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Fire assessment report

HB Fuller Firesound sealant protected joints within Hebel walls to AS 1530.4:2014 and AS 4072.1:2005

Sponsor: HB Fuller Australia Pty Ltd

Report number: FAS200410 Revision: R1.1

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Quality management

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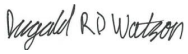
<tr><td></td><td>  </td><td>  </td><td>  </td></tr>
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Executive summary

This report documents the findings of the assessment undertaken to determine the expected fire resistance level (FRL) of HB Fuller Firesound sealant in Hebel wall systems if tested in accordance with AS 1530.4:2014 and assessed in accordance with AS 4072.1:2005.

HB Fuller Firesound is described as a water-based construction sealant which is generally used to seal joints in walls and floors.

The analysis in section 5 of this report found that the proposed systems, together with the described variations, are expected to achieve FRLs as shown in Table 1 to Table 3, if tested in accordance with AS 1530.4:2014 and assessed in accordance with AS 4072.1:2005.

Table 1 Upper horizontal joints protected with HB Fuller Firesound

Joint type	Maximum joint height	Minimum sealant depth	Hebel panel	Joint FRL
Upper horizontal joint	20 mm	16 mm	Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.	-/120/120
	10 mm	10 mm	Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.	-/120/120
The stated FRL only applies to the control joint. The FRL of each CSR Hebel system must have been determined via testing or assessment to AS 1530.4:2014 by an accredited testing laboratory. It should be noted that, FRL of the CSR Hebel panels may vary based on the panel reinforcement and maximum wall height. The overall system FRL must be considered with the FRL of the control joint and the Hebel panel combined.				

Table 2 Vertical joints protected with HB Fuller Firesound

Joint type	Maximum joint width	Minimum sealant depth	Hebel panels	Joint FRL
Vertical joint	20 mm	16 mm	Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.	-/120/120
	10 mm	10 mm	Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.	-/120/120
The stated FRL only applies to the control joint. It is expected that the FRL of the CSR Hebel panel will be determined via testing or assessment by an accredited testing laboratory. It should be noted that, FRL of the CSR Hebel panels may vary based on the panel reinforcement and maximum wall height. The overall system FRL must be considered with the FRL of the control joint and the Hebel panel combined.				

Table 3 Vertical joint between Hebel panels

Joint type	Maximum joint width	Maximum sealant depth	Hebel panel	Joint FRL
Vertical joint	20 mm	16 mm	75 mm thick CSR Hebel PowerPanel. The joint detail is illustrated in Figure 4.	-/120/120
	10 mm	10 mm		
	>10 mm, <20 mm	16 mm		
The stated FRL only applies to the control joint. It is expected that the FRL of the CSR Hebel panel will be determined via testing or assessment by an accredited testing laboratory. The overall system FRL must be considered with the FRL of the control joint and the Hebel panel combined				

The variations and outcome of this assessment are subject to the limitations and requirements described in sections 2, 3 and 6 of this report. The results of this report are valid until 31 October 2026.

Contents

1. Introduction

This report documents the findings of the assessment undertaken to determine the expected fire resistance level (FRL) of HB Fuller Firesound sealant in Hebel wall systems if tested in accordance with AS 1530.4:2014[1] and assessed in accordance with AS 4072.1:2005[2].

This report may be used as Evidence of Suitability in accordance with the requirements of the relevant National Construction Code (NCC) to support the use of the material, product, form of construction or design as given within the scope of this assessment report. It also references test evidence for meeting deemed to satisfy (DTS) provisions of the NCC as applicable to the assessed systems.

This assessment was carried out at the request of HB Fuller Australia Pty Ltd.

The sponsor details are included in Table 4.

Table 4 Sponsor details

Sponsor	Address
HB Fuller Australia Pty Ltd	16-22 Redgum drive Dandenong South VIC 3175 Australia

2. Framework for the assessment

2.1 Assessment approach

An assessment is an opinion about the expected performance of a component or element of structure if it was subject to a fire test.

No specific framework, methodology, standard or guidance documents exists in Australia for doing these assessments. We have therefore followed the 'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence' prepared by the Passive Fire Protection Forum (PFPF) in the UK in 2019[3].

This guide provides a framework for undertaking assessments in the absence of specific fire test results. Some areas where assessments may be offered are:

- Where a modification is made to a construction which has already been tested
- The interpolation or extrapolation of results of a series of fire resistance tests, or utilisation of a series of fire test results to evaluate a range of variables in a construction design or a product
- Where, for various reasons – eg size or configuration – it is not possible to subject a construction or a product to a fire test.

Assessments will vary from relatively simple judgements on small changes to a product or construction through to detailed and often complex engineering assessments of large or sophisticated constructions.

This assessment uses established empirical methods and our experience of fire testing similar products to extend the scope of application by determining the limits for the design based on the tested constructions and performances obtained. The assessment is an evaluation of the potential fire resistance performance if the elements were to be tested in accordance with AS 1530.4:2014.

The expected performance of the proposed systems with the variations documented in this assessment report has been determined by assessing the performance of tested systems against the expected impact of each variation. The systems tested in accordance with AS 1530.4:2014, and

[1] Standards Australia, 2014, Methods for fire tests on building materials, components and structures – Part 4: Fire-resistance tests for elements of construction, AS 1530.4:2014, Standards Australia, NSW.
[2] Standards Australia, 2005, Components for the protection of openings in fire-resistant separating elements: Service penetrations and control joints (Reconfirmed 2016), AS 4072.1:2005 (R2016), Standards Australia, NSW.
[3] Passive Fire Protection Forum (PFPF), 2019, Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, Passive Fire Protection Forum (PFPF), UK.

detailed within Appendix A, are generally considered to be more onerous than the listed system variations which are generally expected to yield a performance equivalent to the tested systems.

2.2 Compliance with the National Construction Code

This assessment report has been prepared to meet the Evidence of Suitability requirements of the NCC 2019 including amendments[4] under A5.2 (1) (d).

This assessment has been written in accordance with the general principles outlined in EN 15725:2010[5] for extended application reports on the fire performance of construction products and building elements. It also references test evidence for meeting a performance requirement or deemed to satisfy (DTS) provision of the NCC under A5.4 for fire resistance levels as applicable to the assessed systems.

This assessment report may also be used to demonstrate compliance with the requirements for Evidence of Suitability under NCC 2016 including amendments[6].

2.3 Declaration

The 'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence' prepared by the PFPF in the UK requires a declaration from the client. By accepting our fee proposal on 16 February 2021, HB Fuller Australia Pty Ltd confirmed that:

- To their knowledge the component or element of structure, which is the subject of this assessment, has not been subjected to a fire test to the standard against which this assessment is being made.
- They agree to withdraw this assessment from circulation if the component or element of structure is the subject of a fire test by a test authority in accordance with the standard against which this assessment is being made and the results are not in agreement with this assessment.
- They are not aware of any information that could adversely affect the conclusions of this assessment and – if they subsequently become aware of any such information – they agree to ask the assessing authority to withdraw the assessment.

3. Limitations of this assessment

- The scope of this report is limited to an assessment of the variations to the tested systems described in section 4.3.
- This report details the methods of construction, test conditions and assessed results that are expected if the systems were tested in accordance with AS 1530.4:2014 and assessed in accordance with AS 4072.1:2005.
- This assessment is applicable to control joints installed in Hebel wall systems exposed to fire from each side in accordance with the requirements of AS 1530.4:2014 where vertical elements must be exposed to heat from the direction required to resist fire exposure.
- This report does not assess the performance of various CSR Hebel systems. The stated FRLs in this report only apply to the control joints. The FRL of each CSR Hebel system must have been determined via testing or assessment to AS 1530.4:2014 by an accredited testing laboratory. The overall system FRL must be considered with the FRL of the control joint and the Hebel panel combined. It should be noted that, FRL of the CSR Hebel panels may vary based on the panel reinforcement and maximum wall height.
- This report is only valid for the assessed systems and must not be used for any other purpose. Any changes with respect to size, construction details, loads, stresses, edge or end

[4] National Construction Code Volumes One and Two - Building Code of Australia 2019 including Amendments, Australian Building Codes Board, Australia
[5] European Committee for Standardization, 2010, Extended application reports on the fire performance of construction products and building elements, EN 15725:2010, European Committee for Standardization, Brussels, Belgium.
[6] National Construction Code Volumes One and Two - Building Code of Australia 2016 including Amendments, Australian Building Codes Board, Australia

conditions – other than those identified in this report – may invalidate the findings of this assessment. If there are changes to the system, a reassessment will need to be done by an Accredited Testing Laboratory (ATL).

- The documentation that forms the basis for this report is listed in Appendix A.
- This report has been prepared based on information provided by others. Warringtonfire has not verified the accuracy and/or completeness of that information and will not be responsible for any errors or omissions that may be incorporated into this report as a result.
- This assessment is based on the proposed systems being constructed under comprehensive quality control practices and following appropriate industry regulations and Australian Standards on quality of materials, design of structures, guidance on workmanship and the expert handling, placing and finishing of the products on site. These variables are beyond the control and consideration of this report.

4. Description of the specimen and variations

4.1 System description

The proposed systems consist of horizontal and vertical control joints in Hebel wall systems protected with HB Fuller Firesound sealant.

4.2 Referenced test data

The assessment of the variations to the tested systems and the determination of the expected performance is based on the results of the fire tests documented in the reports summarised in Table 5. Further details of the tested system are included in Appendix A.

Table 5 Referenced test data

Report number	Test sponsor	Test date	Testing authority
FRT210084 R1.2	HB Fuller Australia Pty Ltd	11 May 2021	Warringtonfire Australia
FRT200323 R1.1		21 June 2021	
FRT210226 R1.1		9 August 2021	
FRT200213 R1.0		25 August 2020	

4.3 Variations to the tested systems

An identical system has not been subject to a fire test. We have therefore assessed the systems using baseline test information for similar systems. The variations to the tested systems – together with the referenced fire tests – are described in Table 6.

Table 6 Variations to tested systems

Item	Reference test	Description	Variations
Direction of exposure	FRT210084 R1.2, FRT210226 R1.1	The joints were tested with exposure from the side of the steel bracket.	It is proposed that the joints are assessed with exposure from each side.
Separating element		Joints were tested in a 75 mm thick CSR Hebel PowerPanel.	It is proposed that the joints are assessed in the following Hebel panels: Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169. It should be noted that, this assessment is limited to the performance of the control

Item	Reference test	Description	Variations
			joints if constructed into the listed Hebel panels. The performance of the Hebel panels is outside the scope of this assessment which needs to be established independently by an ATL.
Vertical joints between Hebal panels	FRT200213 R1.0, FRT200323 R1.1	Performance of 30 mm × 15 mm vertical joint with sealant applied on both sides and 10 mm × 10 mm joint with sealant applied on the exposed side were tested in 150 mm thick concrete floor.	It is proposed that the performance of 20 mm × 16 mm and 10 mm × 10 mm vertical joints in Hebel walls as illustrated in Figure 4 is assessed.

4.4 Schedule of components

Table 7 outlines the schedule of components for the assessed systems subject to a fire test, as referenced in Appendix A.

Table 7 Schedule of components

Item	Description	
Separating element (SE)		
1.	Item name	Hebel panels. Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.
2.	Item name	Adhesive
	Product name	Hebel® Adhesive
3.	Item name	50 mm × 75 mm slotted unequal angle
4.	Item name	50 mm × 50 mm slotted equal angle
5.	Item name	Cladding screws
Fire-stopping protections		
Sealant		
6.	Item name	Sealant
	Product name	H.B. Fuller Firesound
	Density	Nominally 1497 kg/m^3
Backing rod		
7.	Item name	Open cell backing rod
	Material	Polyurethane
Upper horizontal joint		
	Details	20 mm high × 16 mm deep or 10 mm high × 10 mm deep Refer joint A in Figure 1.
	Protection	Protected with HB Fuller Firesound.
Vertical joint		
	Details	20 mm wide × 16 mm deep or 10 mm wide × 10 mm deep Refer joint B in Figure 1.
	Protection	Protected with HB Fuller Firesound.

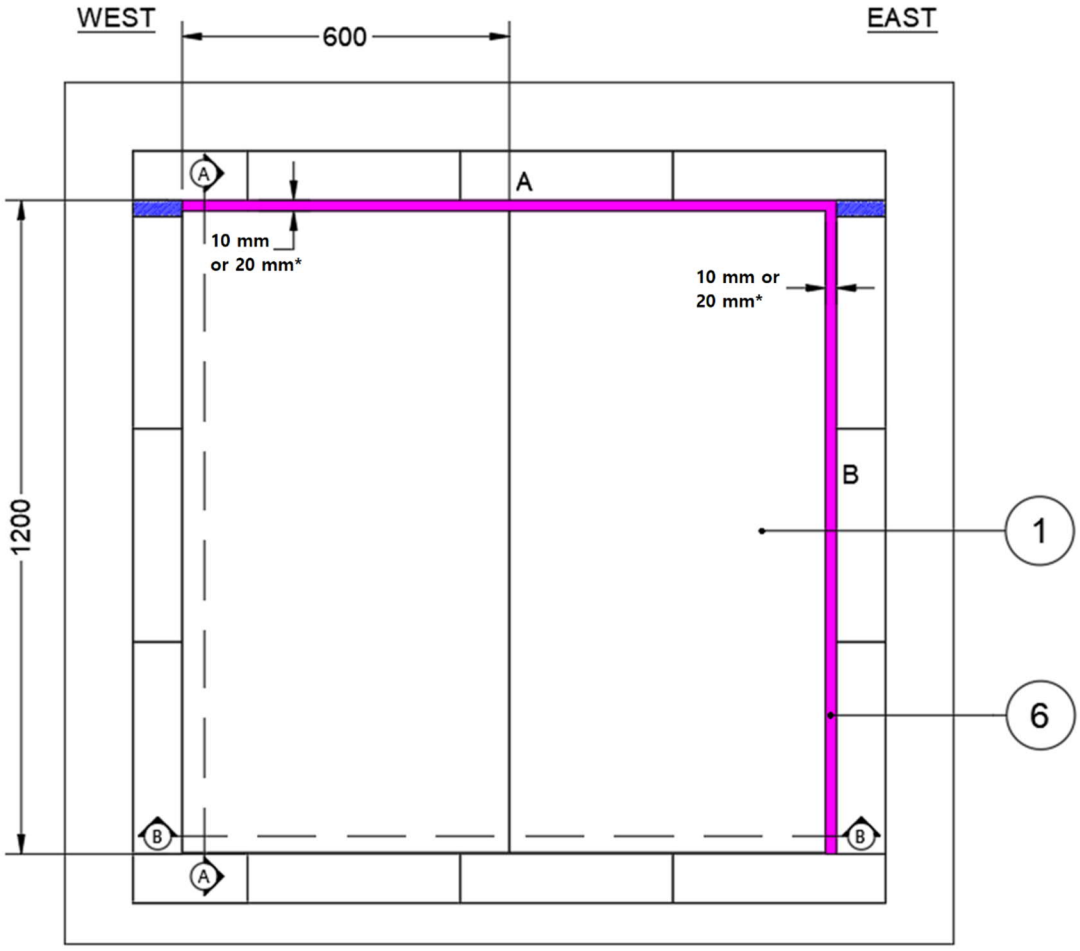

Figure 1 **Elevation view of the test specimen. The image is included to demonstrate the location of the assessed joints. The separating element construction may vary based on the applicable Hebel panel construction details.**

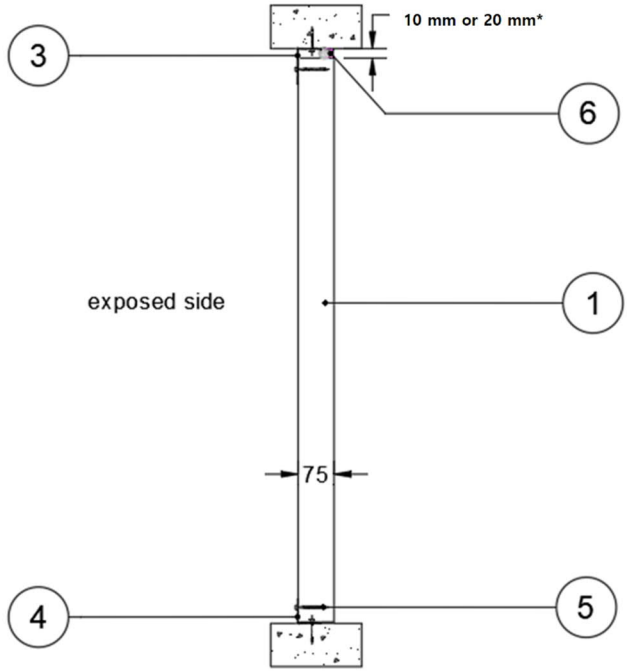

Figure 2 **Cross section A-A. The image is included to demonstrate the location of the assessed joints. The separating element construction may vary based on the applicable Hebel panel construction details.**

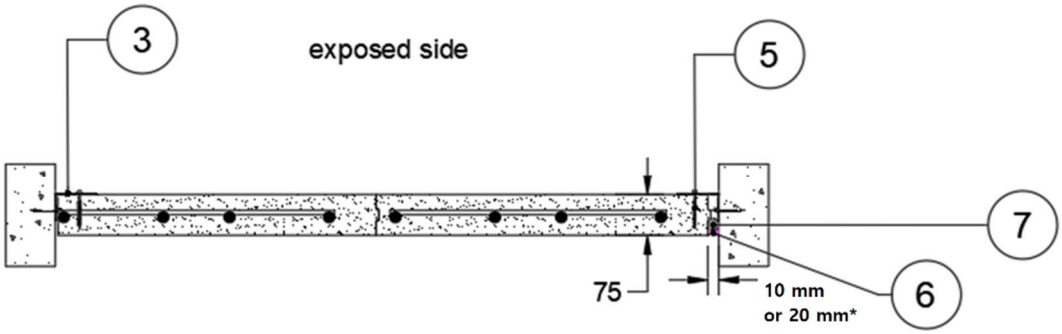

Figure 3 **Cross section B-B. The image is included to demonstrate the location of the assessed joints. The separating element construction may vary based on the applicable Hebel panel construction details.**

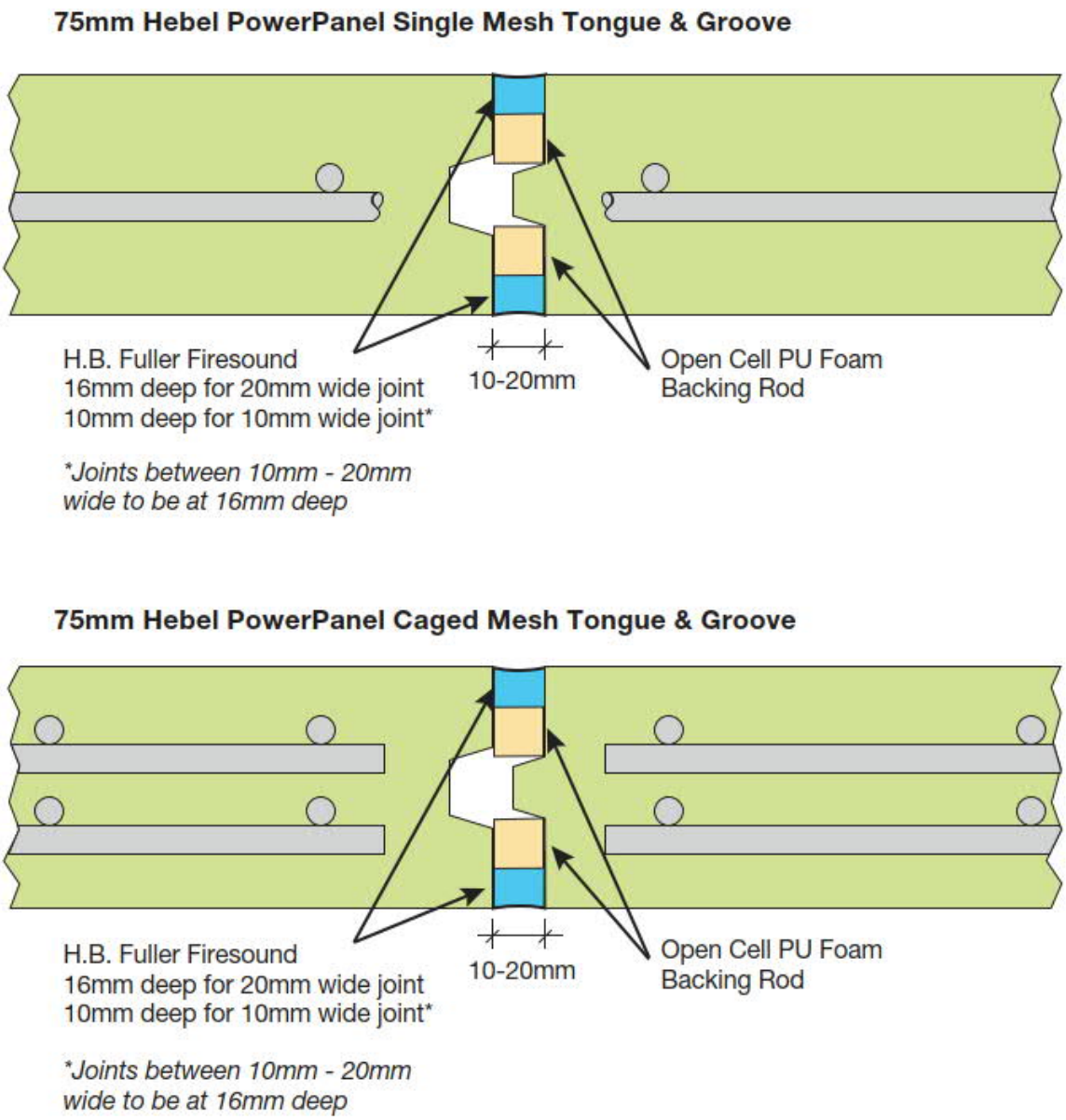

Figure 4 Vertical joint between Hebel panels

5. Assessment of joints protected with HB Fuller Firesound sealant in Hebel wall systems

5.1 Description of variation

The tested system included upper horizontal and vertical control joints protected with HB Fuller Firesound in 75 mm thick CSR Hebel PowerPanel with exposure from the steel bracket side. It is proposed that the joints are assessed with exposure from each direction. Additionally, it is proposed that the joints are assessed if installed in the following Hebel systems:

- Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.

It is also proposed that, vertical joints between Hebel panels protected with HB Fuller Firesound as illustrated in Figure 4 are assessed.

5.2 Methodology

The method of assessment used is summarised in Table 8.

Table 8 Method of assessment

Assessment method	
Level of complexity	Intermediate assessment
Type of assessment	Qualitative – interpolation, Comparative

5.3 Top horizontal joint

In test FRT210084 R1.2, a 20 mm high upper horizontal control joint located on the top side between a 1200 mm high × 1200 mm wide × 75 mm thick CSR Hebel PowerPanel and a concrete block work was tested in accordance with AS 1530.4:2014. The HB Fuller Firesound sealant was applied on the unexposed side into the control joint from a depth of 16 mm and was finished flush. The exposed side was sealed with a 50 mm × 75 mm unequal angle. This construction achieved an FRL of -/120/120.

In FRT210226 R1.1, a 10 mm high upper horizontal control joint located on the top side between a 1200 mm high × 600 mm wide × 75 mm thick CSR Hebel PowerPanel and a concrete block work was tested in accordance with AS 1530.4:2014. The sealant was applied on the unexposed side into the control joint from a depth of 10 mm and was finished flush. The exposed side was sealed with a 50 mm × 75 mm unequal angle. This construction achieved an FRL of -/120/120.

From the test data, it was noted that, HB Fuller Firesound sealant-maintained connection to all surfaces and did not fail integrity and insulation for the duration of the test. As such, these tests demonstrate the ability of HB Fuller Firesound sealant to work effectively in conjunction with Hebel PowerPanels for the tested period.

From the tested construction, it is noted that the sealant and the steel angle are separated by an air gap through the remaining depth of Hebel panel. Due to its high conductivity, the steel angle is expected to heat up and radiate heat to the unexposed side through the air gap. In contrast, the sealant is expected to act as an insulator if exposed from fire side. Therefore, the direction of fire exposure in the tested system is considered to be the most onerous in terms of fire resistance of the joint. As the construction with exposure from the most onerous direction was tested, it is reasonable to conclude that at least similar or better performance is expected to be achieved if exposed from the other side. Based on the above discussion, it can be concluded that the control joints listed in Table 9 are expected to achieve the FRLs as listed, if tested in accordance with AS 1530.4:2014.

Table 9 Upper horizontal joints protected with HB Fuller Firesound sealant

Joint type	Maximum joint height	Minimum Sealant depth	Separating element	FRL
Upper horizontal joint	20 mm	16 mm	75 mm Hebel panel with 50 mm × 75 mm steel angle	-/120/120
	10 mm	10 mm		

It is proposed that the assessed upper horizontal joints listed in Table 9 will be constructed into the following Hebel panels:

- Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.

The fire resistance performance of the proposed Hebel systems is outside the scope of this assessment. The FRL of each CSR Hebel system must have been determined via testing or assessment to AS 1530.4:2014 by an accredited testing laboratory. It is understood that FRL of the CSR Hebel panels may vary based on the panel reinforcement and maximum wall height. Hence, the overall system FRL must be considered with the FRL of the control joint and the Hebel panel combined. This assessment was conducted under the assumption that the proposed Hebel systems will achieve the required period of FRL. The likely performance of the horizontal control joints if installed in the proposed Hebel panels is discussed below.

It is understood that the proposed Hebel systems are generally similar to the tested systems with the inclusion of additional plasterboard linings, steel studs, cavity and insulation barrier. The inclusion of such components is expected to either increase the rigidity of the panel or provide additional burn through resistance. As such, the tested joint configuration still remains as the most onerous in terms of fire resistance. Hence, if the tested upper horizontal joints are installed in the proposed Hebel systems, their FRL is not expected to be impacted negatively. Based on the above discussion, it is concluded that the control joints listed in Table 10 are likely to achieve the FRLs as listed, if tested in accordance with AS 1530.4:2014.

Table 10 Upper horizontal joints protected with HB Fuller Firesound in various Hebel systems

Joint type	Maximum joint height	Minimum sealant depth	Separating element	FRL
Upper horizontal joint	20 mm	16 mm	Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169	-/120/120
	10 mm	10 mm	Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169	-/120/120

5.4 Vertical joint

In test FRT210084 R1.2, a 20 mm wide vertical control joint between a 75 mm thick CSR Hebel PowerPanel and a concrete block work was tested in accordance with AS 1530.4:2014. The HB Fuller Firesound sealant was applied on the unexposed side into the control joint from a depth of 16 mm and was finished flush. The exposed side was sealed with a 50 mm × 75 mm unequal angle. This construction achieved an FRL of -/120/120.

In FRT210226 R1.1, a 10 mm wide vertical control joint between a 75 mm thick CSR Hebel PowerPanel and a concrete block work was tested in accordance with AS 1530.4:2014. The sealant was applied on the unexposed side into the control joint from a depth of 10 mm and was finished flush. The exposed side was sealed with a 50 mm × 75 mm unequal angle. This construction achieved an FRL of -/120/120.

From the tested systems, it is noted that the sealant and the steel angle are separated by an air gap through the remaining depth of Hebel panel. As previously discussed, the tested direction of exposure is considered to be the most onerous in terms of fire resistance as the steel angle is expected to radiate heat while the sealant is expected to act as an insulator. As the construction with exposure from the most onerous direction was tested, it can be concluded that at least similar or better performance is expected to be achieved if exposed from the other direction. Based on the above discussion, it can be concluded that the control joints listed in Table 11 are expected to achieve the FRLs as listed, if tested in accordance with AS 1530.4:2014.

Table 11 Vertical joints protected with HB Fuller Firesound sealant

Joint type	Maximum joint width	Minimum sealant depth	Separating element	FRL
Vertical joint	20 mm	16 mm	75 mm Hebel panel with 50 mm × 75 mm steel angle	-/120/120
	10 mm	10 mm		

It is proposed that the assessed vertical joints listed in Table 11 will be constructed into the following Hebel panels:

- Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.

This report does not assess the performance of the Hebel panels and is prepared under the assumption that the proposed Hebel panels will achieve the required period of FRL. The FRL of the CSR Hebel panel will be determined by an accredited testing laboratory independently.

The proposed Hebel systems remain similar to the tested panel with the addition of plasterboard, steel studs, cavity and insulation barrier. As previously discussed, the addition of these components is expected to either increase the construction rigidity or offer additional burn through resistance. Hence, the performance of the vertical joint is not likely to be affected. Based on the above discussion, it is concluded that the control joints listed in Table 12 are expected to achieve the FRLs as listed, if tested in accordance with AS 1530.4:2014.

Table 12 Vertical joints protected with HB Fuller Firesound in various Hebel systems

Joint type	Maximum joint width	Minimum sealant depth	Separating element	FRL
Vertical joint	20 mm	16 mm	Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.	-/120/120
	10 mm	10 mm	Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.	-/120/120

5.5 Vertical joint between Hebel panels

It is proposed that joints between Hebel panels will be sealed with HB Fuller Firesound as illustrated in Figure 4. The joints can be either 20 mm wide with 16 mm sealant depth or 10 mm wide with 10 mm sealant depth. For joint widths between 10 mm and 20 mm the sealant depth must be 16 mm. The sealant will be applied on both sides of the wall.

The performance of the HB Fuller Firesound sealant in concrete separating element was previously tested in multiple tests. In test FRT200213 R1.0, a 30 mm wide control joint with 15 mm deep HB Fuller Firesound sealant on both sides, installed in a 150 mm concrete floor was tested in accordance with AS 1530.4:2014. The sealant was applied using open cell backing rods. This construction achieved an FRL of -/240/180. The insulation failure at 215 minutes was recorded on the separating element. The joint otherwise maintained insulation up to 240 minutes.

In test FRT200323 R1.1, a 10 mm wide control joint with 10 mm deep HB Fuller Firesound sealant on the exposed side, installed in a 150 mm concrete floor was tested in accordance with AS 1530.4:2014. The sealant was applied using an open cell backing rod. This construction achieved an FRL of -/240/240.

It is noted that, a 30 mm wide joint with 15 mm deep HB Fuller Firesound sealant on both sides is able to maintain integrity and insulation up to 240 minutes. A similar or better performance is expected if the joint width is reduced to 20 mm wide and sealant depth is increased to 16 mm. It is also noted that, a 10 mm wide control joint with 10 mm deep HB Fuller Firesound sealant on the exposed side is able to maintain integrity and insulation up to 240 minutes. If the sealant is applied on both sides a similar or better performance is expected.

The tested systems have demonstrated the ability of HB Fuller Firesound sealant to achieve FRL up to -/240/240 if installed in concrete separating elements. It is noted that the tested joints were construction in concrete floors which are considered more onerous in terms of integrity due to the gravitational effect on sealant. If the joints were constructed in concrete walls, similar or better performance is expected.

The proposed system consists of 75 mm thick CSR Hebel PowerPanel which is either tested or assessed for an FRL of -/90/90 or -/120/120. If the joint between consecutive Hebel panels is sealed with HB Fuller Firesoud, the sealant is expected to maintain connection between the panels at least up to 120 minutes. This has been demonstrated in FRT210084 R1.2 and FRT210226 R1.1. With consideration to the performance and safety margin observed in FRT200213 R1.0 and FRT200323 R1.1, it is reasonable to conclude that the joints are expected to also maintain integrity and insulation at least up to 120 minutes if installed in CSR Hebel Power Panels. Based on the above, it is concluded that the control joints listed in Table 13 are expected to achieve the FRLs as listed, if tested in accordance with AS 1530.4:2014.

Table 13 Vertical joint between Hebel panels

Joint type	Maximum joint width	Minimum sealant depth	Separating element	FRL
Vertical joint	20 mm	16 mm	75 mm thick CSR Hebel Power Panel	-/120/120
	10 mm	10 mm		
	>10 mm, <20 mm	16 mm		

It should be noted that, the indicated FRL in Table 13 is applicable to the control joint only. The FRL of each CSR Hebel system must have been determined via testing or assessment to AS 1530.4:2014 by an accredited testing laboratory. The system FRL will need to be considered in conjunction with the FRL of the control joint and the Hebel panel.

5.6 Assessment outcome

This assessment demonstrates that the control joints listed in Table 14 to Table 16 are expected to achieve FRLs as listed, if they were tested in accordance with AS 1530.4:2014 and assessed in accordance with AS 4072.1:2005.

Table 14 Upper horizontal joints protected with HB Fuller Firesound

Joint type	Maximum joint height	Minimum sealant depth	Hebel panel	Joint FRL
Upper horizontal joint	20 mm	16 mm	Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160,	-/120/120

Joint type	Maximum joint height	Minimum sealant depth	Hebel panel	Joint FRL
			Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.	
	10 mm	10 mm	Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.	-/120/120
The stated FRL only applies to the control joint. It is expected that the FRL of the CSR Hebel panel will be determined via testing or assessment by an accredited testing laboratory. It should be noted that, FRL of the CSR Hebel panels may vary based on the panel reinforcement and maximum wall height. The overall system FRL must be considered with the FRL of the control joint and the Hebel panel combined.				

Table 15 Vertical joints protected with HB Fuller Firesound

Joint type	Maximum joint width	Minimum sealant depth	Hebel panels	Joint FRL
Vertical joint	20 mm	16 mm	Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.	-/120/120
	10 mm	10 mm	Hebel 1070, Hebel 1071, Hebel 1072, Hebel 1073, Hebel 1074, Hebel 1075, Hebel 1076, Hebel 1077, Hebel 1148, Hebel 1149, Hebel 1150, Hebel 1151, Hebel 1159, Hebel 1160, Hebel 1162, Hebel 1163, Hebel 1164, Hebel 1165, Hebel 1166 and Hebel 1169.	-/120/120
The stated FRL only applies to the control joint. It is expected that the FRL of the CSR Hebel panel will be determined via testing or assessment by an accredited testing laboratory. It should be noted that, FRL of the CSR Hebel panels may vary based on the panel reinforcement and maximum wall height. The overall system FRL must be considered with the FRL of the control joint and the Hebel panel combined.				

Table 16 Vertical joint between Hebel panels

Joint type	Maximum joint width	Maximum sealant depth	Hebel panel	Joint FRL
Vertical joint	20 mm wide	16 mm	75 mm thick CSR Hebel Power Panel. The joint detail is illustrated in Figure 4.	-/120/120
	10 mm wide	10 mm		
	>10 mm, <20 mm	16 mm		
The stated FRL only applies to the control joint. It is expected that the FRL of the CSR Hebel panel will be determined via testing or assessment by an accredited testing laboratory. The overall system FRL must be considered with the FRL of the control joint and the Hebel panel combined.				

6. Validity

Warringtonfire Australia does not endorse the tested or assessed product in any way. The conclusions of this assessment may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all conditions.

Due to the nature of fire testing and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy. The inherent variability in test procedures, materials and methods of construction, and installation may lead to variations in performance between elements of similar construction.

This assessment is based on information and experience available at the time of preparation. The published procedures for the conduct of tests and the assessment of test results are subject to constant review and improvement. It is therefore recommended that this report be reviewed on, or before, the stated expiry date.

This assessment represents our opinion about the performance of the proposed systems expected to be demonstrated on a test in accordance with AS 1530.4:2014, based on the evidence referred to in this report.

This assessment is provided to HB Fuller Australia Pty Ltd for their own specific purposes. This report may be used as Evidence of Suitability in accordance the requirements of the relevant National Construction Code. Building certifiers and other third parties must determine the suitability of the systems described in this report for a specific installation.

Appendix A Summary of supporting test data

A.1 Test report – FRT210084 R1.2

Table 17 Information about test report

Item	Information about test report
Report sponsor	HB Fuller Australia Pty Ltd
Test laboratory	Warringtonfire Australia, 409-411 Hammond Road, Dandenong, Victoria 3175, Australia.
Test date	The fire resistance test was done on 11 May 2021.
Test standards	The test was done in accordance with AS 1530.4:2014.
Variation to test standards	None
General description of tested specimen	A 20 mm high upper horizontal control joint located on the top side between a 75 mm thick CSR Hebel PowerPanel and a concrete block work was tested in accordance with AS 1530.4:2014. The HB Fuller Firesound sealant was applied on the unexposed side into the control joint from a depth of 16 mm and was finished flush. The exposed side was sealed with a 50 mm × 75 mm unequal angle. Additionally, a 20 mm wide vertical control joint between a 75 mm thick CSR Hebel PowerPanel and a concrete block work was tested in accordance with AS 1530.4:2014. The HB Fuller Firesound sealant was applied on the unexposed side into the control joint from a depth of 16 mm and was finished flush. The exposed side was sealed with a 50 mm × 75 mm unequal angle.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2014.

The test specimen achieved the following results – see Table 18.

Table 18 Results summary for this test report

Joint type	Joint details	Integrity	Insulation
Upper horizontal joint	20 mm high × 16 mm deep	No failure at 126 minutes	No failure at 126 minutes
Vertical joint	20 mm wide × 16 mm deep	No failure at 126 minutes	No failure at 126 minutes

A.2 Test report – FRT210226 R1.1

Table 19 Information about test report

Item	Information about test report
Report sponsor	HB Fuller Australia Pty Ltd
Test laboratory	Warringtonfire Australia, 409-411 Hammond Road, Dandenong, Victoria 3175, Australia.
Test date	The fire resistance test was done on 9 August 2021.
Test standards	The test was done in accordance with AS 1530.4:2014.
Variation to test standards	None
General description of tested specimen	A 10 mm high upper horizontal control joint located on the top side between a 75 mm thick CSR Hebel PowerPanel and a concrete block work was tested in accordance with AS 1530.4:2014. The HB Fuller Firesound sealant was applied on the unexposed side into the control joint from a depth of 10 mm and was finished flush. The exposed side was sealed with a 50 mm × 75 mm unequal angle. Additionally, a 10 mm wide vertical control joint between a 75 mm thick CSR Hebel Power Panel and a concrete block work was tested in accordance with

Item	Information about test report
	AS 1530.4:2014. The HB Fuller Firesound sealant was applied on the unexposed side into the control joint from a depth of 10 mm and was finished flush. The exposed side was sealed with a 50 mm × 75 mm unequal angle.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2014.

The test specimen achieved the following results – see Table 20.

Table 20 Results summary for this test report

Joint type	Joint details	Integrity	Insulation
Upper horizontal joint	10 mm high × 16 mm deep	No failure at 121 minutes	No failure at 121 minutes
Vertical joint	10 mm wide × 16 mm deep	No failure at 121 minutes	No failure at 121 minutes

A.3 Test report – FRT200213 R1.0

Table 21 Information about test report

Item	Information about test report
Report sponsor	H B Fuller Australia Pty Ltd
Test laboratory	Warringtonfire Australia, 409-411 Hammond Road, Dandenong, Victoria 3175, Australia.
Test date	The fire resistance test was done on 25 August 2020.
Test standards	The test was done in accordance with AS 1530.4:2014.
Variation to test standards	The pressure was up to 3 Pa below the limits prescribed in the standard during the 90-100-minute periods. The pressure and temperature were within the limits for rest of the test duration. This under pressure is unlikely to have affected the outcome of the test.
General description of tested specimen	A 30 mm wide control joint protected with HB Fuller Firesound in 150 mm thick concrete floor was tested. The construction details of the tested specimen are given below:
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2014.

Penetration system	Service	Local fire-stopping protection	Aperture size (mm)	Sealant depth (mm)
A	Control joint	HB Fuller Firesound on each side	30 × 1000	15 mm

The test specimen achieved the following results – see Table 22 .

Table 22 Results summary for this test report

Control joint	Criteria	Results	Fire resistance level (FRL)
A	Structural adequacy	Not applicable	**-/240/180**
	Integrity	No failure at 241 minutes	
	Insulation	Failure at 215 minutes	

A.4 Test report – FRT200323 R1.1

Table 23 Information about test report

Item	Information about test report
Report sponsor	HB Fuller Aust Co P/L
Test laboratory	Warringtonfire Australia, 409-411 Hammond Road, Dandenong, Victoria 3175, Australia.
Test date	The fire resistance test was done on 21 June 2021.
Test standards	The test was done in accordance with AS 1530.4:2014.
Variation to test standards	None
General description of tested specimen	A 10 mm wide control joint protected with HB Fuller Firesound in 150 mm thick concrete floor was tested. The construction details of the tested specimen are given below:

Control joint	Joint width	Local fire-stopping protection	Aperture (mm)	Sealant depth (mm)
D	10 mm	HB Fuller Firesound on the exposed side	10 × 1720	10

Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2014.

The test specimen achieved the following results – see Table 24.

Table 24 Results summary for this test report

Control joint	Criteria	Results	Fire resistance level (FRL)
D	Structural adequacy	Not applicable	**-/240/240**
	Integrity	No failure at 241 minutes	
	Insulation	No failure at 241 minutes	

warringtonfire

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