Fire assessment report

FulaFlex FR Hybrid and Firesound sealants in wall control joints

Sponsor: H B Fuller Australia Pty Ltd

Report number: FAS210035 Revision: R1.0

Issued date: 24 March 2021 Expiry date: 31 March 2026

Quality management

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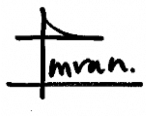
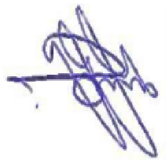
		Signature			
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Executive summary

This report documents the findings of the assessment undertaken to determine the likely fire resistance level (FRL) of a combination of H B Fuller FulaFlex FR Hybrid and Firesound sealant protecting control joints in walls – if tested in accordance with AS 1530.4:2014 and assessed in accordance with AS 4072.1:2005 (R2016).

This assessment makes reference to the test reports FRT200213 R1.0 and FRT190354 R1.0 which consist of control joints protected by H B Fuller sealants in horizontal and vertical substrates, respectively. Both tests were conducted in accordance with AS 1530.4:2014.

In test FRT200213 R1.0, five control joints with the width ranging from 10 mm to 50 mm were tested in a 150 mm thick concrete floor for a period of 240 minutes. The tested control joints A and B were protected by H B Fuller Firesound sealant on both sides of the openings. The tested control joints C, D and E were protected by H B Fuller FulaFlex FR Hybrid sealant. All the tested control joints achieved an FRL of -/240/180.

In test FRT190354 R1.0, four control joints with the width ranging from 10 mm to 40 mm were tested in a 120 mm thick concrete wall for a period of 240 minutes. The tested specimen control joints were protected by H B Fuller FulaFlex FR Hybrid sealant. All the tested control joints achieved an FRL of - /240/120.

The proposed construction shall be as tested in FRT200213 R1.0 in accordance with AS 1530.4:2014 with control joints of various width in 150 mm thick concrete floor with consideration for the following variations:

- The concrete wall thickness can be 120 mm and 175 mm.
- The control joints will be protected with H B Fuller FulaFlex FR Hybrid on one side and Firesound sealant on the other side.
- The concrete wall can be replaced by solid masonry block walls with an established FRL similar to the tested concrete element. The solid masonry wall thickness must not be less than the tested/assessed concrete wall thickness.

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

Table 1 Variations and assessment outcome

<table>
<tr><th>Product</th><th>Thickness (mm)</th><th>Maximum control joint width (mm)</th><th>Minimum sealant depth (mm)</th><th>Sealant location</th><th>FRL</th></tr>
<tr><td rowspan="14">H B Fuller FulaFlex FR Hybrid and Firesound sealants</td><td rowspan="5">120</td><td>10</td><td>10</td><td rowspan="14">FulaFlex FR Hybrid on one side and Firesound on the other side</td><td>-/240/120</td></tr>
<tr><td>20</td><td>10</td><td>-/240/120</td></tr>
<tr><td>30</td><td>15</td><td>-/240/120</td></tr>
<tr><td>40</td><td>20</td><td>-/240/120</td></tr>
<tr><td>50</td><td>25</td><td>-/240/120</td></tr>
<tr><td rowspan="5">150</td><td>10</td><td>10</td><td>-/240/180</td></tr>
<tr><td>20</td><td>10</td><td>-/240/180</td></tr>
<tr><td>30</td><td>15</td><td>-/240/180</td></tr>
<tr><td>40</td><td>20</td><td>-/240/180</td></tr>
<tr><td>50</td><td>25</td><td>-/240/180</td></tr>
<tr><td rowspan="4">175</td><td>10</td><td>10</td><td>-/240/240</td></tr>
<tr><td>20</td><td>10</td><td>-/240/240</td></tr>
<tr><td>30</td><td>15</td><td>-/240/240</td></tr>
<tr><td>40</td><td>20</td><td>-/240/240</td></tr>
</table>

Product	Thickness (mm)	Maximum control joint width (mm)	Minimum sealant depth (mm)	Sealant location	FRL
		50	25		-/240/240

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 March 2026.

Contents

1. Introduction

This report documents the findings of the assessment undertaken to determine the likely fire resistance level (FRL) of a combination of H B Fuller FulaFlex FR Hybrid and Firesound sealant protecting control joints in walls – if tested in accordance with AS 1530.4:2014[1] and assessed in accordance with AS 4072.1:2005 (R2016)[2].

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

The sponsor details are included in Table 2.

Table 2 Sponsor details

Sponsor	Address
H B Fuller Australia Pty Ltd	16-22 Red Gum Drive Dandenong South VIC 3175 Australia

2. Framework for the assessment

2.1 Assessment approach

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

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.

[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.

2.2 Compliance with the National Construction Code

This assessment report has been prepared to meet the evidence of suitability requirements of the National Construction Code Volumes One and Two – Building Code of Australia (NCC) 2019 including Amendment 1[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) provisions 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 Amendment 1[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 1 March 2021, H B 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 AS 4072.1:2005 (R2016).
- The results of this assessment are applicable to fire exposure from either side for the assessed wall system, but not simultaneously.
- 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 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.

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4 National Construction Code Volume One and Two – Building Code of Australia 2019 including Amendment 1, 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 Volume One and Two – Building Code of Australia 2016 including Amendment 1, Australian Building Codes Board, Australia.

- 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

This assessment makes reference to the test reports FRT200213 R1.0 and FRT190354 R1.0 which consist of control joints protected by H B Fuller sealants in either horizontal or vertical substrates. Both tests were conducted in accordance with AS 1530.4:2014.

In test FRT200213 R1.0, five control joints with the width ranging from 10 mm to 50 mm were tested in a 150 mm thick concrete floor for a period of 240 minutes. The tested control joints A and B were protected by H B Fuller Firesound sealant on both sides of the openings. The tested control joints C, D and E were protected by H B Fuller FulaFlex FR Hybrid sealant. All the tested control joints achieved an FRL of -/240/180. The details of the tested specimens are shown in to .

In test FRT190354 R1.0, four control joints with the width ranging from 10 mm to 40 mm were tested in a 120 mm thick concrete wall for a period of 240 minutes. The tested specimen control joints were protected by H B Fuller FulaFlex FR Hybrid sealant. All the tested control joints achieved an FRL of - /240/120.

It is proposed to protect the control joints – in concrete wall or masonry wall with the equivalent FRLs – with FulaFlex FR Hybrid Hybrid sealant on one side and Firesound sealant on the other side. The two sealants will consist of the same thickness within the control joint. It is also proposed to apply the tested sealants to control joints in 120 mm and 175 mm thick walls.

4.2 Referenced test data

The assessment of the variation to the tested system and the determination of the likely performance is based on the results of the fire tests documented in the reports summarised in Table 3. Further details of the tested system are included in Appendix A.

Table 3 Referenced test data

Report number	Test sponsor	Test date	Testing authority
FRT190354 R1.0	H B Fuller Australia Pty Ltd	18 November 2019	Warringtonfire Australia
FRT200213 R1.0	H B Fuller Australia Pty Ltd	25 August 2020	Warringtonfire Australia

4.3 Variations to the tested systems

An identical system has not been subject to a standard fire test. We have therefore assessed the system using baseline test information for similar systems. The variations to the tested systems – together with the referenced standard fire tests – are described in Table 4.

Table 4 Variations to tested systems

Item	Reference test	Description	Variations
Sealant	FRT190354 R1.0 FRT200213 R1.0	The control joints tested in the referenced tests were protected by either FulaFlex FR Hybrid or Firesound sealants. The same sealant was applied on both sides of the joints.	It is proposed to the protect the wall control joints with FulaFlex FR Hybrid sealant on one side and Firesound sealant on the other side. The thickness of the two sealants protecting the joint will be the same.

Item	Reference test	Description	Variations
Separating element		The separating element in FRT190354 R1.0 was constructed by 120 mm thick concrete wall panels. The separating element in FRT200213 R1.0 was a 150 mm thick concrete floor.	It is proposed to apply the tested H B Fuller sealants to the control joints in the concrete wall system with thickness ranging from 120 mm to 175 mm. It is also proposed to apply the tested sealants to solid masonry walls with an equivalent established FRL similar to the tested concrete wall.

4.4 Purpose of the test

AS 4072.1:2005 (R2016) prescribes the requirements for the testing of control joints in accordance with the test method in AS 1530.4:2014.

Section 2 of AS 1530.4:2014 sets out the general requirements for testing of control joint systems in rigid floors. Section 10 of AS 1530.4:2014 sets out procedures for methods for the fire resistance tests for elements of construction including service penetrations and control joints in rigid floor systems.

4.5 Schedule of components

Table 5 outlines the schedule of components for the assessed systems subject to a fire test, as referenced in Appendix A.

Table 5 Schedule of components

Item	Description	
1.	Item name	Concrete
	Product name	120 mm – 175 mm
	Density	2400 kg/m^3 (norminal)
2.	Item name	H B Fuller sealant
	Product name	H B Fuller Firesound and H B Fuller FulaFlex FR Hybrid
	Installation	The sealant was installed in the control joints on both exposed and unexposed sides with the assessed thickness.
3.	Item name	Open cell backing rod
	Material	Polyurethane
	Installation	The backing rods of varying sizes were installed in all the control joints at both sides.

5. Assessment of control joints protected by combined H B Fuller FulaFlex FR Hybrid and Firesound sealants

5.1 Description of variation

The proposed construction shall be as tested in FRT200213 R1.0 in accordance with AS 1530.4:2014 with control joints of various width in 150 mm thick concrete floor with consideration for the following variations:

- The concrete wall thickness can be 120 mm and 175 mm.
- The control joints will be protected with H B Fuller FulaFlex FR Hybrid on one side and Firesound sealant on the other side.
- The concrete wall can be replaced by solid masonry block walls with an established FRL similar to the tested concrete element. The solid masonry wall thickness must not be less than the tested/assessed concrete wall thickness.

This assessment was done to determine the likely performance of the system based on AS 1530.4:2014 and AS 4072.1:2005 (R2016).

5.2 Methodology

The method of assessment used is summarised in Table 6.

Table 6 Method of assessment

Assessment method	
Level of complexity	Intermediate assessment
Type of assessment	Qualitative and quantitative Comparative

5.3 Assessment

5.3.1 Comparison of Fulaflex FR Hybrid and Firesound sealants

In test FRT200213 R1.0, specimens A and E consisted of 30 mm wide × 1000 mm long control joints. Control joint A was protected by 15 mm deep H B Fuller Firesound sealant on both sides and control joint E was protected by 15 mm deep H B Fuller FulaFlex FR Hybrid sealant on both sides. The control joints were tested in a 150 mm thick concrete floor. During the test, both control joints achieved an FRL of -/240/180.

The temperature recorded by the thermocouples on the unexposed sides of the control joints A and E in FRT200213 R1.0 are shown in Figure 1. As indicated in Figure 1, minor difference in temperature on the unexposed side of the joints protected by the two sealants can be observed for the entire testing period, except the temperature recorded by thermocouple 052 on control joint E protected by FulaFlex FR. A further investigation was conducted on control joint B tested in FRT200213 R1.0 and control joint E tested in FRT190354 R1.0. Both tested specimens were 50 mm wide. Control joint B in FRT200213 R1.0 was protected by 25 mm thick Firesound sealant. Control joint E in FRT190354 R1.0 was protected by 25 mm thick FulaFlex FR Hybrid sealant. The temperature recorded on the unexposed side of the two joints are shown in Figure 2. It is also noted that the temperature recorded by all these thermocouples on the unexposed side of sealants of the two joints was less than 180℃ at 240 minutes. Control joint B in FRT200213 R1.0 was tested in a 150 mm thick concrete floor. It is expected that the control joint will maintain the same performance if tested in a wall configuration. Control joint E in FRT190354 R1.0 was tested in a 120 mm thick concrete wall. Increasing the wall thickness to 150 mm is not expected to increase the temperature on the unexposed side of the sealant. Thus, the 50 mm wide control joint in 150 mm thick concrete wall and protected by 25 mm deep FulaFlex FR sealant on both sides are likely to achieve the equivalent fire resistance performance as that for control joint B tested in FRT200213 R1.0.

Based on the above discussion, it is considered that the Firesound sealant can achieve at least the equivalent fire resistance performance with FulaFlex FR Hybrid, subject to that they are applied to the control joints with the same size, wall thickness and sealant depth.

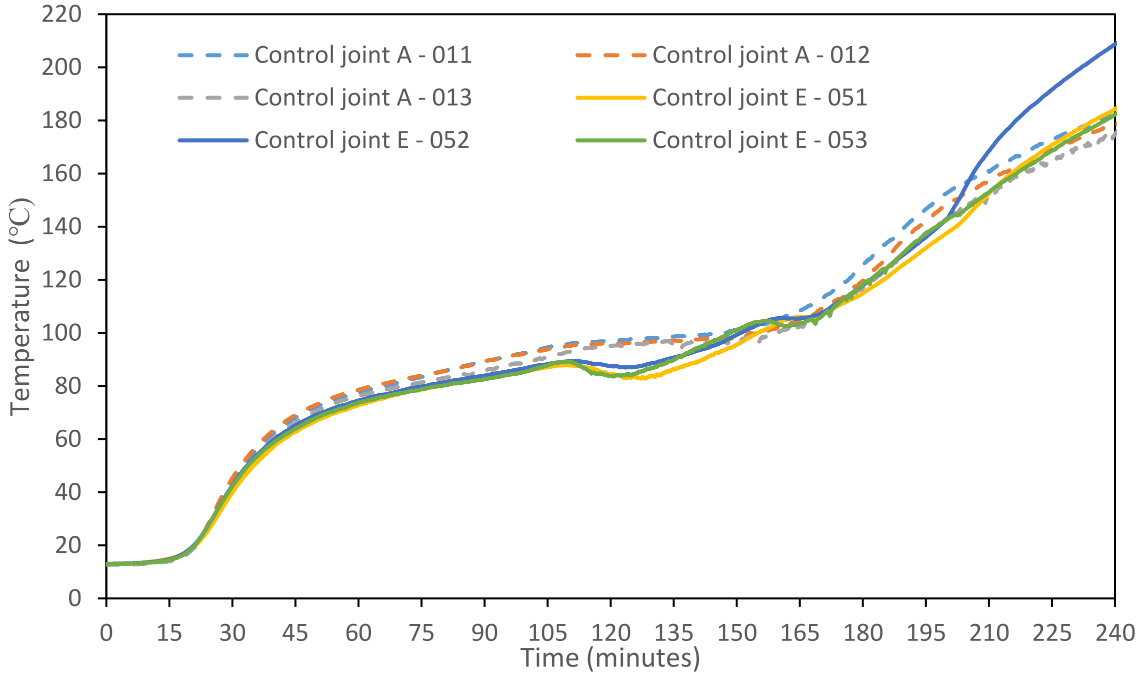

Figure 1 **Temperature at unexposed side on control joints A and E in FRT200213 R1.0**

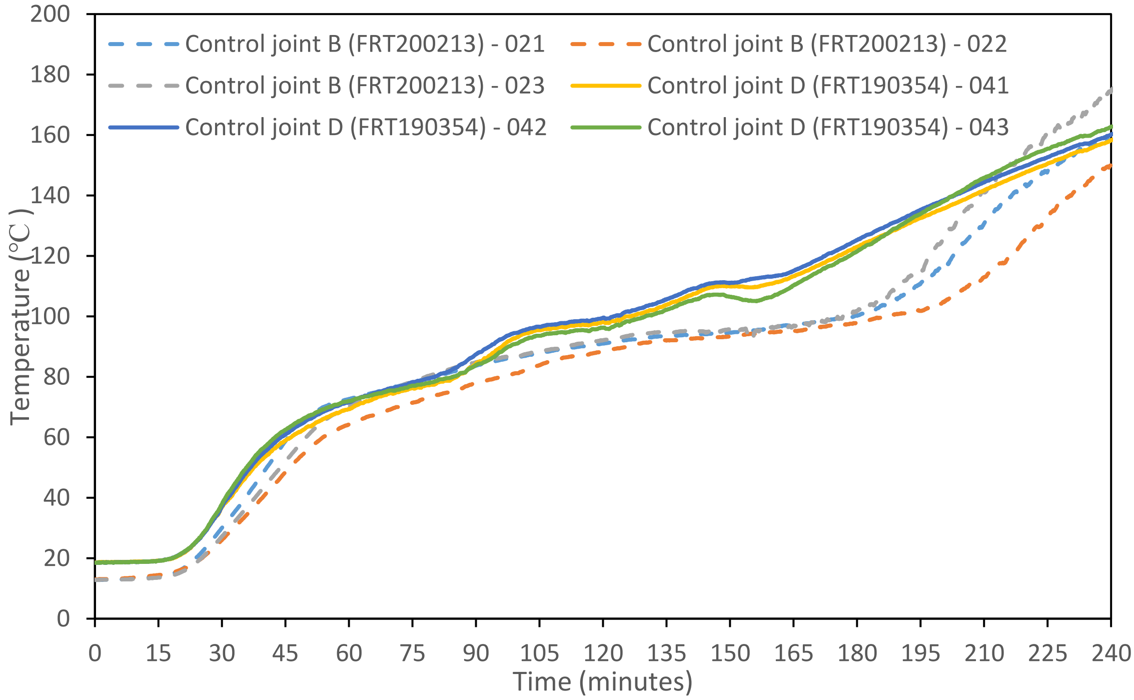

Figure 2 **Temperature at unexposed side on control joint B in FRT200213 R1.0 and control joint D in FRT190354 R1.0**

5.3.2 Control joint in 120 mm thick concrete wall

It is proposed to protect the control joints of 120 mm thick concrete wall or equivalent with H B Fuller FulaFlex FR Hybrid sealant on one side and Firesound sealant on the other side. The proposed control joint width and sealant depth are summarised in Table 7.

Table 7 Control joint details and sealant in 120 mm thick wall

Wall thickness (mm)	Maximum control joint width (mm)	Minimum sealant depth (mm)
120	10	10
	20	10
	30	15
	40	20
	50	25

Control joints in 120 mm thick concrete wall were tested in FRT190354 R1.0 for an exposure duration of 240 minutes. The tested specimens of FRT190354 R1.0 consisted 10 mm, 20 mm, 40 mm and 50 mm wide control joints and they were protected by Fulaflex FR Hybrid sealant on both sides. The tested control joints maintained the integrity and insulation for at least 240 minutes and 120 minutes, respectively. As discussed in section 5.3.1, with the same sealant/wall thickness and control joint width, the Firesound sealant can achieve the equivalent fire resistance performance as FulaFlex FR Hybrid. Thus, replacing the FulaFlex FR Hybrid sealant on one side of the tested control joints by Firesound sealant of same thickness is not expected to be detrimental to the fire resistance performance of the control joints, if tested in accordance with AS 1530.4:2014.

The 30 mm wide control joint with 15 mm deep sealant, either FulaFlex FR Hybrid or Firesound on both sides, were tested in FRT200213 R1.0 control joints A and E. The tested control joints were in a 150 mm thick concrete floor. The temperature recorded by the thermocouples on the unexposed sides of the control joints in FRT200213 R1.0 are shown in Figure 1. It is noted that the temperature on the unexposed side of the tested control joints remained less than 100℃ at 120 minutes. Given the achieved safety margin, it is expected that the 30 mm wide control joint in 120 mm thick concrete wall with 15 mm deep sealant on both sides would achieve a similar fire resistance performance as the other joints tested in FRT190354 R1.0.

Therefore, the proposed control joins and the protection are positively assessed.

5.3.3 Control joint in 150 mm thick concrete wall

It is proposed to protect the wall control joints in a 150 mm thick concrete wall or equivalent with H B Fuller FulaFlex FR Hybrid sealant on one side and Firesound sealant on the other side. The proposed control joint width and sealant depth are summarised in Table 8.

Table 8 Control joint details and sealant in 150 mm thick wall

Wall thickness (mm)	Maximum control joint width (mm)	Minimum sealant depth (mm)
150	10	10
	20	10
	30	15
	40	20
	50	25

In test FRT200213 R1.0, five control joints with the same width and sealant depth shown in Table 8 were tested in a 150 mm thick concrete floor for a period of 240 minutes. The tested control joints A and B were protected by H B Fuller Firesound sealant on both sides of the openings. The tested control joints C, D and E were protected by H B Fuller FulaFlex FR Hybrid sealant. The five tested control joints maintained the integrity performance for 241 minutes and insulated performance for at least 213 minutes.

As discussed in section 5.3.1, with the same sealant/wall thickness and control joint width, the Firesound sealant can achieve the equivalent fire resistance performance as FulaFlex FR Hybrid.

Thus, protecting the tested control joints with FulaFlex FR Hybrid on one side and Firesound on the other side with the sealant depth in Table 8 is not expected to be detrimental to the fire resistance performance of the control joints achieved in the referenced test.

From the discussion above, it is considered that the tested control joints in FRT200213 R1.0, if protected with FulaFlex FR Hybrid on one side and Firesound on the other side with the sealant depth in Table 8, will achieve an FRL of -/240/180.

5.3.4 Control joint in 175 mm thick concrete wall

It is proposed to protect the wall control joints in a 175 mm thick concrete wall or equivalent with H B Fuller FulaFlex FR Hybrid sealant on one side and Firesound sealant on the other side. The proposed control joint width and sealant depth are summarised in Table 9.

Table 9 Control joint details and sealant in 175 mm thick wall

Wall thickness (mm)	Maximum control joint width (mm)	Minimum sealant depth (mm)
175	10	10
	20	10
	30	15
	40	20
	50	25

As indicated in the referenced test reports, the tested control joints with various joint width and sealant depth maintained the integrity performance for at least 240 minutes. The increase in concrete wall thickness is not expected to be detrimental the integrity performance of the proposed construction. Thus, the integrity performance of the proposed control joints protected.

In test FRT190354 R1.0, the control joint specimens were tested in a 120 mm thick concrete wall for a period of 240 minutes. In test FAS200213 R1.0, the control joint specimens were tested in a 150 mm thick concrete floor for a period of 240 minutes. The average and maximum temperature at 240 minutes on the unexposed side the separate elements in the referenced tests are summarised in Table 10. If the tested concrete wall/floor has a thickness of 175 mm, it is likely the temperature on the unexposed side of separating element at 240 minutes will remain less than 200℃. In AS/NZS 3600:2018[9], a minimum thickness of 175 mm is required for concrete wall to achieve a 240-minute insulation performance. Therefore, the 175 mm thick concrete wall is likely to maintain the insulation performance for 240 minutes.

Table 10 Temperature on the unexposed side of the tested concrete element at 240 minutes

	Temperature on separating element – unexposed side (℃)		
	FRT200213 R1.0	FRT190354 R1.0	Difference
Average temperature	204	252	48
Maximum temperature	216	269	53

Figure 1 and Figure 2 show that the sealant temperature rise on the unexposed side of the 30 mm and 50 mm wide control joints was less than 180 ℃ after a 240-minute exposure. Control joint C tested in FRT190354 R1.0 was 40 mm wide and protected with 20 mm deep FulaFlex FR Hybrid sealant on both sides. The temperature on the unexposed side the tested sealant was less than 180℃ after a 240-minute exposure. Therefore, control joints with the width of 30 mm, 40 mm and 50 mm are expected to maintain a 240-minute insulation performance.

The temperature record in FRT190354 R1.0 indicates that the temperature on unexposed side will increase to more than 200 ℃ as the joint width decrease to 20 mm in the tested joint B. It appears that the influence of the higher concrete temperature along the wall edges within the joints becomes more dominant as the joint width reduces. Such effects can be observed as the difference between the temperature on sealant and on the concrete surface is reducing with the decrease of the joint width.

[9] Standards Australia, 2018, Concrete structures, AS 3600:2018 (Incorporating Amendment No. 1), Standards Australia, NSW.

It is therefore reasonable to deduce that if the concrete temperature were held to be less than 200℃, there will be reduced amount of heat transfer from the concrete to the sealant as the temperature of the sealant have been observed as slightly lower than that of the concrete. As above discussed, increasing the concrete wall thickness to 175 mm would result in having a concrete temperature (on the unexposed side) to no more than 200°C, i.e. the concrete will maintain its insulation performance for up to 240 minutes as 175 mm thick concrete has an established FRL of -/240/240.

All the tested control joints with various width and sealant depth maintained the integrity performance for 240 minutes. Increase the thickness of concrete wall is not to be detrimental to the integrity performance of the tested specimens.

5.3.5 Replacing each of the concrete wall system with a solid concrete masonry block wall of equivalent FRL

The test conducted on control joints in concrete walls may be applied to solid masonry block walls provided that the wall system has an equivalent FRL to the concrete wall and that the wall thickness is equal or thicker.

The test data indicates that the FulaFlex FR Hybrid and Firesound sealant achieved an integrity performance up to 240 minutes when applied to both sides of the control joints in a 120 mm thick concrete wall and/or 150 mm thick concrete floor. The insulation performance of the sealant appears to track that of the separating element. The sealant is therefore expected to perform equally in a similar type of construction such as solid concrete masonry block walls provided the walls would perform to the required FRL ie. -/120/120, -/180/180 and -/240/240. The wall thickness must not be less than that of the assessed concrete walls with the same FRLs.

5.4 Conclusion

This assessment demonstrates that the control joints in Table 11 are likely to achieve the established FRL of the concrete or solid masonry block wall system if tested in accordance with AS 1530.4:2014 and AS 4072.1:2005 (R2016). Since the application of the sealant for the control joints are to equal depths on both sides, the system is symmetrical and therefore would be applicable for heat exposure from either side.

Table 11 Summary of assessment

Product	Wall thickness (mm)	Maximum control joint width (mm)	Minimum sealant depth (mm)	Sealant location	FRL
H B Fuller FulaFlex FR Hybrid and Firesound sealants	120	10	10	FulaFlex FR Hybrid on one side and Firesound on the other side	-/240/120
		20	10		-/240/120
		30	15		-/240/120
		40	20		-/240/120
		50	25		-/240/120
	150	10	10		-/240/180
		20	10		-/240/180
		30	15		-/240/180
		40	20		-/240/180
		50	25		-/240/180
	175	10	10		-/240/240
		20	10		-/240/240
		30	15		-/240/240
		40	20		-/240/240
		50	25		-/240/240

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 likely to be demonstrated on a test in accordance with AS 1530.4:2014 and AS 4072.1:2005 (R2016), based on the evidence referred to in this report.

This assessment is provided to H B Fuller Australia Pty Ltd for their own specific purposes. Building certifiers and other third parties are responsible for deciding if they accept this assessment in a particular context.

Appendix A Summary of supporting test data

A.1 Test report – FRT190354 R1.0

Table 12 Information about test report

Item	Information about test report
Report sponsor	H B Fuller Australia Pty Ltd
Test laboratory	Warringtonfire Australia, Unit 2, 409-411 Hammond Road, Dandenong, Victoria 3175, Australia.
Test date	The fire resistance test was completed on 18/11/2019.
Test standards	The test was done in accordance with AS 1530.4:2014.
Ambient temperature	20°C at the start of the test.
Test Duration	241 minutes
Variation to test standards	The pressure varied up to 23 Pa from the prescribed test standard limits during the first 90 minutes of the test but was within the limits for the remainder of the test. Due to the nature of the specimen and the fact that no significant events occurred during these time periods, the variances in pressure are unlikely to have invalidated the test result. The temperature was up to 25 °C above the limits prescribed in the standard during the 45 - 46 minute period. The temperature was within the limits for the rest of the test. This over temperature resulted in the test conditions being more onerous and would not have invalidated the test result.
General description of tested specimen	The test specimen control joints were constructed from five concrete strips of 1600mm long and 120 mm thick. Three of the strips were 200 mm wide mounted centrally and the remaining two were 600 mm and 570 mm place on each side. The central strips were spaced at 10 mm, 20 mm, 40 mm and 50 mm apart forming the four specimen control joints. The strips were held together in a 1900 mm wide by 1600 mm frame.
Instrumentation	The test report states that the instrumentation was in accordance with AS 1530.4:2014.

The test specimen achieved the result in Table 13:

Table 13 Results summary for this test report

Control joint	Criteria	Results	Fire resistance level (FRL)
A	Structural adequacy	Not applicable	**-/240/120**
	Integrity	No failure at 241 minutes	
	Insulation	Failure at 171 minutes	
B	Structural adequacy	Not applicable	**-/240/120**
	Integrity	No failure at 241 minutes	
	Insulation	Failure at 165 minutes	
C	Structural adequacy	Not applicable	**-/240/120**
	Integrity	No failure at 241 minutes	
	Insulation	Failure at 166 minutes	
D	Structural adequacy	Not applicable	**-/240/120**
	Integrity	No failure at 241 minutes	
	Insulation	Failure at 173 minutes	

A.2 Test report – FRT200213 R1.0

Table 14 Information about test report

Item	Information about test report
Report sponsor	H B Fuller Australia Pty Ltd
Test laboratory	Warringtonfire Australia, Unit 2, 409-411 Hammond Road, Dandenong, Victoria 3175, Australia.
Test date	The fire resistance test was completed 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 2 Pa below the limits prescribed in the standard during the 215 – 220 minute period. The pressure and temperature were within the limits for the rest of the test. Due to the nature of the specimen and the fact that no significant events occurred during this time period, this under pressure is unlikely to have invalidated the test result.
General description of tested specimen	The test consisted of five control joints tested in a floor configuration. The specimen control joints were constructed by 150 mm thick concrete strips aligned as per the varying control joint sizes. The concrete strips were supported at the north and south edges by Parallel flange channels (PFC). Masonry anchors were used to fix the concrete strips to the PFC's. Control joint A comprised an aperture size of 30 mm × 1000 mm and protected by 15 mm deep Firesound sealant on both sides. Control joint B comprised an aperture size of 50 mm × 1000 mm and protected by 25 mm deep Firesound sealant on both sides. Control joints C and D comprised the aperture sizes of 10 mm × 1000 mm and 20 mm × 1000 mm respectively. Both control joints were protected by 10 mm deep FulaFlex FR sealant on both sides. Control joint E comprised an aperture size of 30 mm × 1000 mm and protected by 15 mm deep FulaFlex FR sealant on both sides.
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 15.

Table 15 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	
B	Structural adequacy	Not applicable	**-/240/180**
	Integrity	No failure at 241 minutes	
	Insulation	Failure at 213 minutes	
C	Structural adequacy	Not applicable	**-/240/180**
	Integrity	No failure at 241 minutes	
	Insulation	Failure at 225 minutes	
D	Structural adequacy	Not applicable	**-/240/180**
	Integrity	No failure at 241 minutes	
	Insulation	Failure at 218 minutes	
E	Structural adequacy	Not applicable	**-/240/180**
	Integrity	No failure at 241 minutes	
	Insulation	Failure at 217 minutes	

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