



ASFP Technical Guidance Document - TGD 17

Code of practice for the installation and inspection of fire stopping systems in buildings:

Linear joint seals, penetration seals, small cavity barriers

FIRE AND YOUR LEGAL LIABILITY

Fire losses in the UK were over £1bn in 2011. That's why we must all play our part.

Why is this of relevance to me?

If you are involved in provision of a fire protection package, at any level, then you share liability for its usefulness and its operation when it's needed in fire, and that liability will still be there in the event of a court case.

I place the order; it is not my responsibility to install the works!

If it is your responsibility to specify the materials and/or appoint the installation contractor, it is also your responsibility to ensure that they can prove competency for the fire protection materials used, or the works to be carried out. It's no longer simply a duty of care or voluntary – it's a legal obligation.

If you knowingly ignore advice that leads to a failure in the fire performance of any element of installed fire protection within a building, then you are likely to be found to be just as culpable as the deficient installer.

You share liability for the provision of information required under Building Regulation 38 that tells the user of the building about the fire prevention measures provided in the building. Otherwise, the user cannot make an effective risk assessment under the Regulatory Reform (Fire Safety) Order 2005, the Fire Scotland Act 2005, and the Fire & Rescue Services (Northern Ireland) Order 2006.

What is expected of me?

In the event of fire, and deaths, a court will want to know how every fire protection system was selected; the basis for selection of the installer, whether adequate time was provided for its installation, and whether there was adequate liaison between the different parties to ensure it was installed correctly. No ifs, no buts – it's all contained in the Construction, Design and Management Regulations 2007.

The CDM 2007 regulations, enforced by Health and Safety Executive concentrate on managing the risk, and the health and safety of all those who build, those that use the building, those who maintain it and those that demolish it – cradle to grave.

Be aware – the time to consider the above is before the event, not after it!



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The Association was formed in 1976, and currently represents the majority of UK contractors and manufacturers of specialist fire protection products, with associate members representing regulatory, certification, testing and consulting bodies.

The ASFP seeks to increase awareness and understanding of the nature of fire, and the various forms, functions and benefits provided by passive fire protection.

It is willing to make available its specialist knowledge on all aspects of fire protection and can assist specifiers and main contractors in identifying products suitable for specific requirements, both in UK and overseas.

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AMENDMENT SHEET:

ASFP Code of practice for Installation & inspection of fire stopping systems in buildings

[illegible]

Note 1. Amendments may only be inserted by ASFP Secretariat with approval of the ASFP Technical Officer.

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1 INTRODUCTION

This Code of Practice has been written to assist installers and others involved in the installation and inspection of fire stopping systems in buildings. The aim of the code is to ensure that installed fire stopping systems will perform as required in the event of fire and will continue to do so for a reasonable period during the life time of the building.

All fire stopping systems must be installed in accordance with the manufacturer's written instructions.

The ASFP has produced other Codes of Practice for the installation of passive fire protection products including fire resisting ducts and damper and fire protection to structural steelwork.

1.1 Scope

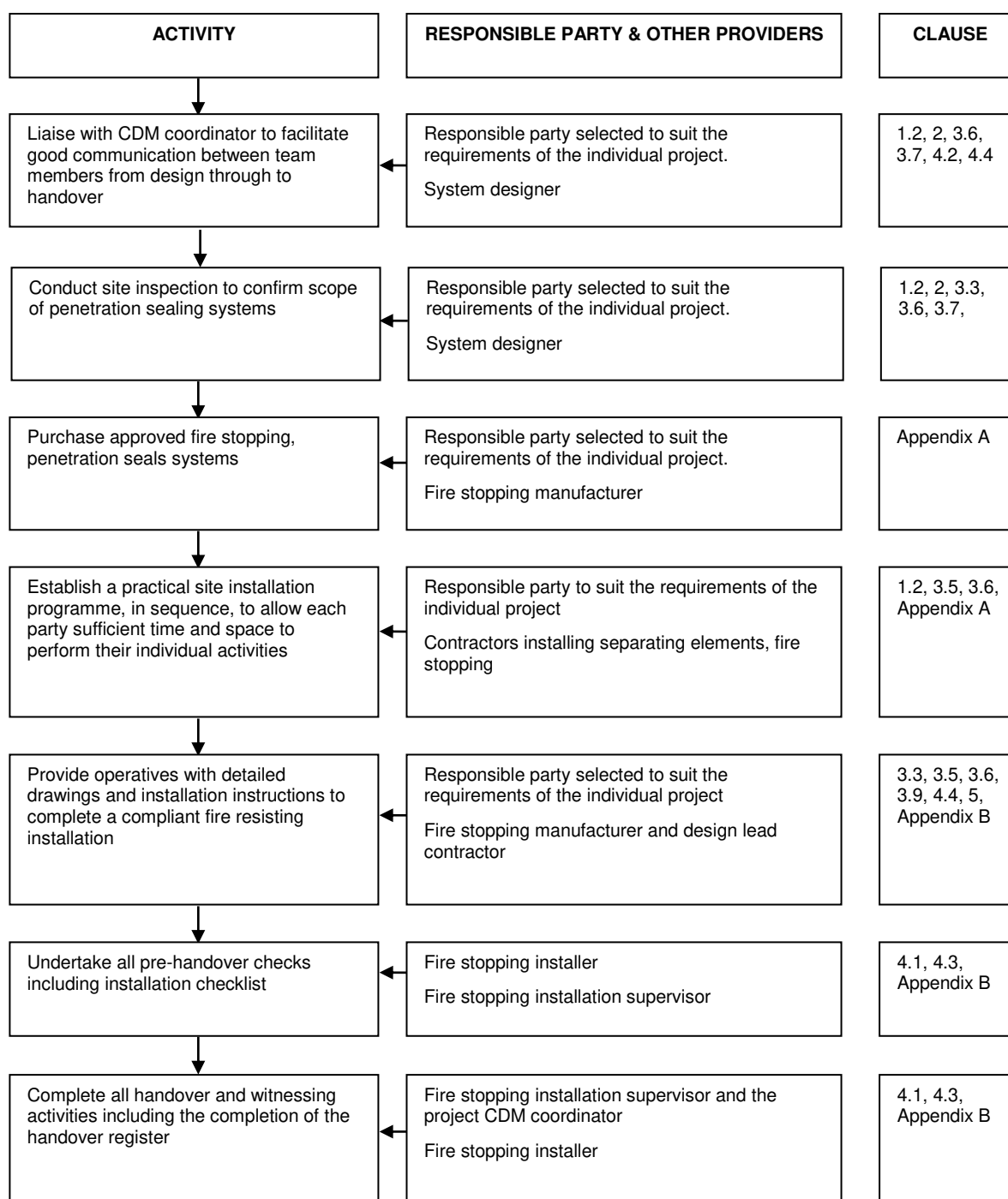
This code of practice provides guidance in the installation of fire stopping systems.

Detailed technical information on the design, testing, certification and regulations pertaining to fire stopping systems can be found in the ASFP 'Red Book' publications entitled 'Fire stopping: Linear joint seals, penetration seals & small cavity barriers 3rd Edition ⁽¹⁾'.

It is essential that this Code of Practice is read in conjunction with the ASFP Red Book as this contains all the technical information that supports the fire stopping systems being installed.

The latest version of each book is available as a free download from www.asfp.org.uk/publications.

1.2 The installation process flow chart



2 DEFINITIONS

A full list of definitions of fire stopping terms is given in the Red Book.

For the purpose of this document, the following additional definitions apply:

CDM Coordinator:

A person appointed by the client for the duration of the project to:

- coordinate the health and safety aspects of design work
- facilitate good communication between all team members
- liaise with the principal contractor regarding on-going design
- Identify, collect and pass on pre-construction information

Contract administrator:

The person responsible for co-ordinating the various requirements of the contract to ensure that all documentation is complete and in order. The contract administrator may be a nominee of the client or specifier, but more usually would be appointed by the contractor.

Designer:

The architect or engineer responsible for designing the fire resisting fire stopping system

Installer:

The company responsible for installing the fire stopping system.

Method statement

A method statement is a document detailing how a particular work item will be carried out. It should include details of the possible dangers/risks associated with the work, the methods of control to be established, and how the work will be managed.

Responsible Person:

Responsible person is defined in several ways under the Regulatory Reform (fire Safety) Order:-

[a] In relation to a workplace, the employer, if the workplace is to any extent under his control.

[b] In relation to any premises not falling within [a]

[i] The person who has control of the premises (as occupier or otherwise) in connection with the carrying on by him of a trade, business or other undertaking (for profit or not), or

[ii] The owner, where the person in control of the premises does not have control in connection with the carrying on by that person of a trade, business or other undertaking

Specification:

The specification is the detailed fire protection requirement as defined for all elements of the structure. It may allow the use of an approved product or nominate a preferred supplier for the fire protection system, in accordance with instructions from the client.

Specifier:

The person or company who issues the specification for fire resisting fire stopping system

3 CONSIDERATIONS WHEN INSTALLING FIRE STOP SYSTEMS

3.1 Choice of specialist installer

Installation of firestopping is ideally undertaken by companies specialising in that activity. When considering using any company for installing fire resisting fire stopping, you should be aware of the following.

Approved Document B Volume 2 ⁽²⁾ states

“Since the fire performance of a product, component or structure is dependent on satisfactory site installation and maintenance, independent schemes of certification and registration of installers and maintenance firms of such will provide confidence in the appropriate standard of workmanship being provided”.

The Scottish Technical Handbooks ⁽³⁾ states that workmanship is considered compliant if:

“the workmanship is covered by a scheme, which complies with relevant recommendations of BS EN ISO 9000: Quality Management and quality assurance standards (there are also independent schemes of accreditation and registration of installers of materials and products that provide a means of ensuring that the work has been carried out by knowledgeable contractors to an appropriate standard);”

The use of independent certification schemes also provides clients and specifiers with confidence regarding the competence of potential contractors, thus helping to fulfil their own duty of care responsibilities under the CDM regulations ⁽⁴⁾ and giving the ‘responsible person’ confidence of compliance with the Regulatory Reform Order ⁽⁵⁾, the Fire Scotland Act 2005 ⁽⁶⁾, and the Fire & Rescue Services (Northern Ireland) Order 2006 ⁽⁷⁾.

The ASFP strongly supports the use of specialist third party certificated installers and requires all ASFP installer/contractor members to hold third party installer certification.

There are a number of UKAS accredited third party certification schemes available for contractors who install fire stopping. These schemes typically include the following:

- Verification of the skills of operatives
- Verification of ability to evaluate suitable products and identify mismatched products or proposed designs that will not work
- Registration of operatives and supervisors
- Planned and random inspection of installations
- Issuing of certificates of conformity on completion
- Audit trail of materials used in each job

The use of non-specialist installers is not recommended because they cannot provide the same level of assurance using a specialist third party certificated installer.

3.2 Choice of products

The manufacturer of the fire stopping system will be able to provide evidence of product quality and fitness for purpose e.g. if they hold third party certification via a UKAS accredited certification body. He will also be able to provide detailed evidence of the fire performance in terms fire test and assessment reports and third party product certification.

In addition, products listed in the ASFP Red book are third party certificated by UKAS accredited certification bodies, which assess the performance and quality of the fire stopping product/system. Third party product certification bodies select samples for initial testing, undertake initial and on-going checks of the manufacturer’s factory production control and implement audit procedures to ensure on-going quality. This provides confidence to the main contractor and the Responsible Person.

UKAS accredited third party product certification and specialist contractors are now favoured by Building Regulations.

AD-B states:

“Confidence that the required level of performance can be achieved will be demonstrated by the use of a system, material, product or structure which is provided under the arrangements of a products conformity certification scheme...”

The ASFP strongly recommends the use of products which have been third party certificated.

CE Marked Products

Products which are CE marked against ETAG 26 Part 2/3 ⁽⁸⁾ will satisfy most of the requirements for third party certification. However, end users should check that the scope of the CE marking covers the product in its end-use application.

3.3 Design Review

Prior to installation at site, a design review should have been carried out to confirm that no alterations to the design have been made that might affect the drawings and hence the products and components to be installed. If alterations have been made then these need to be assessed by a suitably qualified person e.g. the fire stopping manufacturer, a fire safety engineer, a certification/testing body or any combination of these. It may also be necessary to obtain approval from Building Control and/or for the local Fire Authority to be involved.

Any discrepancies should be highlighted to the Contract Administrator for clarification.

Fire stopping is normally the responsibility of the installer who will usually prepare the details in conjunction with the manufacturer, and in accordance with 3rd party Certification requirements. The ASFP ‘Red Book’ provides data and product information for most applications.

Systems shall have been fire tested to BS EN 1366 parts 3 or 4 ⁽⁹⁾ or BS EN 1364 parts 3 or 4 ⁽¹⁰⁾ as appropriate and classified to BS EN 13501-2 or have been fire tested/assessed to BS 476 Part 22. Products tested/assessed against BS 476: Part 22: 1987 ⁽¹¹⁾ may be third party certificated but will not be CE marked.

All fire tests must be carried out by a laboratory accredited to EN ISO 17025 ⁽¹²⁾ by a national accreditation organisation e.g. UKAS or by a body Notified to the European Commission by a Member State for such purposes. Classifications shall be provided for the relevant field of application in accordance to recognised rules for direct and extended application of test data. Fire resistance periods required are usually 30, 60, 90 120 or 240 minutes. It is important to ensure that the design of the system provides insulation performance as well as integrity performance when required.

3.4 Health & safety issues

Ensure that all works are planned and undertaken in line with current Health & Safety legislation, observing specific site conditions and any manufacturer’s literature. This includes being in compliance with the principal contractor’s health and safety work plan.

Attention is drawn to HSE guidance on health and safety in construction sites document HSG 150 ⁽¹³⁾.

The installer must ensure that all relevant Health and Safety data sheets, application instructions and method statements are available to the application operative(s) and client & that they are fully understood.

For more information, see Appendix E3.

3.5 Information to be provided to the installer

Technical information to be provided by the system designer to the fire stopping installation company will typically comprise:

- Fire stopping manufacturers test data sheets and dimensionally detailed technical illustrations
- Details of third party certification for the product being installed
- System designers' project-specific detailed and dimensioned arrangement drawings incorporating
 - the compartment walls and location of fire stopping
 - cross references back to a schedule of all fire stops to include their rating and location.
- Service support arrangement (if applicable)
- Activity programme clearly detailing the sequence of installation relative to each contractor.
- Any additional or special requirements.
- Inspection and handover requirements including need for labelling of finished installations

3.6 Sequence of installation

On receipt of the project-specific drawings detailing the fire stopping arrangement, it will be necessary for the designated principal contractor to establish a coordinated programme for the installation sequence for the barrier, any service and the fire stop. The involvement of the CDM coordinator is strongly recommended.

3.7 Installation considerations

For a cost efficient and successful installation, it should be recognised that issues can occur and that they should be overcome with the continued involvement of the CDM Coordinator. All those involved have the responsibility of addressing and resolving unexpected issues and ensuring that work-in-progress inspections are conducted to ensure that a final inspection before handover to either the commissioning team or the client will not result in any corrective action having to be instigated.

3.8 On-site modifications

During installation, issues can arise that might need either a revised or 'non-standard' solution. These can only be introduced by the system designer who should take advice from the fire stopping manufacturer or a fire safety engineer or a certification/test body or any combination of these. It may also be necessary to obtain approval from Building Control and/or for the local Fire Authority to be involved.

Untested/unapproved modifications may not provide the appropriate fire resistance and dealing with the problem before installation will prevent remedial action being required later.

Where site conditions differ from those covered by the certification or test evidence, the installer will need to consider whether the certification or test evidence is appropriate and take appropriate guidance as above.

3.9 Site remedial work

Where products/system have been installed in a way which deviates from the installation drawings and/or firestopping manufacturer's installation guidance e.g. if conditions or site limitations make it necessary, these need to be identified so that remedial works can be undertaken as required. Before carrying out on-site remedial works, a written Method Statement shall be prepared by the installer and submitted to the Contract Administrator. In all cases, records must show the nature of defect, source of remedial advice and the full extent of remedial work carried out at site.

If incorrect fixing is found after the application of the system has been completed, it may be necessary to replace the entire system or seek the manufacturer's advice regarding the best method of bringing the system up to the required level of performance.

Periodic inspections should be carried out as part of the normal maintenance plan for the building and any damaged fire stopping should be repaired or replaced in accordance with the manufacturer's instructions.

4. INSPECTIONS

4.1 General

Pre-handover and final inspection of the completed installation is a requirement of this code of practice. To undertake these example checklists are provided in Appendix A and B respectively. If an independent inspection is required e.g. for a special project or for a safety critical installation, then third party inspectors may be used. Photographic evidence may be used in reports of inspections.

Firestopping is often inaccessible and provision shall be made for inspection before handover.

4.2 Work-in-progress inspections

Site inspections should be carried out during installation to ensure that the system is being installed correctly. The installer should inspect the installation (or if desired a third party may do so at agreed intervals) to check that the system is being fixed to the manufacturers' specification. The CDM coordinator must monitor compliance with the project-specific design and ensure that the work-in-progress is regularly inspected in accordance with the installers approved method statement and the system design.

4.3 Pre-handover activities

It is in everyone's interest that pre-handover inspections by the fire stopping installer and the hand-over itself are based on an agreed check list. A typical inspection and handover check List can be found in Appendix B.

4.4 Final inspection

At the outset of their involvement, all team members must be made aware of the intended final inspection regime. The final installation must be checked for compliance by the CDM coordinator/Client's Representative. The completed installation forms part of the building's fire safety strategy; every aspect of the installation should be checked against the project-specific drawings included in the system design.

All final inspections must be documented in a handover register that must be retained by members of the team responsible for system design and installation.

A typical inspection and handover check list can be found in Appendix B.

4.5 Planned maintenance inspections, post construction

Periodic inspections should be carried out as part of the normal maintenance plan for the building and any damaged system should be replaced and fixed in the same way as in the original manufacturer's specification. It is recommended that inspections of fire stopping in compartmentation in escape routes be carried out annually in accordance with the Fire Safety Risk Assessment Guides ⁽¹⁴⁾ which form part of the statutory Guidance under the Regulatory Reform (Fire Safety) order.

4.6 Site inspection methodology/criteria

4.6.1 General

Inspection will usually be visual and may include the use of photography to demonstrate compliance or otherwise. Critical thicknesses and other dimensions should be recorded and checked against specification. Deviations should be recorded and re-checked following remedial work.

The inspector should consult with the manufacturer and/or read the manufacturer's instructions rather than consult the installer as to what to check for.

Inspectors should not supervise or in any manner direct any aspect of the installation process.

Inspectors should record the results of inspection including any deviations/problems. These can be recorded on forms following the format in Appendix B.

4.6.2 Proportion and frequency to be inspected

In order to ensure confidence in the completed installation it will be necessary to undertake inspections. Ideally all penetrations should be inspected, but sometimes this is not practicable or possible. If after inspecting a percentage of the installation there are no significant defects, then it can be assumed that the remainder are probably satisfactory. Conversely, if defects are found that could affect the fire performance, more inspections will need to be undertaken until the inspector is confident that remaining uninspected installations are satisfactory. The matrix below is a suggested protocol for inspections.

Time of Inspection	Minimum % to be inspected	Responsibility	If significant defects are found	Form used
During installation	100%	Installing Contractor	Undertake remedial work. Re-inspect all areas where faults were previously found	Appendix B
At handover	20%* or greater of each type of firestopping and throughout the building	CDM Coordinator / Client's Representative	Undertake remedial work. Re-inspect all areas where faults were previously found	Appendix C
After other building work in area of firestopping	100% of areas where other work impacts on firestopping	Building Manager (may be Responsible Person or a designate)	Undertake remedial work. Re-inspect all areas where faults were previously found	Appendix B
Annually e.g. as part of an assessment under the RR(FS)O (see 4.7)	All areas adjacent to or forming escape routes	Responsible Person or Competent Person	Report to Responsible Person who should employ specialist inspectors to undertake full, possibly invasive inspection	Appendix B or from ASFP Guide to inspecting PFP for Fire Risk Assessors ⁽¹⁵⁾

*Note: If a third party certificated installation contractor has been employed, this may be reduced to e.g. 5 - 10%.

4.7 Inspecting pre-installed fire stopping in existing buildings

When fire stopping systems have been installed for some time in an existing building, the inspection agency e.g. a fire risk assessor will need access to records of all the fire stopping installations in the building. These should be available as part of the Regulation 38 information required under the England and Wales Building Regulations. Where no records exist, the inspector's role is much more difficult and consultation should be taken with the responsible person. The need to inspect fire stopping results from

the Regulatory Reform (Fire Safety) Order, the Fire Scotland Act 2005, and the Fire & Rescue Services (Northern Ireland) Order 2006, whereby those fire measures which protect life safety are required to be evaluated as part of a fire risk assessment.

The ASFP has recently published a Guide to inspecting Passive Fire Protection for Fire Risk Assessors ⁽¹⁵⁾ that gives further information on which fire stopping needs to be inspected to comply with the legislation referred to above. This can be downloaded from www.asfp.org.uk

More guidance can be found in the Passive Fire Protection Federation Guide to Fire Risk Assessment of Passive Fire Protection ⁽¹⁶⁾ which can be down loaded from the PFPF website at www.pfpf.org.uk.

5 RECORDS AND REPORTS

Detailed and accurate records are an essential contract requirement. Information should be kept available until handover to the client is completed and statutory duties under Building Regulation 38 are completed – see requirements summarised in Approved Document B Appendix G.

Where appropriate, site records should contain the following information.

- System designers' project-specific detailed and dimensioned arrangement drawings incorporating
 - the compartment walls and location of fire stopping
 - cross references back to a schedule of all fire stops to include their rating and location.
- Maintenance requirements
- Installation checklist (see Appendix A)
- Inspection and handover checklist/requirements (see Appendix B)
- Any additional or special requirements

APPENDIX A – Installation check list

No	Question	Responsibility	Guidelines	Notes
01	Has all the necessary technical information been made available for the fire stopping installer and all other associated trades?	System Designer	Refer to Clause 3.5	
02	Has a project-specific programme of sequenced installation activities been prepared?	Lead Contractor.	An acceptable sequence to achieve the same design criteria can vary from project to project	
03	Does the programme sequence of other trades allow for there being sufficient space on all four sides of the fire stop to fit associated support systems, and apply fixings to complete the penetration seals?	Lead Contractor.	Inaccessible voids and cavities caused by adjacent walls, columns and structural soffits shall be considered during programming.	
04	Does the programme sequence ensure that there are no other services installed that would prevent the fire stopping arrangement being fitted as per the system design?	Lead Contractor.	Other trades cannot 'share' the openings for fire stops and their penetration seals.	
05	Does the programme sequence ensure that there are no ceiling grids / tiles installed that would prevent ease of installation for all associated contractors?	Lead Contractor	.	
06	Has the system designer approved any ad-hoc instructions issued by a third party? e.g. The 'ad-hoc' insertion of stone mineral wool, or similar, in cavities	Fire stopping installer, Barrier contractor, Penetration seal contractor.	The inclusion of non-specified products, material and dimensional modifications may result in the invalidity of the final assembly	
08	Is the method tested and approved for the type size and configuration of barrier that is being used?	Fire stopping Purchaser Fire stopping Manufacturer	Assemblies associated with block work may not be suitable for dry-lining	
09	Are any openings in dry-lined barriers correctly formed, trimmed and lined?	Barrier Contractor/ dry liner	Do trimming members need to be tied back to the soffit and slab?	
10	Prior to installation are method statements, COSHH ⁽¹⁷⁾ assessments and risk assessments available to the installers?	Fire stopping installer, Barrier contractor/dry liner/Penetration seal contractor.	The availability of clear instructions to the installers is essential in ensuring correct installation methods are adopted.	
11	Has the fire stopping, been installed as per the specification?	All parties.	Query before installation if any element appears to be non-compliant	
12	Has adequate space been provided to allow for access to the fire stopping for maintenance and testing purposes?	System Designer.	Consider access on both sides of the fire stopping for both maintenance and future cleaning purposes.	

APPENDIX B – Inspection and handover check list

No.	Question	Responsibility	Guidelines	Notes
01	Is the fire stopping the correct type?	System Designer.	Confirm the fire stopping is the correct type	
02	Are the fire stops correctly identified and labelled?	System Designer or Commissioning Engineer	Any unique system identification or plant item number must be clearly indicated on the fire stopping or agreed location.	
03	Are the fire stops located correctly?	Fire stopping Installer.	The fire stopping position shall be dimensionally checked against the installation drawings / details.	
04	Have supports for the services and/or fire stopping services been installed in accordance with the approved method including using approved fittings?	Lead contractor	Refer to manufacturer for guidance	
06	Is access, through the fire stopping unobstructed?	Fire stopping Installer to advise System Designer if problems are foreseen.	Unobstructed space shall be provided for safe access to fire stopping. Also consider access through ceiling voids and adjacent services.	
07	Has the space around the fire stopping, and within the penetration, been left clear and not been used for the passage of other services?	Fire stopping Installer to advise Lead Contractor if problems are foreseen.	The presence of other services will invalidate the installation method.	
8	At the time of the fire stopping handover, is the fire barrier and penetration seal complete and labelled?	Fire stopping Installer.	Fire stopping installer to record on the handover register if any following trades have still to complete their activities.	
9	Is the fire stopping installation completed and available for handover prior to system commissioning?	Fire stopping Installer.	Obtain relevant acceptance of the fire stopping installation from the CDM coordinator	
10	Is the completed handover register cross referenced back to the identification codes listed in the system designer's fire stopping schedule?	Fire stopping Installer.		

APPENDIX C – Practical guidance notes for installation of fire stopping systems on site (general)

C.1 STORAGE

Storage of fire stopping products must always be carried out according to manufacturers' instructions.

As a general guide, the storage temperature for liquid products will be within the range of 5 - 30°C, and any water-based materials should be protected from frost. Material containers should remain unopened until needed and should be used in date order.

It is vitally important that manufacturer's instructions are followed. If they are not followed then the installation company will be liable for all that follows. The installer should make and maintain full records such as deliveries, usage, product stock identification marks, etc to justify the installation being made.

The manufacturer's recommendations should always be followed in all instances.

C.2 CUTTING, SHAPING AND FIXING

Some components for penetration seal systems or cavity barriers may be cut with conventional tools. Some coated board systems can be cut more easily with a power saw with tungsten tipped blades or a jig saw. Cavity barriers incorporating wire mesh netting will need appropriate cutting tools

Manufacturers printed instructions should always be followed. All cutting should be carried out in well-ventilated areas using suitable dust extractors and operators should wear protective facemasks, as advised by the manufacturer.

Openings in separating elements should conform to manufacturers standard details i.e. be within any limitations on size, shape, surface texture, orientation etc.

C.3 SITE HUMIDITY AND PRODUCT USAGE

The effect of site humidity needs to be considered when installing firestopping. Some systems are susceptible to high humidity. Other systems can withstand the effects of moisture and high humidity and can then be installed before the building is watertight. This enables fire stopping to be completed during the construction phase. Mechanically fixed systems can generally be fixed under most humidity conditions.

All materials delivered to site must be used within the manufacturers' stated shelf life, or otherwise be approved as suitable for use by the manufacturer and used in rotation. Any mixing and use should be carried out in accordance with the manufacturers' instructions. Materials taken from store should attain the temperature recommended for use before being applied

Application of materials should not take place on site when environmental conditions – air and steel temperatures, relative humidity etc– are outside the limits laid down by the manufacturer. It is the applicator's responsibility to monitor these conditions in accordance with the specification, and, when necessary, to maintain auditable records to demonstrate compliance

The installer should allow for any potential delays when planning the work programmes.

C.5 FINISHES AND SURFACE COATINGS

Some fire stopping products are pre-coated at the manufacturer's factory, whilst others are coated at site or finished at site. The installer may be asked to provide a basic finish unless otherwise stated in the contract documents

Where considered appropriate, a benchmark of the relevant application should be carried out on site so that the standard of workmanship and finish can be predetermined and accepted by all interested parties.

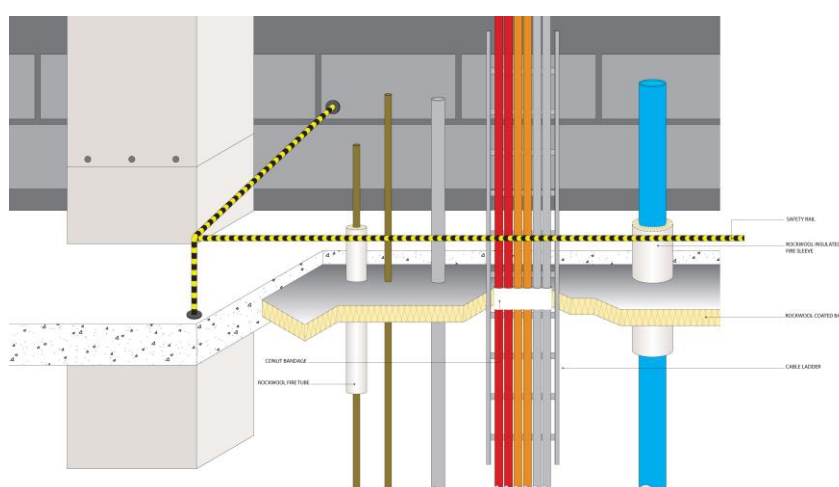
C.6 Special provisions for horizontal seals

Some fire stopping systems used to seal penetrations in floors may be unable to support temporary loads, such as foot traffic, etc, and care must therefore be taken to establish whether or not the installed system is load bearing to standardised levels (See below). ASFP Advisory Note No.1 available from www.asfp.org.uk/publications gives further details

Note that BS EN 1366-3 does not make provision for testing load bearing penetration seals. Consideration shall therefore be given to fire tests under loaded conditions to BS EN 1365-2

All wet-applied fire stopping systems will take time to cure and harden before the permitted load can be tolerated. During the curing time, the installer shall display suitable warning signage and temporary barriers to prevent accidental access onto the horizontal surface and to avoid risk of injury. Any such loading could also be detrimental to the fire performance of the seal.

If the cured fire stopping seal is not load bearing to acceptable standards (see below), all subsequent access onto the fire stopping shall be prevented by a permanent guard rail and suitable signage. Subsequent access shall only be allowed if additional walkway systems are provided to prevent the surface of the seal being over loaded. *Advice should always be obtained from the system manufacturer or from a competent person or organisation.*



LOADS ON HORIZONTAL FIRE STOPPING

The code of practice for dead and imposed loads in buildings is provided by standards, such as PD 6688-1: 2011 where dead loads are calculated from BS 648 or from actual known weights of the materials to be used. In the case of building type A for 'Offices and work areas not covered elsewhere' the minimum imposed floor loads to be expected include figures such as:-

Example of use	Uniformly distributed Load [kN/m ²]	Concentrated Load [kN]
Work rooms (light industrial) without storage	2.5	1.8
Offices for general use	2.5	2.7
Kitchens, laundries, laboratories	3.0	4.5
Mainframe computer rooms	3.5	4.5
Machinery halls	4.0	4.5
Factories, workshops (general industrial)	5.0	4.5

APPENDIX D – Practical guidance notes for installation of specific types of fire stopping systems

Type of fire stop	liaison other trades	priming	masking tape	dimensions	forming/damming/ supporting/framing systems	proven methods	Joints/ seals	labelling	Other
Linear Gap seals		Prime substrates as per fire stopping manufacturer's instructions using recommended products and methods. Confine primers to the area of the bond. Do not allow spillage or contamination of exposed surfaces	Use tape to prevent fire stopping from contaminating adjacent surfaces. Remove tape as soon as is practical without damaging fire stopping system	Verify that the in service dimensions of the system being installed are correct i.e. within the field of application of the tested and classified fire stop/ fire barrier system	Install joint fillers to support fire stop materials during the application, positioned to produce the required cross sectional shape and depth of the installed fire stop, relative to the joint widths that allow sealant movement and required fire resistance periods	Ensure fire stopping materials are directly contacting and fully wetting all substrates, by completely filling all recesses for each joint configuration, providing uniform cross sectional shapes and depths relative to permitted joint widths that allow the required movement	ensure any splices are correctly installed in accordance with manufactures instructions and at correct centres	Affix label/ plate to seal or adjacent supporting construction as per audit requirements. (Typical info includes: seal number, fire resistance period, installer company details including name of operative, date of installation and period between inspections.	Inspector to advise installer of faults within 1 day. Fire stopping not to be enclosed until faults rectified
Penetration seals	ensure services installed first	ditto	ditto	ditto	Ensure supporting systems e.g. any forming or damming systems are installed in accordance with manufacturer's instructions	ditto – ensure no air bubbles between service and seal or between seal and supporting element	Ensure batts/ boards are buttered on edges. Ensure cable trunking is appropriately sealed inside at wall/floor	ditto	Ditto. See also Site safety note above (ASFP TGD 01)
Fire barrier systems	Ditto	n/a	n/a	ditto	Ensure installed framing system, supports, fixings, insulation, etc are within the field of application of the tested and classified fire stop/ fire barrier system	Ensure intimate contact around edge of fire barrier to prevent fire bypassing the system	Ensure joints are finished correctly as per manufacturer's instructions	ditto	as linear gap seals
Small cavity barriers	n/a	as linear gap seals	as linear gap seals	ditto	as linear gap seals	ditto	n/a	ditto	as linear gap seals

APPENDIX E: Regulatory issues

E.1 Regulations

Fire safety of life in new buildings and major alterations is regulated throughout the UK by building regulations, which are enforced by the local building control authority.

The Building Regulations 2000⁽¹⁸⁾ apply in England and Wales and are expressed in broad functional requirements namely B1 Means of Escape, B2 Internal fire spread (linings), B3 Internal fire spread (structure) B4 External Fire Spread and B5 Access to the Fire Brigade.

Clause 4 of Internal fire spread Requirement B3 of the Building Regulations 2000 states “the building shall be designed and constructed so that the spread of unseen fire and smoke within concealed spaces in its structure is inhibited”.

Approved Document B (2006), volumes 1 and 2⁽²⁾ provide non-mandatory guidance that is deemed to comply with the functional requirements of the Building Regulations. Appendix A1 provides the specific provisions of test for fire resistance of elements of structure, whereas Appendix A2 states the minimum periods of fire resistance required.

Alternative approaches are permitted, such as an intermediate approach using BS 9999⁽¹⁹⁾ or via fire safety engineering approaches to BS 7974⁽²⁰⁾ provided that the designer can demonstrate that legislative requirements have been satisfied.

The Building Scotland Regulations 2010⁽³⁾ apply in Scotland and are supported by Technical Handbook (Fire) 2010⁽⁴⁾.

The **Building Regulations (Northern Ireland) 2000⁽²¹⁾** supported by guidance document DFP Technical Booklet E-Fire safety 2005⁽²²⁾ apply in Northern Ireland.

Other fire legislation may also apply for certain buildings e.g. health premises, schools, underground railways etc. and these may require a different level of fire protection from those required in the Building Regulations.

E.2 Statutory duties

The major regulatory requirements are the Regulatory Reform (Fire Safety) Order 2005⁽⁵⁾ and the CDM Regulations 2007⁽⁴⁾

The importance of fire safety is emphasised in recent legislation by means of the RR(FS)O and equivalent legislation in other parts of the UK. This legislation applies to occupied buildings and states that there must be a ‘responsible person’ (see definitions) who is responsible for reducing the risk of fire and its spread, ensuring that fire protection in the premises is maintained and repaired and carrying out a fire risk analysis of the building

A legal duty and liability arises under Regulation 38 of the Building Regulations (England and Wales) to provide details of all fire precautions to the client so that the Responsible Person can carry out the required statutory duties. Regulation 38 of the Building Regulations is specifically referenced in Appendix G of Approved Document B, and requires that fire safety information shall be given to the ‘responsible person’ - as defined in RR(FS)O 2005 - at the completion of the project or when the building is first occupied

The use of fire protection board systems will assist the building to comply with both the RR(FS)O and the CDM Regulations because these systems are of low maintenance and have been shown to be durable.

E.3 Health and safety issues

The Construction, Design and Management Regulations 2007⁽³⁾ are the responsibility of the Main Contractor and apply to the building process and include the construction, alterations and maintenance of buildings and require that dangerous products should be replaced as far as reasonable with those which

do not present or which have a lower hazard. It would be prudent to ensure that measures to ensure regulatory compliance are built into every contract at the specification stage.

Although implementation of the CDM Regulations ⁽⁴⁾ is the responsibility of the main contractor, the specifier/installer should try to remove or reduce the effect of hazardous products by specifying safer alternatives.

The specifier/installer should ensure that the products are not harmful during application or to the building occupants during the lifetime of the building. They should therefore not degrade with time and give off toxic fumes or other materials. If work has to be carried out whilst it is occupied, harmful products should not be liberated into the atmosphere during application

Health, Safety and Environmental precautions on site are delegated to the everyone involved with the contract, but the installer should also require that any products used on site are used in full compliance with the recommendations of manufacturers' health and safety data sheets, and that the safety of all personnel in the vicinity of the application is protected.

Attention is drawn to HSE guidance on health and safety in construction sites document HSG 150⁽¹³⁾.

The installer must ensure that all relevant Health and Safety data sheets, application instructions and method statements are available to the application operative(s) and client & that they are fully understood.

E.4 Complying with EU Environmental Regulations

During and throughout the application process, full compliance with all relevant environmental legislation must be demonstrated. As a minimum, this includes:

- Observance of all precautions and conditions for use of the fire protection system, as defined in the manufacturer's Product Safety Data Sheets and manufacturers' safe working recommendations.
- Compliance with relevant Site Storage Regulations, including COSHH Regulations ⁽¹⁷⁾ where applicable.
- Compliance with Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002 ⁽²³⁾

E.5 Waste disposal

Compliance where relevant with Waste Disposal Regulations, in particular the Hazardous Waste (England and Wales) Regulations 2005⁽²⁴⁾, Waste Duty of Care Regulations 1991⁽²⁵⁾ and, as of April 2008, the Site Waste Management Plan Regulations 2008⁽²⁶⁾ which will apply to all contracts with a value of £300,000 or more.

During and throughout the application process, full compliance with all relevant Health and Safety and Environmental legislation must be demonstrated. As a minimum, this includes:

- Observance of all precautions and conditions for use of the board and the components of the fire protection system, as defined in the manufacturer's Product Safety Data Sheets and manufacturers' safe working recommendations e.g. dust control when cutting, handling etc.
- Compliance with relevant Site Storage Regulations, including COSHH Regulations where applicable.

APPENDIX F: REFERENCES

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3. The Building Regulations Scotland 2010. Scottish Technical Handbook non-domestic 2010. Published by the Scottish government and available from:
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4. Construction (Design and Management) Regulations 2007
5. The Regulatory Reform (Fire Safety) Order 2005.
6. The Fire Scotland Act 2005
7. The Fire & Rescue Services (Northern Ireland) Order 2006.
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Part 1: General Fire Stopping and Fire Sealing Products
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9. BS EN 1366 Parts 3 and 4 Fire resistance tests for penetration systems and linear joint seals
10. BS EN 1364 Parts 3 & 4 Fire resistance tests for non-loadbearing elements – Curtain Walling
11. BS 476 Part 22 Methods for determination of the fire resistance of non-load bearing elements of construction
12. EN ISO 17025: 2005, General requirements for the competence of testing and calibration laboratories
13. Health and Safety in Construction third edition
<http://www.hse.gov.uk/pubns/books/hsg150.htm>
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<http://www.communities.gov.uk/fire/firesafety/firesafetylaw/aboutguides/>
15. ASFP Guide to Inspecting Passive Fire Protection for Fire Risk Assessors. Published by ASFP and available from www.asfp.org.uk
16. Passive Fire Protection Federation Guide to Fire Risk Assessment of Passive Fire Protection download from www.pfpf.org.uk
17. The Control of Substances Hazardous to Health Regulations 2002 (as amended).
18. The Building Regulations 2000 [SI 2000/2531] for England and Wales
19. BS 9999:2008 Code of practice for fire safety in the design, management and use of buildings.
20. BS 7974 Code of practice on the application of fire safety engineering principles to the design of buildings.
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22. The Building Regulations (Northern Ireland) 2000. DFP Technical Booklet E – Fire safety 2005
23. Dangerous Substances and Explosive Atmospheres Regulations 2002.
24. Hazardous Waste (England and Wales) Regulations 2005. SI 894
25. Waste Duty of Care Regulations 1991/28
26. Site Waste Management Plan Regulations 2008 SI No 314 DEFRA.