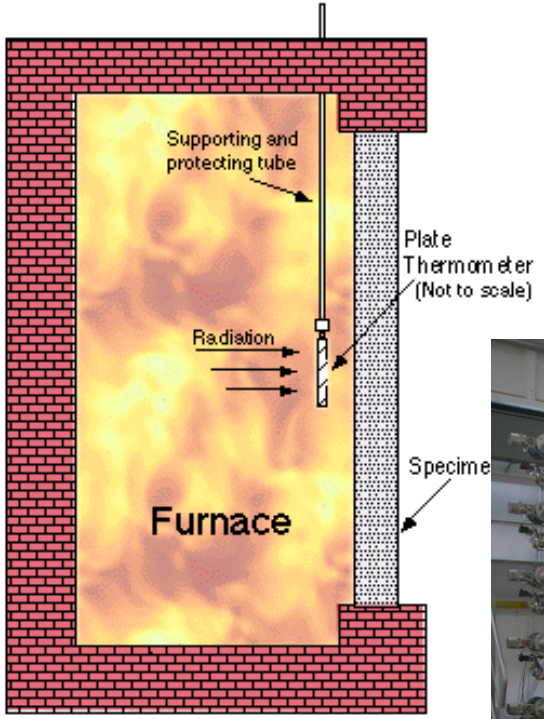
Prevents fire getting:

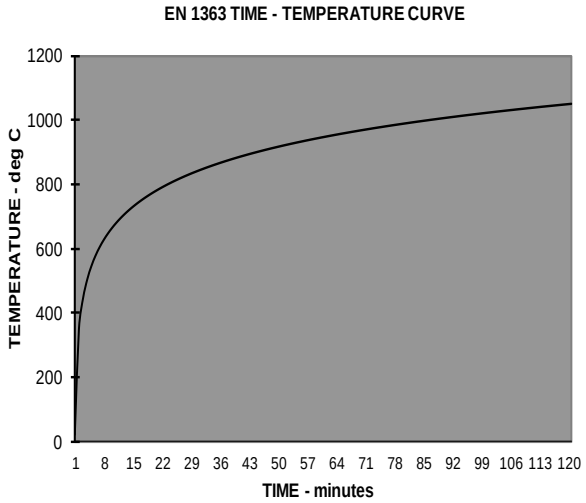
1. Into the duct
2. Exiting the duct if inside



1-4 HOURS

Why Compartmentation is





Why Compartmentation is important

PFP Works - 1

PFP Works - 2

PFP Works - 2

Fire in Birmingham UK high rise tower

- 1st July 2017
- Suspected arson
- 22nd storey of 32 storey block
- 4 pumps
- 20 fire-fighters

Fire in Birmingham UK high rise tower

- No injuries
- 30 - 40 left the building voluntarily
- Area Commander Ben Brook of WFRS said:

“We understand that around 750 people live in the tower block, but that no-one was injured”

Fire in Birmingham UK high rise tower

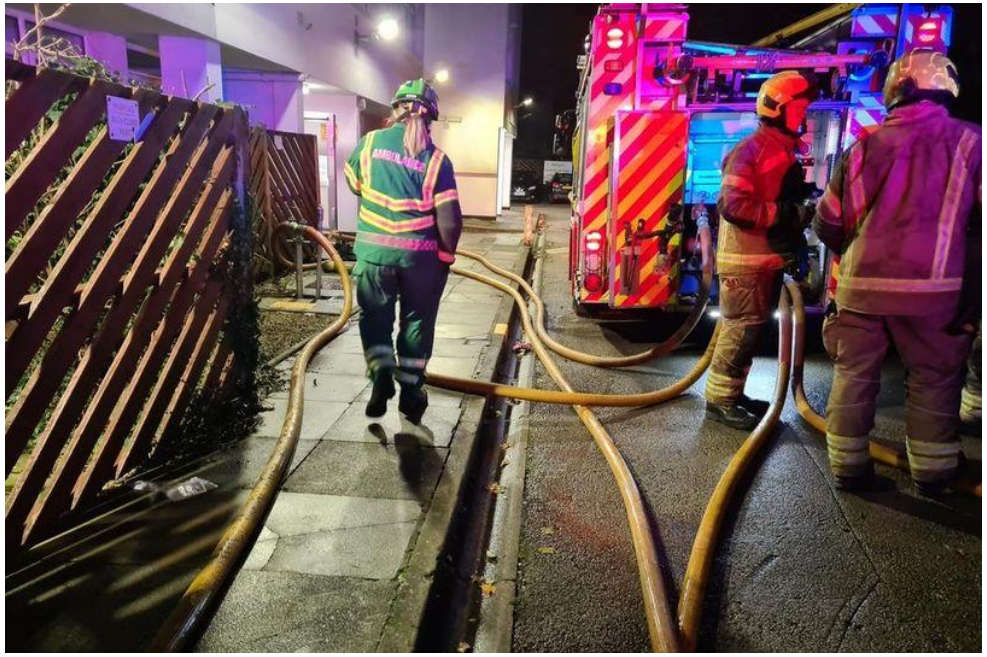
- No injuries
- 30 - 40 left the building voluntarily
- Area Commander Ben Brook of WFRS said:

“The building’s design, which includes compartmentalisation of individual flats, performed as expected”.

Solihull UK high rise tower 5 December 2020

In an update last night, council leader Ian Courts said fire safety systems had successfully contained the fire to the flat where it started.

Solihull UK high rise tower 5 December 2020



"It was heartening to see that the fire doors and seals did their jobs by containing the fire to the one affected flat."

A few ‘Stay Put’ statistics

2017/18 – fires remaining in the room of origin

- Purpose built flats 93% (744 out of 801)
- Hostels and hotels 78%
- Hospitals 93%, Houses 85%
- Communal living (barracks, boarding schools etc) 94%

2010 – 2017 54,000 fires in high rise buildings, but only 0.4% (216) required evacuation of more than 5 residents

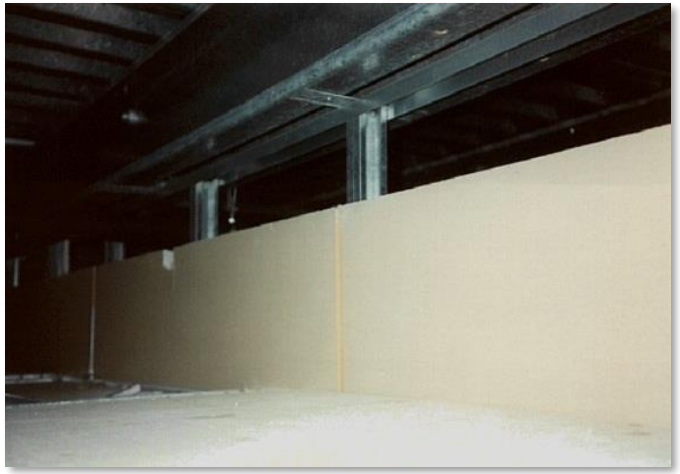
But decision making is based on political thinking

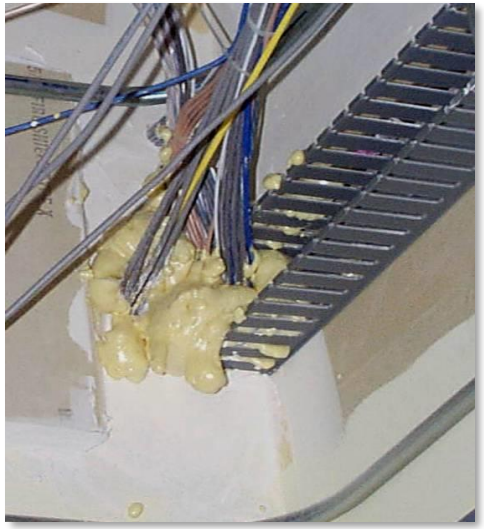
Fire chiefs back stay put policy

22 May 2018

THE NATIONAL Fire Chiefs Council (NFCC) has reiterated its supports for the principle of a ‘Stay Put’ strategy whenever possible.

The installation Issue





Do you see poorly installed Passive Fire Protection?

But what's this?

- Wholly unsuitable firestopping around windows
- Large gaps (~150mm) around windows sealed with rubberised membrane, rigid foam insulation and uPVC.

14
JUNE

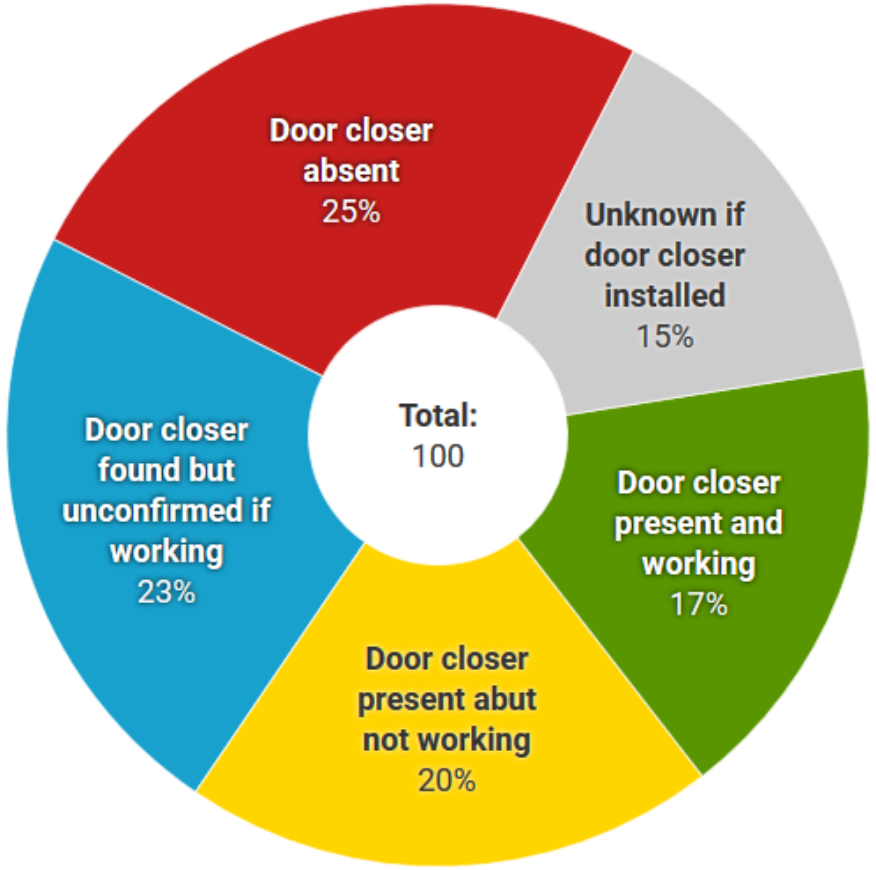
Kensington Aldridge Academy
Kensington Leisure Centre

From Dr Barbara Lane's report to the Public Inquiry

In my opinion, once any localised fire occurred near a flat window – regardless of how that fire started – the majority of the construction materials around the window had no potential fire resisting performance. Therefore, no part of the construction had to ability to substantially prevent fire spread from inside the building into the external rainscreen cavity.

Other items

- Many door closers were missing, or disconnected
- Many fire doors had been replaced with ordinary doors
- Some fire door tests of composite doors have failed
- Government's Building Safety Programme investigated.



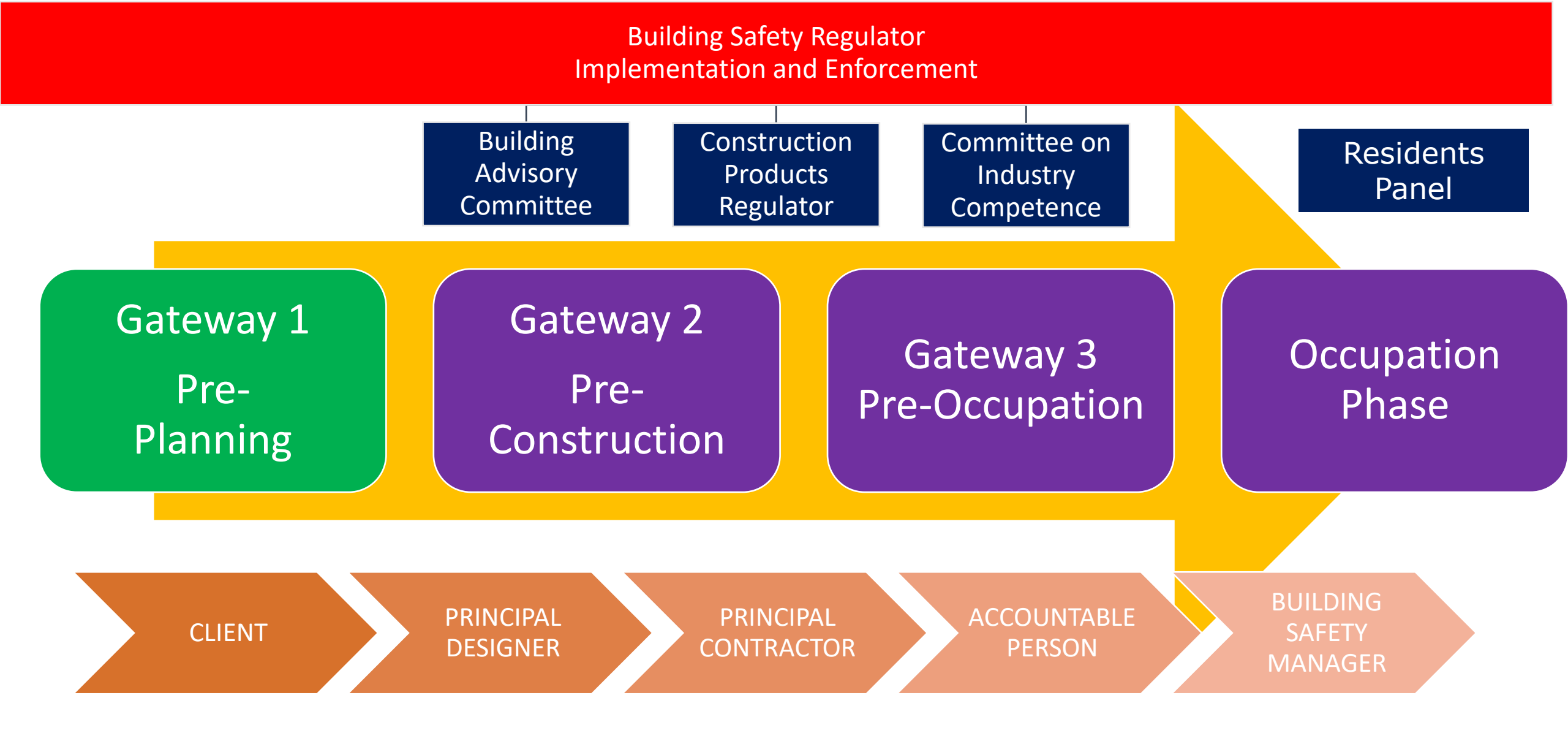
Looking to the future

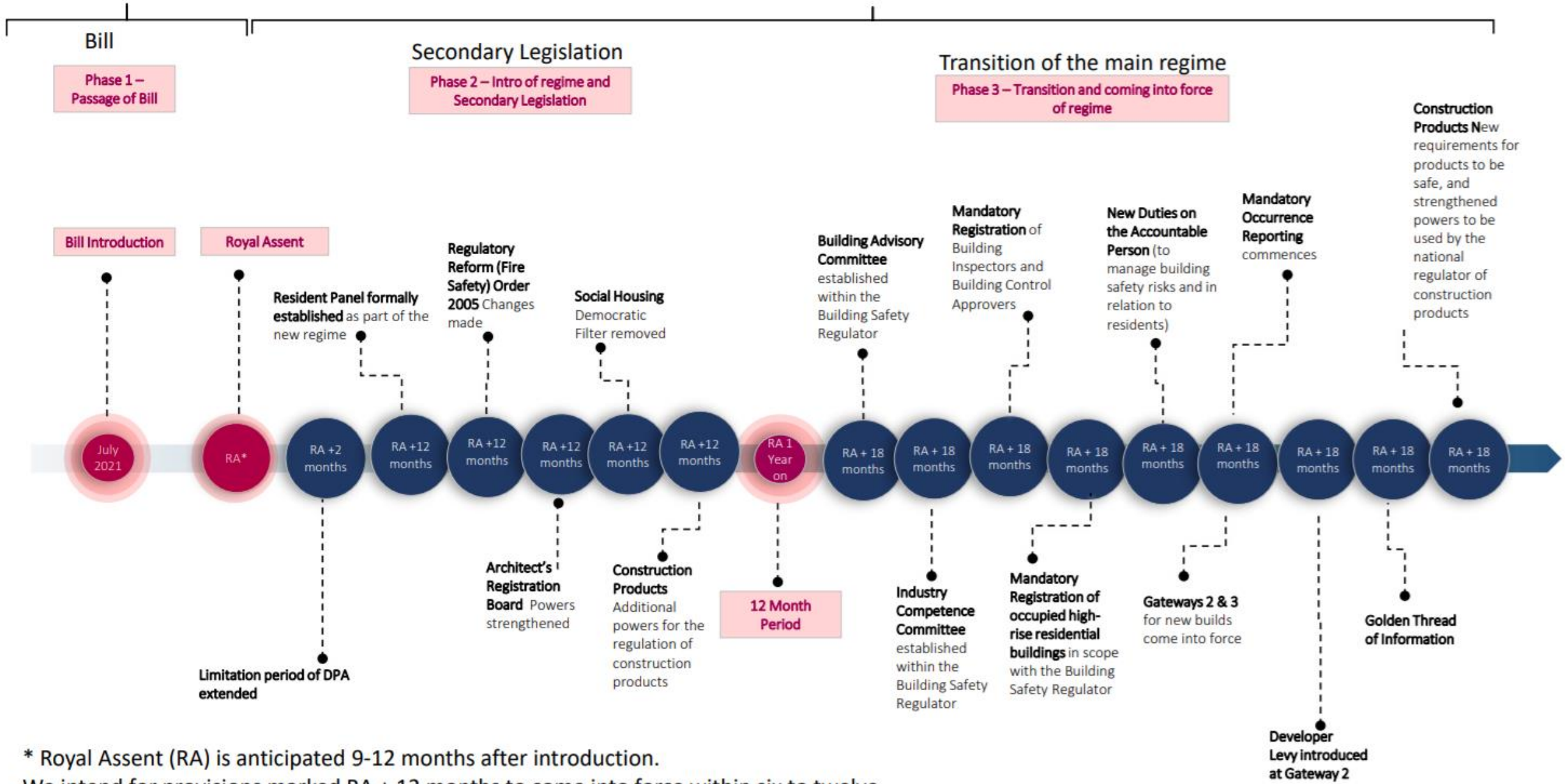
Brief Legislative Update

- **Fire Safety Act**
  - Reinforces Regulatory Reform (Fire Safety) Order 2005

- **Building Safety Act**
  - Enabling legislation to implement all 53 of the Hackitt recommendations
  - New Regulatory regime for HRBs – Lots more inspection – New Regulator (HSE)
  - Greater scrutiny of Construction Products – to mirror Construction Products Regulation
  - Promote competence of those working on **all** buildings

Building Safety Act: Profound change





* Royal Assent (RA) is anticipated 9-12 months after introduction.
We intend for provisions marked RA + 12 months to come into force within six to twelve months of Royal Assent.
We intend for provisions marked RA + 18 months to come into force within twelve to eighteen months of Royal Assent.

Building Safety Bill & Transition

Design and Construction

Gateway 1 – Planning (in force since August 2021)

- To 30 June 2022 some 1,081 consultation requests were received. In 2022, so far, **HSE has raised concerns in 66% of cases, with 30% of cases being re-consultations on cases with outstanding concerns.**

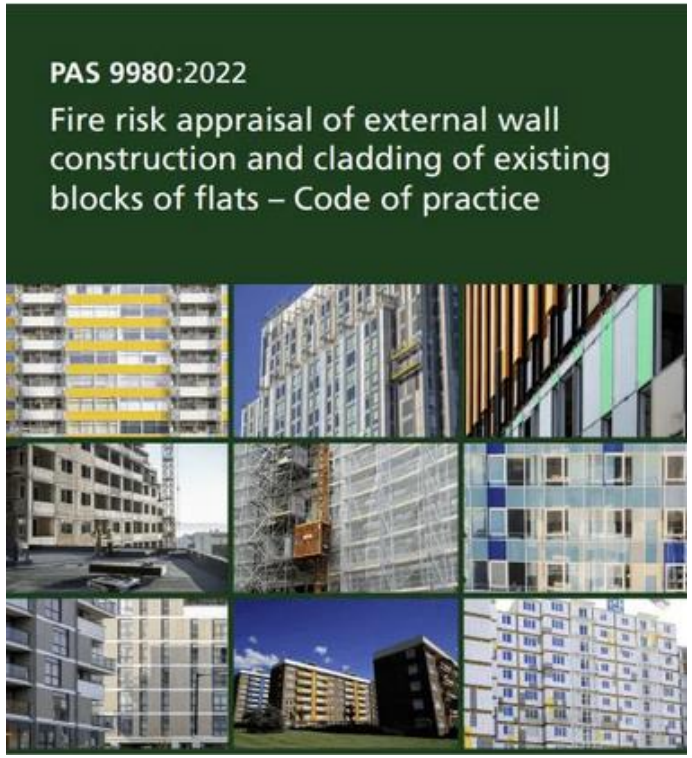
Design and Construction

Gateway 1 – Planning (in force since August 2021)

- Common issues:
  - **single stairs** and lifts
  - Poor/**obstructed accessibility** for fire appliances
  - **unrealistic escape scenarios**
  - lack of care about **vulnerable residents**

Fire Safety Act - Update

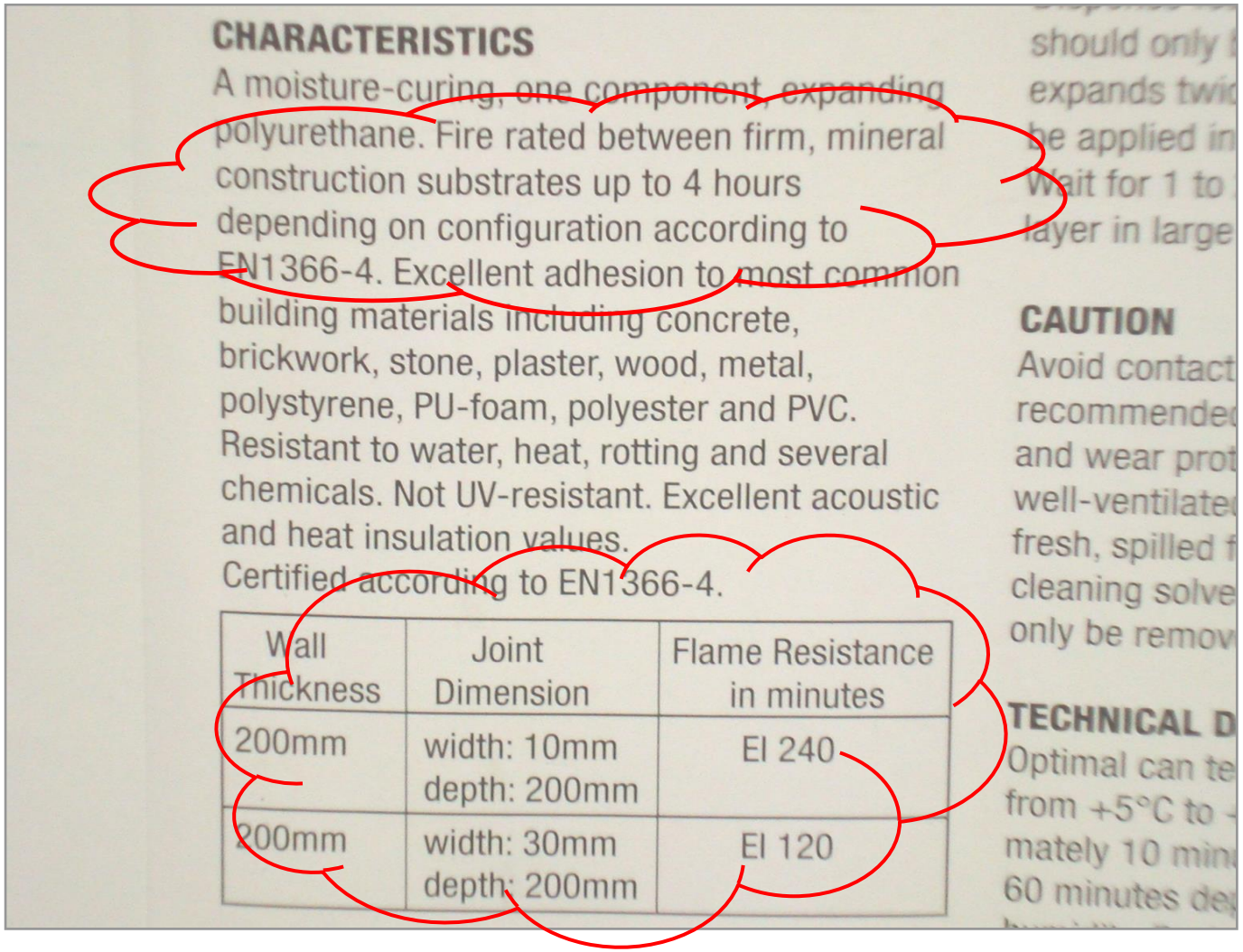
- Passed into law April 2021
- Brings external walls and Flat front doors into scope of RR(FS)O
- Not welcomed initially by many because it left potential for bills for leaseholders
- Problem of supply of adequately trained Fire Risk Assessors capable of assessing external walls – hence PAS 9980
- Still no defined competency for Fire Risk Assessors despite work in WG4
- Will be implemented alongside Building Safety Act



Fire rated foams - myth & reality

It says 4 hours on the tin!

Ensure the correct materials are used for the applications they have been tested against



CHARACTERISTICS

A moisture-curing, one component, expanding polyurethane. Fire rated between firm, mineral construction substrates up to 4 hours depending on configuration according to EN1366-4. Excellent adhesion to most common building materials including concrete, brickwork, stone, plaster, wood, metal, polystyrene, PU-foam, polyester and PVC. Resistant to water, heat, rotting and several chemicals. Not UV-resistant. Excellent acoustic and heat insulation values.
Certified according to EN1366-4.

Wall Thickness	Joint Dimension	Flame Resistance in minutes
200mm	width: 10mm depth: 200mm	EI 240
200mm	width: 30mm depth: 200mm	EI 120

should only
expands twic
be applied in
Wait for 1 to
layer in large

CAUTION

Avoid contact
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TECHNICAL D

Optimal can te
from +5°C to
mately 10 min
60 minutes de

The devil is in the detail…

Does was it says on the tin actually fit the end-use condition?

Claimed Fire Resistance to EN 1366-4

Depth mm	Width mm				
	10	**20**	**30**	**40**	**50**
100	280	140	93	70	56
80	140	70	46	35	28
60	93	46	31	23	18
40	70	35	23	17	14
20	56	28	18	14	11

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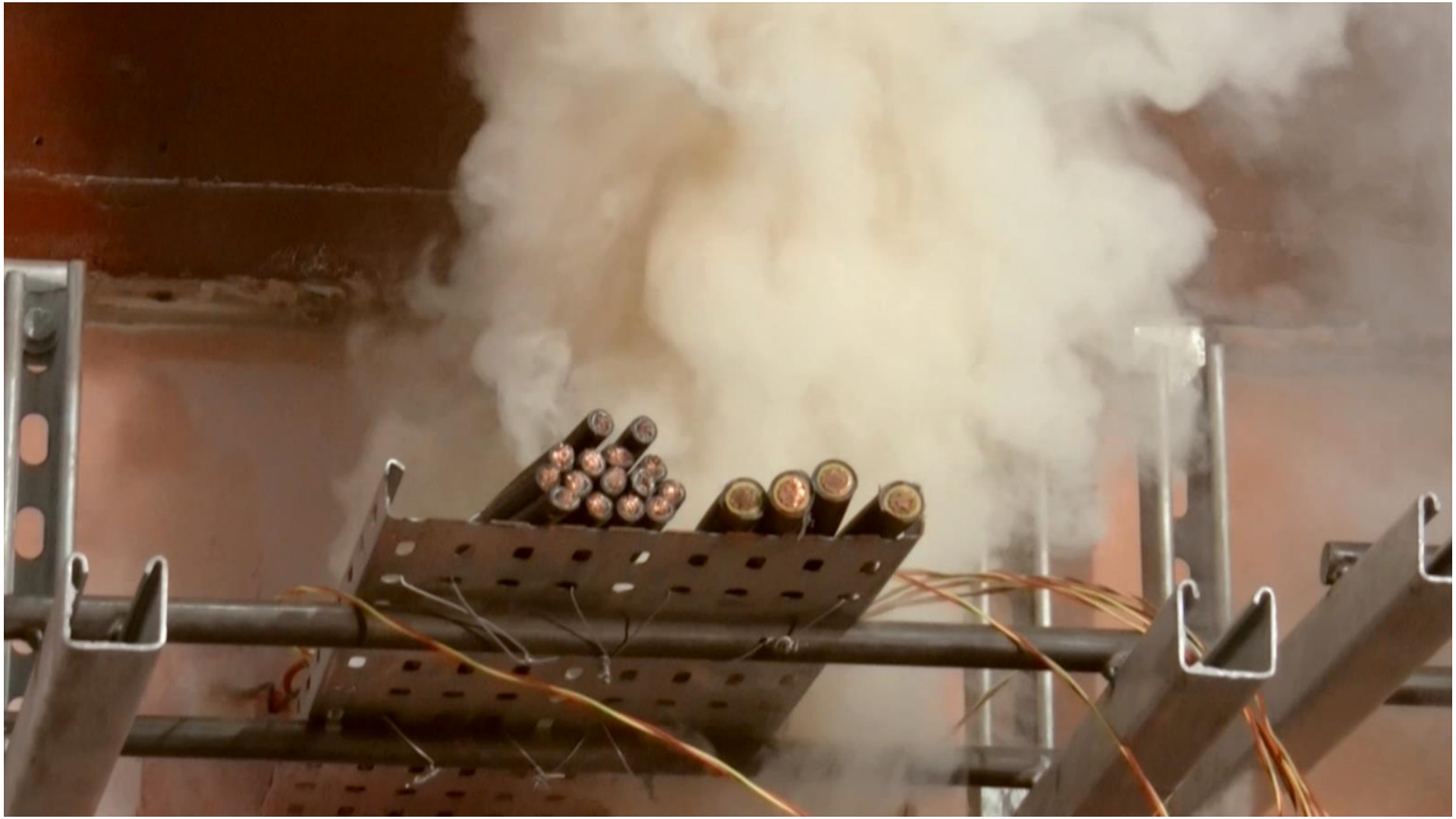


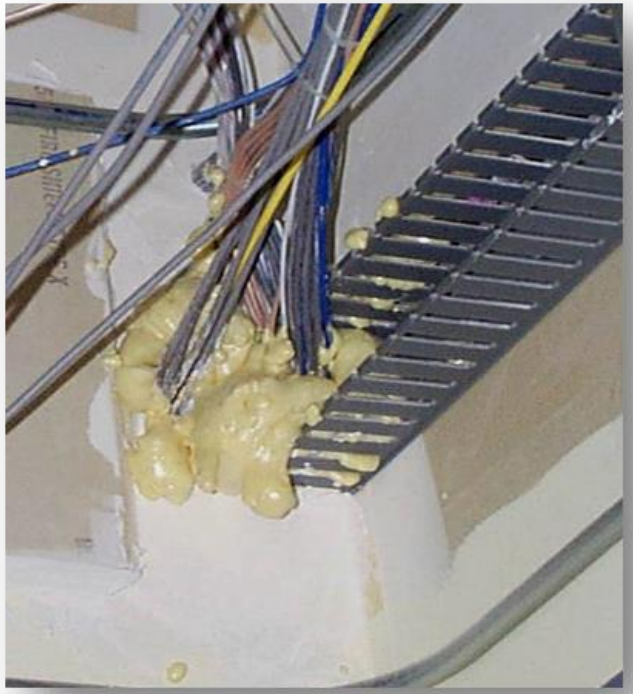
07:57

ASFP tests on PU foam based fire stopping

Time to failure?
9 minutes!

ASFP tests on PU foam based fire stopping

Remember this?



Time to failure?
7 minutes!

Issues that cause poor installation

- Design and Build
- **No bar to entry for PFP installers**
- **Not enough inspection or enforcement for products that are invisible when installed**
- Fixation of price and not value
- Breaking of specification (“Or similar”)
- Multiple sub contracting
- Poorly sequencing of work
- Maintenance (lack of)
- Action by follow on trades.

Would you allow an unqualified plumber or electrician to work on your building?

Design doesn’t always help

Why we need certification of installers

- Builders generally don’t understand fire protection
- Other trades rarely have any concept of the system, the issues, or the need for fire protection
- Construction errors are often not easily seen

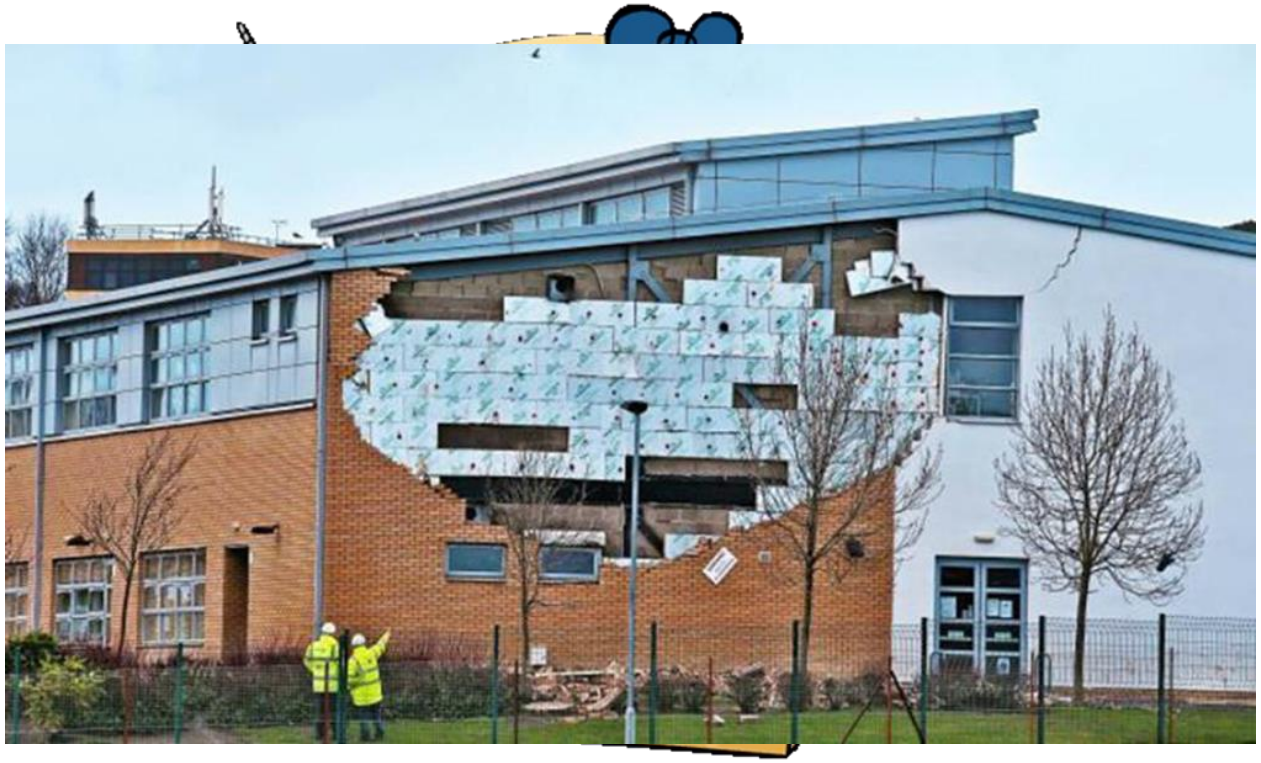


Image 21: *Example of a breach of fire compartmentation from fire-stopping survey of Oxgangs School, dated 22nd August 2016: "there is no plasterboard above the fire door, therefore creating a large breach in the compartment. the area is not fire stopped and a breach exists."*

Image 22: *Example of a breach of fire compartmentation from the fire-stopping survey of Royal High School, dated 22nd August 2016 : "the pipe has not been fire stopped and a breach exists."*

Installer Certification - How does it work?

With installer certification

- **Only staff whose competence has been evaluated are used**

Installer Certification - How does it work?

With installer certification

- Only staff whose competence has been evaluated are used
- **Only third party certificated products used (no mix'n match)**

certifire

CERTIFICATE OF APPROVAL
No CF 426

This is to certify that, in accordance with
TS00 General Requirements for Certification of Fire Protection Products
The undermentioned products of

PROMAT UK LTD

The Sterling Centre, Eastern Road, Bracknell, Berkshire, RG12 2TD
Tel: 01344 381 300 Fax: 01344 381 301

Have been assessed against the requirements of the Technical Schedule(s) denoted below and are approved for use subject to the conditions appended hereto:

CERTIFIED PRODUCT	TECHNICAL SCHEDULE
Promaseal Fire Barrier	TS03 Penetration Sealing Systems

Signed and sealed for and on behalf of CERTIFIRE

Sir Ken Knight
Chairman - Management Council

Issued: 18th July 2006
Revised: 22nd February 2010
Valid to: 17th July 2011

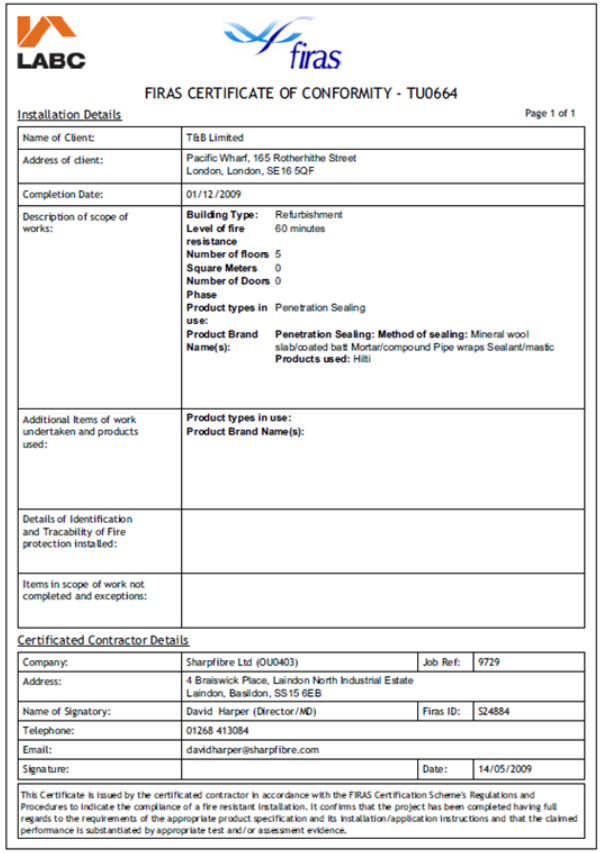
Page 1 of 6

Only valid when authentic CERTIFIRE Seal is in place

Installer Certification - How does it work?

With installer certification

- Only staff whose competence has been evaluated are used
- Only certificated products used (no mix'n match)
- **Records of jobs must prove right products are used**
- **Certificate of completion**



LABC firas

FIRAS CERTIFICATE OF CONFORMITY - TU0664

Installation Details

Page 1 of 1

Name of Client:	T&B Limited
Address of client:	Pacific Wharf, 165 Rotherhithe Street London, London, SE16 5QF
Completion Date:	01/12/2009
Description of scope of works:	**Building Type:** Refurbishment **Level of fire resistance** 60 minutes **Number of floors** 5 **Square Meters** 0 **Number of Doors** 0 **Phase** **Product types in use:** Penetration Sealing **Product Brand Name(s):** **Penetration Sealing: Method of sealing:** Mineral wool slab/coated batt Mortar/compound Pipe wraps Sealant/mastic **Products used:** Hilti
Additional items of work undertaken and products used:	**Product types in use:** **Product Brand Name(s):**
Details of Identification and Tracability of Fire protection installed:	
Items in scope of work not completed and exceptions:	

Certificated Contractor Details

Company:	Sharpfibre Ltd (OU0403)	Job Ref:	9729
Address:	4 Braiswick Place, Laindon North Industrial Estate Laindon, Basildon, SS15 6EB		
Name of Signatory:	David Harper (Director/MD)	Firas ID:	S24884
Telephone:	01268 413084		
Email:	davidharper@sharpfibre.com		
Signature:		Date:	14/05/2009

This Certificate is issued by the certificated contractor in accordance with the FIRAS Certification Scheme's Regulations and Procedures to indicate the compliance of a fire resistant installation. It confirms that the project has been completed having full regards to the requirements of the appropriate product specification and its installation/application instructions and that the claimed performance is substantiated by appropriate test and/or assessment evidence.

Installer Certification - How does it work?

With installer certification

- Only staff whose competence has been evaluated are used
- Only certificated products used (no mix’n match)
- Records of job must prove right products are used
- Certificate of completion
- **Random independent site inspection**

Why we need certification of products

Self declaration	"Tested to / Designed to / Complies with BS 476 Part 22"	No guarantee that products will (or have) reached the correct standards	Was it tested? Was test impartial?	**Uncertain? = RISK**
Test report	"My product was tested." "I have a certificate" **Only a SNAPSHOT**	Was the test sample representative of what is **ACTUALLY produced?**	What if changes to design? To materials?	**Uncertain? = RISK**
3rd party certification	Not only demonstrates product conformity Audits the company's production & product	Ensures the product is supplied to the SAME specification / design AS TESTED	**= CONFIDENCE**	

ASFP Position on third party certification

- Third party certification adds value
- Installer certification MANDATORY for installer members (20 years)
- ***ASFP always recommends the use of third party certificated <u>products</u> for fire protection***
- ***ASFP always recommends to use of third party certificated specialist <u>contractors</u> for installing Passive Fire Protection.***

AVOIDING DEFECTS-PASSIVE FIRE PROTECTION

5.0 Fire Protection

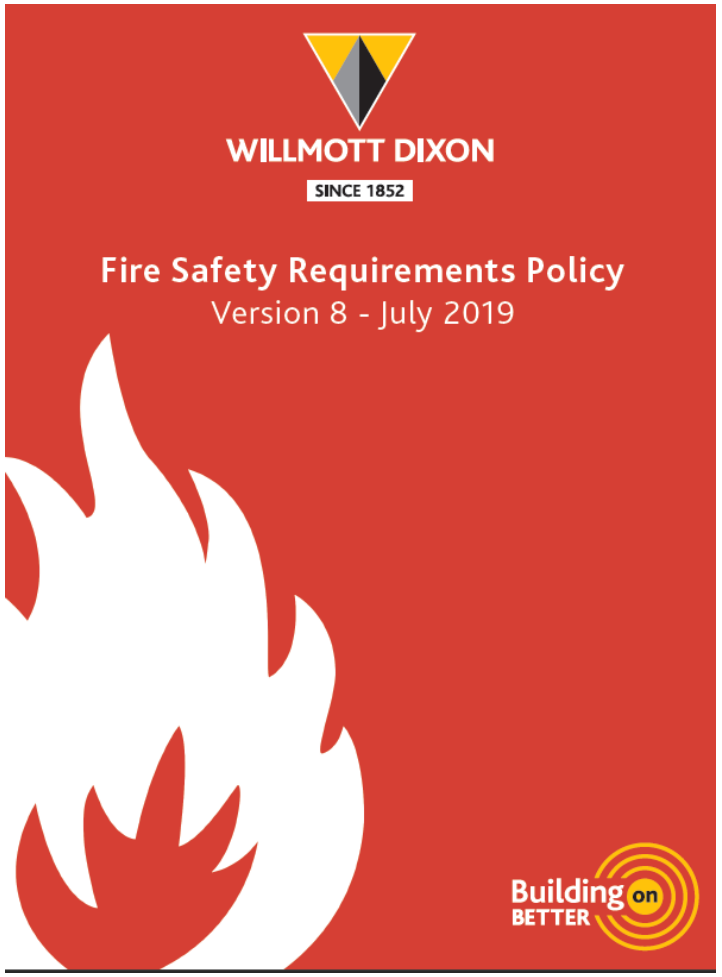
Check List

Pre-construction

- Procure a fire-stopping contractor who is certificated for installing fire stopping by a certification body accredited by the United Kingdom Accreditation Service [UKAS] e.g. Exova Warringtonfire (FIRAS), IFCC or BRE (LPCB). **THIS IS A STRICT KIER REQUIREMENT.**

- Are the fire requirements properly specified and is the Fire Strategy understood?

- Ensure that the Fire Strategy clearly identifies and defines all fire walls / partitions and floors together with associated fire doors, fire screens, etc.

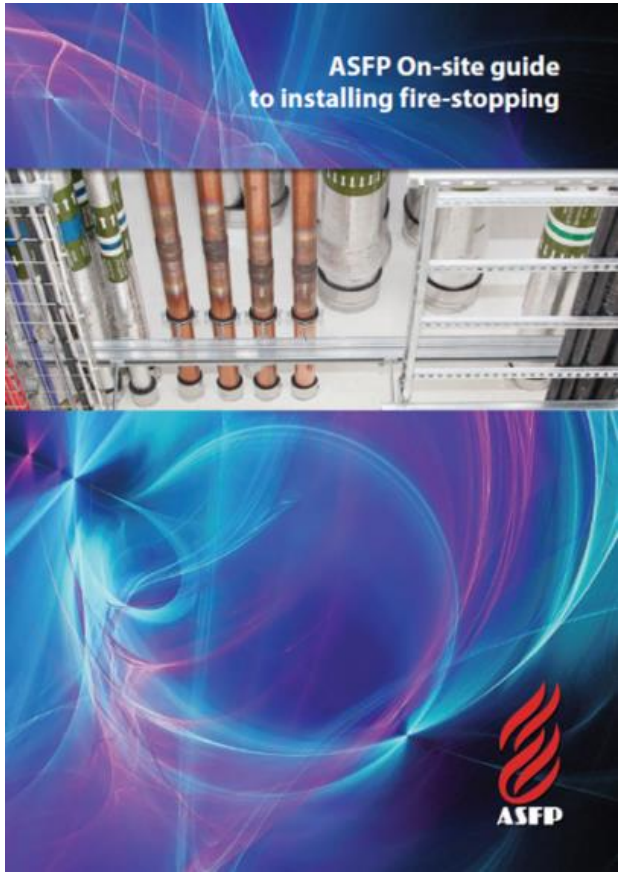


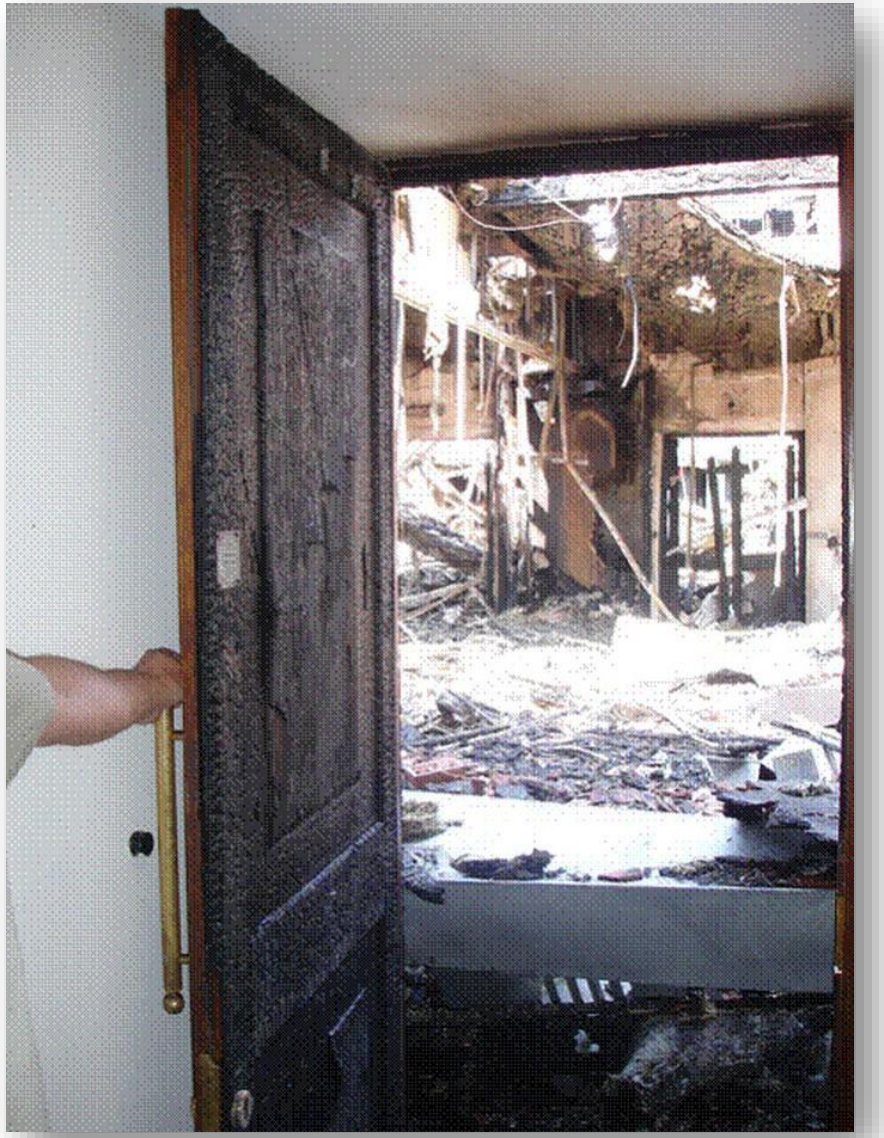
"All fire protection products and systems specified by our Designers and those Supply Chain Partners with design responsibility must hold third party certification by a UKAS accredited body to an appropriate product or performance standard (e.g. BS476, Certifire, etc.) for the exact context within which they are to be used."

Summary

- **Who is the ASFP?**
- **Passive Fire Protection**
- **The installation issue**
- **Fire rated foams – myth and reality**
- **BSA and FSA (brief)**
- **Ensuring best practice**
  - **3rd certification of products & contractors**
- **Summary**

Passive Fire Protection is for life safety and works well if designed, specified and installed correctly



Passive Fire Protection

You only need to use it once…