Reaction to fire performance of various untreated timber building components and assemblies when tested to AS/NZS 1530.3-1999

Short Form Assessment Report

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Copyright and disclaimer

Important disclaimer

Contents

1 Introduction

This short form report refers to an assessment report FCO 3437 titled “reaction to fire performance of various untreated timber building components and assemblies when tested to AS/NZS 1530.3-1999”.

This report is prepared for the purpose of meeting the requirements of NCC 2019 Volume One Amdt.1 and Volume Two Amdt.1 Clause A5.2 (1) (d)(i) and (ii), NCC 2022 Volume One and Volume Two Clause A5G3 (1)(d)(i) and (ii) when meeting the performance in clauses such as Specification 7, Table S7C7 (Other materials or locations).

This report confirms the extent to which the referenced reaction to fire test listed in Section 2 meets the requirements of the fire test standard listed in Section 4 of the report. The proposed minor variations to the tested construction presented in Section 3 are subject to an analysis in Appendix B in the referenced assessment report and the conclusions are presented in Section 5 of this report subject to the validity and limitations in Sections 7 and 8.

2 Supporting Data

This assessment report refers to various tests of solid untreated timber species to support the analysis in the referenced assessment report and conclusions of this report. They are listed below.

Table 1 – Referenced tests tested to AS 1530.3-1976

Report No.		Common name	Botanic name
EBS 19/9/78	E 4161	Oak, Tasmanian (also known as Mountain Ash, Alpine Ash, Messmate or Stringybark)	*Eucalyptus regnans (Mountain Ash), Eucalyptus delegatensis (Alpine Ash), Eucalyptus obliqua (Messmate or Stringybark)*
EBS 19/9/78	E 4219	Cedar, Red, Western	*Thuja Plicata*
EBS 19/9/78	E 4220	Pine, Radiata	*Pinus radiata*
EBS 19/9/78	E 4221	Fir, Douglas (Oregon)	*Pseudotsuga menziesii*
EBS 19/9/78	E 4222	Redwood, California	*Sequoia sempervirens*
EBS 19/9/78	E 4223	Pine, Canada (Western hemlock)	*Tsuga heterophylla*
EBS 19/9/78	E 4224	Walnut, Queensland	*Endiandra palmerstoni*
EBS 19/9/78	E 4225	Teak	*Tectona grandis*
EBS 19/9/78	E 4226	Blackwood	*Acacia melanoxylon*
EBS 19/9/78	E 4227	Maple, Pacific (also known as Meranti, Seraya, Lauan, and Philippine mahogany)	*Aglaia cucullata*
EBS 19/9/78	E 4228	Cypress-pine, White	*Callitris columellaris*
EBS 19/9/78	E 4229	Tallowwood	*Eucalyptus microcorys*
EBS 19/9/78	E 4230	Cedar, Red, Australian	*Toona australis*
EBS 19/9/78	E 4231	Pine, Klinkii	*Aurancaria hunsteinii*
EBS 19/9/78	E 4232	Bean, Black	*Castanospermum australe*
EBS 19/9/78	E 4233	Blackbutt	*Eucalyptus pilularis*
EBS 19/9/78	E 4234	Oak, Tulip	*Argyrodendron actinophyllum, Argyrodendron trifoliolatum, and Argyrodendron peralatum*
EBS 19/9/78	E 4254	Gum, Spotted	*Eucalyptus maculata*
EBS 19/9/78	E 4255	Kapur	*Dryobalanops spp.*
EBS 19/9/78	E 4256	Ramin	*Gonystylus spp.*

The test reports listed above were undertaken by CSIRO, North Ryde (previously known as Experimental Building Station (E.B.S.)) and sponsored by Timber Development Association (New South Wales) who has provided permission for these reports to be referenced in this report.

Table 2 – Referenced tests tested to AS/NZS 1530.3-1999

Report	Common name	Botanical name
FNE 9362B	Ash, Silvertop	*Eucalyptus sieberi*
FNE 9359B	Baltic, Red	*Pinus sylvestris*
FNE 9357B	Baltic, White	*Picea abies*
FNE 9327B	Blackbutt	*Eucalyptus pilularis*
FNE 9356B	Blackbutt, New England	*Eucalyptus campanulata*
FNE 9368B	Bloodwood, Red	*Corymbia gummifera*
FNE 9374B	Box, Grey	*Eucalyptus microcarpa*
FNE 9361B	Brownbarrel	*Eucalyptus fastigata*
FNE 9363B	Gum, Blue, Sydney	*Eucalyptus saligna*
FNE 9367B	Gum, Red, River	*Eucalyptus camaldulensis*
FNE 9355B	Gum, Rose	*Eucalyptus grandis*
FNE 9371B	Gum, Rose	*Eucalyptus grandis*
FNE 9369B	Gum, Shining	*Eucalyptus nitens*
FNE 9370B	Gum, Spotted	*Corymbia maculata*
FNE 9364B	Pine, Hoop	*Araucaria cunninghamii*
FNE 9375B	Ironbark, Red	*Eucalyptus sideroxylon*
FNE 9378B	Ironbark, Grey	*Eucalyptus paniculata*
FNE 9354B	Karri	*Eucalyptus diversicolor*
FNE 9353B	Kwila (Merbau)	*Intsia bijuga*
FNE 9376B	Mahogany, Red	*Eucalyptus resinifera*
FNE 9379B	Mahogany, White	*Eucalyptus acmenoides*
FNE 9365B	Gum, Grey, Mountain /Monkey	*Eucalyptus cypellocarpa*
FNE 9358B	Pine, Slash	*Pinus elliottii*
FNE 9373B	Pine, Slash	*Pinus elliottii*
FNE 9366B	Stringybark, Silvertop	*Eucalyptus laevopinea*
FNE 9360B	Stringybark, Yellow	*Eucalyptus muelleriana*
FNE 9377B	Turpentine	*Syncarpia glomulifera*

The test reports listed above were undertaken by CSIRO and sponsored by Forest and Wood Products Australia.

Table 3 – Supplementary data

Source	Common name	Botanical name
Technical Paper titled: "Early Burning Properties of Australian Building Timber" authored by J. Beesley, J. J. Keough, and A. W. Moulen. Division of Building Research Technical Paper No. 6, 24 pages published by C.S.I.R.O. Australia 1974.	Box, Brush	*Tristania conferta*
	Pine, Hoop	*Araucaria cunninghamii*
	Jarrah	*Eucalyptus marginata*
	Walnut, Yellow	*Beilscmiedia bancroftii*

The tests above were undertaken by CSIRO, North Ryde (previously known as Experimental Building Station (E.B.S.)) and sponsored by Timber Development Association (New South Wales).

In Appendix A of this report, detailed comparisons of the test methods AS A30 Part III - 1970 and AS 1530.3-1976 with respect to the requirements of AS/NZS 1530.3-1999 were undertaken.

As such it is confirmed that the test results for the specimens listed in Tables 1 and 3 are equivalent or more onerous had they been tested in accordance with AS/NZS 1530.3-1999. In addition, it is confirmed that specimen restraints used in the referenced tests in Table 1 and 3 are the same as those required by AS/NZS 1530.3-1999.

3 The proposed minor variations to building component or assembly

The proposed building component or assembly shall be made from the timber specimens as tested in the referenced tests in Tables 1-3 and subject to the following variations:

- The thickness may vary between 12mm and 25mm.

4 Referenced Standard

Standards:

AS/NZS 1530.3-1999 Australian/New Zealand Standard 1530: Method for fire tests on building materials, components and structures, Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release, 1999.

5 Conclusion

Based on the analysis presented in the referenced assessment report, it is the opinion of this Accredited Testing Laboratory that the tested prototypes described in Section 2 when varied as described in Section 3 will achieve the classification indices for Spread of Flame (SOF) and Smoke Developed (SD) stated below in accordance with the method referenced in Section 4 and subject to the validity and limitations in Sections 7 and 8.

Table 4: Spread of Flame Index and Smoke Developed Index for various Timber species

Timber Species (Common name)	Timber Species (Botanical name)	Thickness (mm)	Spread of Flame Index (SOF)	Smoke Developed Index (SD)	Is SOFI less than or equal to 9	Where SOFI is greater than 5 and less than or equal to 9, Is SD less than or equal to 8?
Ash, Silvertop	*Eucalyptus sieberi*	12 to 25	7	3	Yes	Yes
Baltic, Red	*Pinus sylvestris*		9	3	Yes	Yes
Bean, Black	*Castanospermum australe*		8	3	Yes	Yes
Blackbutt	*Eucalyptus pilularis*		6	3	Yes	Yes
Blackbutt (plywood)	*Eucalyptus pilularis*		7	3	Yes	Yes
Blackbutt, New England	*Eucalyptus campanulata*		7	3	Yes	Yes
Blackwood	*Acacia melanoxylon*		9	3	Yes	Yes
Bloodwood, Red	*Corymbia gummifera*		8	3	Yes	Yes
Box, Brush	*Tristania conferta*		7	3	Yes	Yes
Box, Grey	*Eucalyptus microcarpa*		4	3	Yes	-

Timber Species (Common name)	Timber Species (Botanical name)	Thickness (mm)	Spread of Flame Index (SOF)	Smoke Developed Index (SD)	Is SOFI less than or equal to 9	Where SOFI is greater than 5 and less than or equal to 9, Is SD less than or equal to 8?
Brownbarrel	*Eucalyptus fastigata*	12 to 25	8	3	Yes	Yes
Cedar, Red, Australian	*Toona australis*		9	3	Yes	Yes
Fir, Douglas (Oregon)	*Pseudotsuga menziesii*		9	3	Yes	Yes
Gum, Blue, Sydney	*Eucalyptus saligna*		7	3	Yes	Yes
Gum, Grey, Mountain /Monkey	*Eucalyptus cypellocarpa*		5	3	Yes	-
Gum, Red, River	*Eucalyptus camaldulensis*		6	3	Yes	Yes
Gum, Rose (solid and plywood)	*Eucalyptus grandis*		8	3	Yes	Yes
Gum, Shining	*Eucalyptus nitens*		8	4	Yes	Yes
Gum, Spotted	*Eucalyptus maculata*		3	3	Yes	-
Gum, Spotted (plywood)	*Corymbia maculata*		8	3	Yes	Yes
Ironbark, Grey	*Eucalyptus paniculata*		3	3	Yes	-
Ironbark, Red	*Eucalyptus sideroxylon*		5	3	Yes	-
Jarrah	*Eucalyptus marginata*		6	3	Yes	Yes
Kapur	*Dryobalanops Spp*		7	3	Yes	Yes
Karri	*Eucalyptus diversicolor*		6	3	Yes	Yes
Kwila (Merbau)	*Intsia bijuga*		8	5	Yes	Yes
Mahogany, Red	*Eucalyptus resinifera*		6	3	Yes	Yes
Mahogany, White	*Eucalyptus acmenoides*		0	3	Yes	-
Maple, Pacific (also known as Meranti, Seraya, Lauan, and Philippine mahogany)	*Aglaia cucullata*		9	4	Yes	Yes

Timber Species (Common name)	Timber Species (Botanical name)	Thickness (mm)	Spread of Flame Index (SOF)	Smoke Developed Index (SD)	Is SOFI less than or equal to 9	Where SOFI is greater than 5 and less than or equal to 9, Is SD less than or equal to 8?
Oak, Tasmanian (also known as Mountain Ash, Alpine Ash, Messmate or Stringybark)	*Eucalyptus regnans (Mountain Ash), Eucalyptus delegatensis (Alpine Ash), Eucalyptus obliqua (Messmate or Stringybark)*	12 to 25	8	3	Yes	Yes
Oak, Tulip	*Heritiera trifoliolata/ Argyrodendron trifoliolatum*		6	2	Yes	Yes
Pine, Canada (Western hemlock)	*Tsuga heterophylla*		9	3	Yes	Yes
Cypress-pine, White	*Callitris columellaris*		8	3	Yes	Yes
Pine, Hoop (plywood)	*Araucaria cunninghamii*		9	3	Yes	Yes
Pine, Hoop (solid)	*Araucaria cunninghamii*		8	3	Yes	Yes
Pine, Klinkii	*Aurancaria hunsteinii*		9	3	Yes	Yes
Pine, Radiata	*Pinus radiata*		7	2	Yes	Yes
Pine, Slash (solid and plywood)	*Pinus elliottii*		8	3	Yes	Yes
Ramin	*Gonystylus Spp.*		7	3	Yes	Yes
Redwood, California	*Sequoia sempervirens*		9	4	Yes	Yes
Stringybark, Silvertop	*Eucalyptus laevopinea*		6	3	Yes	Yes
Stringybark, Yellow	*Eucalyptus muelleriana*		7	3	Yes	Yes
Tallowwood	*Eucalyptus microcorys*		5	4	Yes	-
Teak	*Tectona grandis*		9	5	Yes	Yes
Turpentine	*Syncarpia glomulifera*		6	3	Yes	Yes

Timber Species (Common name)	Timber Species (Botanical name)	Thickness (mm)	Spread of Flame Index (SOF)	Smoke Developed Index (SD)	Is SOFI less than or equal to 9	Where SOFI is greater than 5 and less than or equal to 9, Is SD less than or equal to 8?
Walnut, Queensland	*Endiandra palmerstoni*	12 to 25	7	3	Yes	Yes
Walnut, Yellow	*Beilscmiedia bancroftii*		8	2	Yes	Yes

6 Field of direct applicability of the results

The results of this assessment are applicable to timber specimens that may have joints (butt and edge joints), and do not have perforations and recesses.

7 Term of Validity

This assessment report will lapse on 31st December 2030. Should you wish us to re-examine this report with a view to the possible extension of its term of validity, would you please apply to us three to four months before the date of expiry. This Division reserves the right at any time to amend or withdraw this assessment in the light of new knowledge.

8 Limitations

The conclusions of this assessment report may be used to directly assess the fire performance under such conditions, but it should be recognised that a single test method will not provide a full assessment of the fire hazard under all fire conditions.

This assessment report does not provide an endorsement by CSIRO of the actual products supplied to the industry. This 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 construction 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 is reviewed on or, before, the stated expiry date.

The information contained in this 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.

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