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Fire assessment report

Surround by Laminex™ Primed Fire Resistance, Moisture Resistant E1 MDF wall panelling in accordance with AS 5637.1:2015

Sponsor: Laminex Group Pty Ltd

Report number: FAS210127 Revision: R1.1

Issued date: 26 July 2021 Expiry date: 30 June 2026

Quality management

Version	Date	Information about the report			
R1.0	Issue: 11/06/2021	Reason for issue	Report issued to Laminex Group Pty Ltd for review and comment.		
			Prepared by	**Reviewed by**	**Authorised by**
		Name	Alim Rasel	Omar Saad	Mahmoud Akl
R1.1	Issue: 26/07/2021	Reason for issue	Amendment to product name		
			Prepared by	**Reviewed by**	**Authorised by**
	Expiry: 30/06/2026	**Name**	Dugald Watson	Yomal Dias	Yomal Dias
		Signature			

Executive summary

This report documents the findings of the assessment undertaken to determine the expected fire hazard properties of Surround by Laminex™ Primed Fire Resistance, Moisture Resistant E1 MDF wall panelling in accordance with AS 5637.1:2015 if tested in accordance with AS ISO 9705:2003 and assessed in compliance with AS 5637.1:2015.

The assessed panels are described to be routed fire retardant treated medium density fibreboards and are proposed to be used as internal wall and ceiling lining in commercial or residential buildings.

The analysis in section 5 of this report found that the proposed system, together with the described variations, are expected to achieve group numbers as shown in Table 1, if tested in accordance with AS ISO 9705:2003 and assessed in compliance with AS 5637.1:2015.

Table 1 Variations and assessment outcome

Panel	Thickness	Exposed surface area	Group number	$SMOGRA_{RC}$ (in $m^2s^{-2} \times 1000$)
Surround by Laminex™ Primed Fire Resistance, Moisture Resistant E1 MDF wall panelling	9 mm – 12 mm	Maximum 152%	2	<100
Panels achieving group number 2 are assessed as group number 2-S according to the requirement of C/VM2- Verification Method: Framework for fire safety design. The outcome of this assessment is applicable to Laminex routed panels only. Perforated panels were not considered in this assessment.				

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 30 June 2026.

Contents

1. Introduction

This report documents the findings of the assessment undertaken to determine the expected fire hazard properties of Surround by Laminex™ Primed Fire Resistance, Moisture Resistant E1 MDF wall panelling if tested in accordance with AS ISO 9705:2003[1] and assessed in compliance with AS 5637.1:2015[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 Laminex Group Pty Ltd. The sponsor details are included in Table 2.

Table 2 Sponsor details

Sponsor	Address
Laminex Group Pty Ltd	22 Trewin St Wendouree VIC 3355 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 hazard properties if the elements were to be tested in accordance with AS ISO 9705:2003.

1 Standards Australia, 2003, Fire tests - Full-scale room test for surface products (Reconfirmed 2016), AS ISO 9705:2003 (R2016), Standards Australia, NSW.
2 Standards Australia, 2015, Determination of fire hazard properties – Wall and ceiling linings, AS 5637.1:2015, 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 National Construction Code Volumes One and Two – Building Code of Australia (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) provisions of the NCC under A5.5 for reaction to fire as applicable to the assessed system.

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 28 April 2021, Laminex Group 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 ISO 9705:2003.
- The outcome of this assessment is limited to routed panels. Perforated panels were not considered in this assessment.
- This report is only valid for the assessed system 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.

[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 system consists of Laminex grey core routed FR MDF panels which are used as internal wall and ceiling lining. The panels are commercially known Surround by Laminex™ Primed Fire Resistance, Moisture Resistant E1 MDF wall panelling.

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 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
RTF200371	Laminex Group Pty Ltd	29 October 2020	Warringtonfire Australia
RTF210023		12 March 2021	

4.3 Variations to the tested systems

An identical system has not been subject to a standard 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 4.

Table 4 Variations to tested systems

Item	Reference test	Description	Variations
Thickness	RTF210023, RTF200371	The tested panel thickness was recorded to be 12 mm.	It is proposed that the panel thickness will be reduced down to 9 mm.

4.4 Test and assessment standard

AS ISO 9705:2003 stipulates full room burn testing techniques for surface products.

AS 5637.1:2015 sets out procedures for assessing internal wall and ceiling linings according to their tendency to ignite, release heat, cause flashover, release smoke and contribute to fire growth.

4.5 Schedule of components

Table 5 outlines the schedule of components for the assessed systems subject to a fire test.

Table 5 Schedule of components of assessed systems

Item	Description	
Lining		
1.	Item name	Routed fire-retardant (FR) medium density fibreboard (MDF) panels
	Product name	Surround by Laminex™ Primed Fire Resistance, Moisture Resistant E1 MDF wall panelling
	Material	The panel consists of a grey-coloured FR MDF board painted on the exposed side with a white-coloured water-based acrylic primer. The panels can be routed in differeent profiles. The exposed surface area must not exceed 152%. The method of calculation to determine the exposed surface area is described in section 5.3.
	Thickness	9 mm – 12 mm
	Minimum density	700 kg/m^2
Installation method		
The panels will be fixed to studs using plasterboard screws (8g × 65 mm). Panel to panel joins will be tongue and groove joins with additional plastic strips (maximum 3.2 mm tall × 11.5 mm wide).		

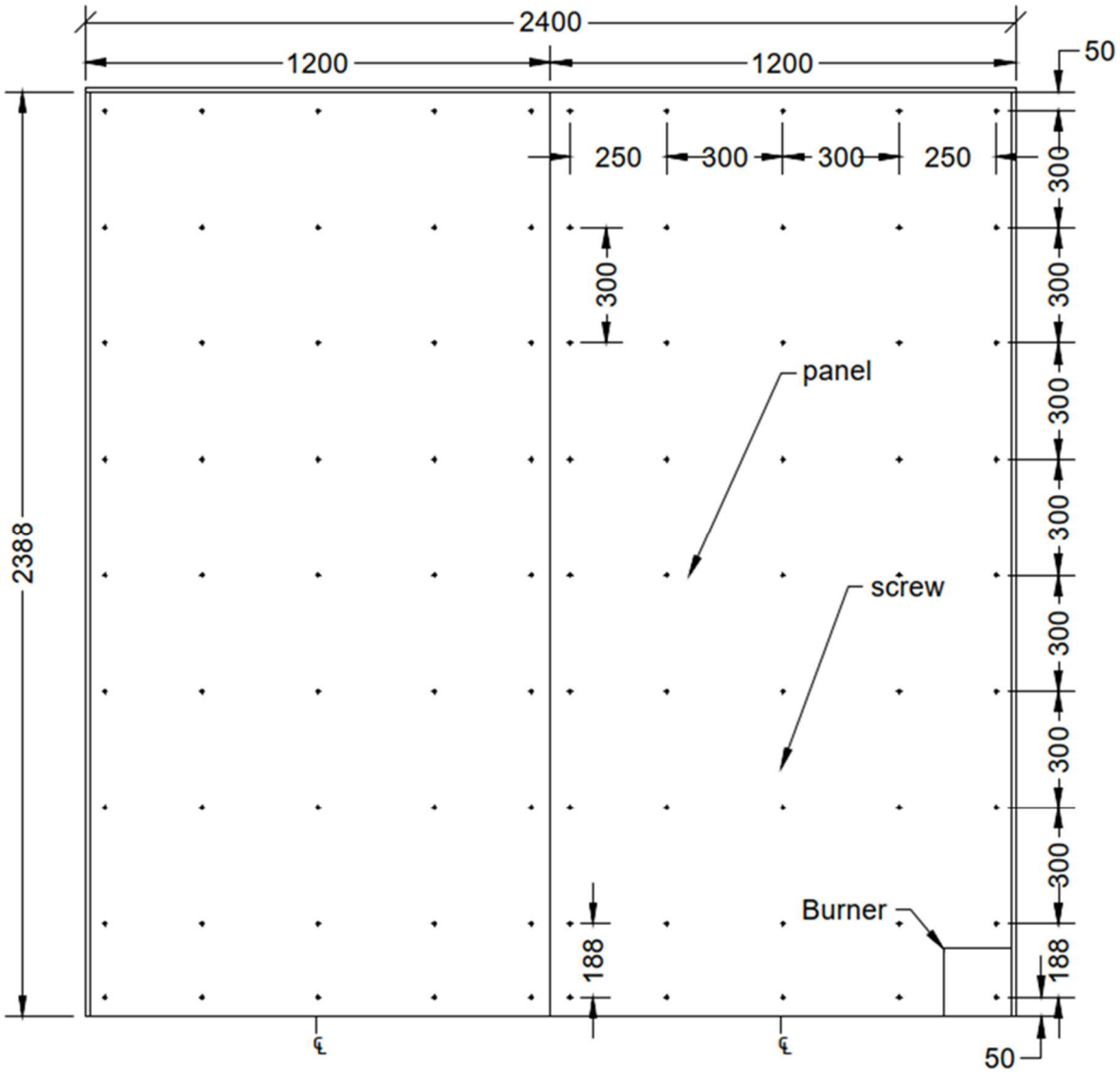

Figure 1 Illustration of tested system in RTF210023 R1.0 – back wall (image reproduced)

5. Assessment of Surround by Laminex™ Primed Fire Resistance, Moisture Resistant E1 MDF wall panelling

5.1 Description of variation

12 mm thick routed fire-retardant medium density fibreboard panels were tested in RTF210023 R1.0. It is proposed that the panel thickness will be decreased down to 9 mm. For commercial purposes, this group of products will be known as Surround by Laminex™ Primed Fire Resistance, Moisture Resistant E1 MDF wall panelling.

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 – interpolation/Comparative

5.3 Assessment

In test RTF210023 R1.0, 12 mm thick routed FR MDF panels were tested in accordance with AS ISO 9705:2003. The panels consisted of grey-coloured FR MDF boards which were painted on the exposed side with white-coloured water-based acrylic primer. The panels were then routed along the length, and had grooves running along the length on both sides as illustrated in Figure 2. The surface density of the panels was recorded to be 783.34 kg/m^2.

Due to the routing, additional surfaces of the panels were exposed to fire in contrast to flat panels. The amount of routing can be expressed as “exposed surface area” which can be calculated as follows,

$$Exposed\ surface\ area = \frac{Total\ exposed\ surface\ area\ due\ to\ routing}{Area\ of\ the\ flat\ or\ non\ routed\ panel} \times 100\%$$

In test RTF210023 R1.0, the exposed surface area was recorded to be 152%. The tested construction achieved group number 2 and $SMOGRA_{RC}$ of 8.1 (in m^2/s^2 × 1000).

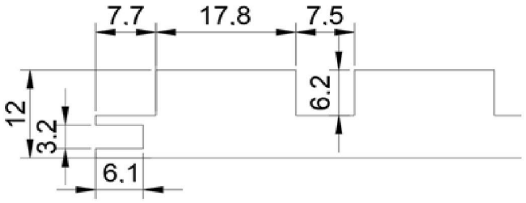

Figure 2 Panel routing details as tested in RTF210023 R1.0 (image reproduced from RTF210023 R1.0)

It is proposed that the thickness of the routed panel will be decreased down to 9 mm. In test RTF200371 R1.0, 9 mm thick green FR MDF panels were tested in accordance with AS ISO 9705:2003. The panel density was recorded to be 806 kg/m^3. This construction achieved group number 2 and a $SMOGRA_{RC}$ of 12.0 (in m^{2}s^{-2} × 1000). Although the core of the panels was green and surfaces were not routed, the results and data of this test were used for comparative analysis on the expected panel performance. The core material of green and grey FR MDF is nearly identical with the exception of a minor variation in dye colour. Due to the small fraction of the panel's

mass, the effect of dye colour to performance is negligible. As such, the test data obtained for 9 mm green FR MDF can be representative of grey FR MDF. Therefore, it is concluded that, 9 mm solid grey core FR MDF is expected to also achieve group number 2.

However, the proposed construction also includes white-coloured water-based acrylic primer on the exposed side and additional routing as illustrated in Figure 2. The routing will increase the overall exposed surface area and could allow for faster preheating of the panel which could bring forward the flashover time. Together with the primer, the proposed construction can be considered more onerous than the tested system in RTF200371 R1.0. Therefore, the performance of the tested FR MDF panels in RTF210023 R1.0 and RTF200371 R1.0 is closely analysed to estimate the expected performance gradation.

It is noted that, in test RTF200371 R1.0, under 100 kW exposure, the heat release rate (HRR) remained below 200 kW up to 600 s. An identical performance was also observed in test RTF210023 where the routed panels were tested and the HRR was recorded to be below 200 kW up to 600s. Additionally, under 300 kW exposure, flashover did not occur up to 16 minutes in both tests. It is therefore considered that the presence of routing is unlikely to cause drastic changes to the performance of the panels. For group 2 performance, the panels need to resist flashover (HHR 1 MW) up to 600 s under 100 kW exposure. Considering that in both tests the highest HRR was 200 kW up to 600 s and no flashover was recorded up to 6 minutes under 300 kW exposure, it can be concluded that, the inclusion of routing (in case of RTF200371 R1.0) or the reduction in thickness (in case of RTF210023 R1.0) is not significant enough to increase the HRR up to 1MW and cause flashover in the first 600 s. Based on the above, the proposed panel thickness from 9 mm to 12 mm is positively assessed.

It is further noted that, the $SMOGRA_{RC}$ for 12 mm routed panel was recorded as 8.1 (in $m^2/s^2 \times 1000$) and 9 mm solid panel was recorded as 12.0 (in $m^2s^{-2} \times 1000$). Therefore, the $SMOGRA_{RC}$ of proposed 9 mm to 12 mm routed panels are conservatively assessed to be <100.

5.4 Conclusion

Based on the above, it is the opinion of this testing laboratory that, the proposed Surround by Laminex™ Primed Fire Resistance, Moisture Resistant E1 MDF wall panels are expected to achieve the group number listed in Table 7 if tested in accordance with AS ISO 9705:2003 and assessed in accordance with AS 5637.1:2015.

Table 7 Conclusion of assessment

Product name	Thickness	Exposed surface area	Group number	$SMOGRA_{RC}$ (in $m^2s^{-2} \times 1000$)
Surround by Laminex™ Primed Fire Resistance, Moisture Resistant E1 MDF wall panelling	9 mm – 12 mm	Maximum 152%	2	<100
Panels achieving group number 2 are assessed as group number 2-S according to the requirement of C/VM2- Verification Method: Framework for fire safety design. The outcome of this assessment is applicable to Laminex routed panels only. Perforated panels were not considered in this assessment.				

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 ISO 9705:2003, based on the evidence referred to in this report.

This assessment is provided to Laminex Group 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 – RTF210023 R1.0

Table 8 Information about test report

Item	Information about test report
Report sponsor	Laminex Group Pty Ltd
Test laboratory	Warringtonfire Australia, 409-411 Hammond Road, Dandenong, Victoria 3175, Australia.
Test date	The fire test was completed on 12 March 2021.
Test standards	The test was done in accordance with AS ISO 9705:2003.
Variation to test standards	1. Smoke obscuration measurements were made using a helium-neon laser smoke photometer, as outlined in annex H of ISO 9705-1:2016 2. The temperature in the area surrounding the fire test room, from the completion of installation until the start of the test, did not remain between 10 to 30 °C. It was between 1 and 3 °C above during the 2.5 hours immediately prior of the start of the test. These minor variations are not likely to negatively affect the test results.
General description of tested specimen	12 mm thick routed FR MDF panels were tested in accordance with AS ISO 9705:2003. The panels consisted of grey-coloured FR MDF boards which were painted on the exposed side with white-coloured water-based acrylic primer. The panels were then routed along the length, and had grooves running along the length on both sides. The surface density of the panels was recorded to be 783.34 kg/m^2. The exposed surface area was recorded to be 152%. The panels were screw fixed using plasterboard screws. Each panel had a groove running along the length, where a plastic strip was slotted in, effectively creating a tongue and groove joint at the panel-to-panel joins.
Instrumentation	The test report states that the instrumentation was in accordance with AS ISO 9705:2003.

The test specimen achieved the following results – see Table 9.

Table 9 Results summary for this test report

Panel	Group number	SMOGRA$_{RC}$ (in m^2/s^2 × 1000)	Time to flashover
12 mm thick grey routed FR MDF panels	2	8.1	16 minutes

A.2 Test report – RTF210023 R1.0

Table 10 Information about test report

Item	Information about test report
Report sponsor	Laminex Group Pty Ltd
Test laboratory	Warringtonfire Australia, 409-411 Hammond Road, Dandenong, Victoria 3175, Australia.
Test date	The fire test was completed on 29 October 2020.
Test standards	The test was done in accordance with AS ISO 9705:2003.
Variation to test standards	Smoke obscuration measurements were made using a helium-neon laser smoke photometer, as outlined in annex H of ISO 9705-1:2016. This variation is not likely to negatively affect the test results.
General description of tested specimen	9 mm thick green FR MDF panels were tested in accordance with AS ISO 9705:2003. The panels were screw fixed using plasterboard screws. The panel density was recorded to be 806 kg/m^3.

Item	Information about test report
Instrumentation	The test report states that the instrumentation was in accordance with AS ISO 9705:2003.

The test specimen achieved the following results – see Table 11 .

Table 11 Results summary for this test report

Panel	Group number	$SMOGRA_{RC}$ (in m^2/s^2 × 1000)	Time to flashover
9 mm thick green FR MDF	2	12	17 minutes

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Warringtonfire Australia Pty Ltd
ABN 81 050 241 524

Perth

Unit 22, 22 Railway Road
Subiaco WA 6008
Australia
T: +61 8 9382 3844

Canberra

Unit 10, 71 Leichhardt Street
Kingston ACT 2604
Australia
T: +61 2 6260 8488

Melbourne

Level 9, 401 Collins Street
Melbourne VIC 3000
Australia
T: +61 3 9767 1000

Sydney

Suite 802, Level 8, 383 Kent Street
Sydney NSW 2000
Australia
T: +61 2 9211 4333

Brisbane

Suite 6, Level 12, 133 Mary Street
Brisbane QLD 4000
Australia
T: +61 7 3238 1700

Melbourne – NATA accredited laboratory

409-411 Hammond Road
Dandenong South VIC 3175
Australia
T: +61 3 9767 1000