



REGULATORY INFORMATION REPORT

ASSESSMENT OF THE CRITICAL RADIANT FLUX (CRF)
PERFORMANCE OF SOLID TIMBER (MINIMUM
THICKNESS 12MM) AND PLYWOOD (MINIMUM
THICKNESS 15MM) WHEN TESTED IN ACCORDANCE
WITH AS/ISO 9239.1-2003

EWFA Report No:

RIR 21419-05

Report Sponsor

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DOCUMENT REVISION STATUS

Date Issued	Issue No	Description
15/6/07	RIR 21419-00	Initial Issue
18/9/07	RIR 21419-01	Typographical amendment and inclusion of 17mm plywood data
21/12/15	RIR 21419-02	Revised to change the details of report sponsor
24/08/16	RIR 21419-03	Typographical amendment
19/06/18	RIR 21419-04	Revised to extend validity for further 5 years
02/07/18	RIR 21419-05	Typographical amendment

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CONTENTS

1	INTRODUCTION	4
2	TESTED PROTOTYPES	4
3	VARIATION FROM TESTED PROTOTYPES	5
	3.1 Timber Flooring 12mm or Thicker (No Substrate)	5
	3.2 Plywood Flooring 15mm or Thicker (No Substrate)	5
	3.3 Timber Flooring 12mm or Thicker on A Substrate	5
	3.4 Plywood Flooring 15mm or Thicker on A Substrate	5
4	REFERENCED TEST PROCEDURES	5
5	FORMAL ASSESSMENT SUMMARY	6
	5.1 Timber Flooring 12mm or Thicker (No Substrate)	6
	5.2 Timber Flooring 12mm or Thicker (No Substrate)	7
	5.3 Timber Flooring 12mm or Thicker on A Substrate	8
	5.4 Plywood Flooring 15mm or Thicker (No Substrate)	9
	5.5 Plywood Flooring 15mm or Thicker on A Substrate	10
6	DIRECT FIELD OF APPLICATION	11
7	REQUIREMENTS	11
8	VALIDITY	11
9	AUTHORITY	12
	9.1 Applicant Undertakings And Conditions Of Use	12
	9.2 General Conditions Of Use	12
	9.3 Authorisation On Behalf Of Exova Warringtonfire Aus Pty Ltd	12
	9.4 Date Of Issue	12
	9.5 Expiry Date	12

1 INTRODUCTION

This Report contains the minimum information required to demonstrate compliance with the Building Code of Australia NCC 2016 Volume One.

The Referenced Assessment Report was prepared at the request of Forest and Wood Products Australia Limited (FWPA) as an assessment of the Fire Hazard performance of solid timber and plywood for use as flooring with respect to the requirements of Specification C1.10 of the National Construction Code 2016 Volume One, Building Code of Australia, Class 2 to Class 9 Buildings (NCC).

Specification C1.10 requires testing to AS/ISO 9239.1-2003 – “Reaction to Fire Tests for Floors Part 1: Determination of the Burning Behaviour Using a Radiant Heat Source”.

The main outcome from these tests is a material's Critical Radiant Heat Flux (CRF). The test measures the radiant energy required to just sustain burning. The test involves the specimen being held horizontally under the influence of a radiant heat source at one end. When ignited the burning progresses along the specimen away from the radiant source until it stops. The radiant heat flux at the point at which burning ceases is the Critical Radiant Heat Flux.

The amount of smoke evolved is also determined using a light extinction smoke meter mounted in the flue, not that dissimilar to the existing unit on the AS/NZS 1530.3 apparatus.

The tested systems considered in this report are described in Section 2 and are subject to the proposed variations described in Section 3 if tested in accordance with the referenced test method described in Section 4. The conclusions of the report are summarised in Section 5.

The validity of the referenced assessment is conditional on compliance with Sections 7, 8 and 9 of this report.

Summaries of the test data on which the referenced assessment is based on are provided in the appendices together with a summary of the critical issues and the main points of argument leading to the assessment conclusions.

2 TESTED PROTOTYPES

The Referenced Assessment Report makes reference to the following reports in Table 1 and 2 referring to tests in accordance with the requirements of the general provisions A1.1 and the Specification C1.10 of the NCC on various solid and plywood timber. The test reports were sponsored by the Forest and Wood Products Australia Limited (FWPA) and undertaken by Warrington Fire Research Australia.

The Referenced Assessment Report makes reference to the latest version of reports WFRA 41117, WFRA 499241 A-K, 2141900 A-D and 2200000A-B. The referenced reports were prepared by Warrington Fire Research Pty Ltd and sponsored by Forest and Wood Products Australia Limited (FWPA).

3 VARIATION FROM TESTED PROTOTYPES

3.1 TIMBER FLOORING 12MM OR THICKER (NO SUBSTRATE)

The proposed construction is for the timber species as tested in the referenced test reports, to be 12mm thick or thicker and fixed to structural framing (e.g. floor joists) and achieve a CRF of 2.2kW/m² and Smoke Development Rate of less than 750% Minutes.

3.2 PLYWOOD FLOORING 15MM OR THICKER (NO SUBSTRATE)

The proposed construction is for the timber plywood species as tested in the referenced test reports, to be 15mm thick or thicker fixed to structural framing (e.g. floor joists) and achieve a CRF of 2.2kW/m² and Smoke Development Rate of less than 750% Minutes.

3.3 TIMBER FLOORING 12MM OR THICKER ON A SUBSTRATE

The proposed construction is for the timber species as tested in the referenced test reports, to be 12mm thick or thicker fixed or laminated to a substrate in Table 3.1 with PVA, or other water-based adhesives and no air gap between flooring and substrate and achieve a CRF of 2.2kW/m² and Smoke Development Rate of less than 750% Minutes.

3.4 PLYWOOD FLOORING 15MM OR THICKER ON A SUBSTRATE

The proposed construction is for the timber plywood species as tested in the referenced test reports, to be 15mm thick or thicker fixed or laminated to a substrate in Table 3.1 with PVA, or other water-based adhesives and no air gap between flooring and substrate and achieve a CRF of 2.2kW/m² and Smoke Development Rate of less than 750% Minutes.

Table 3.1 Proposed Flooring Substrates

Substrate	Thickness (mm)
Particleboard 716kg/m ³	19mm or greater
Fibre cement	15mm or greater
Normal Weight Concrete floor	75mm or greater
Light weight concrete floor	75mm or greater

4 REFERENCED TEST PROCEDURES

Reference was made to Specification C1.10 which requires the Critical Radiant Heat Flux (CRF) and the smoke development rate to be tested in accordance with AS/ISO 9239.1-2003.

5 FORMAL ASSESSMENT SUMMARY

On the basis of the discussion presented in this report it is the considered opinion of this Accredited Testing Laboratory that if the tested specimens described in Section 2 had been configured as described in Section 3 they will achieve the performance stated below if tested in accordance with the test method referenced in Section 4, subject to the requirements in section 7.

5.1 TIMBER FLOORING 12MM OR THICKER (NO SUBSTRATE)

Table 5.1- Performance of Timber Flooring Species

Flooring Species	Thickness (mm)	Performance	
		CRF (kW/m ²)	Smoke Develop. Rate (%- Mins)
Ash, Alpine - <i>Eucalyptus delegatensis</i>	12mm or greater	Greater than or equal to 1.2 and less than 4.5	<750
Ash, Mountain – <i>Eucalyptus regnans</i>			
Ash, Silvertop - <i>Eucalyptus sieberi</i>			
Beech Myrtle - <i>Northofagus cunninghamii</i>			
Blackbutt - <i>Eucalyptus pilularis</i>			
Blackbutt, New England - <i>Eucalyptus andrewsii</i>			
Bloodwood Red - <i>Eucalyptus gummifera</i>			
Box, Brush - <i>Lophostman confertus</i>			
Box, Grey – <i>Eucalyptus microcarpa</i>			
Brownbarrel - <i>Eucalyptus fastigata</i>			
Gum, Blue, Southern (TAS) - <i>Eucalyptus globulus</i>			
Gum, Blue, Southern (VIC) - <i>Eucalyptus globulus</i>			
Gum, Blue, Sydney - <i>Eucalyptus saligna</i>			
Gum, Manna - <i>Eucalyptus viminalis</i>			
Gum, Red, River - <i>Eucalyptus camaldulensis</i>			
Gum, Rose – <i>Eucalyptus grandis</i>			
Gum, Shining – <i>Eucalyptus nitens</i>			
Gum, Spotted - <i>Corymbia maculata</i>			
Gum, Sugar - <i>Eucalyptus cladocalyx</i>			
Gum, Yellow - <i>Eucalyptus leucoxylon</i>			
Ironbark, Grey – <i>Eucalyptus drepanophylla</i>			
Ironbark, Red - <i>Eucalyptus sideroxylon</i>			
Jarraah - <i>Eucalyptus marginata</i>			
Karri - <i>Eucalyptus diversicolor</i>			
Mahogany, Red - <i>Eucalyptus resinifera</i>			
Merbau - <i>Instia bijuga</i>			
Messmate - <i>Eucalyptus obliqua</i>			
Pine, White Cypress - <i>Callitris glaucophylla</i>			
Stringy Bark, Yellow - <i>Eucalyptus muellerana</i>			
Tallowwood - <i>Eucalyptus microcorys</i>			
Turpentine – <i>Syncarpa glomulifera</i>			
Wattle, Silver – <i>Acacia dealbata</i>			

5.2 TIMBER FLOORING 12MM OR THICKER (NO SUBSTRATE)

Table 5.2- Performance of Flooring Species

Flooring Species	Thickness (mm)	Performance	
		CRF (kW/m ²)	Smoke Develop. Rate (%-Mins)
Beech Myrtle - <i>Northofagus cunninghamii</i>	12mm or greater	Greater than or equal to 4.5	<750
Blackbutt, New England - <i>Eucalyptus andrewsii</i>			
Bloodwood Red - <i>Eucalyptus gummifera</i>			
Box, Brush - <i>Lophostman confertus</i>			
Box, Grey – <i>Eucalyptus microcarpa</i>			
Gum, Blue, Southern (TAS) - <i>Eucalyptus globulus</i>			
Gum, Blue, Southern (VIC) - <i>Eucalyptus globulus</i>			
Gum, Blue, Sydney- <i>Eucalyptus Saligna</i>			
Gum, Red, River - <i>Eucalyptus camaldulensis</i>			
Gum, Spotted - <i>Corymbia maculata</i>			
Gum, Sugar - <i>Eucalyptus cladocalyx</i>			
Gum, Yellow - <i>Eucalyptus leucoxylon</i>			
Ironbark, Grey – <i>Eucalyptus drepanophylla</i>			
Ironbark, Red - <i>Eucalyptus sideroxylon</i>			
Jarraah - <i>Eucalyptus marginata</i>			
Karri - <i>Eucalyptus diversicolor</i>			
Mahogany, Red - <i>Eucalyptus resinifera</i>			
Merbau - <i>Instia bijuga</i>			
Pine, White Cypress - <i>Callitris glaucophylla</i>			
Stringy Bark, Yellow- <i>Eucalyptus muellerana</i>			
Tallowwood - <i>Eucalyptus microcorys</i>			
Turpentine – <i>Syncarpa glomulifera</i>			
Wattle, Silver – <i>Acacia dealbata</i>			

5.3 TIMBER FLOORING 12MM OR THICKER ON A SUBSTRATE

Table 5.3 Proposed Flooring Substrates

Substrate	Thickness (mm)
Particleboard 716 kg/m ³	19 mm or greater
Fibre Cement	15 mm or greater
Normal Weight Concrete Floor	75 mm or greater
Light Weight Concrete Floor	75 mm or greater

Table 5.4 Timber Flooring Options for Proposed Substrate

Flooring Species	Thickness (mm)	Performance	
		CRF (kW/m ²)	Smoke Develop. Rate (%-Mins)
Ash, Alpine - <i>Eucalyptus delegatensis</i>	12mm or greater	Greater than or equal to 1.2 and less than 4.5	<750
Ash, Mountain – <i>Eucalyptus regnans</i>			
Ash, Silvertop - <i>Eucalyptus sieberi</i>			
Beech Myrtle - <i>Northofagus cunnighamii</i>			
Blackbutt - <i>Eucalyptus pilularis</i>			
Blackbutt, New England - <i>Eucalyptus andrewsii</i>			
Bloodwood Red - <i>Eucalyptus gummifera</i>			
Box, Brush - <i>Lopehostman confertus</i>			
Box, Grey – <i>Eucalyptus microcarpa</i>			
Brownbarrel - <i>Eucalyptus fastigata</i>			
Gum, Blue, Southern (TAS) - <i>Eucalyptus globulus</i>			
Gum, Blue, Southern (VIC) - <i>Eucalyptus globulus</i>			
Gum, Blue, Sydney - <i>Eucalyptus saligna</i>			
Gum, Manna - <i>Eucalyptus viminalis</i>			
Gum, Red, River - <i>Eucalyptus camaldulensis</i>			
Gum, Rose – <i>Eucalyptus grandis</i>			
Gum, Shining – <i>Eucalyptus nitens</i>			
Gum, Spotted - <i>Corymbia maculata</i>			
Gum, Sugar - <i>Eucalyptus cladocalyx</i>			
Gum, Yellow - <i>Eucalyptus leucoxylon</i>			
Ironbark, Grey – <i>Eucalyptus drepanophylla</i>			
Ironbark, Red - <i>Eucalyptus sideroxylon</i>			
Jarrah - <i>Eucalyptus marginata</i>			
Karri - <i>Eucalyptus diversicolor</i>			
Mahogany, Red - <i>Eucalyptus resinifera</i>			
Merbau - <i>Instia bijuga</i>			
Messmate - <i>Eucalyptus obliqua</i>			
Pine, White Cypress - <i>Callitris glaucophylla</i>			
Stringy Bark, Yellow - <i>Eucalyptus muellerana</i>			
Tallowwood - <i>Eucalyptus microcorys</i>			
Turpentine – <i>Syncarpa glomulifera</i>			
Wattle, Silver – <i>Acacia dealbata</i>			

5.4 PLYWOOD FLOORING 15 MM OR THICKER (NO SUBSTRATE)

Table 5.5 Plywood Flooring Options (No Substrate)-CRF 1.2 and less than 2.2 KW/m²

Species of Plywood Flooring	Thickness (mm)	Performance	
		CRF (kW/m²)	Smoke Development Rate (%- Mins)
Pine, Radiata – <i>Pinus radiata</i>	15mm or greater	Greater than or equal to 1.2 and less than 2.2	<750
Pine, Slash – <i>Pinus elliottii</i>			
Pine, Hoop - <i>Araucaria cunninghamii</i>			
Pine, Radiata – <i>Pinus radiata</i>	17mm or greater		
Pine, Slash – <i>Pinus elliottii</i>			

Table 5.6 Plywood Flooring Options (No Substrate)-CRF 2.2 and less than 4.5 KW/m²

Species of Plywood Flooring	Thickness (mm)	Performance	
		CRF (kW/m ²)	Smoke Development Rate (%- Mins)
Pine, Hoop - <i>Araucaria cunninghamii</i>	15mm or greater	Greater than or equal to 2.2 and less than 4.5	<750
Pine, Radiata – <i>Pinus radiata</i>	17mm or greater		
Pine, Slash – <i>Pinus elliottii</i>			

5.5 PLYWOOD FLOORING 15MM OR THICKER ON A SUBSTRATE

Table 5.7 Proposed Flooring Substrates

Substrate	Thickness (mm)
Particleboard 716 kg/m ³	19mm or greater
Fibre cement	15mm or greater
Normal Weight Concrete floor	75mm or greater
Light Weight Concrete floor	75mm or greater

Table 5.8 Plywood Flooring Options for Proposed Substrate-CRF 1.2 and less than 2.2 KW/m²

Species of Plywood Flooring	Thickness (mm)	Performance	
		CRF (kW/m ²)	Smoke Development Rate (%- Mins)
Pine, Radiata – <i>Pinus radiata</i>	15mm or greater	Greater than or equal to 1.2 and less than 2.2	<750
Pine, Slash – <i>Pinus elliottii</i>			
Pine, Hoop <i>Araucaria cunninghamii</i>			
Pine, Radiata – <i>Pinus radiata</i>	17mm or greater		
Pine, Slash – <i>Pinus elliottii</i>			

Table 5.9 Plywood Flooring Options for Proposed Substrate- CRF 2.2 and less than 4.5 KW/m²

Species of Plywood Flooring	Thickness (mm)	Performance	
		CRF (kW/m ²)	Smoke Development Rate (%- Mins)
Pine, Hoop - <i>Araucaria cunninghamii</i>	15mm or greater	Greater than or equal to 2.2 and less than 4.5	<750
Pine, Radiata – <i>Pinus radiata</i>	17mm or greater		
Pine, Slash – <i>Pinus elliottii</i>			

6 DIRECT FIELD OF APPLICATION

The referenced assessment report applies to floors of buildings that are required to have Fire Hazard Properties in accordance with NCC Specification C1.10.

The results of the referenced assessment report are based on actual test data and the scope is necessarily limited to the specifications indicated in section 3 and discussed in the appendices of the assessment.

7 REQUIREMENTS

The referenced assessment report details the methods of construction, test conditions and assessed results that would have been expected had the specific elements of construction described herein been tested in accordance with AS/ISO 9239.1-2003.

Any further variations other than those identified in this report, may invalidate the conclusions drawn in this report.

8 VALIDITY

The referenced assessment report does not provide an endorsement by Exova Warringtonfire Aus Pty Ltd of the actual products supplied.

The conclusions of the referenced assessment report 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.

Because of 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.

The referenced assessment report can therefore only relate only to the actual prototype test specimens, testing conditions, and methodology described in the supporting data, and does not imply any performance abilities of constructions of subsequent manufacture.

The referenced assessment report 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 the subject of constant review and improvement and it is recommended that this report be reviewed on or, before, the stated expiry date.

The information contained in the referenced assessment report shall not be used for the assessment of variations other than those stated in the conclusions above. The assessment is valid provided no modifications are made to the systems detailed in this report. All details of construction should be consistent with the requirements stated in the relevant test reports and all referenced documents.

9 AUTHORITY

9.1 APPLICANT UNDERTAKINGS AND CONDITIONS OF USE

By using this report as evidence of compliance or performance the applicant(s) confirms 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, and
- they agree to withdraw this assessment from circulation should the component or element of structure be 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, and
- 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, agree to ask the assessing authority to withdraw the assessment.

9.2 GENERAL CONDITIONS OF USE

This report may only be reproduced in full without modifications by the report sponsor. Copies, extracts or abridgments of this report in any form shall not be published by other organisations without the permission of Exova Warringtonfire Aus Pty Ltd.

9.3 AUTHORISATION ON BEHALF OF EXOVA WARRINGTONFIRE AUS PTY LTD

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Revised by:



O.Saad

9.4 DATE OF ISSUE

19/06/2018

9.5 EXPIRY DATE

30/06/2023



REGULATORY INFORMATION REPORT

Fire Hazard Properties of timber floor, wall and ceiling
linings in accordance with requirements of NCC 2019 Volume
One

Client: Forest and Wood Products Australia Limited

Job number: 41117 Issuing consultant: Tanmay Bhat

Date: 17/05/2019 Revision: R9.0

DOCUMENT REVISION STATUS

Date Issued	Issue No	Description
27/05/2005	RIR 41117.1	Initial Issue
01/05/2012	RIR 41117.2	Revised to include reference to Specification C1.10 of BCA 2012 and report reformatted.
30/10/2015	RIR 41117.3	Revised report sponsor
21/12/2015	RIR 41117.4	Revised report sponsor address and typographical amendment
29/07/2016	RIR 41117.5	Typographical amendment
09/08/2016	RIR 41117.6	Revised to include reference to Specification C1.10 of NCC 2015 Volume One
22/03/2018	RIR 41117.7	Revised to extend validity for 5 Years and correct typographical mistakes
26/02/2019	RIR 41117.8	Revise to include requirements of AS 5637.1:2015
17/05/2019	RIR 41117.9	Revised to include reference to Specification C1.10 of NCC 2019 Volume One

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CONTENTS

1	INTRODUCTION	4
2	SUMMARY OF REQUIREMENTS OF NCC Volume One, SPECIFICATION C1.10	4
	2.1 Wall and Ceiling Lining materials	4
	2.2 Flooring materials	6
	2.3 Tested Materials	7
3	TEST RESULTS	9
4	VALIDITY 11	
5	AUTHORITY	12
	5.1 Applicant Undertakings and Conditions of Use	12
	5.2 General Conditions of Use	12
	5.3 Authorisation on Behalf of Warringtonfire Aus Pty Ltd	12
	5.4 Date of Issue	12
	5.5 Expiry Date	12

1 INTRODUCTION

This report contains the minimum information sufficient for regulatory compliance and refers to the assessment report EWFA 41117.9. The referenced report is prepared at the request of Forest and Wood Products Australia Limited (FWPA) as a summary on the fire hazard properties of various timber species to be used as floor, wall and ceiling linings, in accordance with the requirements of NCC 2019 Volume One. Specification C1.10 (Fire hazard properties) sets out requirements and relevant test standards to determine the fire hazard properties of linings, materials and assemblies in Class 2 to 9 buildings. The referenced report is not intended to be a comprehensive assessment on the fire hazard properties of all timber species.

2 SUMMARY OF REQUIREMENTS OF NCC VOLUME ONE, SPECIFICATION C1.10

2.1 WALL AND CEILING LINING MATERIALS

The NCC requires a wall or ceiling lining system to comply with the group numbers specified in Table 1. For buildings not fitted with a sprinkler system (other than FPAA101D or FPAA101H) complying with Specification E1.5, the NCC also requires the following:

1. A smoke growth rate index not more than 100; or
2. A specific extinction area less than 250 m²/kg.

Table 1: Wall and Ceiling Lining Materials (Material Groups Permitted). Source: NCC 2019 Volume One.

Class of building	Fire-isolated exits and fire control rooms	Public corridors	Specific areas	Other areas
Class 2 or 3, Unsprinklered Excluding accommodation for the aged, people with disabilities, and children	Walls: 1 Ceilings: 1	Walls: 1, 2 Ceilings: 1, 2	Walls: 1, 2, 3 Ceilings: 1, 2, 3	Walls: 1, 2, 3 Ceilings: 1, 2, 3
Class 2 or 3, Sprinklered Excluding accommodation for the aged, people with disabilities, and children	Walls: 1 Ceilings: 1	Walls: 1, 2, 3 Ceilings: 1, 2, 3	Walls: 1, 2, 3 Ceilings: 1, 2, 3	Walls: 1, 2, 3 Ceilings: 1, 2, 3
Class 3 or 9a, Unsprinklered Accommodation for the aged, people with a disability, children and health-care buildings	Walls: 1 Ceilings: 1	Walls: 1 Ceilings: 1	Walls: 1, 2 Ceilings: 1, 2	Walls: 1, 2, 3 Ceilings: 1, 2, 3
Class 3 or 9a, Sprinklered Accommodation for the aged, people with a disability, children and health-care buildings	Walls: 1 Ceilings: 1	Walls: 1, 2 Ceilings: 1, 2	Walls: 1, 2, 3 Ceilings: 1, 2, 3	Walls: 1, 2, 3 Ceilings: 1, 2, 3
Class 5, 6, 7, 8 or 9b schools , Unsprinklered	Walls: 1 Ceilings: 1	Walls: 1, 2 Ceilings: 1, 2	Walls: 1, 2, 3 Ceilings: 1, 2	Walls: 1, 2, 3 Ceilings: 1, 2,

Class of building	Fire-isolated <i>exits</i> and fire control rooms	Public corri- dors	Specific areas	Other areas
				3
Class 5, 6, 7, 8 or 9b <i>schools</i> , Sprinklered	Walls: 1 Ceilings: 1	Walls: 1, 2, 3 Ceilings: 1, 2, 3	Walls: 1, 2, 3 Ceilings: 1, 2, 3	Walls: 1, 2, 3 Ceilings: 1, 2, 3
Class 9b other than <i>schools</i> , Unsprinklered	Walls: 1 Ceilings: 1	Walls: 1 Ceilings: 1	Walls: 1, 2 Ceilings: 1, 2	Walls: 1, 2, 3 Ceilings: 1, 2, 3
Class 9b other than <i>schools</i> , Sprinklered	Walls: 1 Ceilings: 1	Walls: 1, 2 Ceilings: 1, 2	Walls: 1, 2, 3 Ceilings: 1, 2, 3	Walls: 1, 2, 3 Ceilings: 1, 2, 3
Class 9c, Sprinklered	Walls: 1 Ceilings: 1	Walls: 1, 2 Ceilings: 1, 2	Walls: 1, 2, 3 Ceilings: 1, 2, 3	Walls: 1, 2, 3 Ceilings: 1, 2, 3

The group number is a measure of ignitability and heat release rate of a material, expressed as a number from 1 to 4, depending on when the material reaches flashover. It can be determined by either:

1. Physical testing in accordance with AS ISO 9705 – 2003; or
2. Small scale testing at 50 kW/m² irradiance in the horizontal orientation in accordance with ISO 5660-1 or AS/NZS 3837.

The procedures and test methodologies to determine the group numbers are prescribed in AS5637.1:2015. The selection of test methods depends upon the type of material, as shown in Figure 1. Refer to the standard for more details.

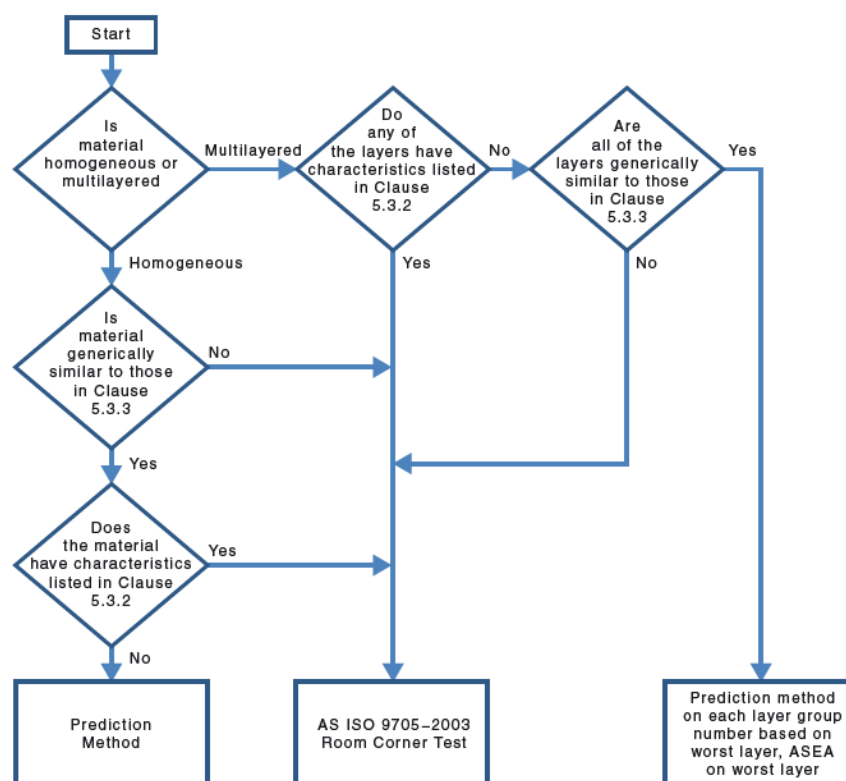


Figure 1: Guidance on selection of test methods. Source: AS 5637.1:2015

2.2 FLOORING MATERIALS

The NCC defines the performance of flooring materials in terms of the critical radiant flux and smoke development rate when tested in accordance with AS ISO 9239.1-2003 Reaction to fire tests for floorings Part 1: Determination of the burning behaviour using a radiant heat source. The critical radiant flux is the incident heat flux expressed in kW/m², at the surface of a specimen at the point where the flame ceases to advance and may subsequently extinguish.

The NCC Specification C1.10 defines the required critical radiant flux for various classes of buildings. It is reproduced below in Table 2 for reference:

Table 2 - NCC Specification C1.10 Critical Heat Flux requirements for flooring materials and floor coverings. Source: NCC 2019 Volume One.

Class of building	Building not fitted with a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification E1.5	Building fitted with a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification E1.5	Fire-isolated <i>exits</i> and fire control rooms
Class 2, 3, 5, 6, 7, 8 or 9b, excluding— (i) Class 3 accommodation for the aged; and (ii) Class 9b as specified below	2.2 kW/m ²	1.2 kW/m ²	2.2 kW/m ²
Class 3	4.5 kW/m ²	2.2 kW/m ²	4.5 kW/m ²

Class of building	Building not fitted with a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification E1.5	Building fitted with a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification E1.5	Fire-isolated <i>exits</i> and fire control rooms
Accommodation for the aged			
Class 9a <i>Patient care areas</i>	4.5 kW/m ²	2.2 kW/m ²	4.5 kW/m ²
Class 9a Areas other than <i>patient care areas</i>	2.2 kW/m ²	1.2 kW/m ²	4.5 kW/m ²
Class 9b auditorium or audience seating area used mainly for indoor swimming or ice skating	1.2 kW/m ²	1.2 kW/m ²	2.2 kW/m ²
Class 9b auditorium or audience seating area used mainly for— other sports or multi-purpose functions.	2.2 kW/m ²	1.2 kW/m ²	2.2 kW/m ²
Class 9c <i>resident use areas.</i>	N/A	2.2 kW/m ²	4.5 kW/m ²
Class 9c Areas other than <i>resident use areas.</i>	N/A	1.2 kW/m ²	4.5 kW/m ²

In a building not protected by a sprinkler system complying with Specification E1.5, a maximum smoke development rate of 750 percent-minutes is additionally prescribed by the NCC.

2.3 TESTED MATERIALS

The timber species and average densities that have been evaluated for wall and ceiling linings of the test samples are summarised in Table 3. Solid timber is considered essentially homogeneous and satisfies the requirements of clauses 4.4 and 5.3.3 of AS 5637.1:2015. Hence, group numbers and times to flashover for solid timber species were determined using empirical correlations based on cone calorimetry (AS/NZS 3837) tests.

The specimens incorporated a solid section or a single tongue and groove joint and were of smooth milled finish and 100mm × 100mm in size.

Table 3 Details of wall and ceiling test specimens

Timber species	Thickness (mm)	Density (kg/m ³)
Ash, Alpine - <i>Eucalyptus delegatensis</i>	19.2	603
Ash, Mountain - <i>Eucalyptus regnans</i>	19.5	686
Ash, Silvertop - <i>Eucalyptus sieberi</i>	19.6	838
Beech Myrtle - <i>Northofagus cunninghamii</i>	19.1	689
Blackbutt - <i>Eucalyptus pilularis</i>	19.1	898
Blackbutt, New England (1) - <i>Eucalyptus andrewsii</i>	19.1	939
Blackbutt, New England (2) - <i>Eucalyptus andrewsii</i>	19.2	874
Blackbutt, WA - <i>Eucalyptus pantens</i>	11.9	878
Blackwood - <i>Acacia melanoxylon</i>	19.2	632
Bloodwood Red - <i>Corymbia gummifera</i>	19	839
Box, Brush - <i>Lophostman confertus</i>	19.1	845
Box, Grey - <i>Eucalyptus microcarpa</i>	19	1,112
Box, Grey, Coast - <i>Eucalyptus bosistoana</i>	19	1119
Brownbarrel - <i>Eucalyptus fastigata</i>	19.5	770
Gum, Blue, Sydney - <i>Eucalyptus saligna</i>	19.1	733
Gum, Blue, Southern (TAS) - <i>Eucalyptus globulus</i>	19.1	776
Gum, Blue, Southern (VIC) - <i>Eucalyptus globulus</i>	19.3	937
Gum, Manna - <i>Eucalyptus viminalis</i>	19	769
Gum, Red, River - <i>Eucalyptus camaldulensis</i>	18.8	846
Gum, Rose - <i>Eucalyptus grandis</i>	19.1	720
Gum, Shining - <i>Eucalyptus nitens</i>	19.5	569
Gum, Spotted - <i>Corymbia maculata</i>	19.2	989
Gum, Sugar - <i>Eucalyptus cladocalyx</i>	19.1	1031
Gum, Yellow - <i>Eucalyptus leucoxylon</i>	19.1	1015
Ironbark, Grey - <i>Eucalyptus drepanophylla</i>	19	1,086
Ironbark, Red - <i>Eucalyptus sideroxylon</i>	19.2	1088
Jarra - <i>Eucalyptus marginata</i>	19.2	834
Karri - <i>Eucalyptus diversicolor</i>	19.1	982
Mahogany, Red - <i>Eucalyptus resinifera</i>	19.2	876
Marri - <i>Eucalyptus callophylla</i>	11.9	814
Merbau - <i>Instia bijuga</i>	19	860
Messmate - <i>Eucalyptus obliqua</i>	19.3	754
Pine, Baltic - <i>Picea abies</i>	21.9	426
Pine, White Cypress - <i>Callitris glaucophylla</i>	20	667
Sheoak, WA - <i>Allocosuarina fraseriana</i>	11.9	689
Stringy Bark, Yellow - <i>Eucalyptus muellerana</i>	18.7	822
Tallowwood - <i>Eucalyptus microcorys</i>	19.2	990
Turpentine - <i>Syncarpa glomulifera</i>	19.1	1072
Wattle, Silver - <i>Acacia dealbata</i>	18.6	604

The timber species and average densities of the test samples that have been evaluated for flooring materials are summarised in Table 4. Each specimen incorporated tongue and groove joints was of smooth milled finish and 1050mm × 230mm in size.

Initial screening tests were carried out to ascertain the most severe orientation (grain parallel or perpendicular to the radiant heat source) and then the program completed by testing the most severe orientation.

Table 4 Details of flooring test specimens

Timber species	Thickness (mm)	Density (kg/m ³)
Ash, Alpine - <i>Eucalyptus delegatensis</i>	19.2	661
Ash, Mountain – <i>Eucalyptus regnans</i>	19.5	610
Ash, Silvertop - <i>Eucalyptus sieberi</i>	19.6	860
Beech Myrtle - <i>Northofagus cunninghamii</i>	19.1	736
Blackbutt - <i>Eucalyptus pilularis</i>	19.2	909
Blackbutt, New England (1) - <i>Eucalyptus andrewsii</i>	19.2	957
Blackbutt, New England (2) - <i>Eucalyptus andrewsii</i>	19.2	1060
Blackwood - <i>Acacia melanoxylon</i>	19.3	588
Bloodwood Red - <i>Eucalyptus gummifera</i>	19.0	897
Box, Brush - <i>Lophostman confertus</i>	19.3	844
Box, Grey – <i>Eucalyptus microcarpa</i>	19.1	1,093
Brownbarrel - <i>Eucalyptus fastigata</i>	19.5	789
Gum, Blue, Sydney - <i>Eucalyptus saligna</i>	19.3	800
Gum, Blue, Southern (TAS) - <i>Eucalyptus globulus</i>	19.1	759
Gum, Blue, Southern (VIC) - <i>Eucalyptus globulus</i>	19.5	924
Gum, Manna - <i>Eucalyptus viminalis</i>	19.1	744
Gum, Red, River - <i>Eucalyptus camaldulensis</i>	18.9	845
Gum, Rose – <i>Eucalyptus grandis</i>	19.1	691
Gum, Shining – <i>Eucalyptus nitens</i>	19.5	708
Gum, Spotted - <i>Corymbia maculata</i>	19.2	974
Gum, Sugar - <i>Eucalyptus cladocalyx</i>	19.5	1038
Gum, Yellow - <i>Eucalyptus leucoxylon</i>	19.2	1001
Ironbark, Grey – <i>Eucalyptus drepanophylla</i>	19.1	1093
Ironbark, Red - <i>Eucalyptus sideroxylon</i>	19.1	1158
Jarra - <i>Eucalyptus marginata</i>	19.3	853
Karri - <i>Eucalyptus diversicolor</i>	19.1	980
Mahogany, Red - <i>Eucalyptus resinifera</i>	19.2	938
Merbau - <i>Instia bijuga</i>	19.0	842
Messmate - <i>Eucalyptus obliqua</i>	19.3	771
Pine, Celerytop - <i>Phyllocladus asplenifolius</i>	19.4	588
Pine, Radiata – <i>Pinus Radiata</i>	19.6	530
Pine, White Cypress - <i>Callitris glaucophylla</i>	20.1	674
Stringy Bark, Yellow - <i>Eucalyptus muellerana</i>	18.9	820
Tallowwood - <i>Eucalyptus microcorys</i>	19.2	994
Turpentine – <i>Syncarpa glomulifera</i>	19.2	1044
Wattle, Silver – <i>Acacia dealbata</i>	19.0	597

The Messmate results were subject to high variability and therefore the lowest result was reported. Subsequent test may result in this value being increased.

3 TEST RESULTS

Table 5 summarises the test results obtained for wall and ceiling linings:

Table 5 Wall and Ceiling Lining Results

Timber species	Group Number	Average specific extinction area (m ² /kg)
Ash, Alpine - <i>Eucalyptus delegatensis</i>	3	<10
Ash, Mountain - <i>Eucalyptus regnans</i>	3	<10
Ash, Silvertop - <i>Eucalyptus sieberi</i>	3	<10
Beech Myrtle - <i>Northofagus cunninghamii</i>	3	<10
Blackbutt - <i>Eucalyptus pilularis</i>	3	<10
Blackbutt, New England (1) - <i>Eucalyptus andrewsii</i>	3	<10
Blackbutt, New England (2) - <i>Eucalyptus andrewsii</i>	3	<10
Blackbutt, WA - <i>Eucalyptus pantens</i>	3	<10
Blackwood - <i>Acacia melanoxylon</i>	3	<10
Bloodwood Red - <i>Corymbia gummifera</i>	3	<10
Box, Brush - <i>Lophostman confertus</i>	3	<10
Box, Grey - <i>Eucalyptus microcarpa</i>	3	<10
Box, Grey, Coast - <i>Eucalyptus bosistoana</i>	3	<10
Brownbarrel - <i>Eucalyptus fastigata</i>	3	<10
Gum, Blue, Sydney - <i>Eucalyptus saligna</i>	3	<10
Gum, Blue, Southern (TAS) - <i>Eucalyptus globulus</i>	3	<10
Gum, Blue, Southern (VIC) - <i>Eucalyptus globulus</i>	3	<10
Gum, Manna - <i>Eucalyptus viminalis</i>	3	<10
Gum, Red, River - <i>Eucalyptus camaldulensis</i>	3	<10
Gum, Rose - <i>Eucalyptus grandis</i>	3	<10
Gum, Shining - <i>Eucalyptus nitens</i>	3	<10
Gum, Spotted - <i>Corymbia maculata</i>	3	<10
Gum, Sugar - <i>Eucalyptus cladocalyx</i>	3	<10
Gum, Yellow - <i>Eucalyptus leucoxylon</i>	3	<10
Ironbark, Grey - <i>Eucalyptus drepanophylla</i>	3	<10
Ironbark, Red - <i>Eucalyptus sideroxylon</i>	3	<10
Jarra - <i>Eucalyptus marginata</i>	3	<10
Karri - <i>Eucalyptus diversicolor</i>	3	<10
Mahogany, Red - <i>Eucalyptus resinifera</i>	3	<10
Marri - <i>Eucalyptus callophylla</i>	3	<10
Merbau - <i>Instia bijuga</i>	3	<10
Messmate - <i>Eucalyptus obliqua</i>	3	<10
Pine, Baltic - <i>Picea abies</i>	3	<10
Pine, White Cypress - <i>Callitris glaucophylla</i>	3	<10
Sheoak, WA - <i>Allocosuarina fraseriana</i>	3	<10
Stringy Bark, Yellow - <i>Eucalyptus muellerana</i>	3	<10
Tallowwood - <i>Eucalyptus microcorys</i>	3	<10
Turpentine - <i>Syncarpa glomulifera</i>	3	<10
Wattle, Silver - <i>Acacia dealbata</i>	3	<10

Table 6 summarises the test results obtained for flooring materials:

Table 6 Flooring Results

Timber species	Critical Radiant Flux (kW/m ²)	Smoke Development Rate (%-min)
Ash, Alpine - <i>Eucalyptus delegatensis</i>	3.6	10
Ash, Mountain - <i>Eucalyptus regnans</i>	2.7	10
Ash, Silvertop - <i>Eucalyptus sieberi</i>	4.1	16
Beech Myrtle - <i>Northofagus cunninghamii</i>	4.5	12
Blackbutt - <i>Eucalyptus pilularis</i>	4.3	5
Blackbutt, New England (1) - <i>Eucalyptus andrewsii</i>	6.5	6
Blackbutt, New England (2) - <i>Eucalyptus andrewsii</i>	4.9	8
Blackwood - <i>Acacia melanoxylon</i>	5.7	3
Bloodwood Red - <i>Eucalyptus gummifera</i>	6.2	9
Box, Brush - <i>Lophostosia confertus</i>	5.0	19
Box, Grey - <i>Eucalyptus microcarpa</i>	8.8	6
Brownbarrel - <i>Eucalyptus fastigata</i>	4.3	9
Gum, Blue, Sydney - <i>Eucalyptus saligna</i>	3.9	23
Gum, Blue, Southern (TAS) - <i>Eucalyptus globulus</i>	6.4	13
Gum, Blue, Southern (VIC) - <i>Eucalyptus globulus</i>	5.0	12
Gum, Manna - <i>Eucalyptus viminalis</i>	3.6	9
Gum, Red, River - <i>Eucalyptus camaldulensis</i>	6.3	1
Gum, Rose - <i>Eucalyptus grandis</i>	3.4	16
Gum, Shining - <i>Eucalyptus nitens</i>	3.7	13
Gum, Spotted - <i>Corymbia maculata</i>	8.6	11
Gum, Sugar - <i>Eucalyptus cladocalyx</i>	6.3	1
Gum, Yellow - <i>Eucalyptus leucoxylon</i>	5.6	1
Ironbark, Grey - <i>Eucalyptus drepanophylla</i>	8.4	1
Ironbark, Red - <i>Eucalyptus sideroxylon</i>	9.6	11
Jarraah - <i>Eucalyptus marginata</i>	8.2	7
Karri - <i>Eucalyptus diversicolor</i>	5.9	4
Mahogany, Red - <i>Eucalyptus resinifera</i>	7.1	10
Merbau - <i>Instia bijuga</i>	9.9	1
Messmate - <i>Eucalyptus obliqua</i>	3.6	6
Pine, Celerytop - <i>Phyllocladus asplenifolius</i>	3.5	29
Pine, Radiata - <i>Pinus radiata</i>	3.5	7
Pine, White Cypress - <i>Callitris glaucophylla</i>	8.5	19
Stringy Bark, Yellow - <i>Eucalyptus muellerana</i>	3.5	1
Tallowwood - <i>Eucalyptus microcorys</i>	5.1	4
Turpentine - <i>Syncarpa glomulifera</i>	7.0	2
Wattle, Silver - <i>Acacia dealbata</i>	5.9	2

All the maximum smoke development rates were substantially below the limit of 750 percent-minutes.

The Messmate results were subject to high variability and therefore the lowest result was reported. Subsequent test may result in this value being increased.

4 VALIDITY

The referenced assessment report does not provide an endorsement by Warringtonfire Aus Pty Ltd of the actual products supplied.

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.

Because of 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.

The assessment can therefore only relate only to the actual prototype test specimens, testing conditions, and methodology described in the supporting data, and does not imply any performance abilities of constructions of subsequent manufacture.

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 the subject of constant review and improvement and it is recommended that this report be reviewed on or, before, the stated expiry date.

The information contained in this report shall not be used for the assessment of variations other than those stated in the conclusions above. The assessment is valid provided no modifications are made to the systems detailed in this report. All details of construction should be consistent with the requirements stated in the relevant test reports and all referenced documents.

5 AUTHORITY

5.1 APPLICANT UNDERTAKINGS AND CONDITIONS OF USE

By using this report as evidence of compliance or performance, the applicant(s) confirms 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, and
- they agree to withdraw this assessment from circulation should the component or element of structure be 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, and
- 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, agree to ask the assessing authority to withdraw the assessment.

5.2 GENERAL CONDITIONS OF USE

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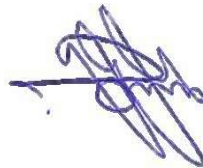
5.3 AUTHORISATION ON BEHALF OF WARRINGTONFIRE AUS PTY LTD

Prepared by:



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5.4 DATE OF ISSUE

17/05/2019

5.5 EXPIRY DATE

31/03/2023



REGULATORY INFORMATION REPORT

Fire hazard properties of timber veneers on standard MDF
and particleboard substrates in accordance with
AS 5637.1:2015

Client: Forest and Wood Products Australia Ltd

Report number: 45982 Revision: R13.0

DOCUMENT REVISION STATUS

Date Issued	Issue No	Description
25/09/06	RIR 45982.1	Initial Issue
15/06/07	RIR 45982.2	Extension of application to any timber veneers
09/04/10	RIR 45982.3	Extension of application to any timber veneers and adhesives
04/05/10	RIR 45982.4	Typographical amendment
07/07/10	RIR 45982.5	Typographical amendment
19/5/2011	RIR 45982.6	Inclusion of Pyrotech flame retardant MDF as a substrate
12/8/2011	RIR 45982.7	Inclusion of FLAMEBLOCK™ FRMDF flame retardant MDF as a substrate
15/8/2011	RIR 45982.8	Typographical amendment
19/09/2011	RIR 45982.9	Typographical amendment
21/12/2015	RIR 45982.10	Revised to change the details of report sponsor
23/09/2016	RIR 45982.11	Revised to confirm validity with respect to 2016 NCC
18/03/2019	RIR 45982.12	Revalidation in accordance with AS 5637.1:2015
24/09/2019	RIR 45982.13	Revised to include proposed variation to timber veneer thickness

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CONTENTS

1	INTRODUCTION	4
2	TESTED PROTOTYPES	4
3	VARIATION TO TESTED PROTOTYPES	6
3.1	Timber veneers on MDF and particleboard substrates	6
4	REFERENCED TEST PROCEDURES	6
5	FORMAL ASSESSMENT SUMMARY	6
6	DIRECT FIELD OF APPLICATION	7
7	REQUIREMENTS	7
8	VALIDITY	7
9	AUTHORITY	8
9.1	Applicant Undertakings and Conditions of Use	8
9.2	General Conditions of Use	8
9.3	Authorisation on behalf of Warringtonfire Australia	8
9.4	Date of Issue	8
9.5	Expiry Date	8

1 INTRODUCTION

This report contains the minimum information sufficient for regulatory compliance and refers to the assessment report Warringtonfire 45982.13. The referenced report was prepared at the request of the Forest and Wood Products Australia (FWPA) as an assessment on the fire hazard properties of timber veneers on Medium Density Fibreboard (MDF) and particleboard substrates for use as wall and ceiling linings in accordance with the requirements of AS 5637.1:2015.

The tested prototypes described in section 2 of this report, when subjected to the proposed variations described in section 3 and tested in accordance with the relevant standards described in section 4, are assessed to achieve performance as summarised in section 5.

The validity of this assessment is conditional on compliance with sections 6, 7, 8 and 9 of this report.

2 TESTED PROTOTYPES

The referenced assessment report is based on the reports summarised in Tables 1 and 2 referring to tests on veneered MDF and particleboard products. The reports were sponsored by Timber Development Association NSW Ltd and undertaken by Warringtonfire Australia, CSIRO and BRANZ.

Table 1 – Referenced AS3837 Tests of Solid Timber

WFRA 499163j	WFRA 499163f	WFRA 499163t	WFRA 499140f
WFRA 499163b	WFRA 499163k	WFRA 499182l	WFRA 499163q
WFRA 499240d	WFRA 499140d	WFRA 499163r	WFRA 499182k
WFRA 499163i	WFRA 499163s	WFRA 499163d	WFRA 499182e
WFRA 499240b	WFRA 499182n	WFRA 499163p	WFRA 499163n
WFRA 499163h	WFRA 499163e	WFRA 499182j	WFRA 499182h
WFRA 499140a	WFRA 499240c	WFRA 499182b	WFRA 499240n
WFRA 499163l	WFRA 499163c	WFRA 499163u	WFRA 499240a
WFRA 499163v	WFRA 499163g	WFRA 499182m	WFRA 499182i
WFRA 499140e	WFRA 499182c	WFRA 499182d	FH4384
WFRA 499182f	WFRA 499140b	WFRA 499163a	FH4385
WFRA 499182g	WFRA 499163o	WFRA 499140c	FH4389
FH4391	FH4392	FH4393	FH4394
FH4390			

Table 2 – Referenced AS/NZS3837 Tests of Particleboard and MDF

Report	Species	Total Thickness
WFRA 499240g	Medium Density Fibreboard (MDF)	12mm
WFRA 499240k	Particleboard	12mm
WFRA 2146200E	Medium Density Fibreboard (MDF)	12mm
CMIT 02/276	Medium Density Fibreboard (MDF)	12mm
FH4386	Medium Density Fibreboard (MDF) faced with PVA adhesive	6.5mm
FH4388	Medium Density Fibreboard (MDF) faced with Resorcinol adhesive	6.5mm

Table 3 – Referenced AS/NZS3837 Tests of Veneered Particleboard and MDF

Report	Species	Total Thickness
WFRA 499240H.1	0.6mm Ash, Alpine (<i>Eucalyptus Sieberi</i>) veneer on each side of 12mm thick MDF	13.5mm
WFRA 499240J.1	0.6mm Box, Brush (<i>Lophostman confertus</i>) veneer on each side of 12mm thick MDF	13.5mm
WFRA 499240L.1	0.6mm Ash, Alpine (<i>Eucalyptus Sieberi</i>) veneer on each side 12mm thick Particleboard	13.5mm
WFRA 499240M.1	0.6mm Box, Brush (<i>Lophostman confertus</i>) veneer on each side of 12mm Particleboard	13.5mm
CMIT 02/276	Tasmanian Oak Veneer on 12mm thick Particleboard	12mm

3 VARIATION TO TESTED PROTOTYPES

3.1 Timber veneers on MDF and particleboard substrates

The following combinations of timber veneers can be bonded to particleboard or MDF substrates and obtain the Group numbers described in Table 6, if tested in accordance with the requirements of AS 5637.1:2015.

Table 4: Summary of Proposed Lining Construction

Substrate	
Material	Particleboard 6mm minimum thickness and a Dry Density nominally 700kg/m ³
	MDF 6mm minimum thickness and a Dry Density 560kg/m ³ to 740kg/m ³
Veneers for all Substrates	
Material	Unmodified untreated timber or CCA treated Radiata pine
Thickness	Up to 1.2 mm
Seasoned Density	Veneer density Up to 1120 kg/m ³ for Particleboard and standard MDF substrates
Adhesive Material	PVA or Resorcinol
Position of Veneers	A timber veneer shall be applied to each face, though does not have to be of the same species on each side

4 REFERENCED TEST PROCEDURES

This assessment is made in accordance with requirements of AS 5637.1:2015. Group numbers for particleboard and standard MDF are determined from the prediction method, based on the heat release data obtained from cone testing in accordance with AS/NZS 3837:1998. Group numbers for substrates treated with flame retardants are determined from AS ISO 9705-2003 room burn tests as a poor correlation was found between the cone and room burn tests.

5 FORMAL ASSESSMENT SUMMARY

Based on the discussion presented in Appendix B of the referenced assessment report, the variations described in Section 3 will achieve the performance stated below, if tested in accordance with the standards referenced in Section 4. The performance is conditional to the variations satisfying all requirements described in Section 7.

Table 5: Formal assessment summary

Lining Construction		Performance		
		Group Number	Average Specific Extinction Area (m ² /kg)	SMOGRA (m ² /s)
Substrate				
Material	Particleboard 6mm minimum thickness and Dry Density nominally 700kg/m ³ MDF 6mm minimum thickness and Dry Density 560kg/m ³ to 740kg/m ³	3	<250	-
Veneers for all Substrates				
Material	All unmodified untreated timber or CCA treated Radiata pine previously tested to Group 3. <i>The list excludes Teak, Burmese – Tectona grandis</i>			
Thickness	Up to 1.2mm (Nominal)			
Seasoned Density	Veneer density Up to 1120 kg/m ³ for Particleboard and standard MDF substrates			
Adhesive Material	PVA and Resorcinol			
Position of Veneers	A timber veneer shall be applied to each face, though does not have to be of the same species on each side			

6 DIRECT FIELD OF APPLICATION

This assessment applies to internal wall and ceiling linings of class 2 to 9 buildings with fire hazard properties in accordance with the requirements of Specification C1.10 of NCC 2016, Volume 1 Amendment 1.

7 REQUIREMENTS

All timber species to be used as veneers should be tested previously to achieve Group 3.

Any further variations with respect to size, constructional details, edge or end conditions, other than those identified in this report, may invalidate the conclusions drawn in this report.

8 VALIDITY

This assessment report does not provide an endorsement by Warringtonfire Australia of the actual products supplied.

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.

Because of 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.

The assessment can therefore only relate to the actual prototype test specimens, testing conditions, and methodology described in the supporting data, and does not imply any performance abilities of constructions of subsequent manufacture.

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 the

subject of constant review and improvement and it is recommended that this report be reviewed on or, before, the stated expiry date.

The information contained in this report shall not be used for the assessment of variations other than those stated in the conclusions above. The assessment is valid provided no modifications are made to the systems detailed in this report. All details of construction should be consistent with the requirements stated in the relevant test reports and all referenced documents.

9 AUTHORITY

9.1 APPLICANT UNDERTAKINGS AND CONDITIONS OF USE

By using this report as evidence of compliance or performance the applicant(s) confirms that:

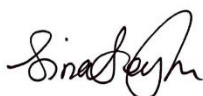
- to their knowledge the component or element of structure, which is the subject of this assessment, has not been subjected to a fire test to the Standard against which this assessment is being made, and
- they agree to withdraw this assessment from circulation should the component or element of structure be 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, and
- 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, agree to ask the assessing authority to withdraw the assessment.

9.2 GENERAL CONDITIONS OF USE

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9.3 AUTHORISATION ON BEHALF OF WARRINGTONFIRE AUSTRALIA

Prepared by:



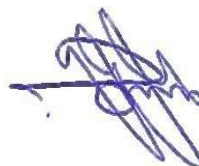
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9.4 DATE OF ISSUE

24 September 2019

9.5 EXPIRY DATE

30 September 2024



REGULATORY INFORMATION REPORT

An assessment of solid timber wall and ceiling linings in accordance with AS5637.1:2015

Report Sponsor:

EWFA Report No: RIR 45980.10

Forest and Wood Products Australia Ltd.

Level 11, 10-16 Queen Street,

Melbourne,

VIC – 3000.

Document revision status

Date Issued	Issue No	Description
28/2/2014	RIR 45980.5	Initial Issue
26/06/2014	RIR 45980.6	Change of sponsor details
21/12/2015	RIR 45980.7	Revised report sponsor address and typographical amendment
09/08/2016	RIR 45980.9	Revised to include reference to Specification C1.10 of NCC 2015 Volume 1
11/12/2018	RIR 45980.10	Revised to comply with specifications of AS5637.1:2015

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Contents

1	Introduction	5
2	Tested prototypes	5
3	Variation to tested prototypes	6
3.1	Variation to the Thickness of Wall and Ceiling Linings	6
3.2	Inclusion of various joint profiles in Wall and Ceiling Linings	6
4	Referenced test standards	6
5	Formal assessment summary	6
6	Direct field of application	8
7	Requirements	8
8	Validity	8
9	Authority	9
9.1	Applicant undertakings and conditions of use	9
9.2	General conditions of use	9
9.3	Authorisation on behalf of Warringtonfire Aus Pty Ltd	9
9.4	Date of issue	9
9.5	Expiry date	9

1 Introduction

This report contains the minimum information sufficient for regulatory compliance and refers to the Assessment report EWFA 45980.10.

The referenced assessment report supersedes the previous edition of EWFA 45980.9

The referenced report is an assessment of the fire hazard properties of various timber species for use as wall and ceiling linings in accordance with requirements of AS5637.1:2015. The objective of this standard is to provide means for the determination of a group number, smoke growth rate index (SMOGR_{RC}) and average specific extinction area (ASEA) for internal wall and ceiling linings, as required by the NCC 2016 (Volume One).

The tested prototypes described in Section 0 of this report, when subjected to the proposed variations described in Section 3 and tested in accordance with the relevant standards described in Section 4, are assessed to achieve performance as summarised in Section 0.

The validity of this assessment is conditional on compliance with Sections 6, 7, 8 and 9 of this report.

2 Tested prototypes

The referenced assessment is based on reports summarised in Table 1, being tests on various timber species in accordance AS/NZS 3837:1998. Group numbers for each species were determined using the prediction method described in AS5637.1:2015 (Clause 8). Natural timber is an essentially homogeneous material and satisfies all prerequisites of AS5637.1:2015 (clause 4.4, 5.3.3 and 9) to determine group numbers based on the prediction method.

Table 1 – Referenced Test Reports

WFRA 499163j	WFRA 499163f	WFRA 499163t	WFRA 499140f
WFRA 499163b	WFRA 499163k	WFRA 499182l	WFRA 499163q
WFRA 499240d	WFRA 499140d	WFRA 499163r	WFRA 499182k
WFRA 499163i	WFRA 499163s	WFRA 499163d	WFRA 499182e
WFRA 499240b	WFRA 499182n	WFRA 499163p	WFRA 499163n
WFRA 499163h	WFRA 499163e	WFRA 499182j	WFRA 499182h
WFRA 499140a	WFRA 499240c	WFRA 499182b	WFRA 499240n
WFRA 499163l	WFRA 499163c	WFRA 499163u	WFRA 499240a
WFRA 499163v	WFRA 499163g	WFRA 499182m	WFRA 499182i
WFRA 499140e	WFRA 499182c	WFRA 499182d	FH4384
WFRA 499182f	WFRA 499140b	WFRA 499163a	FH4385
WFRA 499182g	WFRA 499163o	WFRA 499140c	FH4389
FH4391	FH4392	FH4393	FH4394

Each of the tests in the above mentioned reports consisted of three specimens comprising two sections and included a tongue and groove joint with specimen size nominally 100mm by 100mm. The specimen thicknesses were nominally 9mm, 10mm, 12mm or 19mm and the finish on the timber was smooth milled.

The referenced reports were issued by Warrington Fire Research Pty Ltd and sponsored by Forest and Wood Products Australia Limited, who has granted permission for reference of the test data in this report.

3 Variation to tested prototypes

3.1 Variation to the Thickness of Wall and Ceiling Linings

It is proposed that the timber species referenced in the test reports in Section 2 may be used at a minimum thickness of 9mm for wall and ceiling linings.

3.2 Inclusion of various joint profiles in Wall and Ceiling Linings

It is proposed that the timber species in the referenced tests reports described in Section 2 may be used to as wall and ceiling linings with various profiles

- V-Joint
- Ship lap profile
- Regency
- Or any other profiled lining nominally 9mm thick or greater and incorporating profile features leaving a minimum of 5mm thickness of timber at discrete locations across the lining board.

4 Referenced test standards

The referenced assessment report is prepared to comply with requirements of AS/NZS3837:1998 and AS5637.1:2015 for use as internal wall and ceiling linings, as per NCC 2016 (Volume 1).

5 Formal assessment summary

Based on the discussion presented in the referenced assessment report, it is the considered opinion of this testing authority that if the tested specimens described in Section 2 are configured as described in Section 3, they will achieve the performance stated in Table 2, if tested in accordance with the test method referenced in Section 4, subject to the requirements of Section 7.

Table 2 – Assessment Summary

Species	Minimum Thickness (mm)	Group No.	Average Specific Extinction Area (m ² /kg)
Ash, Alpine - <i>Eucalyptus delegatensis</i>	9	3	<250
Ash, Mountain – <i>Eucalyptus regnans</i>	9	3	<250
Ash, Silvertop - <i>Eucalyptus sieberi</i>	9	3	<250
Beech Myrtle - <i>Northofagus cunnighamii</i>	9	3	<250
Blackbutt - <i>Eucalyptus pilularis</i>	9	3	<250
Blackbutt, New England - <i>Eucalyptus andrewsii</i>	9	3	<250
Blackbutt, WA - <i>Eucalyptus patens</i>	9	3	<250
Blackwood - <i>Acacia melanoxylon</i>	9	3	<250
Bloodwood Red - <i>Corymbia gummifera</i>	9	3	<250
Box, Brush - <i>Lophostman confertus</i>	9	3	<250
Box, Grey – <i>Eucalyptus microcarpa</i>	9	3	<250

Species	Minimum Thickness (mm)	Group No.	Average Specific Extinction Area (m ² /kg)
Box, Grey, Coast – <i>Eucalyptus bosistoana</i>	9	3	<250
Brownbarrel - <i>Eucalyptus fastigata</i>	9	3	<250
Gum, Blue, Sydney - <i>Eucalyptus saligna</i>	9	3	<250
Gum, Blue, Southern (TAS) - <i>Eucalyptus globulus</i>	9	3	<250
Gum, Blue, Southern (VIC) - <i>Eucalyptus globulus</i>	9	3	<250
Gum, Manna - <i>Eucalyptus viminalis</i>	9	3	<250
Gum, Red, River - <i>Eucalyptus camaldulensis</i>	9	3	<250
Gum, Rose – <i>Eucalyptus grandis</i>	9	3	<250
Gum, Shining – <i>Eucalyptus nitens</i>	9	3	<250
Gum, Spotted - <i>Corymbia maculata</i>	9	3	<250
Gum, Sugar - <i>Eucalyptus cladocalyx</i>	9	3	<250
Gum, Yellow - <i>Eucalyptus leucoxylon</i>	9	3	<250
Ironbark, Grey – <i>Eucalyptus drepanophylla</i>	9	3	<250
Ironbark, Red - <i>Eucalyptus sideroxylon</i>	9	3	<250
Jarraah - <i>Eucalyptus marginata</i>	9	3	<250
Karri - <i>Eucalyptus diversicolor</i>	9	3	<250
Mahogany, Red - <i>Eucalyptus resinifera</i>	9	3	<250
Marri - <i>Eucalyptus callophylla</i>	9	3	<250
Merbau - <i>Instia bijuga</i>	9	3	<250
Messmate - <i>Eucalyptus oblique</i>	9	3	<250
Oak, American - <i>Quercus abla</i>	9	3	<250
Pine, Baltic - <i>Picea abies</i>	9	3	<250
Pine, Hoop - <i>Araucaria cunninghamii</i>	9	3	<250
Pine, Radiata – <i>Pinus radiata</i>	9	3	<250
Pine, Radiata – <i>Pinus radiata</i> . CCA treated	9	3	<250
Pine, White Cypress - <i>Callitris glaucophylla</i>	9	3	<250
Rosewood, Papua New Guinea - <i>Pterocarpus indicus</i>	9	3	<250
Sheoak, WA - <i>Allocosuarina fraseriana</i>	9	3	<250

Species	Minimum Thickness (mm)	Group No.	Average Specific Extinction Area (m ² /kg)
Stringy Bark, Yellow - <i>Eucalyptus muellerana</i>	9	3	<250
Tallowwood - <i>Eucalyptus microcorys</i>	9	3	<250
Turpentine – <i>Syncarpa glomulifera</i>	9	3	<250
Walnut, Black (American Walnut) - <i>Juglans nigra</i>	9	3	<250
Wattle, Silver – <i>Acacia dealbata</i>	9	3	<250
Western Red Cedar – <i>Thuja plicata</i>	9	3	<250

6 Direct field of application

The results of the referenced assessment report are applicable to internal wall and ceiling linings that are required to have fire hazard properties in accordance with AS5637.1:2015.

7 Requirements

The referenced assessment report details the methods of construction, test conditions and assessed results had the specific elements of construction described herein been tested and assessed in accordance with AS/NZS3837:1998 and AS5637.1:2015.

Any further variations with respect to size, constructional details, loads, stresses, edge or end conditions, other than those identified in this report, may invalidate the conclusions drawn in this report.

8 Validity

The referenced assessment report does not provide an endorsement by Exova Warringtonfire Aus Pty Ltd of the actual products supplied.

The conclusions of the referenced 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.

Because of 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.

The referenced assessment can therefore only relate to the actual prototype test specimens, testing conditions, and methodology described in the supporting data, and does not imply any performance abilities of constructions of subsequent manufacture.

The referenced 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 the subject of constant review and improvement and it is recommended that the referenced report be reviewed on or, before, the stated expiry date.

The information contained in the referenced report shall not be used for the assessment of variations other than those stated in the conclusions above. The assessment is valid provided no modifications are made to the systems detailed in the referenced report. All details of construction should be consistent with the requirements stated in the relevant test reports and all referenced documents.

9 Authority

9.1 Applicant undertakings and conditions of use

By using this report as evidence of compliance or performance, the applicant(s) confirms 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, and
- they agree to withdraw this assessment from circulation should the component or element of structure be 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, and
- 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, agree to ask the assessing authority to withdraw the assessment.

9.2 General conditions of use

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9.3 Authorisation on behalf of Warringtonfire Aus Pty Ltd

Prepared by:



Tanmay Bhat

Reviewed by:



Mahmoud Akl

9.4 Date of issue

11 December 2018

9.5 Expiry date

31 December 2023