

**Project Reference:** 4790682420

**Report Number:** 4790682420-1

**Issue Date:** 28<sup>th</sup> March 2023

**UL Technical Assessment Report of Fire Performance of Linear Joint Seals in Terms of AS 4072.1:  
2005 & AS 1530.4 2005/14 Based on Fire Test Evidence**

**Report Prepared for:**

**Tenmat Ltd**

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**This report has been prepared by Chris Johnson, Senior Staff Engineer, in full accordance with the PFPF standard procedures guidance, (as outlined in the 2021 edition of 'Guide to undertaking technical assessments of fire performance of construction products based on test evidence') and in line with the principles of EN 15725: 2010.**

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**Client Name:** Tenmat Ltd

**Date of Report:** 28th March 2023

This report relates to a request from Tenmat Ltd to undertake an assessment of the likely fire test performance of Linear Joint seals in terms of AS 4072.1: 2005 & AS 1530.4 2005/14, based on supporting test evidence in accordance with EN 1366-4: 2006 & classification to EN 13501-2: 2016.

The request to assess was for the following reason:

- To assess the fire performance (up to 120 minutes integrity and insulation) of Tenmat NVFB Linear Joint seals in terms of AS 4072.1: 2005 & AS 1530.4 2005/14

## **1. Definition**

In accordance with the PFPF guide – **Undertaking Technical Assessments of Fire Performance of Construction Products Based on Fire Test Evidence** the definition used for the scope of this report is as follows.

*‘A technical evaluation of the likely performance of a component or element of structure (as defined in Approved Document B for England and Wales or their equivalent in Scotland and Northern Ireland) if it were subject to a standard fire test.*

*An assessment may consider design changes to a tested element of construction for a specific project or it could form a wider scope of approval with a defined period of validity*

*Assessments are based on sufficient relevant test evidence and provide a defined scope of approval for a particular design or range of designs and is an opinion of the likely performance of a component or element if it were subject to a standard fire test’.*

For the purpose of this assessment the level of complexity is defined as –

## **2. Intermediate Assessment**

The assessment of intermediate complexity and significant changes to a tested product or system. Such changes may be critical to the fire performance of the product or construction being assessed.

### **3. Client Declaration**

During the application process the client Tenmat Ltd has confirmed in writing the following.

All information and evidence provided is accurate and reflects exactly the product or system which is subject to assessment. All information relevant to the assessment; references, drawings technical specifications, photographs and test/certification reports have been made available to the UL assessor; including any test failures and any information/evidence which they are aware of which may be unfavourable to the assessment outcome.

The client has also confirmed that they have not been refused an assessment by any other competent organisation and that to their knowledge the product or system has not been tested in the configuration (or similar) they are seeking an assessment on.

The original application declaration is kept on file for reference.

### **4. UL Declaration**

UL have agreed to undertake this assessment based on the client's supplied information and their declaration confirming full disclosure of information. UL have reviewed the application and have completed an impartiality assessment. This report therefore represents an independent expert opinion, which has not been influenced by any commercial, financial, or other pressures, that could compromise impartiality.

### **5. Introduction**

Fire resistance tests in accordance with EN 1366-4: 2006 have been carried out on Linear Joint sealing systems referenced Tenmat NVFB, which have subsequently been classified in accordance with EN 13501-2: 2016.

### **6. Assumptions**

It is assumed that the walls and floors into/between which the joint and gap seals are installed have been proven via test to provide at least the same performance as that required of the seal.

It is assumed that the proposed seals will be installed by competent installers in a similar manner to the tested specimen and that the seals will be identical to the specimens tested/classified in the report referenced in Annex B to this report, unless detailed otherwise within this report.

## 7. Supporting Data

### 7.1 UL Report No. 4789980605

A classification report for Tenmat NVFB linear joint seals in accordance with EN 13501-2: 2016 based upon the following tests:

Name of laboratory	Name of sponsor	Test and Date	Test method
UL International (UK) Ltd – UKAS Accreditation 5772	Name held on confidential file	UL 4789367874, 27/07/2020	EN 1366-4: 2006 + A1: 2010
		UL 4789566552-01, 10/09/2020	
		UL 4789612844-01, 25/11/2020	

The classifications given are based on the actual tested configuration and the field of application permitted by EN 1366-4: 2006 and are reproduced in Annex B to this report.

Report Sponsor: Tenmat Ltd

Report date: 6th July 2021

## 8. Description of the proposed systems

The proposed configurations and fire resistance performance are given in Annex B.

The classification code may be understood as follows:

- E XX – Integrity of XX minutes
- EI XX – Integrity and insulation of XX minutes
- H – Horizontally oriented joint e.g. floor to floor
- V – vertically oriented joint e.g. wall to wall
- T – Horizontal joint in a wall e.g. head of wall
- X – No movement capability tested
- F – Spliced in the field (not at the factory)
- W XXX to W YYY – minimum to maximum joint width in mm

## **9. Assessment – Performance to AS 4072.1: 2005 & AS 1530.4 2005/14**

### **General**

It is proposed that joint seals referenced Tenmat NVFB, as classified in the UL Report No. 4789980605, will provide up to 120 minutes integrity and insulation performance, with respect to AS 4072.1: 2005 & AS 1530.4 2005/14, when installed in a variety of configurations between floors and walls, as detailed in Annex B.

It is however, necessary to consider any significant differences between the EN 1366-4: 2006 standard and the required AS 4072.1: 2005 & AS 1530.4 2005/14.

It is noted that the requirements of the 2005 and 2014 versions of the AS 1530.4 standard are the same for the proposed applications and therefore this report is considered applicable to both versions.

The following aspects of the test are considered relevant to the performance of the seals:

- Mounting and installation – Both AS1530.4: 2014 and EN 1366-4: 2006 require that control joints are installed and tested in a manner representative of the intended application.
- Heating conditions – Both standards use the same specified heating conditions ( $T = 345 \log_{10}(8t + 1) + 20$ ) and instrumentation (Plate Thermometer required by EN 1366-4: 2006 is an option in AS 1530.4: 2014)
- Dimensions – AS 1530.4: 2014 requires a minimum specimen length of 1000 mm and EN 1366-4: 2006 requires a minimum specimen length of 900 mm, however all of the tested joints were significantly longer to achieve the 10:1 length to width ratio, with test lengths of up to 4000 mm.
- Pressure conditions – Both standards require that the test specimens be subjected to identical pressure conditions
- Instrumentation of specimens – The instrumentation of the specimens is of the same type and is applied at similar positions and therefore is expected to result in the same performance.
- Failure criteria – The failure criteria of both tests for Integrity and Insulation are identical, with the exception of the omission of gap gauges from the EN 1366-4 standard. Gap gauges however are not used for smaller control joints under the AS1530.4 standard either and in any case the formation of gaps was not observed in any of the supporting tests, for the performance periods given.

The parameters discussed above indicate that the EN 1366-4: 2006 test is equivalent to, and of equal severity to a AS1530.4: 2014 test, and therefore based upon the above, it is considered that Tenmat NVFB joint seals, as detailed in Annex B, would provide up to 120 minutes integrity and insulation performance, depending on configuration, if subjected to a test in accordance with AS1530.4: 2014 and AS 4072.1: 2005.

### 10. Limits of Applicability

The conclusions of this report only apply to the fire performance of Linear Joint seals Tenmat NVFB Linear Joint seals in terms of AS 4072.1: 2005 & AS 1530.4 2005/14 as detailed in section 8 of this report.

This assessment does not constitute product certification by UL and should not be used to demonstrate compliance where the project requires product certification.

### 11. Conclusions

It can be concluded that the Tenmat NVFB Linear Joint seals are capable of providing up to 120 minutes integrity and insulation performance, in terms of AS 4072.1: 2005 & AS 1530.4 2005/14, depending on configuration, as detailed in Annex B.

### 12. UL Confirmation of Validity

This assessment is issued on the basis of the test data and information to hand at the time of issue. If contradictory evidence becomes available to the assessing authority the assessment will be unconditionally withdrawn and the applicant will be notified in writing. Similarly, the assessment should be re-evaluated, if the assessed construction is subsequently tested, since actual test data is deemed to take precedence.


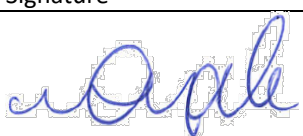
This assessment is valid for an initial period of five years (if the clause above is not enacted) after which time it is recommended that it be submitted to the assessing authority for re-evaluation.

This report may only be used in its entirety and should be supplied to interested parties or AHJ's as such.

NB This assessment report is not valid unless it incorporates all pages and the declaration duly signed by the applicant's representative.

### 13. Signatories

Engineer Completing the Assessment on behalf of UL.

Name of Engineer	Signature	Date
Chris Johnson		24/03/2023
Name of Reviewer	Signature	Date
David Yates		27/03/2023

<b>Date of Issue</b>	<b>28<sup>th</sup> March 2023</b>
<b>Date end of validity (five years from issue)</b>	<b>27<sup>th</sup> March 2028</b>

**13. Annex A – Declaration by the Applicant**

Reference No. \_\_\_\_\_

We the undersigned confirm that we have read and complied with the obligations placed on us by the

Passive Fire Protection Forum (PFPF)

**Guide to undertaking technical assessments and engineering evaluations based on fire test evidence**

2021

Industry Standard Procedure

We confirm that any changes which are the subject of this assessment have not to our knowledge been tested to the standard against which this assessment has been made.

We agree to withdraw this assessment from circulation should the component or element of structure, or any of its component parts be the subject of a failed fire resistance test to the standard against which this assessment is being made.

We understand that this assessment is based on test evidence and will be withdrawn should evidence become available that causes the conclusion to be questioned. In that case, we accept that new test evidence may be required.

We are not aware of any information that could affect the conclusions of this assessment. If we subsequently become aware of any such information, we agree to ask the assessing authority to withdraw the assessment.

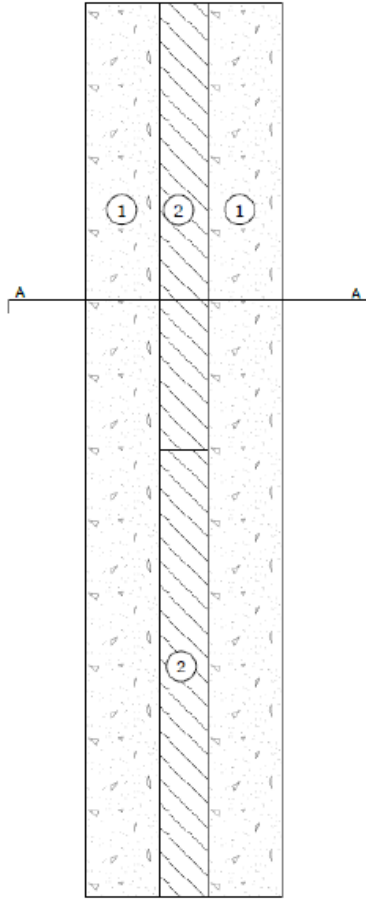
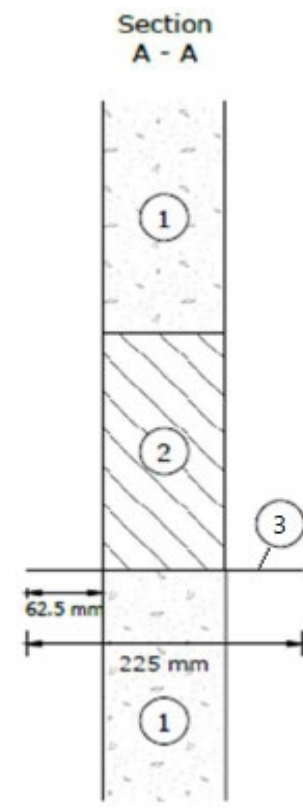
*(in accordance with the principles of FTSG Resolution 82)*

Signature: *Chris Thompson*  
Name: \_\_\_\_\_  
Chris Thompson  
Position: \_\_\_\_\_  
Global Product Manager  
Company: \_\_\_\_\_  
Tenmat Ltd  
Date: \_\_\_\_\_  
14/4/2023  
\_\_\_\_\_



**Annex B – Assessed performance and configurations**

**Vertical linear joint or gap seals with 1 x 100 mm thick Tenmat NVFB, between rigid wall constructions with thickness of minimum 100 mm**

<b>Joint System:</b> Tenmat NVFB compress fitted and flush to both faces of the wall	
Construction details: 	Section A - A 
1. 100 mm leightweight rigid wall 2. Tenmat NVFB 3. 225 mm Damp Proof Course (DPC) bonded centrally	

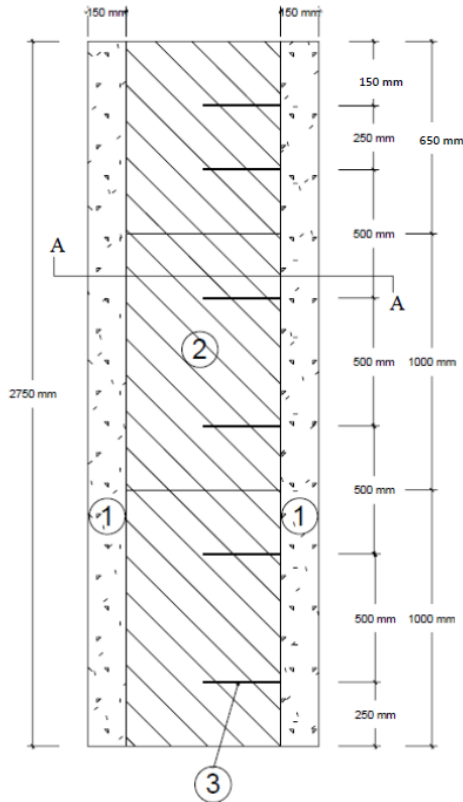
Substrate	Min. Depth (mm)	Seal Material*	Classification
Masonry / concrete	100	Stone mineral wool 110kg/m <sup>3</sup> , compress fitted by approximately 5 mm. With or without DPC	<b>EI 120 – V – X – F – W 10 to W 200</b>

\*Minor irregularities ( $\leq 5$  mm) on each face to be sealed with PFC Corofil Acoustic Intumescent Sealant to a min. depth of 10 mm.

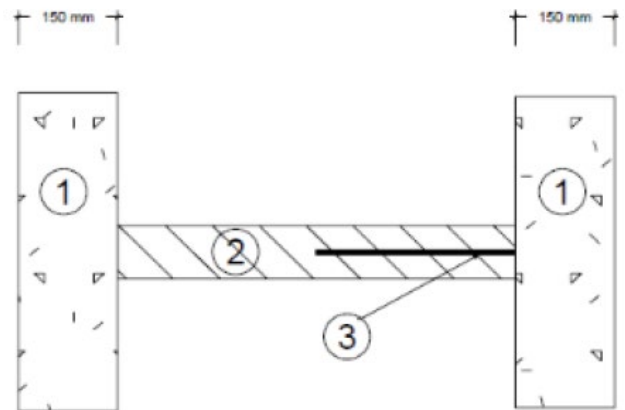
**Vertical linear joint or gap seals with 1 x 82 mm thick Tenmat NVFB, installed within the cavity of rigid wall constructions with thickness of minimum 150 mm**

**Joint System:** Tenmat NVFB compress fitted within the cavity of the walls. The Tenmat NVFB is retained in place using MP Brackets installed at mid depth of the barrier and fixed at maximum 500 mm centres.

Construction details:



Vertical section:



- 1. 100 mm leightweight concrete leaf
- 2. Tenmat NVFB
- 3. Tenmat MP Bracket

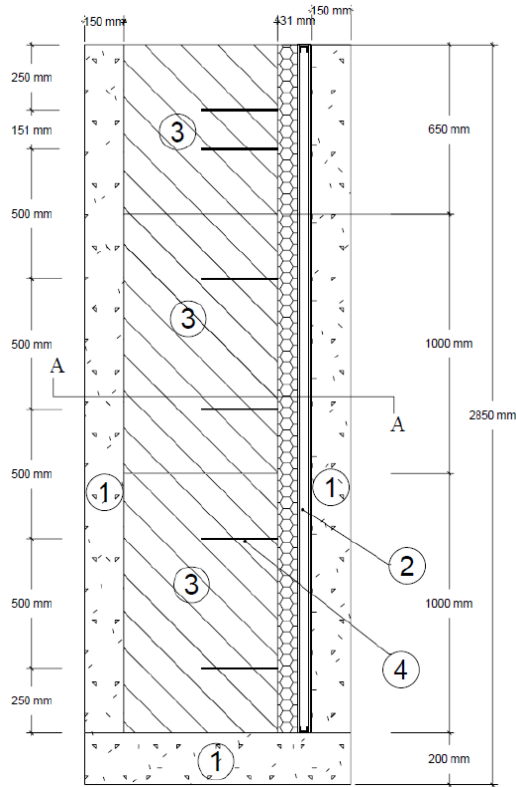
Substrate	Min. Depth (mm)	Seal Material*	Classification
Masonry / concrete	82	Stone mineral wool 110kg/m <sup>3</sup> , with or without foil facings, compress fitted by approximately 5 mm. Fixed with MP Brackets at maximum 500 mm centres. With or without DPC	<b>E 120 – V – X – F – W 201 to W 600, EI 30 – V – X – F – W 201 to W 600</b>

\*Minor irregularities ( $\leq 5$  mm) on each face to be sealed with PFC Corofil Acoustic Intumescent Sealant to a min. depth of 10 mm.

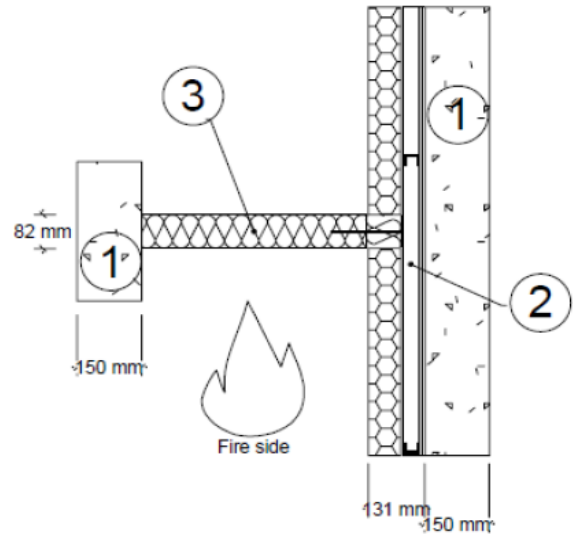
**Vertical linear joint or gap seals with 1 x 82 mm thick Tenmat NVFB, installed within the cavity between rigid walls with thickness of minimum 150 mm and Metsec supporting construction**

**Joint System:** Tenmat NVFB compress fitted within the cavity of the walls. The Tenmat NVFB is retained in place using MP Brackets installed at mid depth of the barrier and fixed at maximum 500 mm centres.

Construction details:



Vertical section:



1. 100 mm lightweight concrete leaf
2. SFS system 135 mm overall thickness, comprising 90mm Metsec C stud, clad internally with 2 x 15mm Knauf Fire Panel, clad externally with 1 x 12mm RCM Y-Wall and minimum 75mm Rockwool Duo Slab
3. Tenmat NVFB
4. Tenmat MP Bracket

Substrate	Min. Depth (mm)	Seal Material*	Classification
Masonry / Concrete / Metsec system	82	Stone mineral wool 110kg/m <sup>3</sup> , with or without foil facings, compress fitted by approximately 5 mm. Fixed with MP Brackets at maximum 500 mm centres.	E 120 – V – X – F – W 10 to W 600, EI 30 – V – X – F – W 10 to W 600

\*Minor irregularities (≤ 5 mm) on each face to be sealed with PFC Corofil Acoustic Intumescent Sealant to a min. depth of 10 mm.

**Rigid floor constructions with minimum thickness of minimum 150 mm**

**Linear joint or gap seals with 1 x 100 mm thick Tenmat NVFB**

**Joint System:** Tenmat NVFB compress fitted and flush to the bottom side of the floor

Construction details:

1. 150 mm leightweight rigid floor  
2. Tenmat NVFB

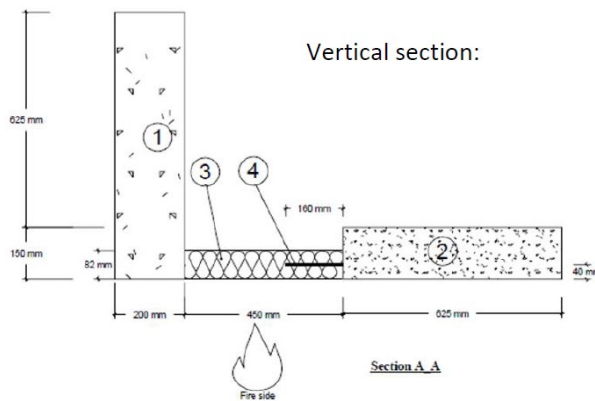
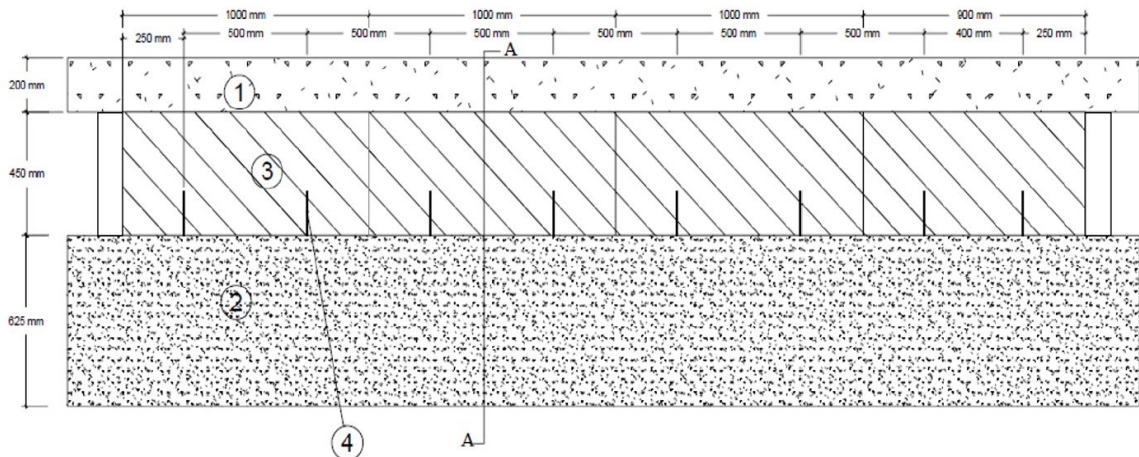
Substrate	Min. Depth (mm)	Seal Material*	Classification
Masonry / concrete	100	Stone mineral wool 110kg/m <sup>3</sup> , compress fitted by approximately 5 mm. With or without DPC	EI 120 – H – X – F – W 10 to W 100
			E 120 – H – X – F – W 101 to W 200, EI 90 – H – X – F – W 101 to W 200

\*Minor irregularities (≤ 5 mm) on each face to be sealed with PFC Corofil Acoustic Intumescent Sealant to a min. depth of 10 mm.

**Linear joint or gap seals with 1 x 82 mm thick Tenmat NVFB**

**Joint System:** Tenmat NVFB compress fitted within the aperture and flush to the bottom side of the floor. The Tenmat NVFB is retained in place using MP Brackets installed at mid depth of the barrier and fixed at maximum 500 mm centres.

Construction details:



1. 600 mm x 626 mm lightweight aggregate
2. 150 mm thick lightweight concrete floor
3. Tenmat NVFB
4. Tenmat MP Bracket

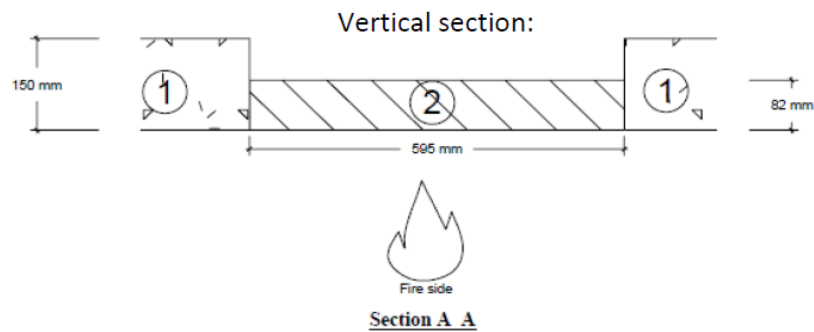
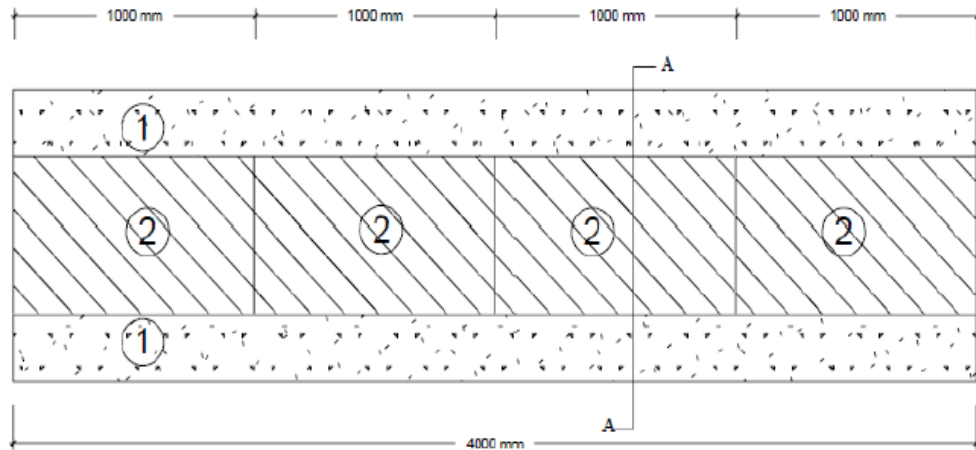
Substrate	Min. Depth (mm)	Seal Material*	Classification
Masonry / concrete	82	Stone mineral wool 110kg/m <sup>3</sup> , with or without foil facings, compress fitted by approximately 5 mm. With or without DPC	<b>E 120 – H – X – F – W 201 to W 450,</b> <b>EI 30 – H – X – F – W 201 to W 450</b>

\*Minor irregularities (≤ 5 mm) on each face to be sealed with PFC Corofil Acoustic Intumescent Sealant to a min. depth of 10 mm.

**Linear joint or gap seals with 1 x 82 mm thick Tenmat NVFB**

**Joint System:** Tenmat NVFB compress fitted within the aperture and flush to the bottom side of the floor. The Tenmat NVFB is retained in place using MP Brackets installed at mid depth of the barrier and fixed at maximum 500 mm centres.

Construction details:



1. 150 mm thick lightweight aggregate floor
2. Tenmat NVFB

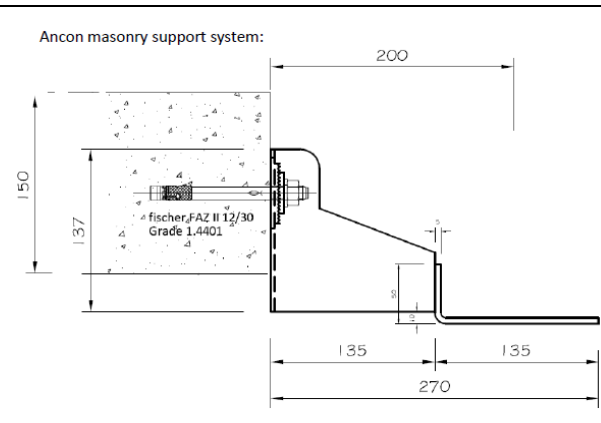
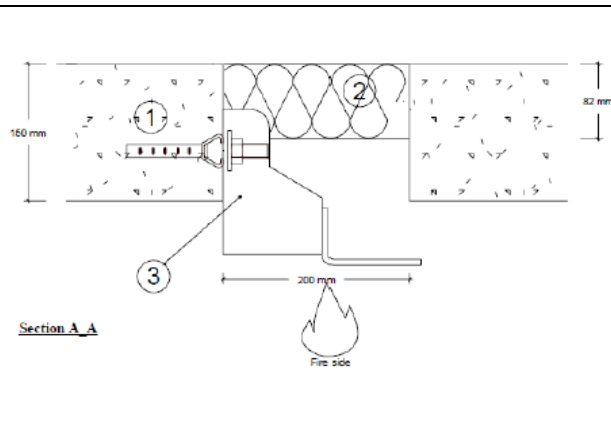
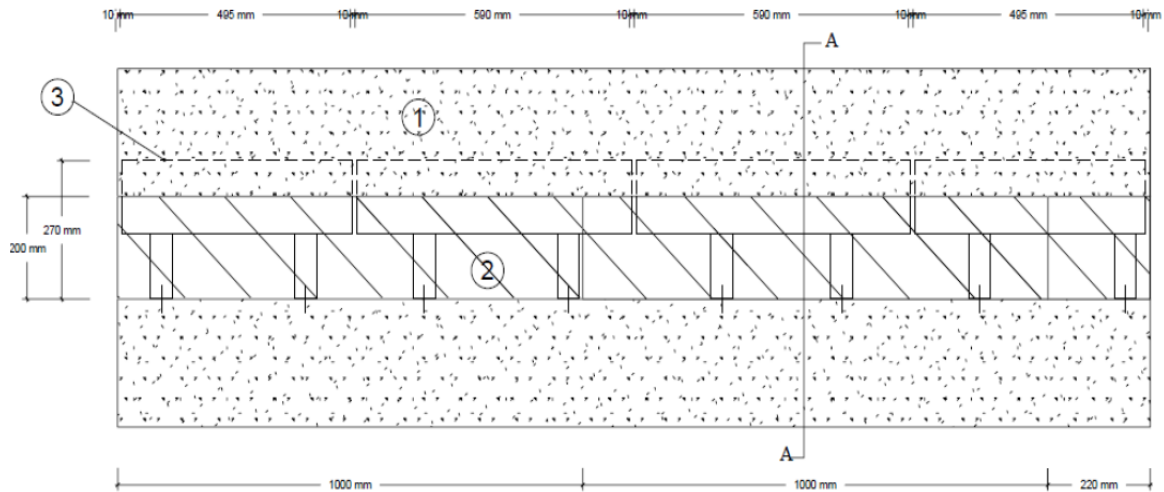
Substrate	Min. Depth (mm)	Seal Material*	Classification
Masonry / concrete	82	Stone mineral wool 110kg/m <sup>3</sup> , with or without foil facings, compress fitted by approximately 5 mm. With or without DPC	E 60 – H – X – F – W 451 to W 595, EI 30 – H – X – F – W 451 to W 595

\*Minor irregularities ( $\leq 5$  mm) on each face to be sealed with PFC Corofil Acoustic Intumescent Sealant to a min. depth of 10 mm.

**Linear joint or gap seals with 1 x 82 mm thick Tenmat NVFB**

**Joint System:** Tenmat NVFB compress fitted within the aperture and flush to the top side of the floor. The Tenmat NVFB is notched around an Ancon MDC/P masonry support system at maximum 300 mm centres. Minimum gap from top of support bracket to top of masonry floor slab 28 mm.

Construction details:



1. 150 mm thick lightweight concrete floor
2. Tenmat NVFB
3. Ancon masonry MDC/P support system

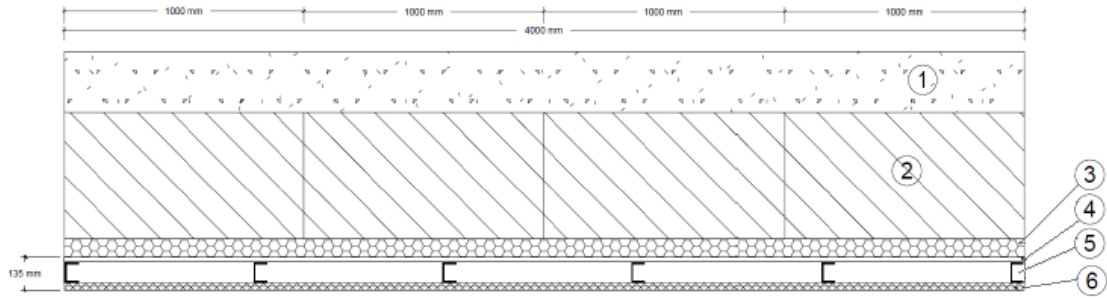
Substrate	Min. Depth (mm)	Seal Material*	Classification
Masonry / concrete	82	Stone mineral wool 110kg/m <sup>3</sup> , with or without foil facings, compress fitted by approximately 5 mm. With or without DPC	<b>EI 120 – H – X – F – W 200</b>
			<b>E 120 – H – X – F – W 201 to W 450, EI 30 – H – X – F – W 201 to W 450</b>

\*Minor irregularities (≤ 5 mm) on each face to be sealed with PFC Corofil Acoustic Intumescent Sealant to a min. depth of 10 mm.

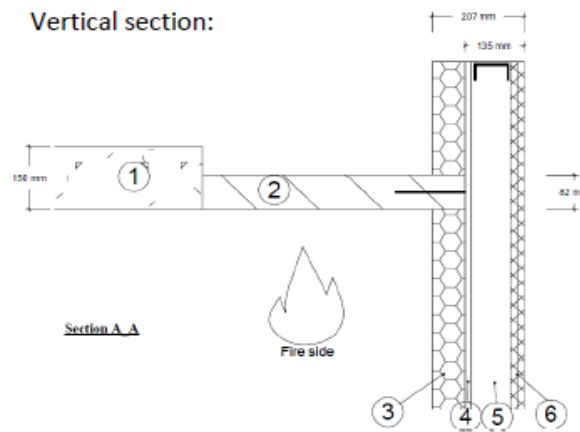
**Linear joint or gap seals with 1 x 82 mm thick Tenmat NVFB, installed within the cavity between rigid floors with thickness of minimum 150 mm and Metsec wall supporting construction**

**Joint System:** Tenmat NVFB compress fitted within the cavity and flush to the bottom side of the floor. The Tenmat NVFB is retained in place using MP Brackets installed at mid depth of the barrier and fixed at maximum 500 mm centres.

Construction details:



Vertical section:



1. 100 mm leightweight aggregate floor
2. Tenmat NVFB
3. Minimum 75 mm Rockwool Duo Slab
4. 1 x 12 mm RCM Y-Wall
5. 90 mm Metsec C stud
6. 2 x 15mm Knauf Fire Panel

Substrate	Min. Depth (mm)	Seal Material*	Classification
Masonry / Concrete / Metsec system	82	Stone mineral wool 110kg/m <sup>3</sup> , with or without foil facings, compress fitted by approximately 5 mm. Fixed with MP Brackets at maximum 500 mm centres.	<b>E 120 – H – X – F – W 10 to W 595,</b> <b>EI 60 – H – X – F – W 10 to W 595</b>

\*Minor irregularities (≤ 5 mm) on each face to be sealed with PFC Corofil Acoustic Intumescent Sealant to a min. depth of 10 mm.