



REGULATORY INFORMATION REPORT

Assessment of Plywood for use as a wall
and ceiling lining with respect to the
Building Code of Australia NCC 2015
Volume 1 Specification C1.10

EWFA Report No:

RIR 45981.8

Report Sponsor:

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1 INTRODUCTION

This report contains the minimum information sufficient for regulatory compliance with the Building Code of Australia NCC 2015 Volume 1 and refers to the assessment report EWFA 45981.8.

The referenced assessment report (EWFA 45981.8) was prepared at the request of Forest and Wood Products Australia Limited (FWPA) as an assessment of the Fire Hazard performance of plywood made from various timber species and of various thicknesses for use as wall and ceiling linings in accordance with the requirements of Specification C1.10 of the Building Code of Australia NCC 2015 Volume 1.

For the verification of fire hazard properties the Building Code of Australia NCC 2015 Volume 1 Specification C1.10 requires testing to ISO 9705 "Fire tests – Full scale room test for surface products" or AS/NZS 3837:1998 "Method of test for heat and smoke release rates for material and products using an oxygen consumption calorimeter". ISO 9705 is commonly referred to as the "ISO room fire test", whilst AS/NZS 3837:1998 is better known as the "Cone calorimeter test".

As an alternative to an ISO 9705 test the BCA permits testing to AS/NZS 3837:1998 "Method of test for heat and smoke release rates for material and products using an oxygen consumption calorimeter" in conjunction with the prediction method outlined in Specification A2.4 of the BCA.

The main outcome from these tests is a material's "Group Number". The materials Group Number is an indication of its 'time to flashover' in the ISO room fire test. The Group Number may be gained directly from testing a material in the above-mentioned ISO room fire test, or alternatively be predicted using data obtained from testing of the material in the cone calorimeter.

The referenced assessment report is not intended to be a comprehensive assessment of all commercially available plywood, moreover it details results obtained for plywood made from timber species tested at the time of issue of the referenced assessment report. However, should further testing be undertaken the referenced assessment report may be updated to reflect the results of such testing.

The tested systems are described in Section 2 and 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 this report is conditional on compliance with Sections 7, 8 and 9 of the report.

2 TESTED PROTOTYPES

The referenced assessment report is based on the reports summarised in Table 1 and 2 referring to tests in accordance Specification C1.10 of the Building Code of Australia NCC 2015 Volume 1 on various solid and plywood timber.

Table 1 – Referenced Test Reports – 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			

Each of the tests in Table 1 (prefixed WFRA) consisted of three specimens comprising two sections and included a tongue and groove joint with total specimen size nominally 100mm by 100mm. The specimen thicknesses were nominally 12mm or 19mm and the finish on the timber was smooth milled.

Each of the tests in Table 1 (prefixed FH) consisted of three specimens comprising one section with total specimen size nominally 100mm by 100mm. The specimen thicknesses were nominally 10mm and the finish on the timber was smooth milled.

Table 2 – Referenced Test Reports - Plywood

Report	Species	Thickness
WFRA 499240Ej	Lauan - <i>Shorea agsaboensi</i>	3.6mm
WFRA 499240F	Pine, Radiata – <i>Pinus radiata</i>	7.3mm

Each of the tests in Table 2 each consisted of three specimens comprising one sections of total specimen size nominally 100mm by 100mm. The specimen thicknesses were nominally 4mm or 7mm 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 the referenced assessment report.

Table 3 – Referenced Test Reports – MDF with Adhesive

Report	Species	Thickness
FH4386	Medium Density Fibreboard (MDF) + PVA Adhesive	6.5mm
FH4387	Medium Density Fibreboard (MDF) + PU Adhesive	6.5mm
FH4388	Medium Density Fibreboard (MDF)+ Resorcinol Adhesive	6.5mm

Each of the tests in Table 3 consisted of three specimens comprising one section with total specimen size nominally 100mm by 100mm. The specimen thicknesses were nominally 6.5mm, 6mm substrate with a nominal thickness of adhesive applied to the surface.

3 VARIATION TO TESTED PROTOTYPES

3.1 INCREASE IN THE THICKNESS OF PLYWOOD FOR WALL AND CEILING LININGS

It is proposed that for plywood tested in the test reports shown in Table 2 of Section 2 may be used at a minimum thickness of nominally 6mm for wall and ceiling linings without limitation of substrate for use as wall and ceiling linings.

3.2 APPLICATION OF TESTED TIMBER SPECIES AS PLYWOOD

It is proposed that for plywood may constructed from the species tested in Table 1 and they may be used at a minimum thickness of nominally 6mm for wall and ceiling linings without limitation of substrate.

3.3 APPLICATION OF VARIOUS ADHESIVES TO THE CONSTRUCTION OF PLYWOOD

In addition to the variations above the proposed wall linings shall be made from plywood constructed from the species tested in Table 1 using the same methods and the adhesives listed below.

- PVA
- Resorcinol
- PU

4 REFERENCED TEST PROCEDURES

Reference was made to Building Code of Australia NCC 2015 Volume 1 Specification C1.10 which requires the calculation of “Group Number” and “Average Extinction Area” to be calculated using Clause 3 of Specification A2.4 from data obtained by testing the material at 50 kW/m² irradiance in the horizontal orientation with an edge frame in accordance with AS/NZS 3837:1998 – *Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.*

5 FORMAL ASSESSMENT SUMMARY

On the basis of the discussion presented in the referenced assessment report it is the considered opinion of this test authority 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

Table 4 – List of Plywood Species Assessed

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 cunninghamii</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 pantens</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
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

Species	Minimum Thickness (mm)	Group No.	Average Specific Extinction Area (m ² /kg)
Ironbark, Red - <i>Eucalyptus sideroxylon</i>	9	3	<250
Jarrah - <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
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

Table 5 – List of Plywood Adhesives Assessed

PVA
Resorcinol
PU

6 DIRECT FIELD OF APPLICATION

The referenced assessment report applies to wall and ceiling linings of buildings that are required to have Fire Hazard Properties in accordance with Building Code of Australia NCC 2015 Volume 1 Specification C1.10.

7 REQUIREMENTS

The referenced assessment report details the methods of construction, test conditions and assessed results that would be expected had the specific elements of construction described herein been tested in accordance with AS/NZS 3837:1998.

Any further variations with respect to size, constructional details, edge or end conditions, other than those identified in the referenced assessment report, may invalidate the conclusions drawn in the referenced assessment 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 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 the referenced assessment 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 the referenced assessment 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 or individuals without the permission of Exova Warringtonfire Aus Pty Ltd.

9.3 AUTHORISATION ON BEHALF OF EXOVA WARRINGTONFIRE AUS PTY LTD

Prepared by:

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Reviewed by:



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9.4 DATE OF ISSUE

09/08/2016

9.5 EXPIRY DATE

31/03/2020