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Fire assessment report

Control joints protected with HB Fuller Firesound in plasterboard walls in accordance with AS 1530.4:2014

Sponsor: HB Fuller Aust P/L

Report number: FAS210209 Revision: R1.1

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Quality management

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R1.0	Issue: 27/10/2021	Reason for issue	Initial issue		
			Prepared by	**Reviewed by**	**Authorised by**
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	Expiry: 31/10/2026		**Prepared by**	**Reviewed by**	**Authorised by**
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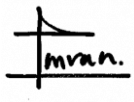
		Signature			

Executive summary

This report documents the findings of the assessment undertaken to determine the expected fire resistance level (FRL) of control joints protected with HB Fuller Firesound sealant in plasterboard walls – 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 Vertical joints protected with HB Fuller Firesound sealant

Reference Test	Maximum joint width	Local fire-stopping protection	Minimum sealant depth	Separating element	FRL
FRT210007 R1.0	16 mm	• HB Fuller Firesound	16 mm on both sides	Minimum 96 mm plasterboard wall, (1 × 16 mm)	-/90/90
	15 mm	• HB Fuller Firesound • Open cell backing rod	16 mm on both sides		-90/60
	15 mm	• HB Fuller Firesound Open cell backing rod	13 mm on both sides	Minimum 90 mm plasterboard wall, (1 × 13 mm)	-/60/60
	13 mm	• HB Fuller Firesound	13 mm on both sides		-/60/60
FRT210008	16 mm	• HB Fuller Firesound	32 mm on both sides	Minimum 128 mm plasterboard wall, (2 × 16 mm)	-/180/180
	15 mm	• HB Fuller Firesound™ • Open cell backing rod	20 mm on both sides		-/180/180
	15 mm	• HB Fuller Firesound™ • Open cell backing rod	20 mm on both sides	Minimum 116 mm plasterboard wall, (2 × 13 mm)	-/120/120
	13 mm	• HB Fuller Firesound	26 mm on both sides		-/120/120

- The FRL of the 1 × 13 mm, 1 × 16 mm, 2 × 13 mm or 2 × 16 mm plasterboard wall systems must be established through test or assessment for at least -/60/60, -/90/90, -/120/120 and -/180/180, respectively by an accredited testing laboratory (ATL).
- The applicable plasterboard wall will include but not limited to USG Boral as tested, or other equivalent plasterboards supplied by other manufacturer such as CSR, Siniat or BGC.

Table 2 Top joints protected with HB Fuller Firesound sealant

Reference Test	Maximum joint height	Local fire-stopping protection	Minimum sealant depth	Separating element	FRL
FRT210007 R1.0	20 mm	• HB Fuller Firesound	16 mm on both sides	Minimum 96 mm plasterboard wall, (1 × 16 mm)	-/90/90
	20 mm	• HB Fuller Firesound	13 mm on both sides	Minimum 90 mm plasterboard wall, (1 × 13 mm)	-/60/60
FRT210008 R1.0	20 mm	• HB Fuller Firesound	32 mm on both sides	Minimum 128 mm plasterboard wall, (2 × 16 mm)	-/180/180
	20 mm	• HB Fuller Firesound	26 mm on both sides	Minimum 116 mm plasterboard wall, (2 × 13 mm)	-/120/120

- The FRL of the 1 × 13 mm, 1 × 16 mm, 2 × 13 mm or 2 × 16 mm plasterboard wall systems must be established through test or assessment for at least -/60/60, -/90/90, -/120/120 and -/180/180, respectively by an ATL.
- The applicable plasterboard wall will include but not limited to USG Boral as tested, or other equivalent plasterboards supplied by other manufacturer such as CSR, Siniat or BGC.

Table 3 Bottom joints protected with HB Fuller Firesound sealant

Reference Test	Maximum joint height	Local fire-stopping protection	Minimum Sealant depth	Separating element	FRL
FRT210007 R1.0	10 mm	• HB Fuller Firesound	16 mm on both sides	Minimum 96 mm plasterboard wall, (1 × 16 mm)	-/90/90
	10 mm	• HB Fuller Firesound	13 mm on both sides	Minimum 90 mm plasterboard wall, (1 × 13 mm)	-/60/60
FRT210008 R1.0	10 mm	• HB Fuller Firesound	32 mm on both sides	Minimum 128 mm plasterboard wall (2 × 16 mm)	-/180/180
	10 mm	• HB Fuller Firesound	26 mm on both sides	Minimum 116 mm plasterboard wall (2 × 13 mm)	-/120/120

- The FRL of the 1 × 13 mm, 1 × 16 mm, 2 × 13 mm or 2 × 16 mm plasterboard wall systems must be established through test or assessment for at least -/60/60, -/90/90, -/120/120 and -/180/180, respectively by an ATL.
- The applicable plasterboard wall will include but not limited to USG Boral as tested, or other equivalent plasterboards supplied by other manufacturer such as CSR, Siniat or BGC.

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 control joints protected with HB Fuller Firesound sealant in plasterboard walls – 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 Aust P/L. The sponsor details are included in Table 4.

Table 4 Sponsor details

Sponsor	Address
HB Fuller Aust P/L	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.

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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.

This assessment has been written using appropriate test evidence generated at accredited laboratories to the relevant test standard. The supporting test evidence has been deemed appropriate to support the manufacturer's stated design.

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 July 2021, HB Fuller Aust P/L 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.
- This assessment is applicable to 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 is only valid for the assessed system/s and must not be used for any other purpose. Any changes with respect to size, construction details, loads, stresses, edge or end 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 B.

[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

- 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 top, bottom and vertical control joints protected with HB Fuller Firesound sealant in plasterboard wall systems.

4.2 Referenced test data

The assessment of the variation to the tested system 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 B.

Table 5 Referenced test data

Report number	Test sponsor	Test date	Testing authority
FRT210007 R1.0	HB Fuller Aust P/L	22 June 2021	Warringtonfire Australia
FRT210008 R1.0		23 June 2021	

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	Tested system	Variations
Plasterboard wall	FRT210007 R1.0 FRT210008 R1.0	The control joints were tested in USG Boral plasterboard wall.	It is proposed that, the applicable plasterboard wall will include but not limited to USG Boral as tested, or other equivalent plasterboards supplied by other manufacturer such as CSR, Siniat or BGC
Bottom joints		10 mm high bottom joints with varying sealant death were tested in FRT210007 R1.0 and FRT210008 R1.0 respectively. The joints did not meet the pressure conditions of clause 10.8.2 of AS 1530.4:2014.	It is proposed that the joints are assessed in compliance with AS 1530.4:2014.
Short joints		20 mm and 10 mm high top and bottom joints were tested in FRT210007 R1.0 and FRT210008 R1.0. The joints did not meet the length requirement of clause 10.4.2 of AS 1530.4:2014.	

4.4 Test and Assessment standard

Section 2 of AS 1530.4:2014 specifies the general requirements for conducting fire resistance tests. Section 10 of AS 1530.4:2014 gives guidelines for determining the fire resistance of elements of construction penetrated by services and control joints.

AS 4072.1:2005 sets out minimum requirements for construction, installation and application of fire resistance tests to sealing systems.

4.5 Schedule of components

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

Figure 1 to Figure 3 shows details of the assessed joints. These images are included to demonstrate the location of the control joint. The joint width, sealant depth and plasterboard wall construction may vary as outlined in section 5.

Table 7 Schedule of components

Item	Description	
Separating element (SE)		
1.	Item name	Plasterboard wall
	Wall configuration	1 × 13 mm, 1 × 16 mm, 2 × 13 mm or 2 × 16 mm plasterboard wall systems with established FRL of -/60/60, -/90/90, -/120/120 and -/180/180, respectively. The FRL of the plasterboard walls will be established through test or assessment by an ATL.
	Product name	The applicable plasterboard wall will include but not limited to USG Boral as tested, or other equivalent plasterboards supplied by other manufacturer such as CSR, Siniat or BGC.
2.	Item name	Steel frame
	Overall size	To suit the plasterboard wall
3.	Item name	Sealant
	Product name	HB Fuller Firesound
	Density	Nominal density 1900 kg/m^3 (26 days of curing)

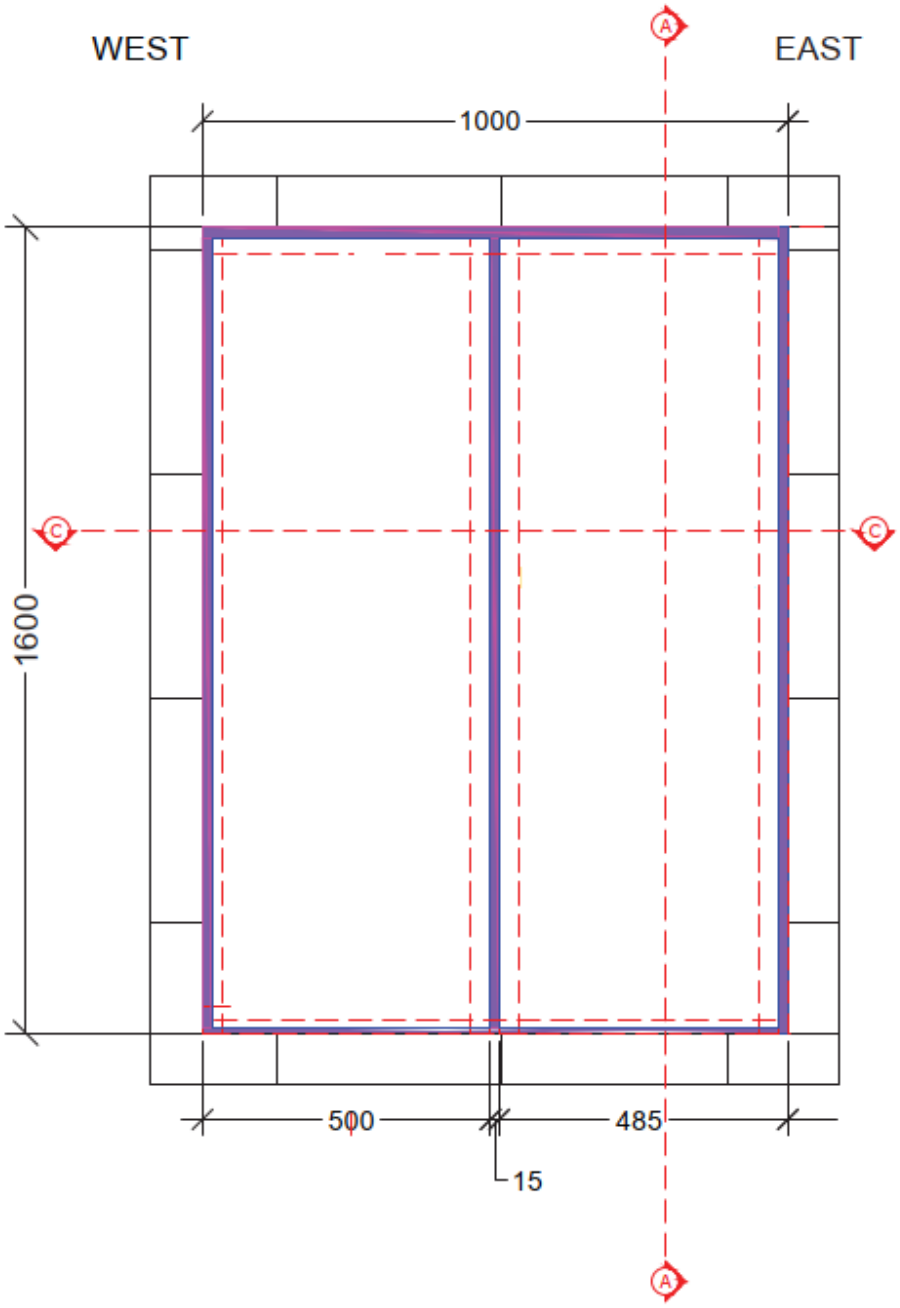


Figure 1 Elevation view of the assessed joints.

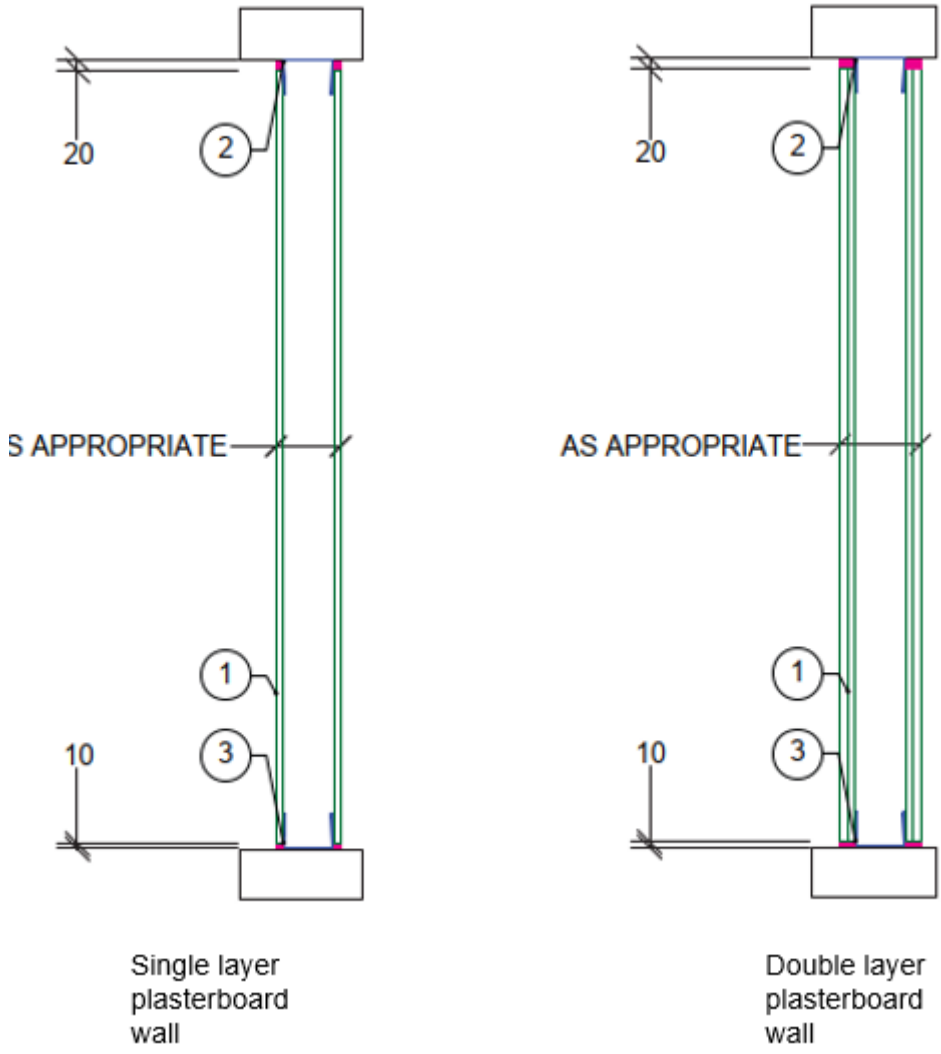
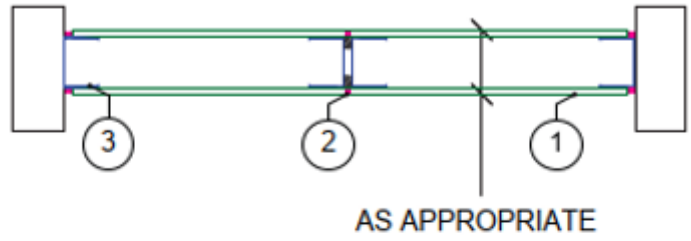
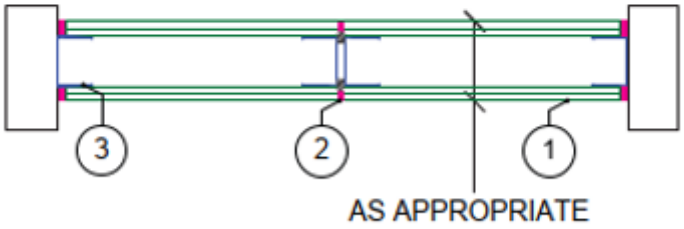


Figure 2 Cross section A-A.



Single layer plasterboard wall



Double layer plasterboard wall

Figure 3 Cross section C-C.

5. Assessment – Control joint protected with HB Fuller Firesound

5.1 Description of variation

A series of top, bottom and vertical control joints protected with HB Fuller Firesound in USG Boral plasterboard walls were tested in FRT210007 R1.0 and FRT210008 R1.0. It is proposed that, the applicability of the plasterboard walls will be extended including other equivalent plasterboards walls supplied by other manufacturer such as CSR, Siniat or BGC.

The tested bottom joints did not meet the pressure conditions of clause 10.8.2 of AS 1530.4:2014. Additionally, top and bottom joint installed in 1 × 13 mm and 2 × 13 plasterboard walls did not meet the length requirement of clause 10.4.2 of AS 1530.4:2014. It is therefore proposed these variations in test conditions are analysed and the performance of the control joints are assessed in accordance with the stipulation of AS 1530.4:2014.

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 and comparative

5.3 Vertical joints

In test FRT210007 R1.0 and FRT21008 R1.0, a series of vertical joints protected with HB Fuller Firesound in plasterboard wall systems were tested in accordance with AS 1530.4:2014. The construction of tested joint and achieved fire resistance performance are listed in Table 9.

Table 9 Vertical joints tested in FRT210007 R1.0 and FRT210008 R1.0

Reference Test	Joint details	Local fire-stopping protection	Sealant depth	Separating element	Fire resistance performance
FRT210007 R1.0	16 mm wide × 1400 mm high × 16 mm deep (Joint B)	• HB Fuller Firesound	16 mm on both sides	96 mm plasterboard wall, (1 × 16 mm)	Integrity: No failure at 121 minutes Insulation: Failure at 97 minutes
	15 mm wide × 1400 mm high × 96 mm deep (Joint C)	• HB Fuller Firesound • Open cell backing rod	16 mm on both sides		Integrity: No failure at 121 minutes Insulation: Failure at 87 minutes
	15 mm wide × 1400 mm high × 90 mm deep (Joint F)	• HB Fuller Firesound Open cell backing rod	13 mm on both sides	90 mm plasterboard wall, (1 × 13 mm)	Integrity No failure at 121 minutes Insulation: Failure at 64 minutes

Reference Test	Joint details	Local fire-stopping protection	Sealant depth	Separating element	Fire resistance performance
	13 mm wide × 1400 mm high × 13 mm deep (Joint G)	• HB Fuller Firesound	13 mm on both sides		Integrity: No failure at 121 minutes Insulation: Failure at 73 minutes
FRT210008 R1.0	16 mm wide × 1400 mm high × 32 mm deep (Joint B)	• HB Fuller Firesound	32 mm on both sides	128 mm plasterboard wall (2 × 16 mm)	Integrity: No failure at 195 minutes Insulation: No failure at 195 minutes
	15 mm wide × 1400 mm high × 128 mm deep (Joint C)	• HB Fuller Firesound™ • Open cell backing rod	20 mm on both sides		Integrity: No failure at 195 minutes Insulation: No failure at 195 minutes
	15 mm wide × 1400 mm high × 116 mm deep (Joint F)	• HB Fuller Firesound™ • Open cell backing rod	20 mm on both sides	116 mm plasterboard wall (2 × 13 mm)	Integrity: No failure at 195 minutes Insulation: Failure at 177 minutes
	13 mm wide × 1400 mm high × 26 mm deep (Joint G)	• HB Fuller Firesound	26 mm on both sides		No failure at 195 minutes Failure at 190 minutes

It is proposed that the tested vertical joints will be installed in 1 × 13 mm, 1 × 16 mm, 2 × 13 mm or 2 × 16 mm plasterboard wall systems with an established FRL of -/60/60, -/90/90, -/120/120 and - /180/180, respectively. The FRL of the plasterboard walls must be established through test or assessment by an accredited testing laboratory (ATL).

The applicable plasterboard wall will include but not limited to USG Boral as tested, or other equivalent plasterboards supplied by other manufacturer such as CSR, Siniat or BGC. Hence, the FRL of the system will be governed by the FRL of the plasterboard wall. With consideration to the above, the FRL of the joints in conjunction with the plasterboard wall systems are assessed as listed in Table 12.

5.4 Top joints

In test FRT210007 R1.0 and FRT21008 R1.0, a series of horizontal top joints protected with HB Fuller Firesound in plasterboard wall systems were tested in accordance with AS 1530.4:2014. The construction of tested joints and achieved fire resistance performance are listed in Table 10.

Table 10 Top joint tested in FRT210007 R1.0 and FRT210008 R1.0

Reference Test	Joint details	Local fire-stopping protection	Sealant depth	Separating element	Fire resistance performance
FRT210007 R1.0	1000 mm wide × 20 mm high × 16 mm	• HB Fuller Firesound	16 mm on both sides	96 mm plasterboard wall, (1 × 16 mm)	Integrity: No failure at 121 minutes Insulation: Failure at 98 minutes

Reference Test	Joint details	Local fire-stopping protection	Sealant depth	Separating element	Fire resistance performance
	deep (Joint A)				
	584 mm wide × 20 mm high × 13 mm deep (Joint E)	• HB Fuller Firesound	13 mm on both sides	90 mm plasterboard wall, (1 × 13 mm)	Integrity No failure at 121 minutes Insulation: Failure at 76 minutes
FRT210008 R1.0	1000 mm wide × 20 mm high × 32 mm deep (Joint A)	• HB Fuller Firesound	32 mm on both sides	128 mm plasterboard wall (2 × 16 mm)	Integrity No failure at 195 minutes Insulation: No failure at 195 minutes
	584 mm wide × 20 mm high × 26 mm deep (Joint E)	• HB Fuller Firesound	26 mm on both sides	116 mm plasterboard wall (2 × 13 mm)	Integrity: No failure at 195 minutes Insulation: Failure at 189 minutes

It is proposed that the tested top joints will be installed in 1 × 13 mm, 1 × 16 mm, 2 × 13 mm or 2 × 16 mm plasterboard wall systems with an established FRL of -/60/60, -/90/90, -/120/120 and -/180/180 respectively. The FRL of the plasterboard walls must be established through test or assessment by an ATL. The applicable plasterboard wall will include but not limited to USG Boral as tested, or other equivalent plasterboards supplied by other manufacturer such as CSR, Siniat or BGC.

From Table 10, it is noted that Joint E tested in FRT210007 R1.0 and FRT210008 R1.0 were 584 mm in length (recorded as width in the test report). As such, the services did not meet the 1 m length specification of clause 10.4.2 of AS 1530.4:2014. Hence, no FRL was assigned in the test report.

In test FRT210007 R1.0, Joint A was 1 m in length and was vertically separated from joint E by a 16 mm thick plasterboard panel. Therefore, both joint A and joint E were subjected to similar test conditions in terms of temperature and pressure. Hence, the performance of joint A provides good indication of the likely performance of joint E. Joint E has demonstrated its ability to achieve 121 minutes of integrity performance. However, this performance was observed for shorter joint. If the joint length is increased to 1 m, the insulation performance of the joint is not likely to be impacted. However, the integrity performance needs to be further analysed. It is noted that the separating element is a 1 × 13 mm plasterboard wall system which has an established FRL of -/60/60. Hence, significant safety margin is observed on the performance of sealant. With consideration to the performance of joint A, observed performance of the joint E and the established FRL of the separating element, it is reasonable to estimate joint E will maintain at least 60 minutes of integrity performance if the length is increased to 1 m and installed in a 1 × 13 mm wall system. Based on the above, the proposal is positively assessed.

In Test FRT210008 R1.0, Joint A was 1 m in length and was vertically separated from joint E by a 2 × 16 mm thick plasterboard panels. Therefore, both joint A and joint E were subjected to similar test condition in terms of temperature and pressure. As such, the performance of joint A provides good indication of the likely performance of joint E. Joint E has demonstrated its ability to achieve 195 minutes of integrity performance. However, this performance was observed for shorter joint. As discussed above, if the joint length is increased to 1 m, the insulation performance of the joint is not likely to be impacted. However, the integrity performance will need to be further analysed. It is noted that the separating element is 2 × 13 mm plasterboard wall system which has an established FRL of -/120/120. With consideration to the performance of joint A, observed performance of the joint E and

the established FRL of the separating element, it is reasonable to estimate joint E will maintain at least 120 minutes of integrity performance if the length is increased to 1 m and installed in a 2 × 13 mm wall system. Based on the above, the proposal is positively assessed. The assessed performance of the top joints is listed in Table 13.

5.5 Bottom joints

In test FRT210007 R1.0 and FRT210008 R1.0, a series of bottom joints protected with HB Fuller Firesound in plasterboard wall systems were tested in accordance with AS 1530.4:2014. The construction of tested joints and achieved fire resistance performance are listed in Table 11.

Table 11 Bottom joints tested in FRT210007 R1.0 and FRT210008 R1.0

Reference Test	Joint details	Local fire-stopping protection	Sealant depth	Separating element	Fire resistance performance
FRT210007 R1.0	1000 mm wide × 10 mm high × 16 mm deep (Joint D)	• HB Fuller Firesound	16 mm on both sides	96 mm plasterboard wall, (1 × 16 mm)	Integrity: No failure at 121 minutes Insulation: Failure at 114 minutes
	584 mm wide × 10 mm high × 13 mm deep (Joint H)	• HB Fuller Firesound	13 mm on both sides	90 mm plasterboard wall, (1 × 13 mm)	Integrity No failure at 121 minutes Insulation: Failure at 94 minutes
FRT210008 R1.0	1000 mm wide × 10 mm high × 32 mm deep (Joint D)	• HB Fuller Firesound	32 mm on both sides	128 mm plasterboard wall (2 × 16 mm)	Integrity No failure at 195 minutes Insulation: No failure at 195 minutes
	584 mm wide × 10 mm high × 26 mm deep (Joint H)	• HB Fuller Firesound	26 mm on both sides	116 mm plasterboard wall (2 × 13 mm)	Integrity: No failure at 195 minutes Insulation: No failure at 195 minutes

It is proposed that the tested bottom joints will be installed in 1 × 13 mm, 1 × 16 mm, 2 × 13 mm or 2 × 16 mm plasterboard wall systems with an established FRL of -/60/60, -/90/90, -/120/120 and -/180/180 respectively. The FRL of the plasterboard walls will be established through test or assessment by an ATL. The applicable plasterboard wall will include but not limited to USG Boral as tested, or other equivalent plasterboards supplied by other manufacturer such as CSR, Siniat or BGC.

No FRL was assigned to bottom joint D and H in test FRT210007 R1.0 as the pressure conditions in clause 10.8.2 of AS 1530.4:2014 were not met. To assess the likely performance of joint D and H, top joint A in FRT210007 R1.0 was further analysed. Joint A was 20 mm high with 16 mm sealant depth and maintained integrity and insulation up to 121 minutes and 98 minutes respectively. It is noted that joint A is wider than joint D and H and were subjected to more severe pressure condition than what is

required for joint D and H. With consideration above, it is understood that joint A is more onerous than joint D and H. As the more onerous joint achieved 121 minutes of integrity and 98 minutes of insulation, similar or better performance can be expected of joint D and joint H.

It is further noted that, joint H was 584 mm in length (recorded as width in the test) and as such did not meet the 1 m length specification of clause 10.4.2 of AS 1530.4:2014. However, joint A met both the length and pressure conditions of AS 1530.4:2014 and is wider than joint H. As such, joint A can be considered more onerous than joint H for same sealant depth. As joint A achieved 121 minutes of integrity performance, same can be expected of joint H with same sealant depth. However, it is noted that joint H will be installed in a 1 × 13 mm plasterboard wall with a sealant depth of 13 mm. The reduction of sealant depth may negatively impact the integrity performance. With consideration to the performance of joint A, observed performance of the joint H and the established FRL of the separating element, it is reasonable to estimate joint H will maintain at least 60 minutes of integrity performance if the length is increased to 1 m and installed in a 1 × 13 mm wall system. Based on the above discussion, joint H is positively assessed. The likely performance of the bottom joint discussed in this section is summarised in Table 14.

In test FRT210008 R1.0, no FRL was assigned to bottom joint D and H as the pressure condition in clause 10.8.2 of AS 1530.4:2014 were not met. As above, the performance of top joint A tested in FRT210008 R1.0 was further analysed to assess the likely performance of joint D an H. Joint A was 20 mm high with 32 mm sealant depth and maintained 195 minutes of integrity and insulation. It is noted that joint A is wider than joint D and H and were subjected to more severe pressure condition than what is required for joint D and H. With consideration above, it is understood that joint A is more onerous than joint D and H. As the more onerous joint achieved 195 minutes of integrity and insulation, similar or better performance can be expected of service D and H.

It is further noted that, joint H was 584 mm in length (recorded as width in the test) and as such did not meet the 1 m length specification of clause 10.4.2 of AS 1530.4:2014. As above, joint A meet both the pressure and length condition of the AS 1530.4:2014 and is wider than joint H. Therefore, joint A can be considered more onerous than joint H for same sealant depth. As joint A achieved 195 minutes of integrity performance, same can be expected of joint H with same sealant depth. However, it is noted that sealant H will be installed in a 2 × 13 mm plasterboard wall with a sealant depth of 26 mm. The reduction of sealant depth may negatively impact the integrity performance. With consideration to the performance of joint A, observed performance of the joint H and the established FRL of the separating element, it is reasonable to estimate joint H will maintain at least 120 minutes of integrity performance if the length is increased to 1 m and installed in a 2 × 13 mm wall system. Based on the above, joint H is positively assessed. The likely performance of the bottom joint discussed in this section is summarised in Table 14.

5.6 Assessment outcome

This assessment demonstrates that the control joints listed in Table 12 to Table 14 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 12 Vertical joints protected with HB Fuller Firesound sealant

Reference Test	Maximum joint width	Local fire-stopping protection	Minimum sealant depth	Separating element	FRL
FRT210007 R1.0	16 mm	• HB Fuller Firesound	16 mm on both sides	Minimum 96 mm plasterboard wall, (1 × 16 mm)	-/90/90
	15 mm	• HB Fuller Firesound • Open cell backing rod	16 mm on both sides		-90/60
	15 mm	• HB Fuller Firesound	13 mm on both sides	Minimum 90 mm plasterboard	-/60/60

Reference Test	Maximum joint width	Local fire-stopping protection	Minimum sealant depth	Separating element	FRL
		Open cell backing rod		wall, (1 × 13 mm)	
	13 mm	• HB Fuller Firesound	13 mm on both sides		-/60/60
FRT210008	16 mm	• HB Fuller Firesound	32 mm on both sides	Minimum 128 mm plasterboard wall, (2 × 16 mm)	-/180/180
	15 mm	• HB Fuller Firesound™ • Open cell backing rod	20 mm on both sides		-/180/180
	15 mm	• HB Fuller Firesound™ • Open cell backing rod	20 mm on both sides	Minimum 116 mm plasterboard wall, (2 × 13 mm)	-/120/120
	13 mm	• HB Fuller Firesound	26 mm on both sides		-/120/120

- The FRL of the 1 × 13 mm, 1 × 16 mm, 2 × 13 mm or 2 × 16 mm plasterboard wall systems must be established through test or assessment for at least -/60/60, -/90/90, -/120/120 and -/180/180, respectively by an accredited testing laboratory (ATL).
- The applicable plasterboard wall will include but not limited to USG Boral as tested, or other equivalent plasterboards supplied by other manufacturer such as CSR, Siniat or BGC.

Table 13 Top joints protected with HB Fuller Firesound sealant

Reference Test	Maximum joint height	Local fire-stopping protection	Minimum sealant depth	Separating element	FRL
FRT210007 R1.0	20 mm	• HB Fuller Firesound	16 mm on both sides	Minimum 96 mm plasterboard wall, (1 × 16 mm)	-/90/90
	20 mm	• HB Fuller Firesound	13 mm on both sides	Minimum 90 mm plasterboard wall, (1 × 13 mm)	-/60/60
FRT210008 R1.0	20 mm	• HB Fuller Firesound	32 mm on both sides	Minimum 128 mm plasterboard wall, (2 × 16 mm)	-/180/180
	20 mm	• HB Fuller Firesound	26 mm on both sides	Minimum 116 mm plasterboard wall, (2 × 13 mm)	-/120/120

- The FRL of the 1 × 13 mm, 1 × 16 mm, 2 × 13 mm or 2 × 16 mm plasterboard wall systems must be established through test or assessment for at least -/60/60, -/90/90, -/120/120 and -/180/180, respectively by an ATL.
- The applicable plasterboard wall will include but not limited to USG Boral as tested, or other equivalent plasterboards supplied by other manufacturer such as CSR, Siniat or BGC.

Table 14 Bottom joint protected with HB Fuller Firesound sealant

Reference Test	Maximum joint height	Local fire-stopping protection	Minimum Sealant depth	Separating element	FRL
FRT210007 R1.0	10 mm	• HB Fuller Firesound	16 mm on both sides	Minimum 96 mm plasterboard wall, (1 × 16 mm)	-/90/90
	10 mm	• HB Fuller Firesound	13 mm on both sides	Minimum 90 mm plasterboard wall, (1 × 13 mm)	-/60/60
FRT210008 R1.0	10 mm	• HB Fuller Firesound	32 mm on both sides	Minimum 128 mm plasterboard wall (2 × 16 mm)	-/180/180
	10 mm	• HB Fuller Firesound	26 mm on both sides	Minimum 116 mm plasterboard wall (2 × 13 mm)	-/120/120

- The FRL of the 1 × 13 mm, 1 × 16 mm, 2 × 13 mm or 2 × 16 mm plasterboard wall systems must be established through test or assessment for at least -/60/60, -/90/90, -/120/120 and -/180/180, respectively by an ATL.
- The applicable plasterboard wall will include but not limited to USG Boral as tested, or other equivalent plasterboards supplied by other manufacturer such as CSR, Siniat or BGC.

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 Aust P/L 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 Drawings and additional information

Table 15 Details of drawings

Figure number	Date	Drawn by
Figure 1 to Figure 3	25 October 2021	HB Fuller Aust P/L

Appendix B Summary of supporting test data

B.1 Test report – FRT210007 R1.0

Table 16 Information about test report

<table>
<tr><th>Item</th><th>Information about test report</th></tr>
<tr><td>Report sponsor</td><td>HB Fuller Aust P/L</td></tr>
<tr><td>Test laboratory</td><td>Warringtonfire Australia, 409-411 Hammond Road, Dandenong, Victoria 3175, Australia.</td></tr>
<tr><td>Test date</td><td>The fire resistance test was done on 22 June 2021.</td></tr>
<tr><td>Test standards</td><td>The test was done in accordance with AS 1530.4:2014.</td></tr>
<tr><td>Variation to test standards</td><td>• Control joint E and H were shorter than the full length specified in clause 10.4.2 of AS 1530.4:2014.
• The furnace pressure was measured at mid-height of the vertical control joints and not at mid-height of control joint D and H as specified in clause 10.8.2 of AS 1530.4:2014.
These variations in test condition and their impact in likely fire resistance performance were discussed in the assessment report.</td></tr>
<tr><td>General description of tested specimen</td><td>A series of top, bottom and vertical control joins protected with HB Fuller Firesound was tested. The tested specimens are listed below:
<table>
<tr><th>Control joint</th><th>Aperture size</th><th>Local fire-stopping protection</th><th>Sealant depth</th><th>Sealant height / width</th></tr>
<tr><td>A</td><td>1000 mm wide × 20 mm high × 16 mm deep</td><td>• HB Fuller Firesound™</td><td>16 mm</td><td>20 mm</td></tr>
<tr><td>B</td><td>16 mm wide × 1400 mm high × 16 mm deep</td><td>• HB Fuller Firesound™</td><td>16 mm</td><td>16 mm</td></tr>
<tr><td>C</td><td>15 mm wide × 1400 mm high × 96 mm deep</td><td>• HB Fuller Firesound™
• Open cell backing rod</td><td>16 mm</td><td>15 mm</td></tr>
<tr><td>D</td><td>1000 mm wide × 10 mm high × 16 mm deep</td><td>• HB Fuller Firesound™</td><td>16 mm</td><td>10 mm</td></tr>
<tr><td>E</td><td>584 mm wide × 20 mm high × 13 mm deep</td><td>• HB Fuller Firesound™</td><td>13 mm</td><td>20 mm</td></tr>
<tr><td>F</td><td>15 mm wide × 1400 mm high × 90 mm deep</td><td>• HB Fuller Firesound™
• Open cell backing rod</td><td>13 mm</td><td>15 mm</td></tr>
<tr><td>G</td><td>13 mm wide × 1400 mm high × 13 mm deep</td><td>• HB Fuller Firesound™</td><td>13 mm</td><td>13 mm</td></tr>
<tr><td>H</td><td>584 mm wide × 10 mm high × 13 mm deep</td><td>• HB Fuller Firesound™</td><td>13 mm</td><td>10 mm</td></tr>
</table></td></tr>
<tr><td>Instrumentation</td><td>The test report states that the instrumentation was in accordance with AS 1530.4:2014.</td></tr>
</table>

The test specimen achieved the following results – see Table 17.

Table 17 Results summary for this test report

Control joint	Criteria	Results	Fire resistance level (FRL)
A	Structural adequacy	Not applicable	**-/120/90**
	Integrity	No failure at 121 minutes	
	Insulation	Failure at 98 minutes	
B	Structural adequacy	Not applicable	**-/120/90**
	Integrity	No failure at 121 minutes	
	Insulation	Failure at 97 minutes	
C	Structural adequacy	Not applicable	**-/120/60**
	Integrity	No failure at 121 minutes	
	Insulation	Failure at 87 minutes	
D	Structural adequacy	Not applicable	**NA***
	Integrity	No failure at 121 minutes	
	Insulation	Failure at 114 minutes	
E	Structural adequacy	Not applicable	**NA***
	Integrity	No failure at 121 minutes	
	Insulation	Failure at 76 minutes	
F	Structural adequacy	Not applicable	**-/120/60**
	Integrity	No failure at 121 minutes	
	Insulation	Failure at 64 minutes	
G	Structural adequacy	Not applicable	**-/120/60**
	Integrity	No failure at 121 minutes	
	Insulation	Failure at 73 minutes	
H	Structural adequacy	Not applicable	**NA***
	Integrity	No failure at 121 minutes	
	Insulation	Failure at 94 minutes	

B.2 Test report – FRT210008 R1.0

Table 18 Information about test report

<table>
<tr><th>Item</th><th>Information about test report</th></tr>
<tr><td>Report sponsor</td><td>HB Fuller Aust P/L</td></tr>
<tr><td>Test laboratory</td><td>Warringtonfire Australia, 409-411 Hammond Road, Dandenong, Victoria 3175, Australia.</td></tr>
<tr><td>Test date</td><td>The fire resistance test was done on 23 June 2021.</td></tr>
<tr><td>Test standards</td><td>The test was done in accordance with AS 1530.4:2014.</td></tr>
<tr><td>Variation to test standards</td><td>• Control joint E and H were shorter than the full length specified in clause 10.4.2 of AS 1530.4:2014.
• The furnace pressure was measured at mid-height of the vertical control joints and not at mid-height of control joint D and H as specified in clause 10.8.2 of AS 1530.4:2014.
These variations in test condition and their impact in likely fire resistance performance were discussed in the assessment report.
• The pressure was up to 9 Pa above the limits prescribed in the standard during the 150–155-minute period. The pressure and temperature were within the limits for the rest of the test. This overpressure resulted in more onerous test conditions, so would not have invalidated the test result.</td></tr>
<tr><td>General description of tested specimen</td><td>A series of top, bottom and vertical control joins protected with HB Fuller Firesound was tested. The tested specimens are listed below:
<table>
<tr><th>Control joint</th><th>Aperture size</th><th>Local fire-stopping protection</th><th>Sealant depth</th><th>Sealant height / width</th></tr>
<tr><td>A</td><td>1000 mm wide × 20 mm high × 32 mm deep</td><td>• HB Fuller Firesound™</td><td>32 mm</td><td>20 mm</td></tr>
<tr><td>B</td><td>16 mm wide × 1400 mm high × 32 mm deep</td><td>• HB Fuller Firesound™</td><td>32 mm</td><td>16 mm</td></tr>
<tr><td>C</td><td>15 mm wide × 1400 mm high × 128 mm deep</td><td>• HB Fuller Firesound™
• Open cell backing rod</td><td>20 mm</td><td>15 mm</td></tr>
<tr><td>D</td><td>1000 mm wide × 10 mm high × 32 mm deep</td><td>• HB Fuller Firesound™</td><td>32 mm</td><td>10 mm</td></tr>
<tr><td>E</td><td>584 mm wide × 20 mm high × 26 mm deep</td><td>• HB Fuller Firesound™</td><td>26 mm</td><td>20 mm</td></tr>
<tr><td>F</td><td>15 mm wide × 1400 mm high × 116 mm deep</td><td>• HB Fuller Firesound™
• Open cell backing rod</td><td>20 mm</td><td>15 mm</td></tr>
<tr><td>G</td><td>13 mm wide × 1400 mm high × 26 mm deep</td><td>• HB Fuller Firesound™</td><td>26 mm</td><td>13 mm</td></tr>
<tr><td>H</td><td>584 mm wide × 10 mm high × 26 mm deep</td><td>• HB Fuller Firesound™</td><td>26 mm</td><td>10 mm</td></tr>
</table></td></tr>
<tr><td>Instrumentation</td><td>The test report states that the instrumentation was in accordance with AS 1530.4:2014.</td></tr>
</table>

The test specimen achieved the following results – see Table 19.

Table 19 Results summary for this test report

Control joint	Criteria	Results	Fire resistance level (FRL)
A	Structural adequacy	Not applicable	**-/180/180**
	Integrity	No failure at 195 minutes	
	Insulation	No failure at 195 minutes	
B	Structural adequacy	Not applicable	**-/180/180**
	Integrity	No failure at 195 minutes	
	Insulation	No failure at 195 minutes	
C	Structural adequacy	Not applicable	**-/180/180**
	Integrity	No failure at 195 minutes	
	Insulation	No failure at 195 minutes	
D	Structural adequacy	Not applicable	**NA***
	Integrity	No failure at 195 minutes	
	Insulation	No failure at 195 minutes	
E	Structural adequacy	Not applicable	**NA***
	Integrity	No failure at 195 minutes	
	Insulation	Failure at 189 minutes	
F	Structural adequacy	Not applicable	**-/180/120**
	Integrity	No failure at 195 minutes	
	Insulation	Failure at 177 minutes	
G	Structural adequacy	Not applicable	**-/180/180**
	Integrity	No failure at 195 minutes	
	Insulation	Failure at 190 minutes	
H	Structural adequacy	Not applicable	**NA***
	Integrity	No failure at 195 minutes	
	Insulation	No failure at 195 minutes	

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