

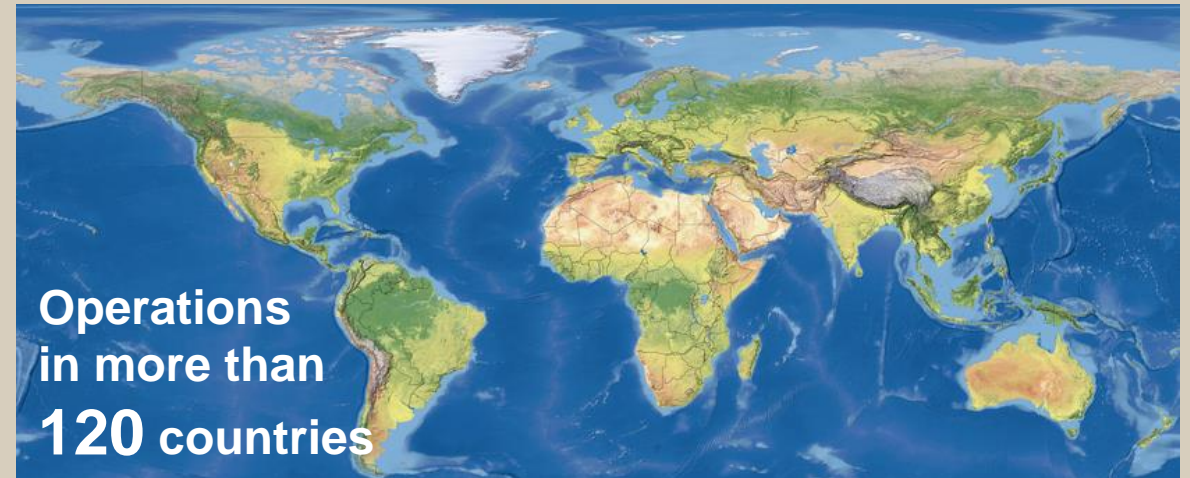


FIRESTOP – LIFE SAFETY AND PASSIVE FIRE PROTECTION



WHO ARE HILTI?

A brief Introduction



WE WORK WITH THE HOUSING SECTOR ACROSS THE UK

Sustainable

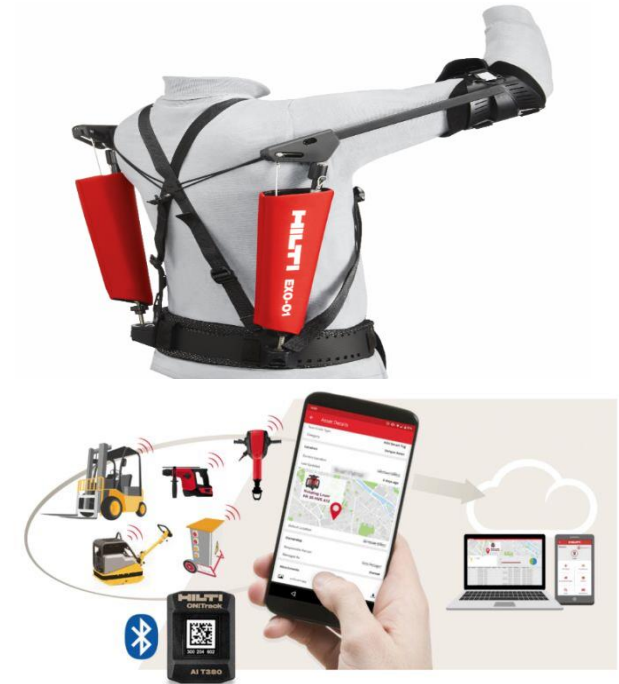


CO₂ Neutral by 2023

Experienced



Innovative

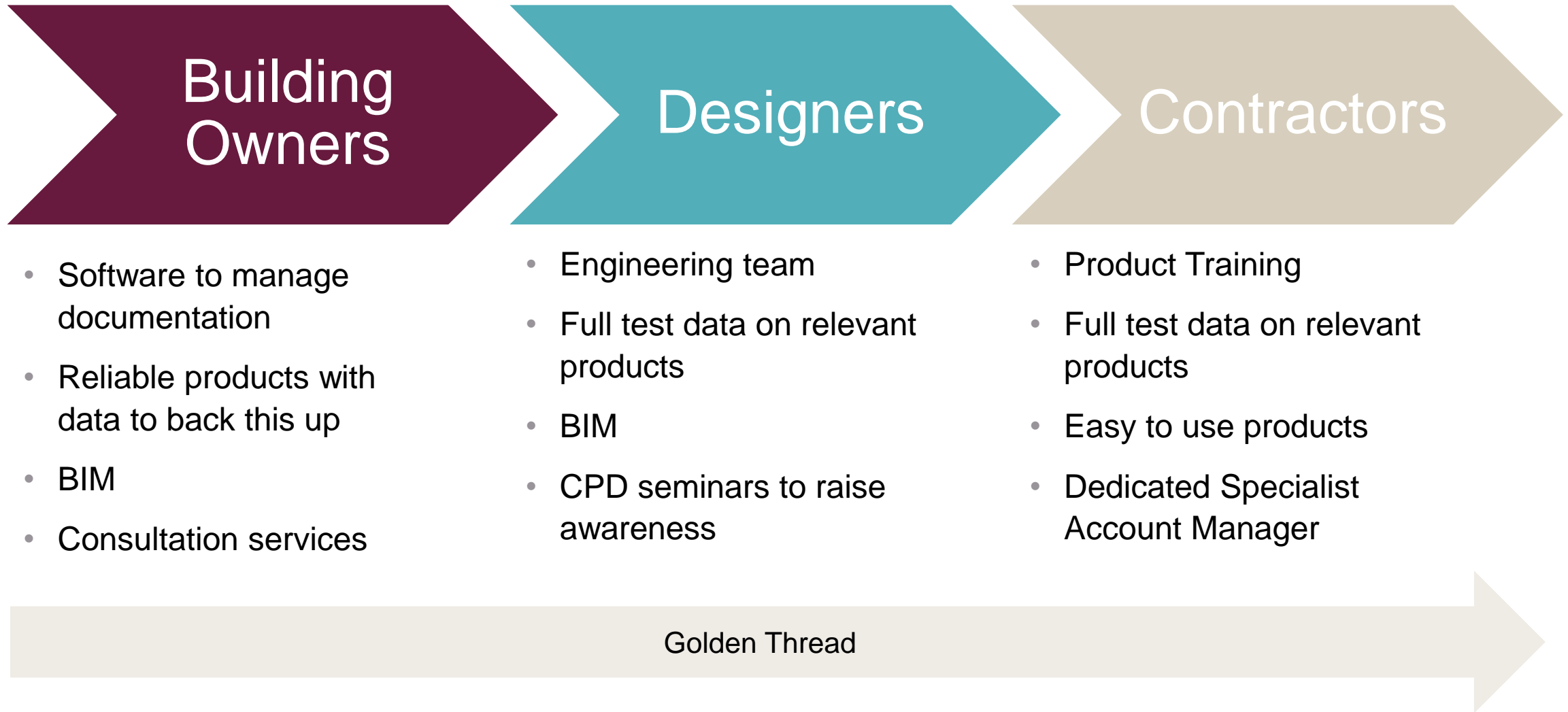


6.2% of sales spend on R&D

AGENDA

1. Partnering with Hilti
2. The importance of passive fire protection
3. Firestop systems testing criteria – EN 1366
4. EN standards essentials
5. Myths and misconceptions
6. How *not* to Firestop
7. How to Firestop
8. Wrap up and references.

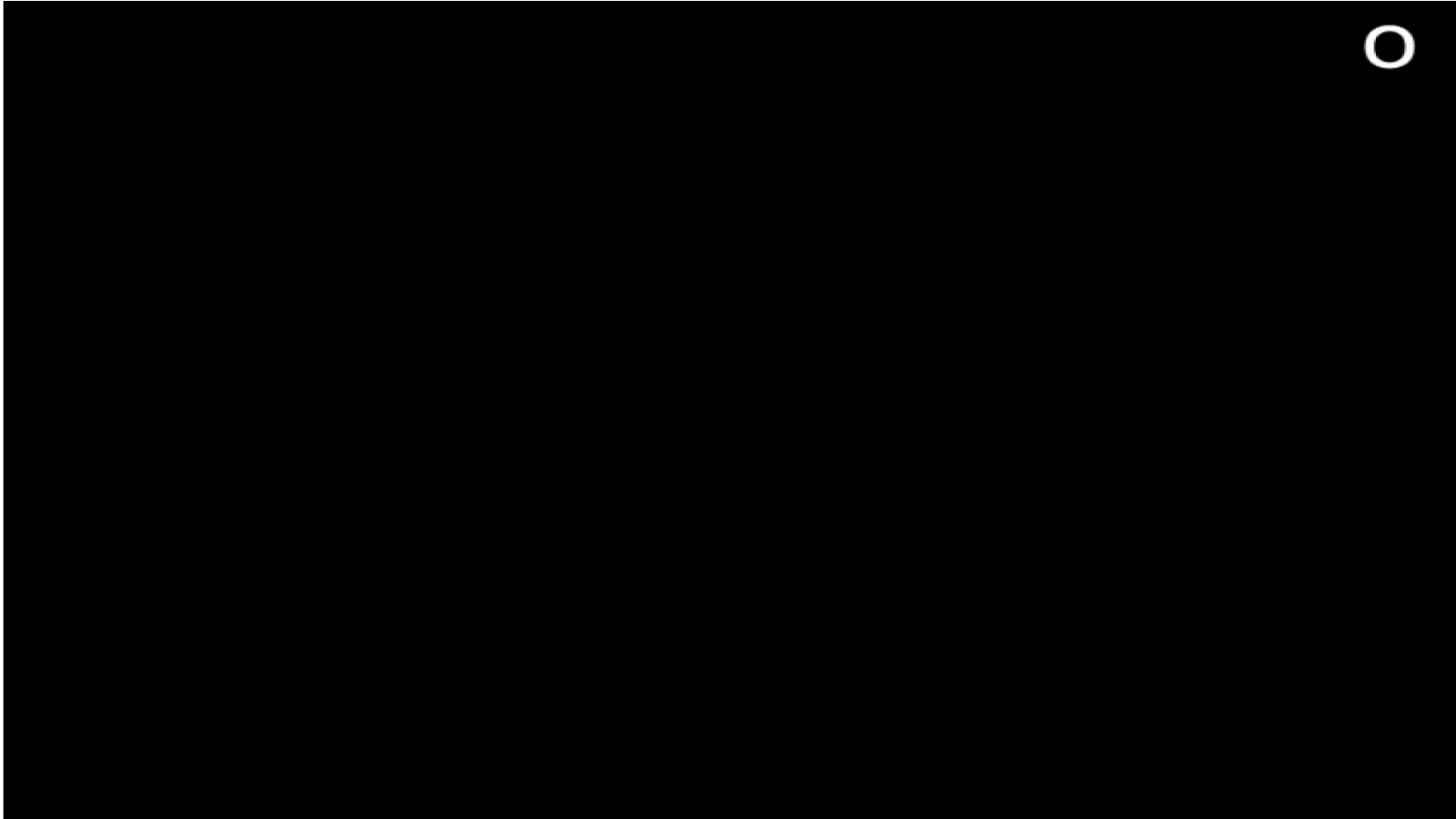
HILTI CAN PARTNER ACCROSS THE WHOLE PROJECT



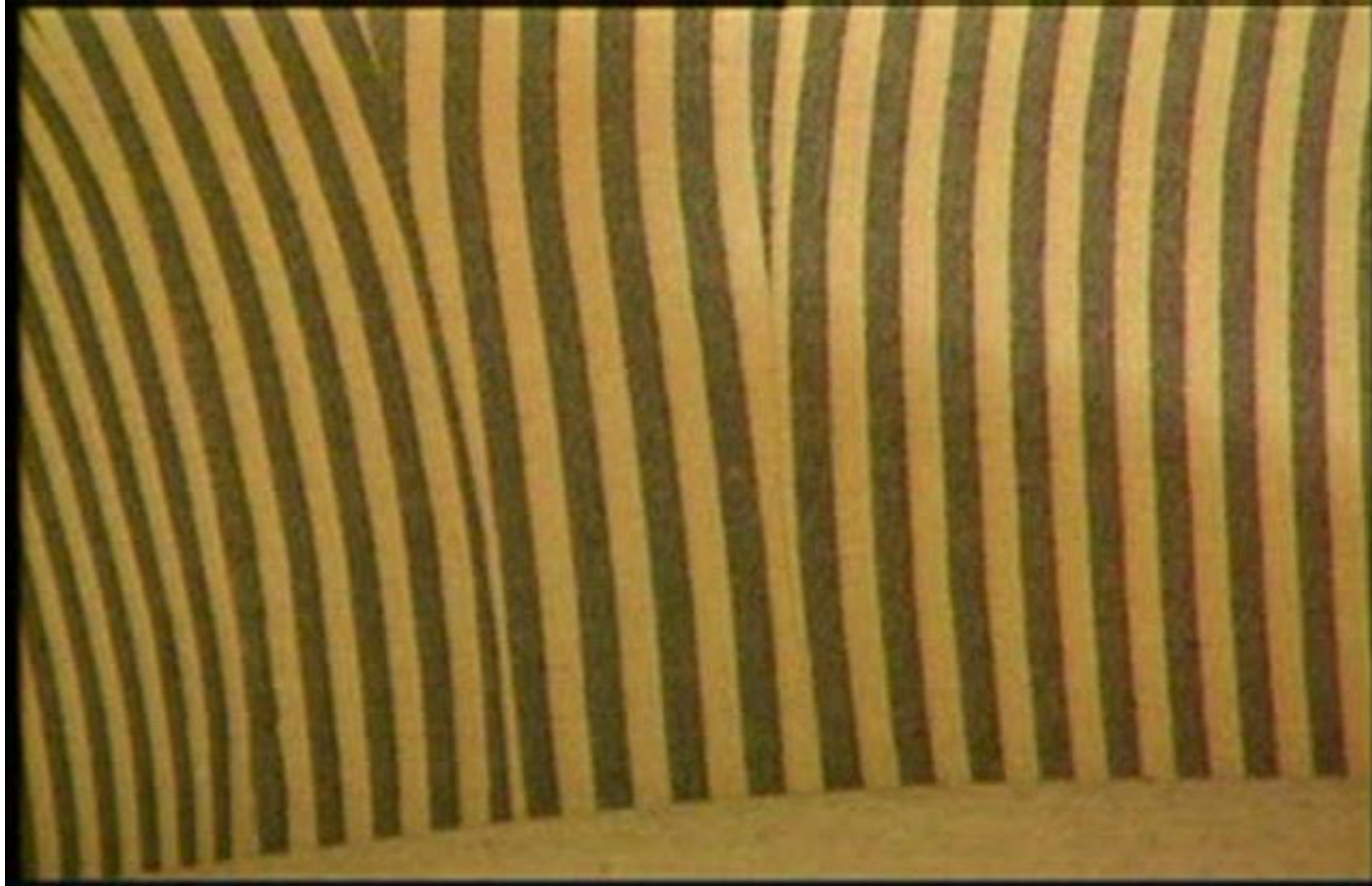
AGENDA

1. Partnering with Hilti
2. The importance of passive fire protection
3. Firestop systems testing criteria – EN 1366
4. EN standards essentials
5. Myths and misconceptions
6. How *not* to Firestop
7. How to Firestop
8. Wrap up and references.

THE IMPORTANCE OF PASSIVE FIRE PROTECTION



FIVE MINUTES FIRE



FIRE STOPPING SYSTEMS – FIRE STRATEGY



Fire detection and alert



Fire Escape Routes



Fire Suppression



Fire Compartmentation

FIRE STOPPING SYSTEMS

The Importance of Passive Fire Protection

Facts about Fire:

Worldwide, a fire breaks out every 7 seconds.

- Annual UK Statistics:
- Cause of 700 deaths (excl Grenfell)
- Business Disruption £1.3bn (£3.4m a day)
- Annual costs of Arson: £2.4bn
- Government Reports Overall £7bn Cost to the UK Economy
- Fire makes up 47% of all insurance claims

Source: Aviva Insurance



FIRE STOPPING SYSTEMS

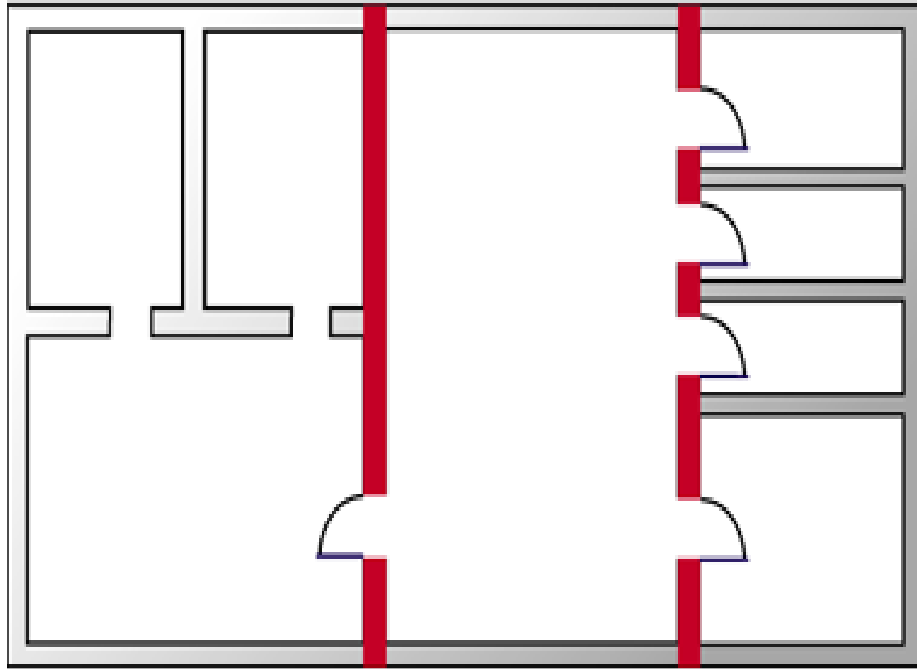
Facts about Fire

- Smoke travels at between 15 and 90 meters per minute
- 67% of fire related deaths are through smoke inhalation
- 44% of deaths are people who were not in the room of origin
- 47% of survivors could not see more than 3.5 meters

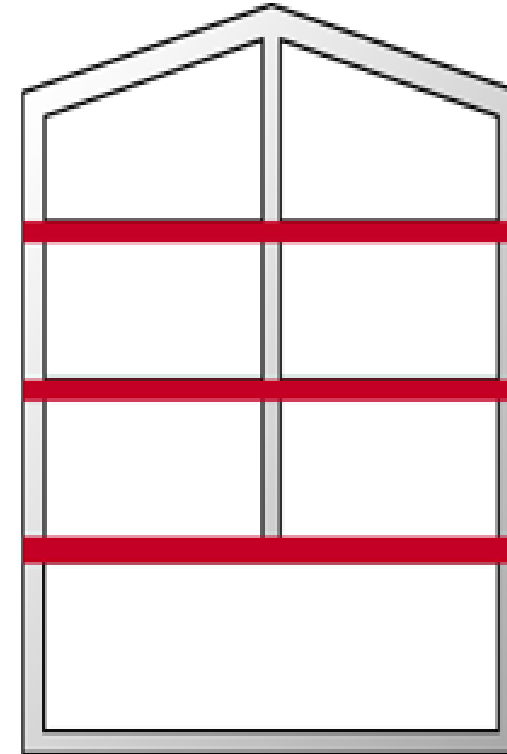


FIRE STOPPING SYSTEMS

Compartmentation



Fire walls



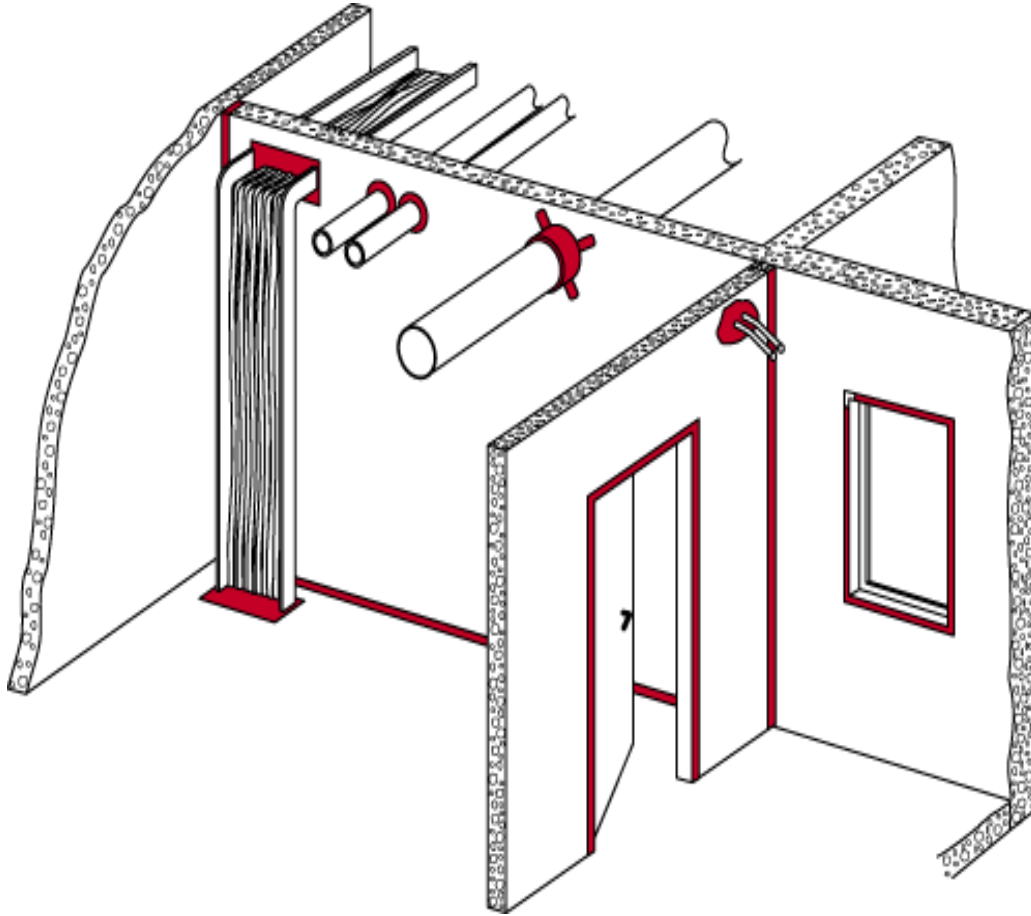
Fire floors

Compartmentation...."is achieved by dividing the building into a series of fire tight boxes termed compartments which will form a barrier to the products of combustion; smoke, heat and toxic gases."

Tech Handbook 2.1.0

FIRE STOPPING SYSTEMS

Firestopping restores the integrity of compartments breached by services and other openings



- Openings in fire-resisting walls & floors are areas of weakness
- Goal of Firestop is to ensure safe escape (Time!)
- Firestop systems should have the same fire-rating for the wall or floor

BUILDING REGULATIONS & LEGISLATION

In the Secretary of States view, the requirements of B3 will be met if...

...the building is sub-divided by elements of fire-resisting construction into compartments;

“The building shall be designed .. so that the unseen spread of **fire and smoke** .. is inhibited” ADB B3-4



BUILDING REGULATIONS & LEGISLATION

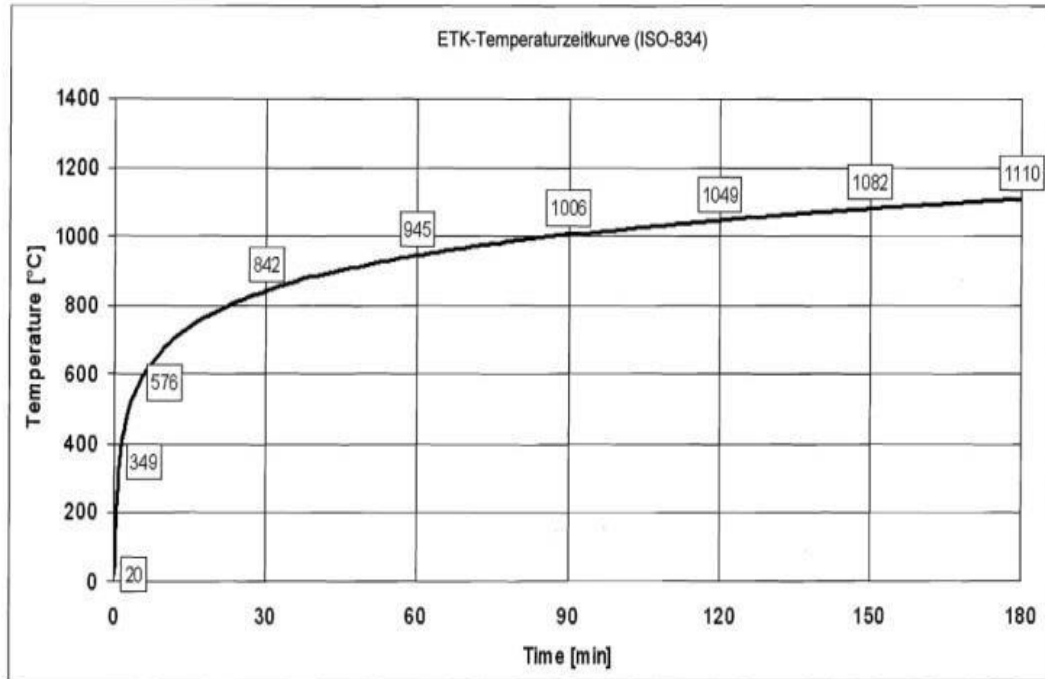
In the Secretary of States view, the requirements of B3 will be met if...




“**every joint** or imperfection of fit .. should be adequately protected by sealing or Firestopping” ADB 11.2

“the .. product .. should be in accordance with a specification or design which has been **shown by test** to be capable of meeting that performance or have been **assessed from test evidence** against appropriate standards” Appendix ‘A’ 1A



MELTING POINTS OF COMMON MATERIALS



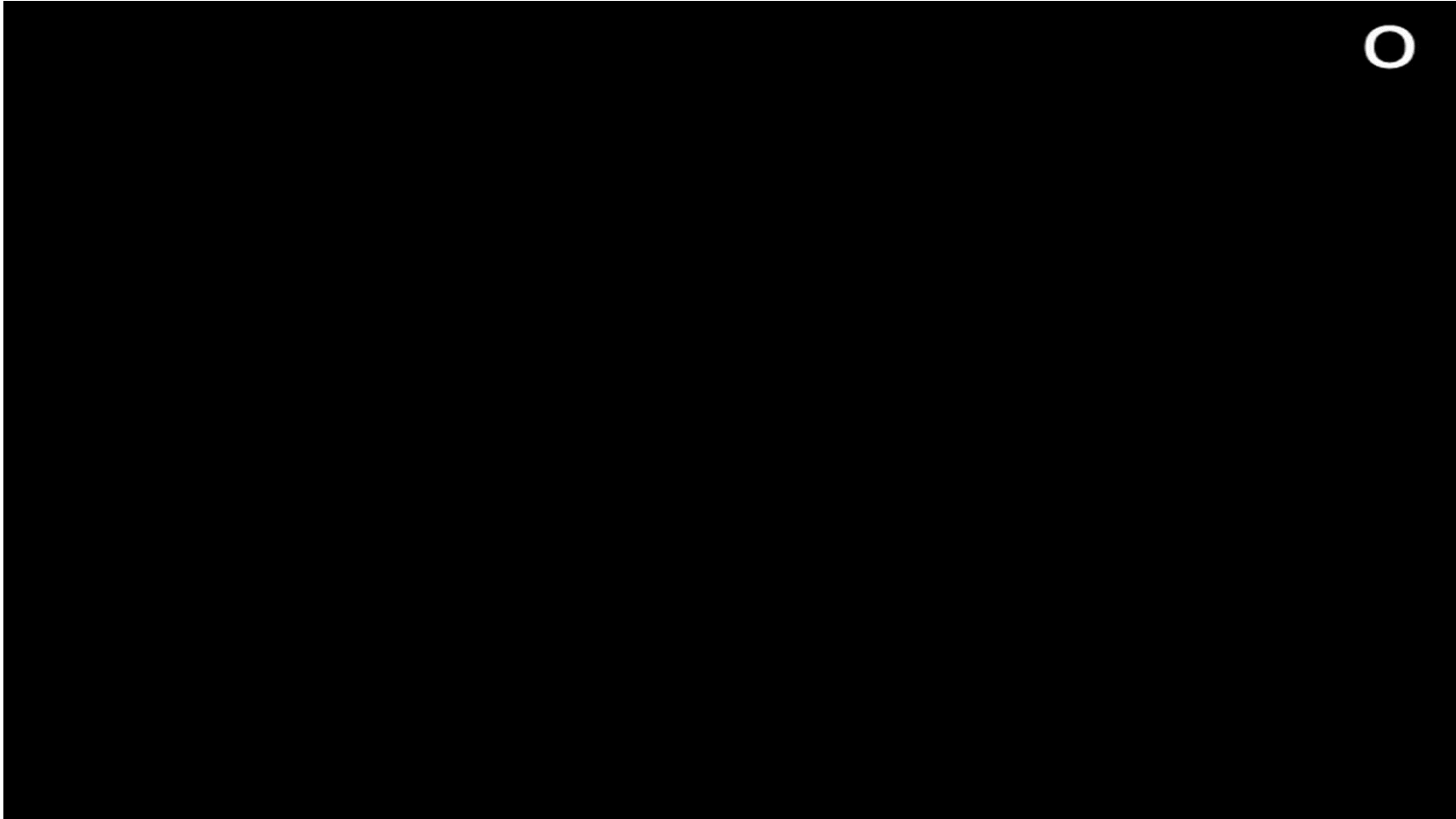
PVC Plastic	Fiberglass Insulation	Aluminium
200°C	600°C	660°C
		

Combustible penetrating items typically require specialized firestop products

AGENDA

1. Partnering with Hilti
2. The importance of passive fire protection
3. Firestop systems testing criteria – EN 1366
4. EN standards essentials
5. Myths and misconceptions
6. How *not* to Firestop
7. How to Firestop
8. Wrap up and references.

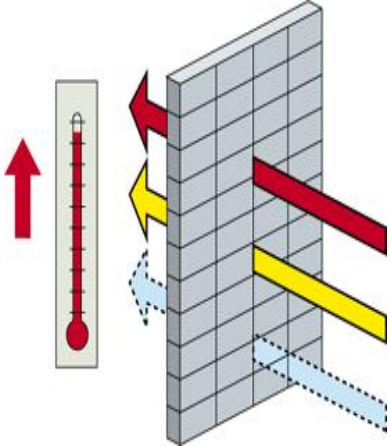
PASSIVE FIRE TESTING



WHY EN1366 TESTING IS STRINGENT

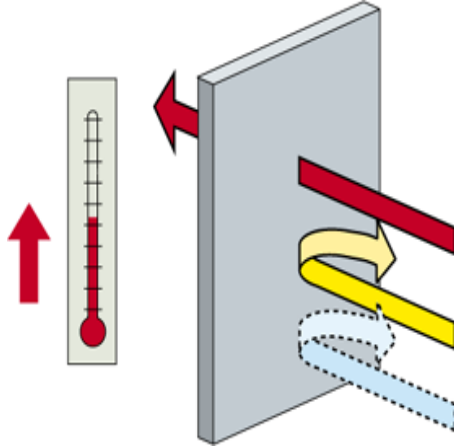
Load bearing Capacity*

Measures the structural stability of the product in fire



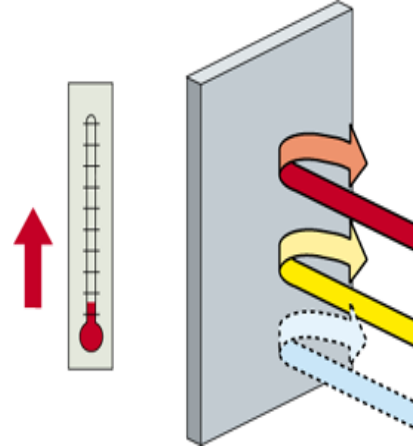
Integrity*

Measures the ability of a product to prevent gas & flame to pass through it in a fire



Insulation*

Measures the ability of an element to insulate, i.e. how long it takes for the non-fire side of the element to reach 180°



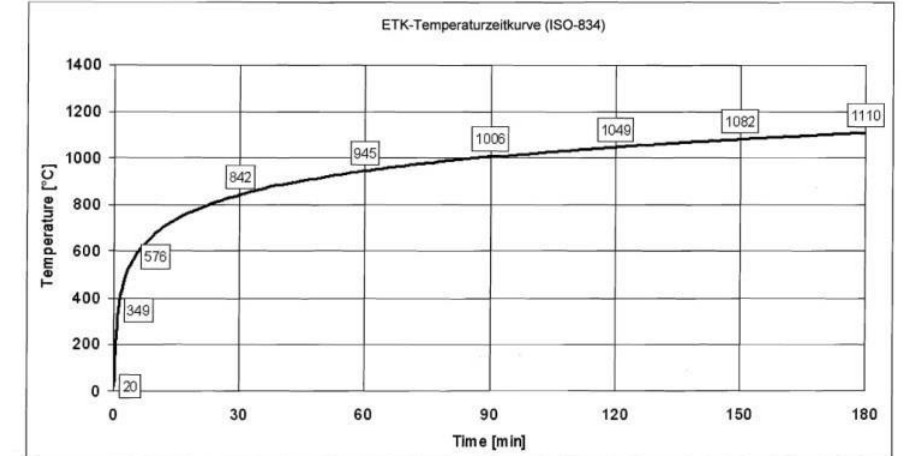
Additional testing:

- Cyclic testing
- Explosion resistance
- 30 year age testing
- Fixing suitability
- Acoustics
- Air sealing
- Load bearing capacity
- Movement capabilities
- Seismic
- Mould resistance
- Water resistance

*All three criteria are measured in hours and minutes.

FIRE TESTING – VARIATIONS

- **Fuel:** oil, gas
- **Thermocouples:** blob, wire, plate
- **Furnace pressure:** 5 to 20 Pa
- **Pressure measurement:** mid height, below soffit
- **Configuration of sample:** random (e.g. BS) to standard (DIN)
- **Failure criteria:** Insulation (DIN) Integrity (the rest)

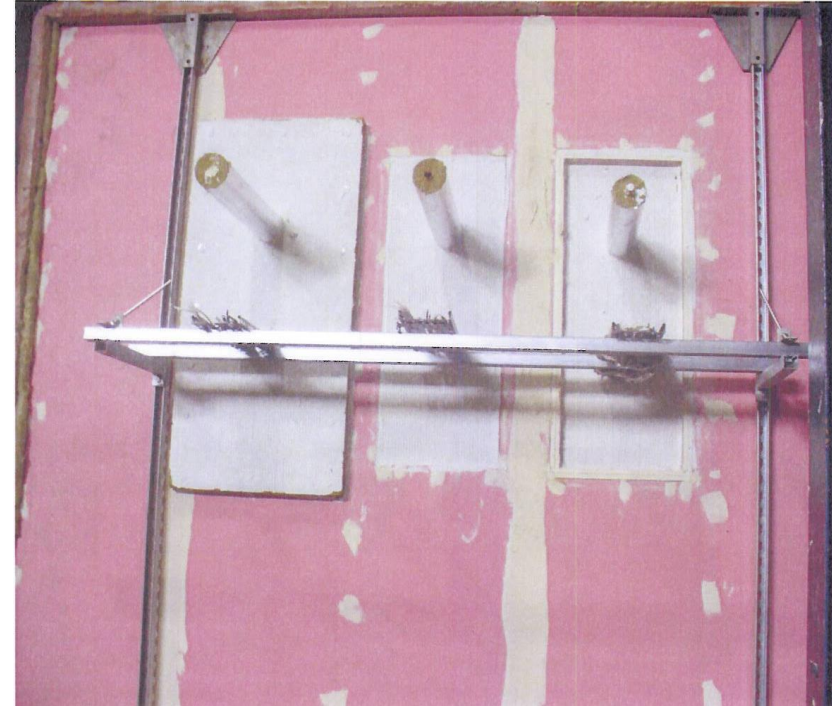
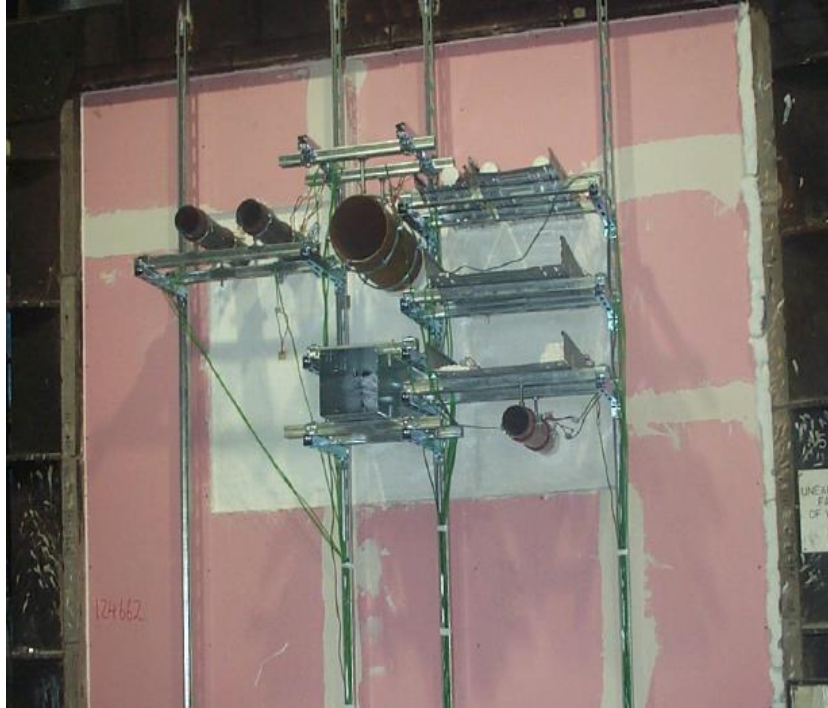


Standard fire curve is common to all!

Testing variation means that there is no transparency or comparability between products tested to different standards.

WHY EN1366 TESTING IS STRINGENT

Firestop Testing examples:



Tested to BS 476 yet very different scopes of application

AGENDA

1. Partnering with Hilti
2. The importance of passive fire protection
3. Firestop systems testing criteria – EN 1366
4. EN standards essentials
5. Myths and misconceptions
6. How *not* to Firestop
7. How to Firestop
8. Wrap up and references.

WHAT DOES THE EUROPEAN TESTING MEAN?

British Standard

How to run the furnace	BS 476-20
Penetration seals	ad hoc
Linear joint seals	ad hoc
Curtain wall full scale	N/A
Curtain wall part conf	N/A

European Standard

How to run the furnace	EN 1363-1:1999
Penetration seals	EN 1366-3:2004
Linear joint seals	EN 1366-4:2007
Curtain wall full scale	EN 1364-3:2007
Curtain wall part conf	EN 1364-4:2007

Testing to EN more severe than any national test standard!
Field of application rules more restrictive in EN standards
European Testing standards are relevant and specific to the application.
WHAT YOU TEST IS WHAT YOU GET!
You have verified the field of application from the ETA document

BENEFITS OF ETA FOR FIRESTOP PRODUCTS

Safety - Comparable, realistic, demanding, standardised results

Transparency - Independent testing with standard configurations

Conformity - Common guidelines and compliance with EU requirements for all manufacturers

Reliability / Quality - Third party approval, inspection and traceability

Increased safety and proven reliability of Firestop systems leading to reduced liability for specifiers and installers



BUILDING REGULATIONS – WHAT HAPPENS IF THE FIRE TEST DOESN'T COVER THE APPLICATION

- From Appendix 'A' 1A a qualified fire engineer can make a judgement based on test results:
"or assessed from test evidence against appropriate standards"
- This judgement **cannot** be in the form of a fax or letter from the supplier
- It must include a detailed drawing and/or description of the application
- There must be a reference to more onerous testing.

Engineering Judgement by a Qualified Fire Engineer

HILTI		Hilti. Outperform. Outlast.	
Hilti (Gt. Britain) Ltd 1 Trafford Wharf Road Manchester M17 1BY	PROJECT: Cardiff Signalling Centre	HILTI MO: Gt Britain	Page: 2/3
	CUSTOMER: Network Rail	CONTACT PARTNER: Mike Hughes Tel: +44 (0)7714 139 609	Inq. number: 12080307
		Date: 06/12	Name: A. Brockett

Firestop seals according to: Fire resistance of the Hilti CP 653 system

Rating: E Rating- 60 minutes, I Rating - 60 minutes

Note:
Hilti Corporation ("Hilti") has provided this specification on the basis of the data and information given to Hilti by "the customer" the respective Hilti product information and the existing level of technical knowledge (state of the art). This specification relates to the expected level of fire resistance performance, should the proposed detail be subjected to the standardised fire resistance test against which the judgement was made.
The accuracy of this specification is guaranteed provided that:
1. only original Hilti products as defined in this specification are used;
2. these specific products are used and installed only by a competent and experienced user in a manner which represents the state of the art and by strictly obeying the calculations and conditions mentioned in this specification as well as all relevant technical instructions, the operating manual, the setting manual and the installation manual and other data sheets of Hilti;
3. the proposed performance, the listed prerequisites and criteria conform with the conditions actually existing on the jobsite and have been checked and agreed by the user.



INFORMATION WE NEED

Fire Rating/Insulation rating – To be defined by the Customer

Penetration/Opening Size - To be defined by the Customer

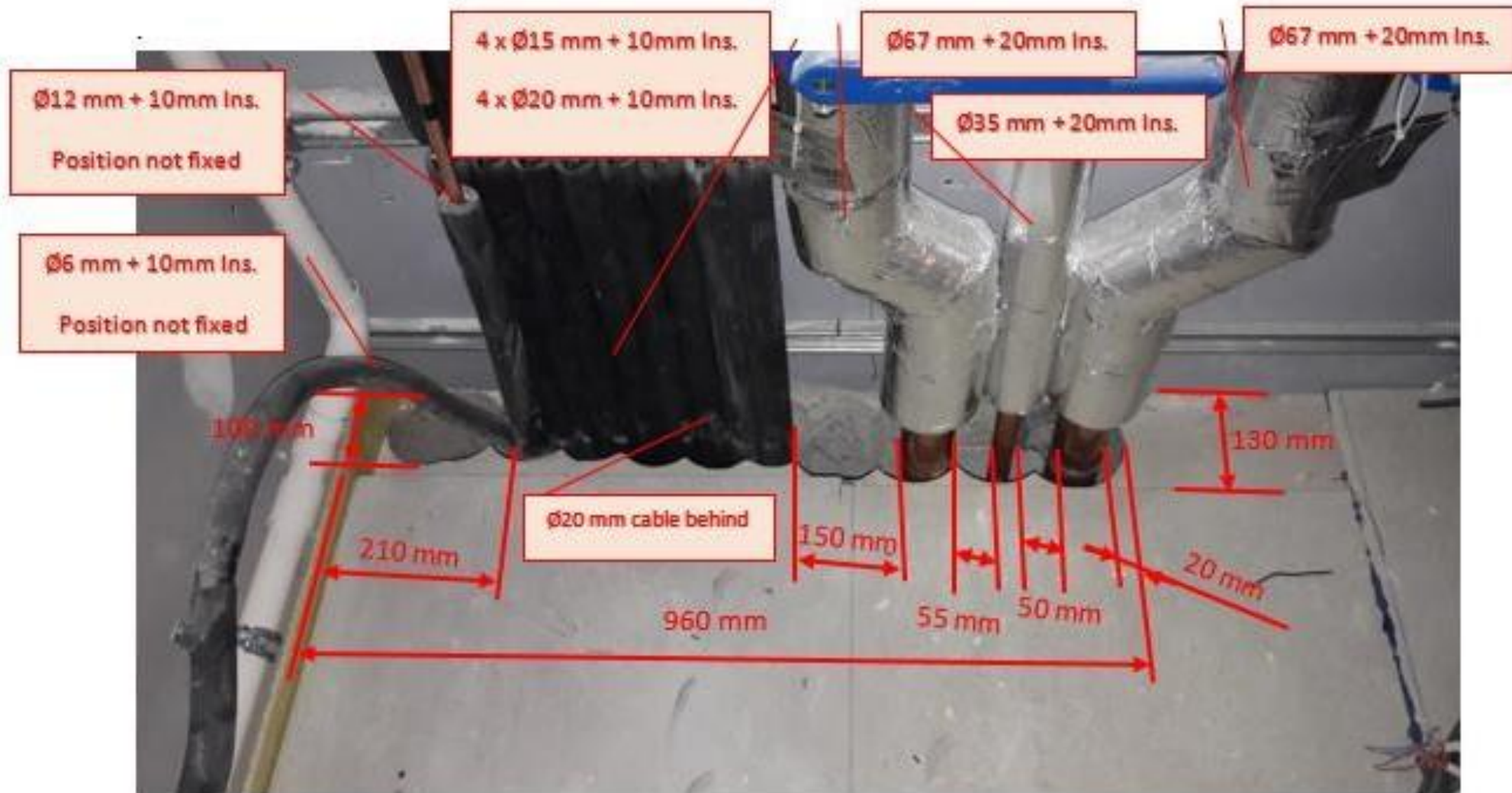
Base Material and Thickness - To be defined by the Customer

Material of the services and sizes - To be defined by the Customer

Further Requirements – To be defined by the customer



In order to provide a solution, we need crucial information
– the input needs to come from the customer

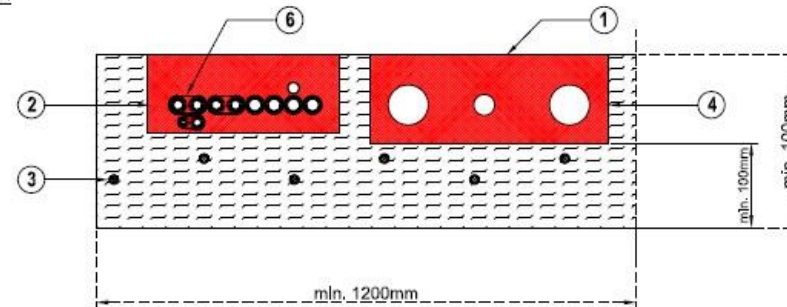


HILTI		ENGINEERING JUDGMENT / FIRESTOP DETAIL	
Hilti (Gt. Britain) Ltd 1 Trafford Wharf Road Manchester M17 1BY T:0800 886 100 E:etteamfirestop@hilti.com	PROJECT:	HILTI MO:	Page: 2 / 3
		GB	Inq. number: 17080804
	CUSTOMER:	CONTACT PARTNER:	Date: 03.08.2017
			Name: S. BEEJOOA

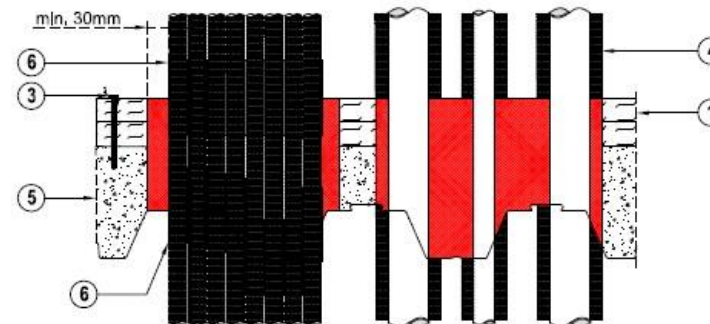
Firestop seals according to : Fire resistance of the Hilti CFS-F FX Firestop Foam for metal pipe penetrations.
Rating : E Rating up to 60mins; I Rating up to 60mins as per EN 1366-3:2009

Details:

Plan View:



Section View:



Note:
Hilti Corporation ("Hilti") has provided this specification on the basis of the data and information given to Hilti by "the customer" the respective Hilti product information and the existing level of technical knowledge (state of the art). This specification relates to the expected level of fire resistance performance, should the proposed detail be subjected to the standardised fire resistance test against which the judgement was made.
The accuracy of this specification is guaranteed provided that:
1. only original Hilti products as defined in this specification are used,
2. these specific products are used and installed only by a competent and experienced user in a manner which represents the state of the art and by strictly obeying the calculations and conditions mentioned in this specification as well as all relevant technical instructions, the operating manual, the setting manual and the installation manual and other data sheets of Hilti.
3. the proposed performance, the listed prerequisites and criteria conform with the conditions actually existing on the jobsite and have been checked and agreed by the user.

The EJ must contain a bespoke drawing. On this page we have provided a plan view and section view for clarity.

AGENDA

1. Partnering with Hilti
2. The importance of passive fire protection
3. Firestop systems testing criteria – EN 1366
4. EN standards essentials
5. Myths and misconceptions
6. How *not* to Firestop
7. How to Firestop
8. Wrap up and references.

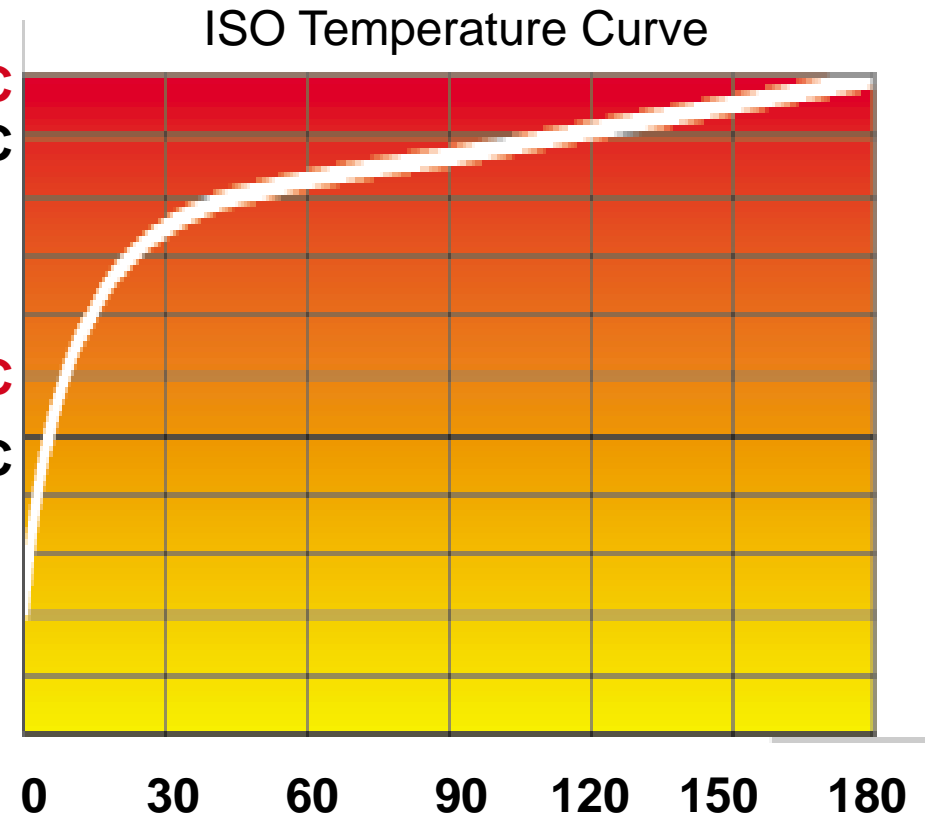
MYTHS AND MISCONCEPTIONS

Myth-1: "...rock wool is fire rated.."



Stone Wool **1200°C**
1000°C

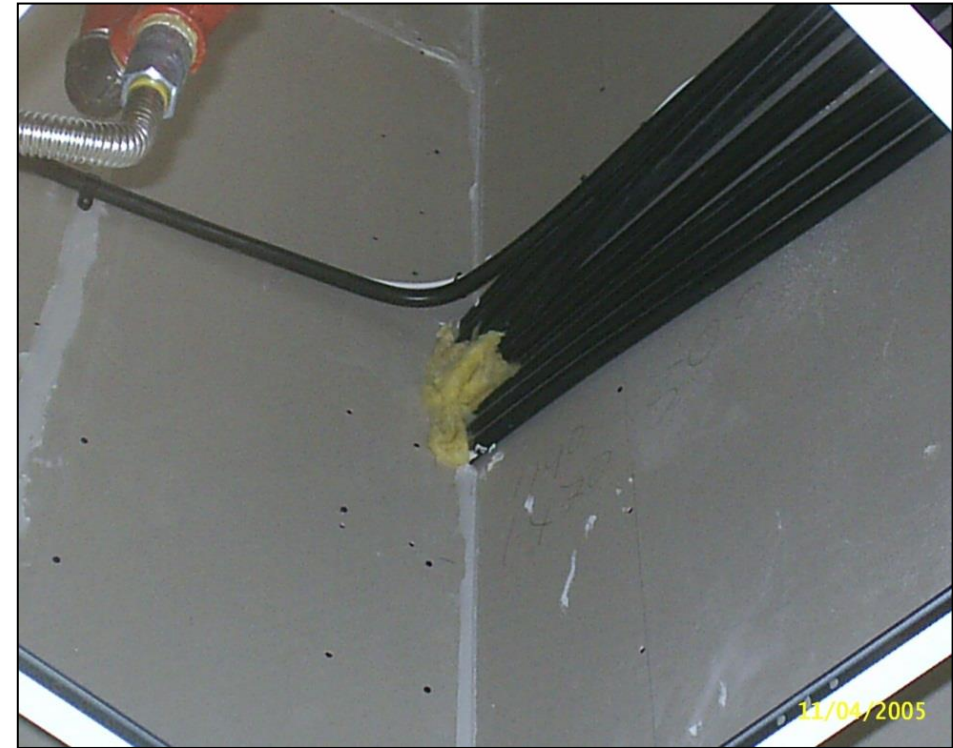
Glass Wool **650°C**
500°C



Mineral wool used alone is NOT a Fire Stop solution

MYTHS AND MISCONCEPTIONS

Myth-1: "...rock wool is fire rated.."



Mineral wool used alone is NOT a Fire Stop solution

MYTHS AND MISCONCEPTIONS

Myth-2: “...it’s fire rated foam...”

- “Fire foam”
- “Intumescent foam”
- “Fire resistant foam”

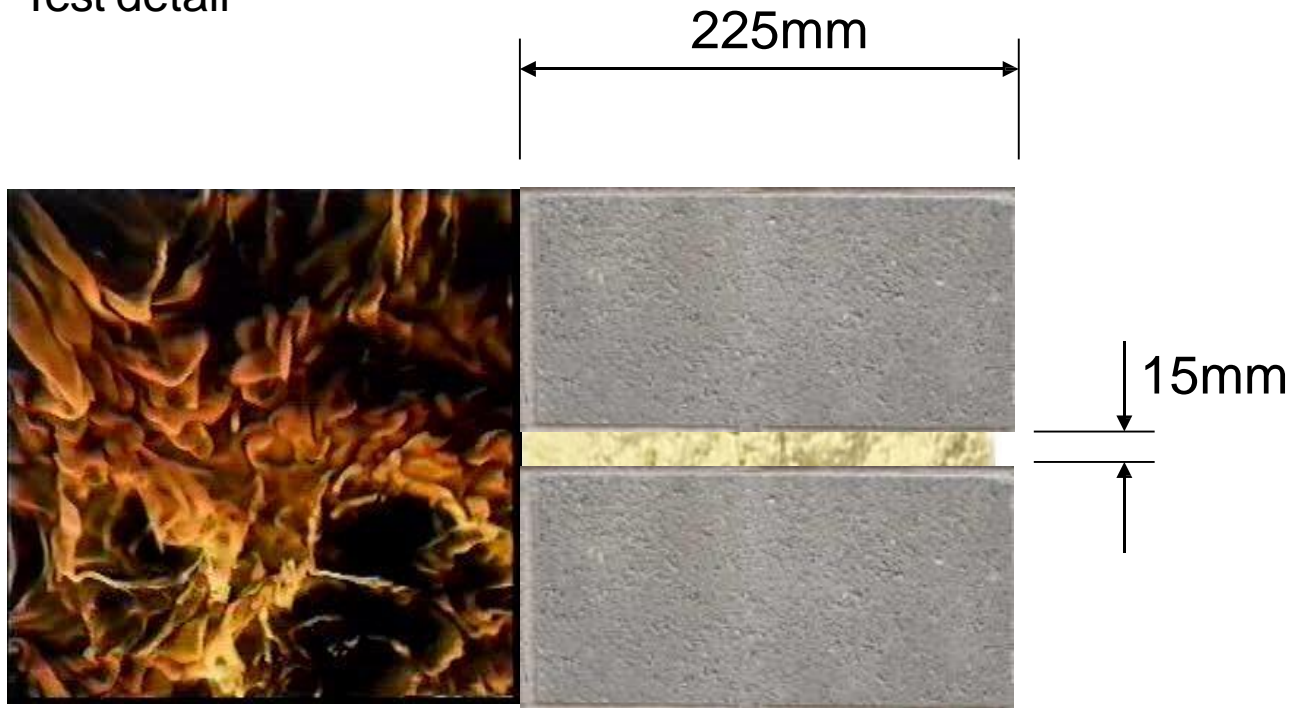


Expanding Foams in a can are NOT Fire Stop solutions

MISCONCEPTIONS

Fire Foam- PU Foam

Test detail



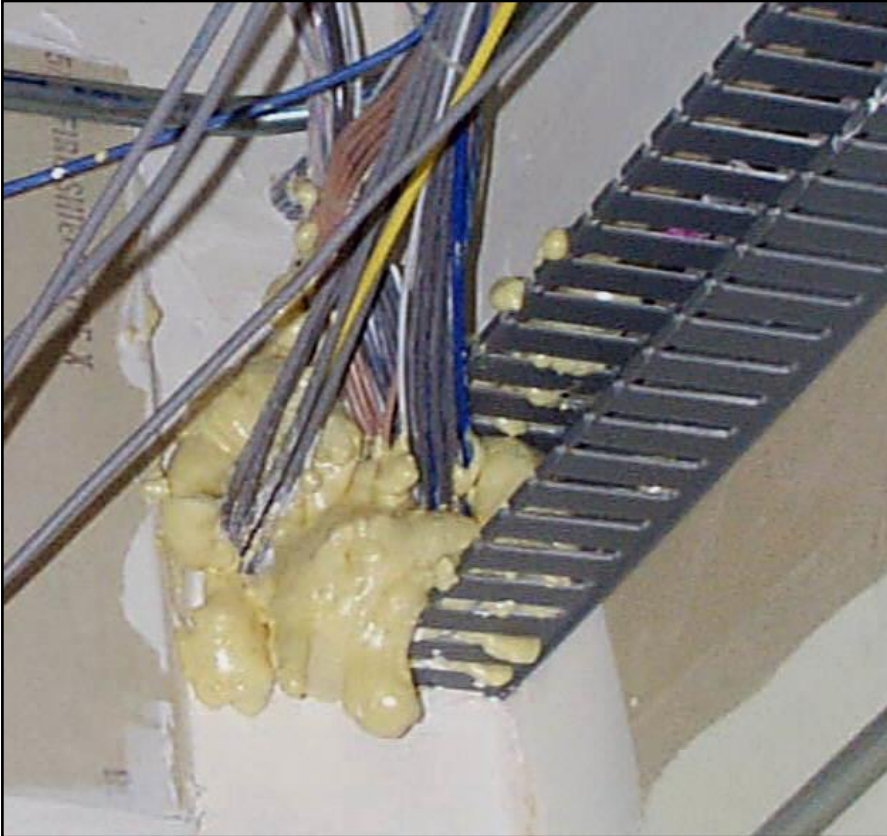
MYTHS AND MISCONCEPTIONS

Myth-2: “...it’s fire rated foam...”



MYTHS AND MISCONCEPTIONS

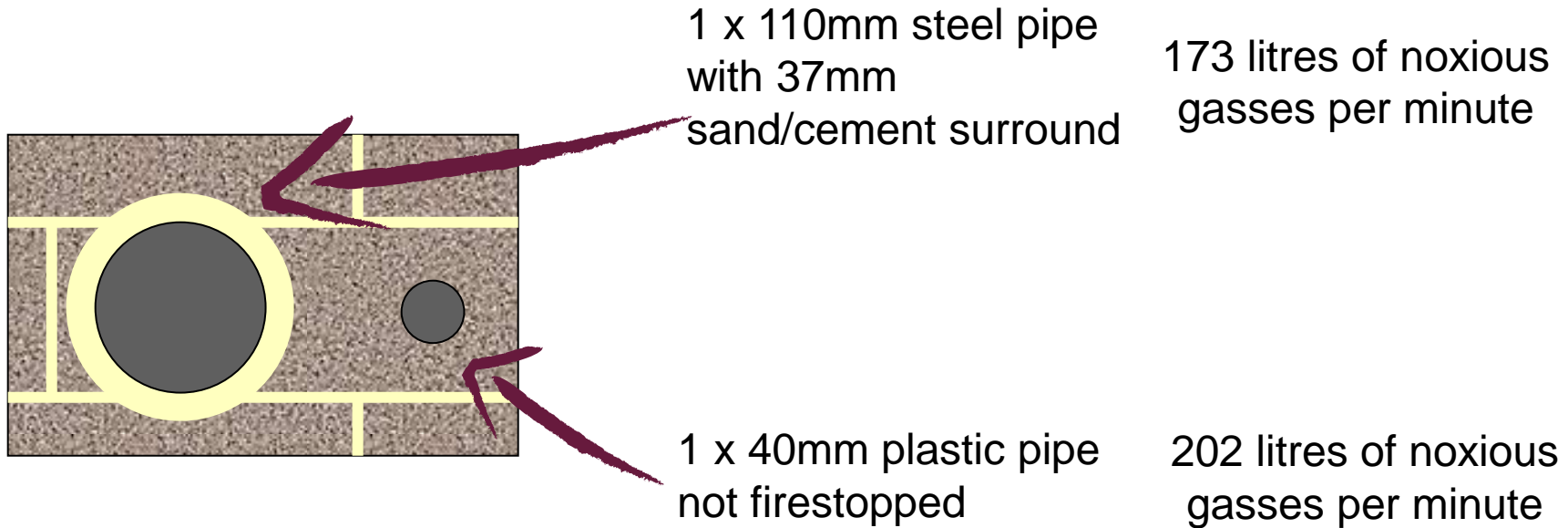
Myth-2: "...it's fire rated foam..."



Expanding Foams in a can are NOT Fire-Stop solutions

MYTHS AND MISCONCEPTIONS

Myth-3: "...it's less than 2 inch..."



1875 litres in 5 minutes enough to fill nearly 1,000 lungs!

AGENDA

1. Partnering with Hilti
2. The importance of passive fire protection
3. Firestop systems testing criteria – EN 1366
4. EN standards essentials
5. Myths and misconceptions
6. How *not* to Firestop
7. How to Firestop
8. Wrap up and references.

HOW NOT TO FIRESTOP

How not to ... “Joint Sealants”



“You get what you pay for”

HOW NOT TO FIRESTOP

How not to ... “Pipes penetrations”



Sealing and Back-filling Pipe penetrations should follow Manufacturer's recommendations

HOW NOT TO FIRESTOP

How not to ... “ Pipes Collars”



Intumescent Pipe collars may be simple but they must be anchored and sealed into the building element correctly

HOW NOT TO FIRESTOP

How not to ... “ Dampers and Ducting”



Ducts and dampers **MUST** be fitted to manufacturers instruction so they perform correctly

HOW NOT TO FIRESTOP

How not to ... “Services through Plasterboard”



Pattressing is not a tested and valid firestopping system

HOW NOT TO FIRESTOP

How not to ... “ Risers”



Open service risers are not a cheap solution

HOW NOT TO FIRESTOP

How not to ... Torres Windsor, Madrid, 2005



What happens when fire protection is not carried out?

HOW NOT TO FIRESTOP

How not to ... Torres Windsor, Madrid, 2005



What happens when fire protection is not carried out?

AGENDA

1. Partnering with Hilti
2. The importance of passive fire protection
3. Firestop systems testing criteria – EN 1366
4. EN standards essentials
5. Myths and misconceptions
6. How *not* to Firestop
7. How to Firestop
8. Wrap up and references.

HOW TO FIRESTOP – PLASTIC PIPES



CFS-C P Firestop Collar
Up to 180mins fire rating
50mm up to 250mm



CFS-W EL Pipe Wrap
Up to 240mins fire rating
50mm up to 160mm



CFS-C EL Endless Collar
Up to 120mins fire rating
16mm up to 160mm

HOW TO FIRESTOP – CPVC SPRINKLER PIPES



CPVC pipes are used as a lightweight and easy connection fit solution to sprinkler pipes.

It has to be treated in isolation against any other pipes or cables, contact with any other plastic material or non-approved sealant can cause corrosion and split the pipe.

The two main manufacturers both have a list of approved sealants, but there are very few products which are compatible with both chemical variations of the product.

HOW TO FIRESTOP – CPVC SPRINKLER PIPES

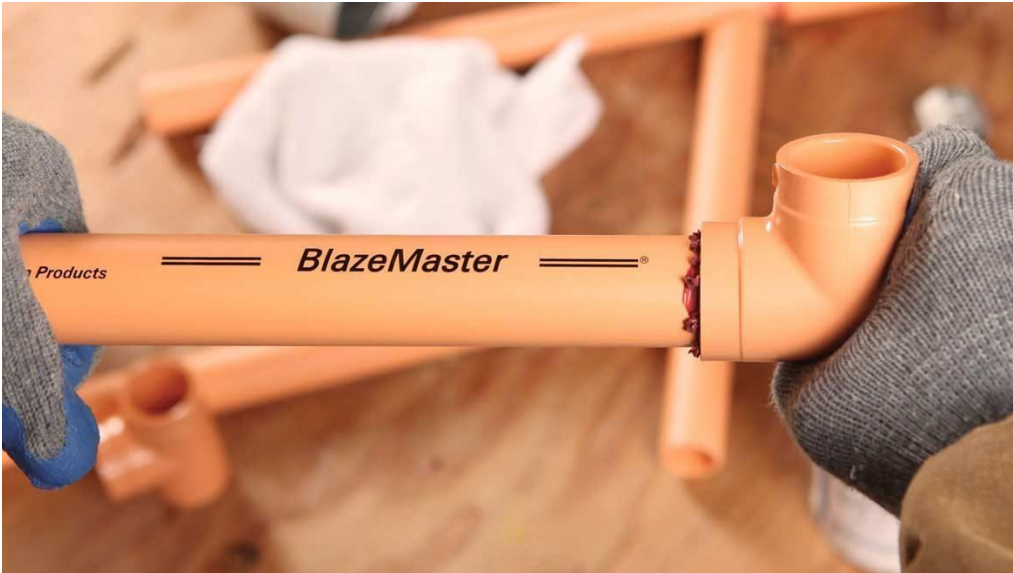
CFS-FIL

Approved firestop seal for use on C-PVC pipes (Lubrizol Blazemaster / Spears Flameguard)

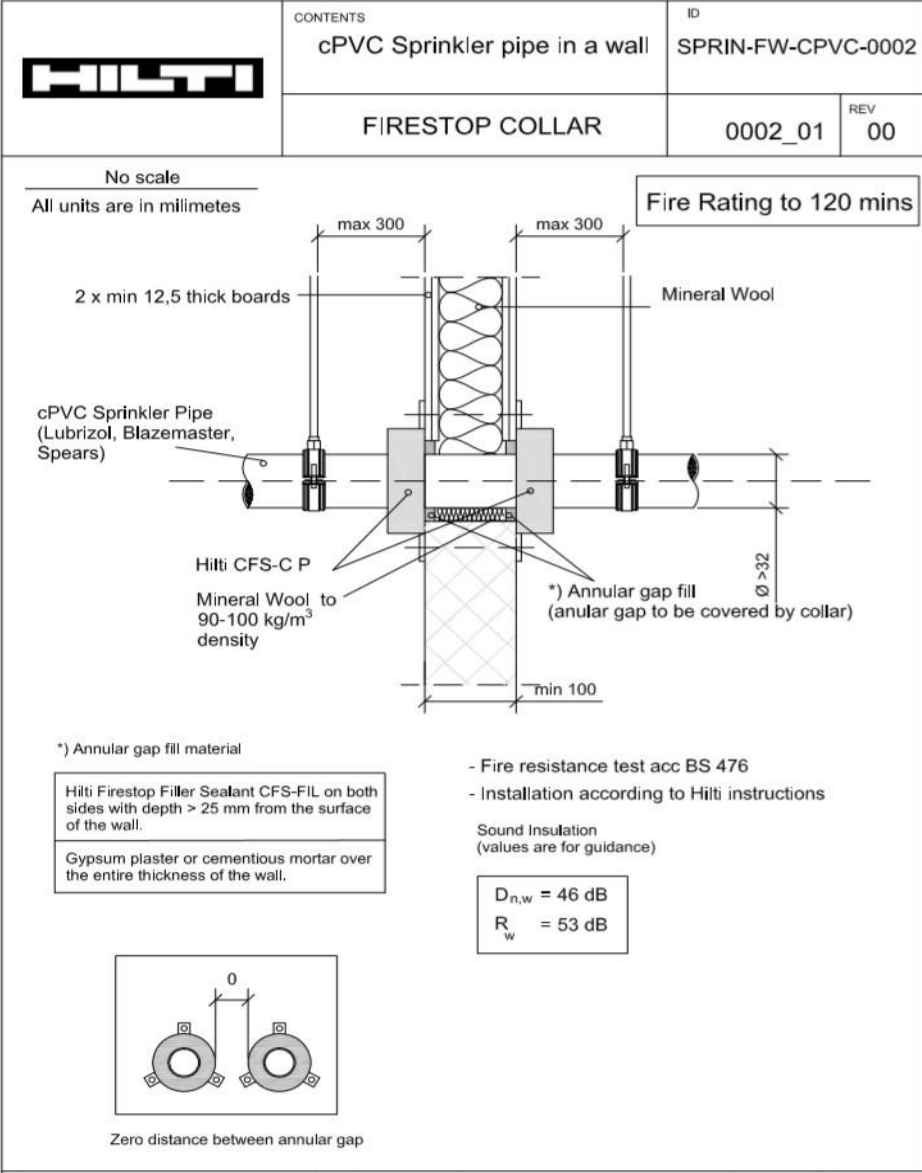
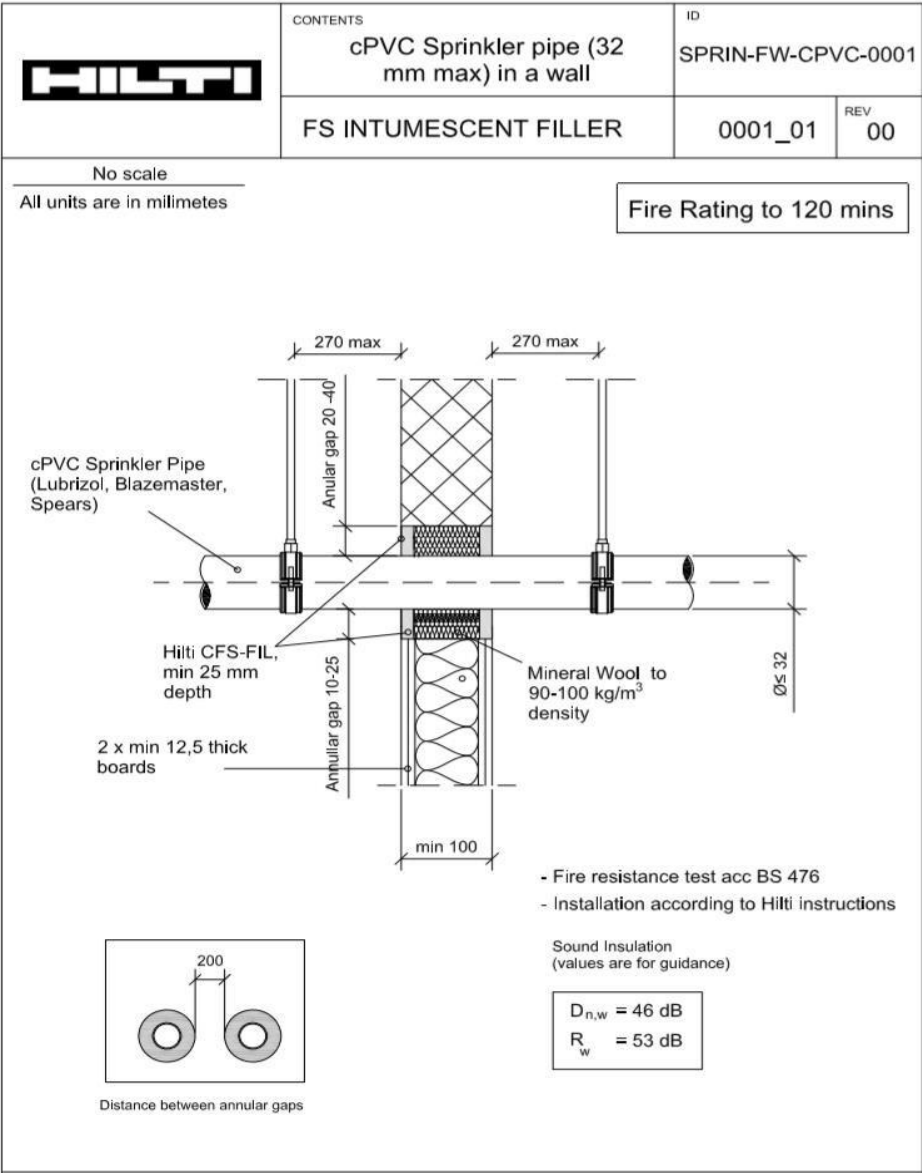
Can be used in isolation up to 32mm dia pipes, in suitable penetration which allows for 60/40 ratio

Approvals for CFS-C EL endless collar with CFS-FIL seal for larger pipes.

REFER TO PRODUCT DATA SHEET

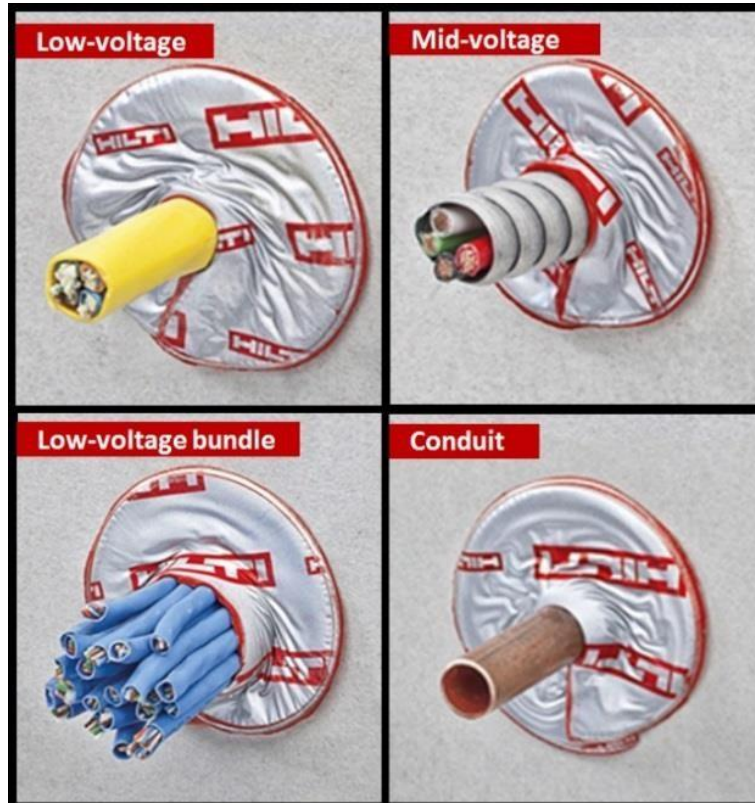


HOW TO FIRESTOP – CPVC SPRINKLER PIPES

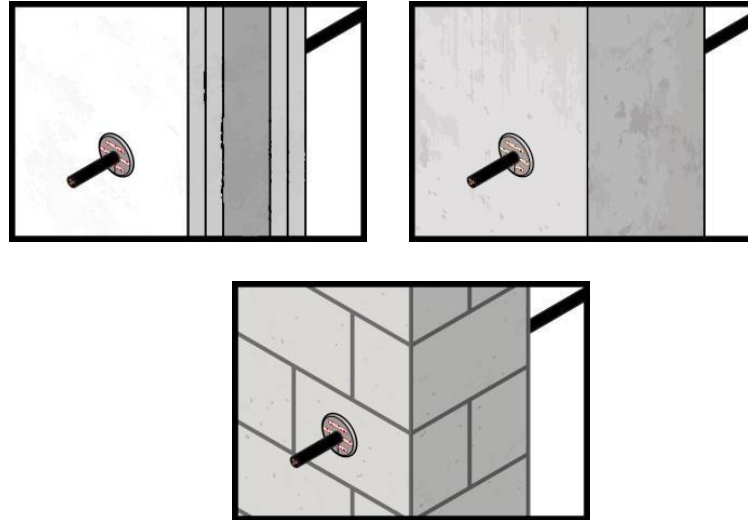


HOW TO FIRESTOP - SINGLE / SMALL DIA CABLE BUNDLES

Penetrating items



Base materials



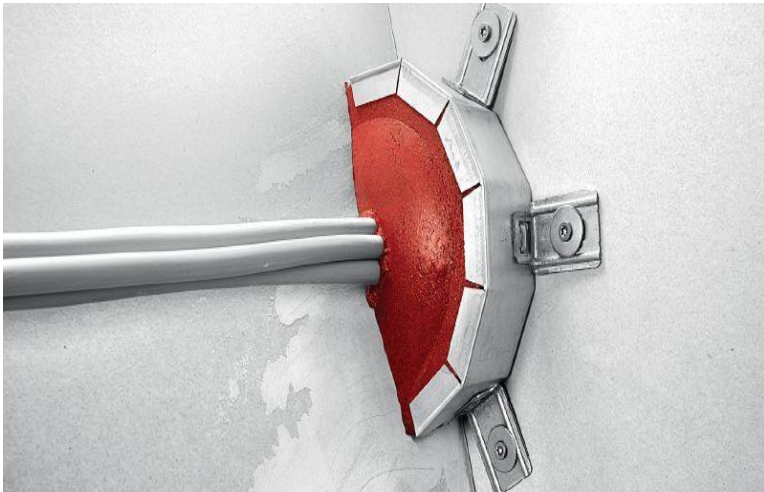
Holes up to 25mm or 1"
Peel **Stick** **Done**



Value Proposition

- **Fast:** Installs in less than 10 seconds
- **Simple:** Easy to install and sealant free
- **Powerful:** Broad range of applications
- Cable sizes up to **21mm**
- Plastic conduit up to **16mm**
- Copper pipes / tubes up to **16mm**
- Up to 120 min fire rating
- No backfilling required

HOW TO FIRESTOP – SINGLE CABLES & BUNDLES



CFS CC – Cable Collar

Max opening size – 4" / 108mm dia

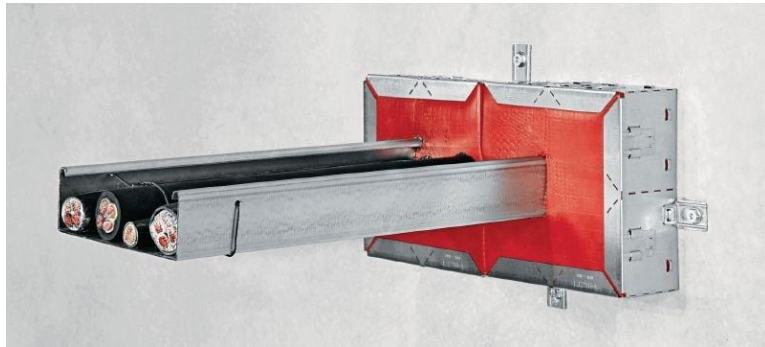
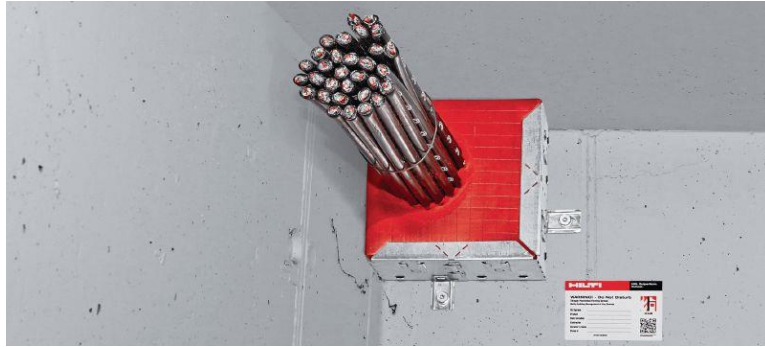
- Single cables up to **50mm**
- Cable bundles up to **100mm** (maximum diameter of single cables **21 mm**)
- Plastic conduit up to **32mm flexi** and **40mm rigid** (with or without cables)
- Can use over existing PU foam installs
- Problem solver for difficult cable applications (no annular gap)
- Re-penetrable to allow increase in future cable capacity

Up to 120 mins fire rating

Up to 59db acoustic sound reduction

REFER TO PRODUCT DATA SHEET

HOW TO FIRESTOP – MIXED PENETRATIONS



CFS RCC – Rectangular Cable Collar

Single <162mm Double <362mm Triple <562mm

- Single cables up to **80mm**
- Cable bundles up to **150mm** (maximum diameter of single cables **21 mm**)
- Single plastic conduit up to **50mm** / **bundle up to 80mm** (with or without cables)
- Metal conduit up to **16mm** (with or without cables)
Plastic pipes up to **50mm** / Steel pipes up to **114mm**
- Can use over existing PU foam installs
- Problem solver for difficult cable applications (no annular gap)
- Re-penetrable to allow increase in future cable capacity

Up to 190 mins fire rating

Up to 63db acoustic sound reduction

REFER TO PRODUCT DATA SHEET

HOW TO FIRESTOP- SINGLE / CABLE BUNDLES



CFS SL –Speed Sleeve

- Single cable up to **80mm**
- Cables **MAX filled device** (maximum diameter of single cables **21 mm**)
- Single plastic conduit up to **50mm / bundle up to 80mm** (with or without cables)
- Plastic conduits up to **63mm** (with or without cables)
- Metal conduits up to **63mm** (with or without cables)
- The ideal solution when cable configurations are regularly changed, eg data centres, and server rooms



Up to 120 mins fire rating

REFER TO PRODUCT DATA SHEET

HOW TO FIRESTOP - MIXED PENETRATIONS



CFS-FX

- Cables (bundles / trays / trunking)
- Mixed penetrations
- Combustible and non-combustible pipes
- Flexible seal allows future re-penetration
- Easy maintenance and retrofitting of cables

Up to 120 mins fire rating

Up to 60dB acoustic sound reduction

REFER TO PRODUCT DATA SHEET



HOW TO FIRESTOP - MIXED PENETRATIONS

CFS-BL

- Temporary or permanent sealing around cables, cable bundles and cable trays in wall / floor openings
- Easy maintenance and retrofitting of cables / pipes
- Economical installation and future proof system
- Up to 120 mins Fire Rating
- Acoustic noise reduction >59dB

REFER TO PRODUCT DATA SHEET



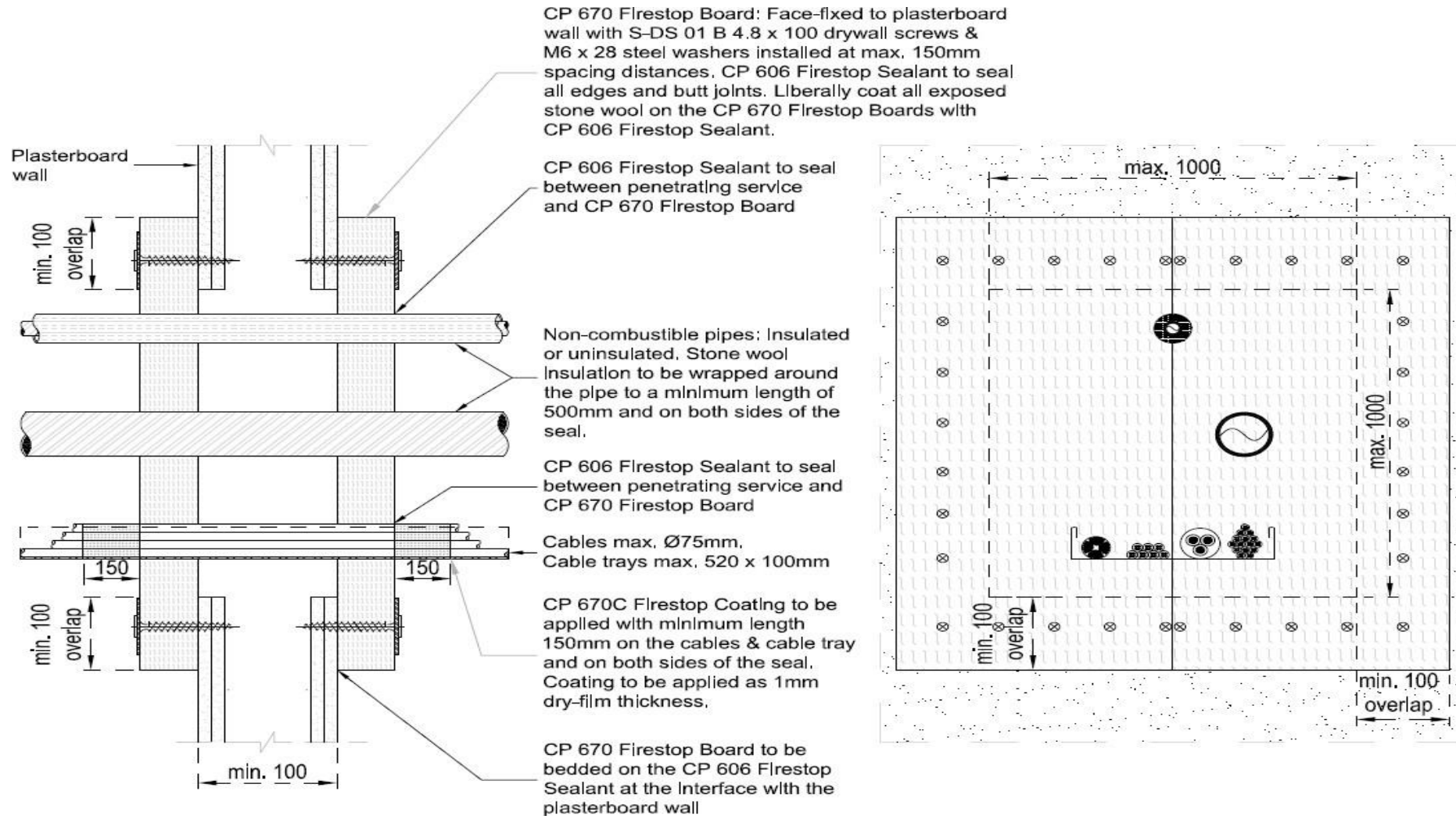
HOW TO FIRESTOP - MIXED PENETRATIONS



CP 670 Coated Board
Up to 240mins fire rating

HOW TO FIRESTOP

. CP 670 Coated Board 1.3



HOW TO FIRESTOP

Does it Work? “Case-Study: ICI-Wilton Site”



Compartmentation Works

HOW TO FIRESTOP

Does it Work? “Case-Study: ICI-Wilton Site”



Compartmentation Works

AGENDA

1. Partnering with Hilti
2. The importance of passive fire protection
3. Firestop systems testing criteria – EN 1366
4. EN standards essentials
5. Myths and misconceptions
6. How *not* to Firestop
7. How to Firestop
8. Wrap up and references.

DOCUMENTATION MANAGER – KEEPING TRACK



- **Step 1: Preparation
(back office)**

- Create project
- Add technical documents
- Upload 2D plan
- Define users for different tasks

- **Step 2: Document Firestop
(mobile app user)**

- Capture penetrations
- Take pictures w/ mobile device
- Scan QR code with label
- Set markers on 2D plan

- **Step 3: Create reports
(back office)**

- Standard report
- Excel report
- 2D plan report

Software programs available to make tracking and documentation easier

FIRESTOP SUPPORT

- **Site support**

Supporting you and your customers on jobsites with product demonstrations and trainings

- **Technical advisory service**

By phone or by email – our office based engineering team are never more than a click or a call away :-

0800 886 100

Email - gbtas@hilti.com

ASK Hilti - <https://ask.hilti.co.uk/>

- **Firestop products / technical documents**

Available 24/7 you can find our documentation on our dedicated section on [Hilti website](#)

- **Firestop Installation videos**

[Hilti's Youtube firestop channel](#) runs through how to install step by step their firestop products



THANK YOU

Contact

- Lee Frost
Government and Firestop Specialist
M +44 7802 205 846
T +44 800 886 100
E lee.frost@hilti.com
- GB
[Tel:0800886100](tel:0800886100)
Email: gbtas@hilti.com
Web: www.hilti.co.uk/engineering