FSi Promat

Passive Fire Protection

Guidance Document:
Penetration Seals & Fire-Resistant Walls

V2

FIRE SAFETY, NO COMPROMISE.

etex inspiring ways of living

PFP Guidance

Contents

Need extra information? Get in touch:

E: technical.fsi.uk@etexgroup.com | T: 01530 449155

Introduction

Guidance Document

This guidance document is designed to outline key considerations when specifying FSi Promat fire stopping systems for fire-resistant wall constructions. It highlights standard processes to ensure compliant fire stopping systems can be applied to building constructions.

The document covers methods of construction for three and four-sided apertures, single service penetrations, and the parameters and requirements of the fire stopping system to be included.

In accordance with Approved Document B (ADB), which provides statutory guidance on fire safety matters within and around buildings, it is essential to ensure that all fire stopping systems meet the necessary performance criteria. This includes compliance with requirements for:

- Internal fire spread (B3),
- External fire spread (B4),
- Access and facilities for the fire service (B5)1.

Additionally, the Building Safety Act mandates that building owners and managers must ensure the safety of their buildings, particularly in relation to fire safety. This includes adhering to the guidance provided by manufacturers of the substrates and ensuring that all installations are in line with third-party certification documents for the proposed fire stopping system.

Important Note:

This document contains general guidance. It is crucial to adhere to the manufacturer's installation guidance for the substrates, as well as the specific guidance provided in third-party certification documents for the proposed fire stopping system.

4-Sided Apertures

- Assembly in Fire Resistant Substrates
- Standard Siniat 4-sided Aperture
- Stopseal Batt System

4-Sided Apertures

Assembly in Fire Resistant Substrates

A key element of any compartment line is the substrate itself. Whether it is a wall, floor, ceiling, or roof, it must be constructed and assembled in accordance with the manufacturer's guidelines. This ensures it replicates the precise test design to which it was subjected.

The integrity of the substrate is crucial for maintaining the overall fire resistance of the compartment. Proper construction and assembly are essential to ensure that the substrate performs as expected under fire conditions. This includes using the correct materials, following specified installation procedures, and ensuring that all components are properly integrated.

Adhering to the manufacturer's guidelines is vital because these guidelines are based on rigorous testing and certification processes. These tests simulate real-world fire scenarios to verify that the substrate can withstand high temperatures and prevent the spread of fire and smoke. By following these guidelines, you can ensure that the substrate will provide the necessary level of protection in the event of a fire.

Additionally, it is important to consider the compatibility of the substrate with other firestopping systems and components. This includes ensuring that any penetrations, joints, or other openings are properly sealed and protected. Proper coordination between different elements of the fire protection system is essential to maintain the integrity of the compartment line.

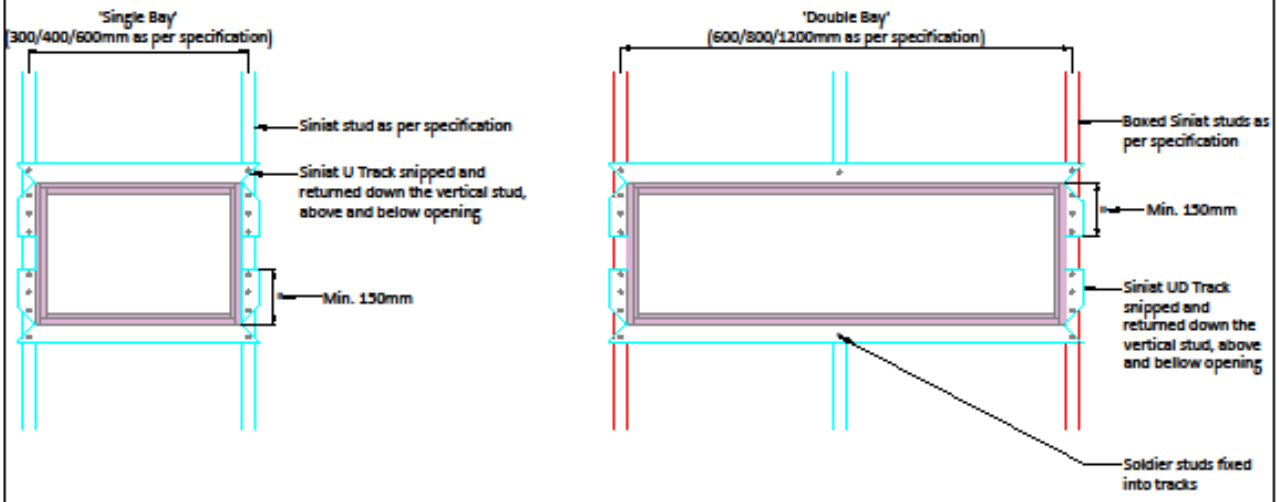
In summary, the substrate is a fundamental component of any compartment line, and its proper construction and assembly are critical for ensuring fire safety. By adhering to the manufacturer's guidelines and ensuring compatibility with other firestopping systems, you can help to create a robust and effective fire protection system.

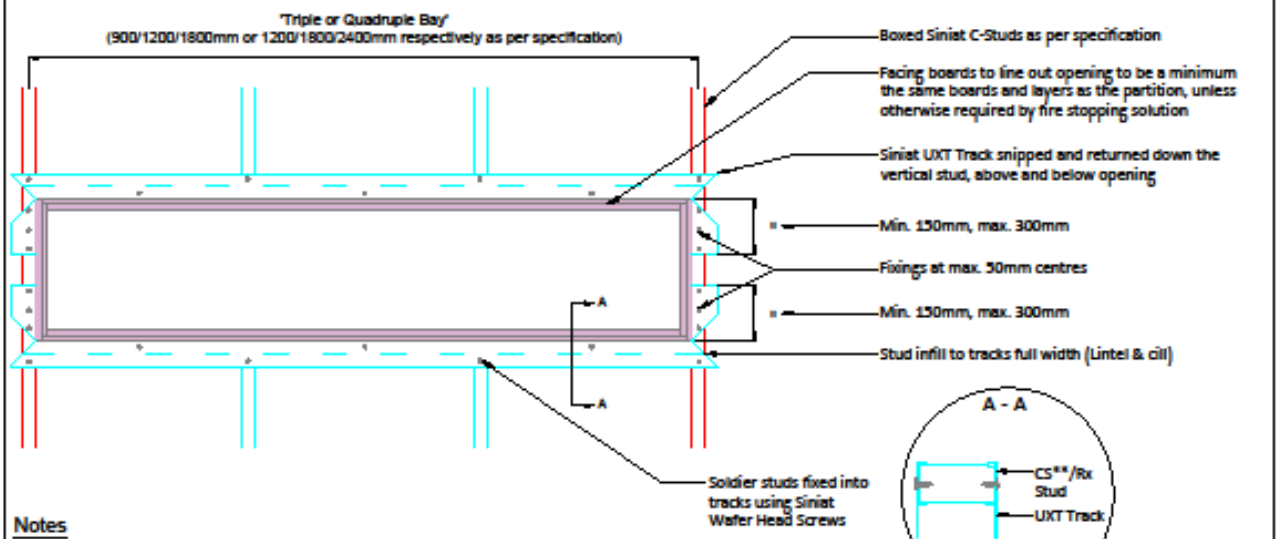
4-Sided Apertures

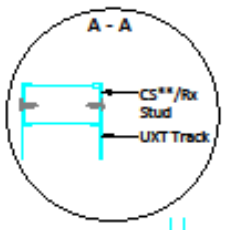
Standard Siniat 4-sided Aperture

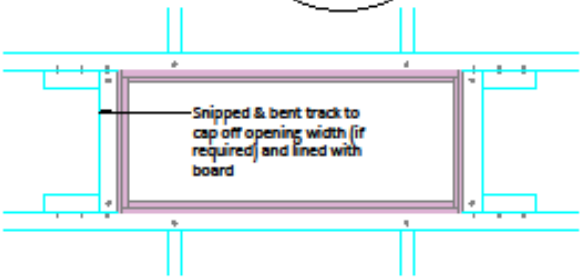
Note: For performance and fixing criteria, refer to associated specification

siniat









Notes

Details are for self-supported services only. If glazed screens are required within openings contact Siniat technical services for the appropriate detail.

If required, the opening can be capped off to reduce the opening width using snipped & bent Siniat tracks, capped off with appropriate Siniat boards.

In fire rated walls consult fsi for a range of fire stopping options.

Not to be used above doorways where door jamb is fouled by the opening.

It is recommended that service locations are identified prior to 1st fix stage.

Opening to be capped as a minimum to the firestop manufacturers tested detail and also consideration to the system board specification.

REV.	DATE	NATURE OF REV.	REV. BY	APP'D
F	29/01/25	Documentation tidy up	TB	CS
E	10/01/25	Naming Conventions	CT	CS
D	11/12/24	Naming conventions	TB	CS
C	22/10/24	General update	TB	CS
B	09/08/23	Annotation	CT	CS

LETTERBOX OPENINGS	ELEVATION	DATE 06/06/23	DRAWN SA
		SCALE NTS	CHECKED CS
CD003 Letterbox Openings			APPROVED RC

REVISION F

4-Sided Apertures

Stopseal® Batt System

The typical sealing option for 4 sided penetrations through flexible and rigid walls is the Stopseal® Batt system where not deflective movement is required.

The Stopseal® Batt System is the ideal choice for contractors, architects, and building owners who prioritise both safety and efficiency. Its combination of fire resistance, flexibility, ease of installation, and durability makes it a versatile, cost-effective fire stopping solution that ensures long-term protection for your building and its occupants.

The Stopseal® Batt System is engineered to provide exceptional fire resistance, helping to prevent the spread of fire, smoke, and gases through service penetrations and construction joints. Certified to the highest standards, it ensures your building's fire barriers maintain their integrity under extreme conditions.

The Stopseal® Batt can be installed in various applications, typically from both sides as a friction-fit system or a Pattress-fit system depending on the intended fire resistance or service types present.

There are also solutions that can be applied from one side, although the test data for these would have a more limited scope.

Please consult the technical team at FSi Promat for further details.

3-Sided Apertures

- Assembly in Fire Resistant Substrates
- Standard Siniat 3-sided Aperture
- Flexi Coat ® System

3-Sided Apertures

Assembly in Fire Resistant Substrates

Three-sided apertures are typically constructed where ceiling grids, suspended ceilings, or low floors are to be installed, and a standard 4-sided letterbox cannot be used.

Adhering to the manufacturer's guidelines is vital, as these guidelines are based on rigorous testing and certification processes. These tests simulate real-world fire scenarios to confirm that the substrate can withstand high temperatures and prevent the spread of fire and smoke. By following these guidelines, you can ensure that the substrate will provide the necessary level of protection in the event of a fire.

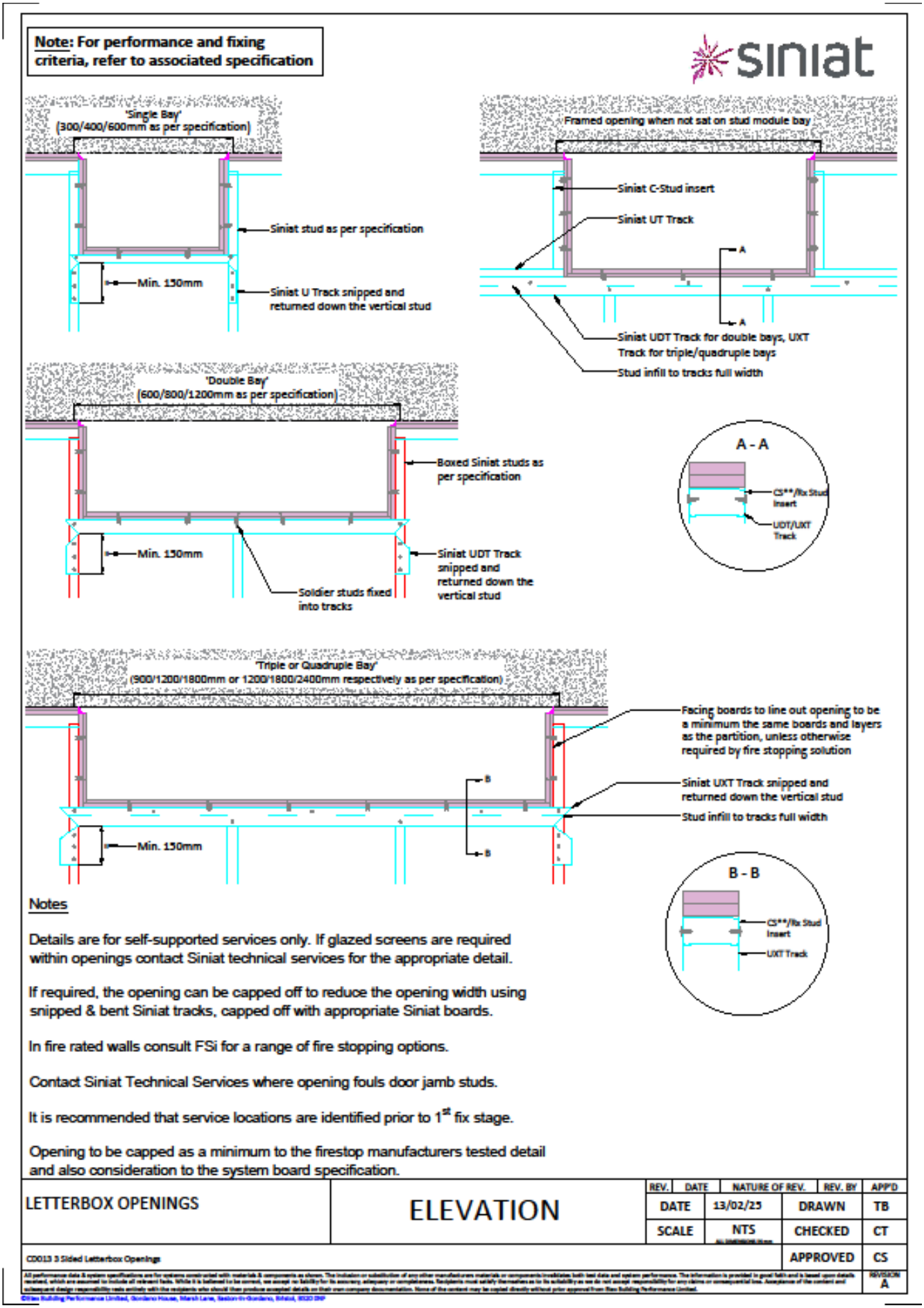
Additionally, it is important to consider the compatibility of the substrate with other fire stopping systems and components. This includes ensuring that any penetrations, joints, or other openings are properly sealed and protected. Proper coordination between different elements of the fire protection system is essential to maintain the integrity of the compartment line.

In summary, the substrate is a fundamental component of any compartment line, and its proper construction and assembly are critical for ensuring fire safety. By adhering to the manufacturer's guidelines and ensuring compatibility with other fire stopping systems, you can help to create a robust and effective fire protection system.

There are additional considerations with three-sided applications, as any potential deflective movement that is designed to be accommodated by deflection heads will be transferred to the fire stopping system. As a result, the fire stopping product must be suitable to perform to the same standard.

3-Sided Apertures

Standard Siniat 3-sided Aperture



3-Sided Apertures

Flexi Coat ®

Where there is a requirement to accommodate deflection in 3 and 4 sided apertures FSi Promat would recommend the Flexi® Coat System.

One of the key features of the Flexi® Coat system is its ability to accommodate movement, particularly in areas where structural deflection occurs. In many modern buildings, floors and slabs may experience movement due to structural loads, thermal expansion, or general building settlement. These movements can impact fire stopping solutions, which must maintain their integrity under such conditions.

The Flexi® Coat system is specifically designed to address this challenge. It is developed to be used in situations where movement must be accommodated, particularly as a result of slab deflection.

The system's movement performance has been rigorously tested and verified in accordance with the EN 1366-4 test standard, which evaluates the fire resistance of linear joint seals under movement conditions. This ensures that the system remains effective even when subjected to dynamic structural changes.

Testing and Third-Party Assessments

Although there is currently no specific EN test standard that directly evaluates the ability of a fire stopping sealing system to accommodate service deflection within penetration seals, the Flexi® Coat system has undergone extensive independent assessments to validate its performance in such applications.

To support its suitability for use in real-world fire stopping scenarios, the system has been assessed through:

- Extensive linear joint testing for movement, conducted in accordance with the EN 1366-4 test standard.
- Direct testing to the EN 1366-3 test standard, which evaluates fire resistance performance for penetration seals.
- Third-party assessments, based on a combination of test data and practical performance evaluations, ensuring compliance with industry best practices and fire safety regulations.

3-Sided Apertures

Flexi Coat ®

Flexi Coat® Coating

Up to 4hrs fire resistance* | Linear joints | Penetration seals | Flexibility +/- 25% | Acoustic properties* | Third party certified | UKCA | CE | UNDERGROUND

Flexi Coat® is an ablative, highly advanced, highly flexible coating. Apply to uncoated stonewool boards to reinstate the fire resistance performance of wall and floor constructions where apertures are penetrated by single or multiple services, as well as curtain wall and perimeter facade applications. Flexi Coat® has been designed to be used where movement accommodation of +/- 25% is required.

EN1366-4 – Linear Seals
EN1366-3 – Penetration Seals
EN 1364-4
EN13501-2 – Fire Classification
UL-EU-00642-CPR
ETA-20/1030 - Linear Seals
ETA-20/1010 - Penetration Seals
UAE Certificate of compliance
LUL - Reg. No. 5302
EN10140 – Airborne Sound
EN1026 – Air Permeability
EN1027 – Water Permeability

Available in 5, 10 and 20kg pails

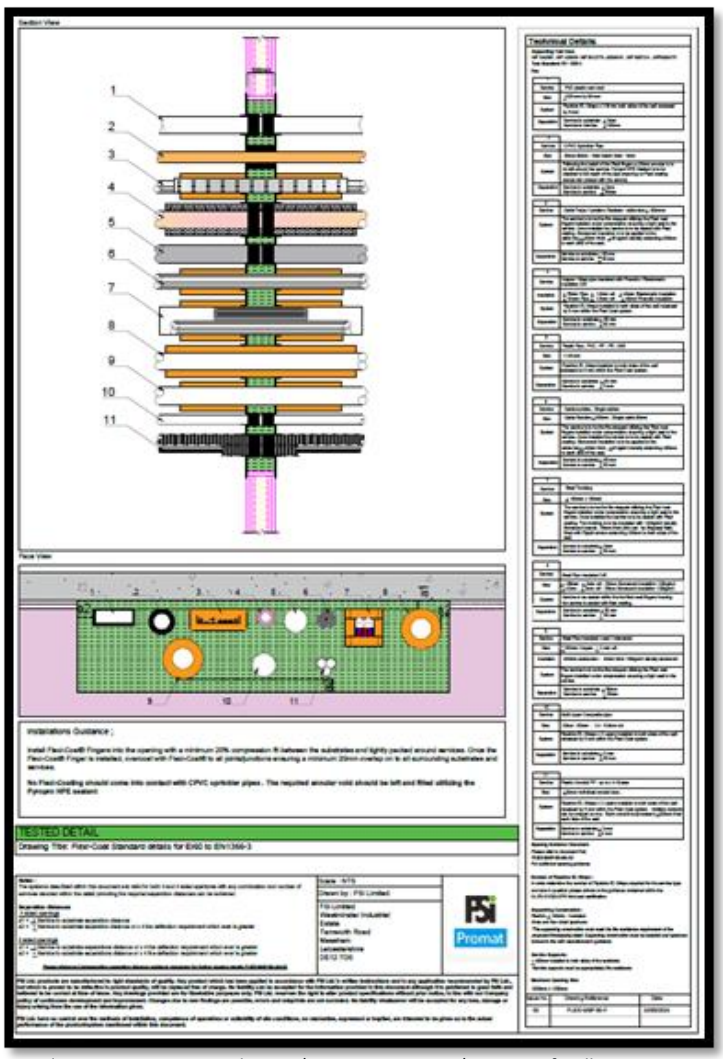
Multi-Service Penetration
Documents

These documents are supplied to clarify in a single document a variety of information including but not limited to:

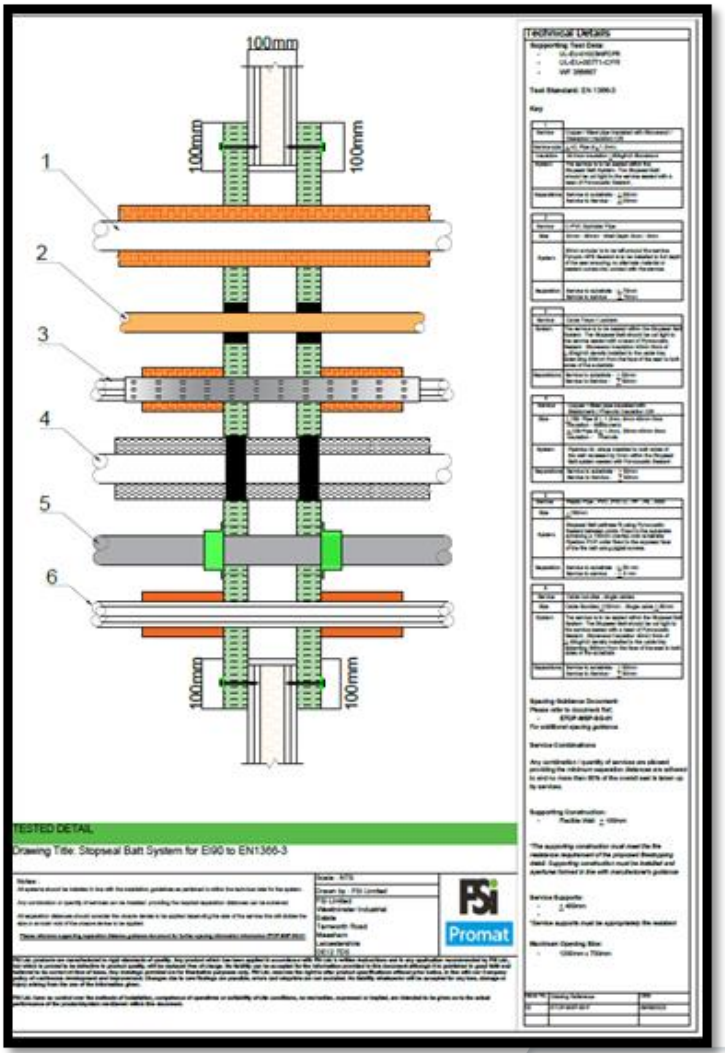
- Service types allowed
- Maximum service size
- Insulation thicknesses
- Maximum void sizes
- Any additional insulation requirement

The scope of application achieved will vary depending on the level of the fire resistance required and so there are typically several documents for 30-, 60-, 90- and 120-minutes fire resistance.

FLEXI -MSP-60-F



STOP -MSP-60-F



Service Spacing
Within Apertures

The correct service spacing is vital to ensure a compliant seal is achieved which is denoted within the FSi Promat spacing guidance documents.

With the spacing documents the matrix can used to identify the spacing requirements between services and the substrate.

These figures should be considered as early as possible during the design process to ensure the correct spacings can be achieved considering the size of aperture and service types required. **In addition, the depth of any continuous insulation to be applied to services should be factored in as this will influence the separation distance that can be achieved.**

	Copper/Steel Pipe (Insulation Type :- Stonewool , Glasswool C/S)	Cable Tray	Plastic Pipe + Pipebloc EL Wrap	Plastic Pipe + Pipebloc PCP Collar
Copper/Steel Pipe (Insulation Type :-Stonewool ,Glasswool , C/S)	50mm	50mm	50mm	50mm
Cable Tray	50mm	50mm	50mm	50mm
Plastic Pipe + Pipebloc EL Wrap	50mm	50mm	0mm	0mm
Plastic Pipe + Pipebloc PCP Collar	50mm	50mm	50mm	0mm

	Copper/Steel Pipe (Insulation Type :- Stonewool , Glasswool C/S)	Cable Tray	Plastic Pipe + Pipebloc EL Wrap	Plastic Pipe + Pipebloc PCP Collar	C-PVC Pipe + Pyropro HPE Sealant	Single Cable	Copper/Steel Pipe (Insulation Type :- Elastomeric, Phenolic C/S) + Pipebloc EL Wraps	Steel Pipe – Copper Steel Uninsulated ((L/I C/I Insulation)	Cable Bundle	Copper/Steel Pipe (Insulation Type :- Elastomeric, Phenolic C/S ,I/S) + Pyropro HPE Sealant
Copper/Steel Pipe (Insulation Type :-Stonewool ,Glasswool , C/S)	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm
Cable Tray	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm
Plastic Pipe + Pipebloc EL Wrap	50mm	50mm	0mm	0mm	50mm	50mm	50mm	50mm	50mm	50mm
Plastic Pipe + Pipebloc PCP Collar	50mm	50mm	50mm	0mm	50mm	50mm	50mm	50mm	50mm	50mm
C-PVC Pipe + Pyropro HPE Sealant	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm
Single Cable	50mm	50mm	50mm	50mm	50mm	0mm	50mm	50mm	50mm	50mm
Copper/Steel Pipe (Insulation Type :- Elastomeric, Phenolic C/S) + Pipebloc EL Wraps	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm
Steel Pipe – Copper Steel Uninsulated (L/I, C/I) Insulation)	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm
Copper/Steel Pipe (Insulation Type :- Elastomeric, Phenolic C/S ,I/S) + Pyropro HPE Sealant	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	0mm
Cable Bundle	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm
Substrate	50mm	50mm	50mm	0mm	50mm	50mm	50mm	50mm	50mm	0mm

Notes

All spacing is not inclusive of any required closure device that is to be applied to the service.

Spacing should be taken from the perimeter of any Continuous / Sustained insulation + Closure

All systems are tested to EN1366-3.

Please refer to the installation guidance for the relevant system as pertained to within the technical data sheets.

All service supports should be positioned ≤ 400mm from both faces of the substrate .

The spacing guidelines advised are relevant for the fire resistance period for the tested systems as per FSi Standard Details .

All spacings are a minimum requirement and can be increase without limit .

Local / Interrupted insulation may impact on the ability to achieve separation distances between services. This should be considered during the design stage depending on the project requirements and site conditions.

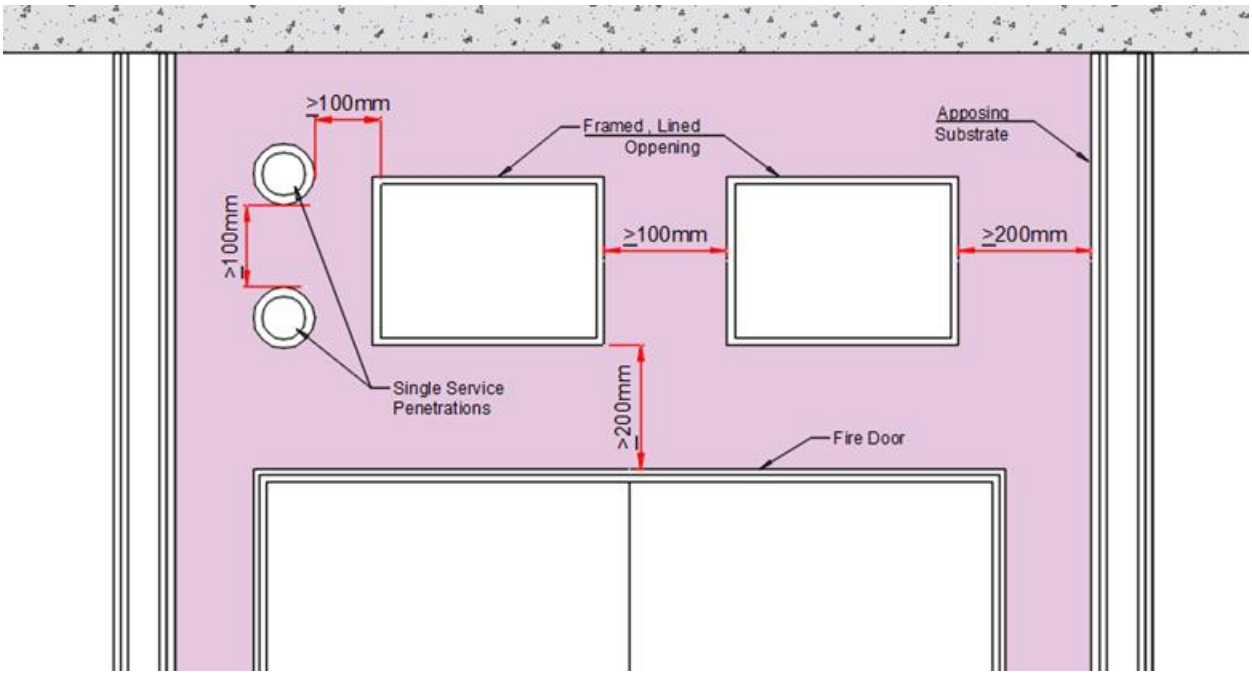
Spacing Consideration
Between Apertures

The guidance provided is supported by testing in accordance with the BS EN 1366-3 standard, along with the associated field of application data derived from this testing.

All apertures should be framed and lined in accordance with the wall manufacturer's guidance, and spacings must be measured from the internal edge of the aperture facing.

These distances are provided as guidance and may be adjusted, subject to the wall manufacturer's recommendations. Any such variations must be agreed upon at the design stage by all Appointed Persons.

Annexure A



Single Service Penetrations = 100mm

Aperture to Aperture = 100mm

Distance to any other aperture type i.e Fire doors, Ducts, Dampers = 200mm

Distance to Opposing substrates = 200mm

Maximum Void Sizes

For FSi Promat Sealing Systems

Stopseal® Batt System Walls	Maximum Void
Flexible / Rigid up to EI60	2600mm x 2600mm
Flexible / Rigid up to EI120	1200mm x 730mm

Stopseal® Batt System Floors	Maximum Void
Rigid Floor EI60 Friction Fit	1100mm x 1500mm = 1.65m2
Rigid Floor EI60 Pattress Fit	1300mm x 1100mm = 1.43m2
Rigid Floor EI120 Friction Fit	1100mm x 750mm = 0.825mm

Flexi® Coat Fingers	Maximum Void
Walls Flexible / Rigid up to EI90	1200mm x 1200mm
Flexible / Rigid up to EI120	1200mm x 1200mm

Silverseal® HS Compound	Maximum Void
Rigid Floors	1800mm x 1800mm = 3.24m2
Rigid Walls	1100mm x 1100mm

FSi Promat Products and Systems – Compliance with BS EN 1366-3:2021

FSi Promat products and systems are tested to the most rigorous standards for service penetrations, specifically BS EN 1366-3:2021. This standard includes requirements for testing specific wall constructions in a controlled manner to ensure compliance with its defined parameters.

For flexible wall build-ups, BS EN 1366-3:2021 mandates that the substrate be constructed using Type F gypsum plasterboard, in accordance with EN 520.

Annexure B

Table 2 — Standard double-sided flexible wall constructions

Intended fire resistance	Steel stud depth [mm]	Lining		Insulation: Mineral wool		Overall wall thickness [mm]
		Number of layers at each side	Thickness of boards [mm]	Thickness [mm]	Density [kg/m^3]	
EI 30	44 - 55	1	12,5	40 - 50	30 - 60	69 - 80
EI 60	44 - 55	2	12,5	40 - 50	30 - 60	94 - 105
EI 90 or EI 120 [a]	44 - 55	2	12,5 [b]	40 - 50	85 - 115	94 - 105
EI 120	62 - 75	2	15	60 - 70	85 - 115	122 - 135

Components:
Head/floor track, studs in accordance with EN 14195
Lining: Paper-faced, gypsum plasterboard type F in accordance with EN 520
Fixings: Self drilling/self-tapping screws
Jointing compound: Gypsum plaster

NOTE The distance between the stud centres is typically 600 mm or 625 mm.

[a] This is the intended resistance to fire for the test of a penetration seal and does not state that a wall with these dimensions will have a classification of EI 120 in all cases.

[b] Restrictions to the field of direct application apply. See 13.3.2. If for EI 90 walls it is intended to cover walls with only one layer of board on each side, a wall with a gypsum board with a thickness of 25 mm may be used in the test.

As a result, the field of application allows for substrates to be constructed using any gypsum board that meets EN 520 or calcium silicate board, provided that the substrate is classified under EN 13501-2 with an equal or greater fire resistance rating.

Annexure C

13.3.2.1 Test results obtained with the standard double-sided flexible wall constructions in accordance with 7.2.2.1.2.1may be used for all double-sided flexible wall constructions (with and without insulation) of the same or higher fire resistance classification in accordance with EN 13501-2 with a lining made of Gypsum boards in accordance with EN 520 or Calcium Silicate boards which are CE marked based on an ETA for the application as lining of flexible walls, if their construction is in accordance with the rules given in Table 5.

Interchangeability of Substrates

When we test our fire stopping systems, we typically test them on flexible walls with a minimum thickness of 75mm to 100mm. Through the field of application achieved from testing to the EN1366-3:2021 test standard, an increased scope is established, as outlined in Annex D (as referenced in ASFP Guidance Note 15).

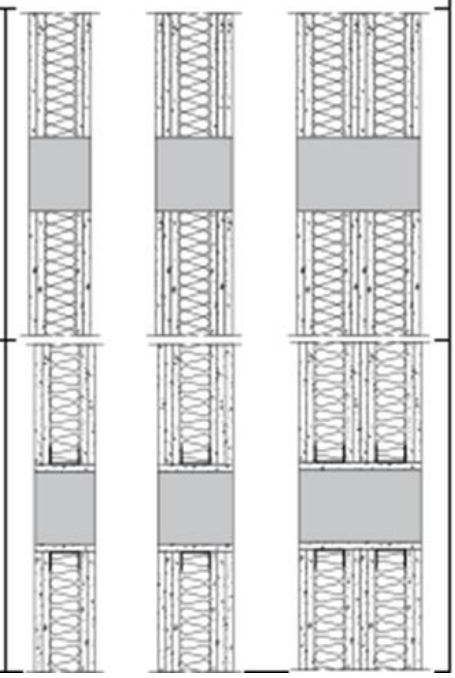
The number of board layers and the overall board layer thickness must be equal to or greater than that tested when no aperture framing is used. When a minimum 12.5mm aperture lining is applied, the board layer thickness may be reduced, provided the overall wall thickness remains equal to or greater than that tested.

An aperture framing is considered part of the penetration seal. Tests conducted without aperture framing will cover applications with aperture framing but not vice versa. Flexible wall constructions with timber studs follow the guidance provided in BS EN1366-3:2021 and/or BS EN1366-4:2021.

The table overleaf provides guidance but is not exhaustive. For other wall constructions, consult BS EN1366-3:2021 or BS EN1366-4:2021 as appropriate. The guidance in this document can also be used to justify interchangeability of supporting constructions tested to the earlier versions of BS EN1366-3 and/or BS EN 1366-4.

Annexure D

Construction tested	Constructions covered (vertical section except stated otherwise)
	a) Flexible wall constructions with the same or higher number of board layers of the same or higher overall lining thickness on each side of the wall and the same insulation as tested
	b) Flexible wall constructions with the same or higher number of board layers of the same or higher board thickness as tested on each side of the wall, with an aperture framing and insulation of any type



Please see : Advisory Note 15 ASFP position on interchangeability of flexible wall construction for fire stopping, for full scope on the wall configurations supported.

Shaft Wall Guidance

Shaft walls (non-symmetrical walls) are not considered within the EN 1366-3 test standard for penetration seals. This absence of consideration for typical asymmetrical shaft wall constructions poses challenges in identifying appropriate testing protocols for various systems and penetration services.

Non-symmetrical wall constructions can be tested, provided they are exposed to fire from both sides. However, due to the limited scope of the European test standards, the range of applications for these walls is restricted, often requiring additional assessments.

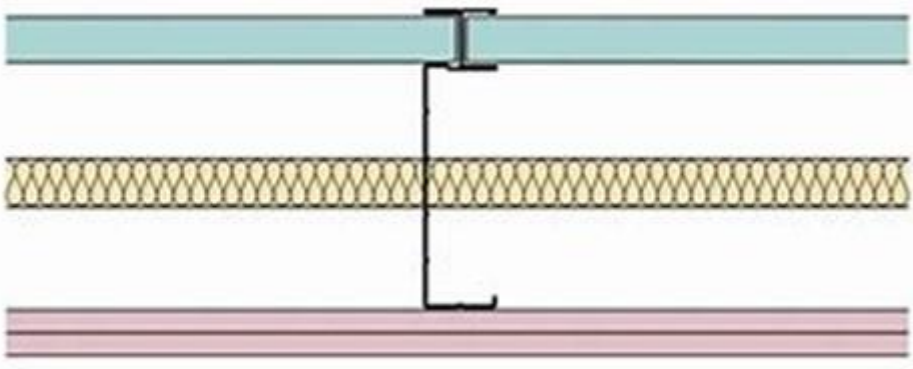
In practice, non-symmetrical walls can be used based on symmetrical wall testing, provided the asymmetry involves an addition to the tested wall without any reduction in the thickness or geometry of the tested components. This ensures the fire resistance properties remain uncompromised.

As more test evidence and assessments become available, viable solutions for non-symmetrical walls will increase, allowing for a broader scope of applications. However, it is crucial to consider this issue early in the design stage to ensure compliance with fire safety regulations.

Whenever possible, it is advisable to specify substrates with typical symmetrical build-ups to avoid complications and ensure the widest scope of application for the project.

Annexure E

Non-symmetrical shaft wall



Ducts and Dampers
Guidance

It is essential that all fire Dampers and Ductwork are properly fire tested and installed in accordance with the manufacturer's instructions.

These instructions must be supported by relevant test data. The tested system provided by the manufactures will include guidance on the following tested parameters:

- Substrate types tested
- The gap width tolerances from service to substrate
- The overall void size allowed,
- The sealing system the services were tested with

The EN test standard does not account for mixed service penetrations, so these service types must have their own dedicated apertures to ensure the systems perform as tested.

The test Standards for Fire Dampers (EN1366-2) and Ductwork (EN1366-1)

consider not only fire resistance but also smoke leakage, which is not a factor in typical fire resistance testing.

Systems tested to the EN1366-3 test standard for service penetrations are not suitable for fire stopping of Fire Dampers and Ductwork and therefore would not be considered a tested solution.

Dampers and ducts should penetrate separating walls in their own aperture be sealed in line with the service manufacturers tested systems.

Gateway 2: Passive Fire Protection

Guidance for Building Designers

As a leading manufacturer of fire protection products, we understand the critical importance of passive fire protection (PFP) in ensuring the safety and integrity of buildings.

Gateway 2, part of the Building Safety Act 2022, represents a pivotal stage in the building design process where detailed plans and specifications for fire safety must be meticulously developed and approved. This guidance page aims to provide building designers with comprehensive insights into Gateway 2 requirements and the key considerations for specifying passive fire protection systems.

Understanding Gateway 2

Gateway 2 is the stage where the detailed design of a building is scrutinised before construction begins. It requires designers to demonstrate compliance with building regulations, particularly those related to fire safety. The Building Safety Regulator will review all aspects of the building's design, focusing on the fire safety systems to be installed. FSi Promat (Etex Building Performance) is dedicated to supporting this process though collaboration across our group of companies.

Key Considerations for Passive Fire Protection

Compliance with regulations is paramount. All designs must meet the requirements of the UK Building Regulations, particularly Part B (Fire Safety), which includes provisions for fire resistance, compartmentation, and means of escape. Selecting fire-resistant materials that have been tested and certified is essential.

Ensuring the structural integrity of the building is vital. Structural elements must withstand fire exposure, which may involve applying protective coatings or sprays to steel structures and using fire-resistant concrete. Special attention should be given to the design of curtain walls and spandrel zones, which can be vulnerable to fire spread. Proper insulation and fire-stopping in these areas are necessary.

Maintaining detailed records of all fire safety measures, including specifications, installation details, and maintenance plans, is crucial for compliance with the Golden Thread of information required by the Building Safety Regulator.

Conclusion

Gateway 2 is a critical phase in the building design process, requiring meticulous planning and adherence to fire safety regulations. By considering the key aspects of passive fire protection outlined above, building designers can ensure their projects meet the highest standards of safety and compliance. As a manufacturer of fire protection products, we are committed to supporting designers with the best solutions and expertise to navigate Gateway 2 successfully.

Ensuring compliance with fire stopping materials at the design stage of a high-rise buildings is crucial for meeting stringent building codes and standards. By integrating fire stopping solutions early in the design process, architects and engineers can ensure that all materials and systems are tested and certified to meet regulatory requirements. This proactive approach not only enhances the safety and integrity of the building but also avoids costly modifications and potential compliance issues later. The main points in terms of the specification of Fire stopping systems would be as follows.

Wall type

Are the substrate symmetrical and of the required depth a construction tested to the relevant standards applicable for the project. If they the substrate are non-symmetrical, are they supported by appropriate testing or assessment in line with the project requirements

Movement

Are there any deflections to consider in the project, either within linear joints or service penetrations? Structural engineers should determine not only the amount of deflection but also the type. For example, is this a one-way settling movement or dynamic cyclic movements resulting from live loads over time? This will impact not only the proposed sealing system but also the spacing, service size, insulation depth, etc.

Aperture size

Are all openings proposed supported by the testing considering the type of sealing system that is required?

Service type and size

Are all service types tested to the EN1366-3 test standard and within tolerance in terms of diameter. If there is insulation required to be applied is the insulation type tested and of a tested depth?

Separation distances between apertures

Is each service aperture separated to the requirements of the not only the wall manufacturer but also supported by the testing performance with the fire stopping products and systems?

Service spacing within apertures

Are the service apertures separated according to the requirements of the wall manufacturer and supported by the testing performance of the fire stopping products and systems?

Cavity Barrier Range

FSi Promat offers a comprehensive range of cavity barriers for both vertical and horizontal applications, suitable for both fully closed and open states. Our products are rigorously tested to the highest industry standards to ensure optimal performance.

For detailed technical specifications and certifications, please visit our **fire stopping products page**, where you can download all our certified solutions.

Contact Information

Got Questions? Get in Touch

Need fast access to product information or documents?

All of our data sheets and standard details are available online at www.promat.com/en-gb.

If you have questions, need to discuss project requirements, or want to book in for training, let us know:

Technical Department:

E: technical.fsi.uk@etexgroup.com

T: 01530 449155

Sales Orders:

E: sales@firesafeandsound.com

T: 01708 890524

FSi Limited
Westminster Industrial Estate
Measham
Leicestershire
DE12 7DS

Tel: 01530 515130

sales.fsi.uk@etexgroup.com

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