



Test on flame-retardant treated OVL/BTR grade exterior hardwood plywood at 50-kW/m² irradiance in accordance with AS/NZS 3837:1998

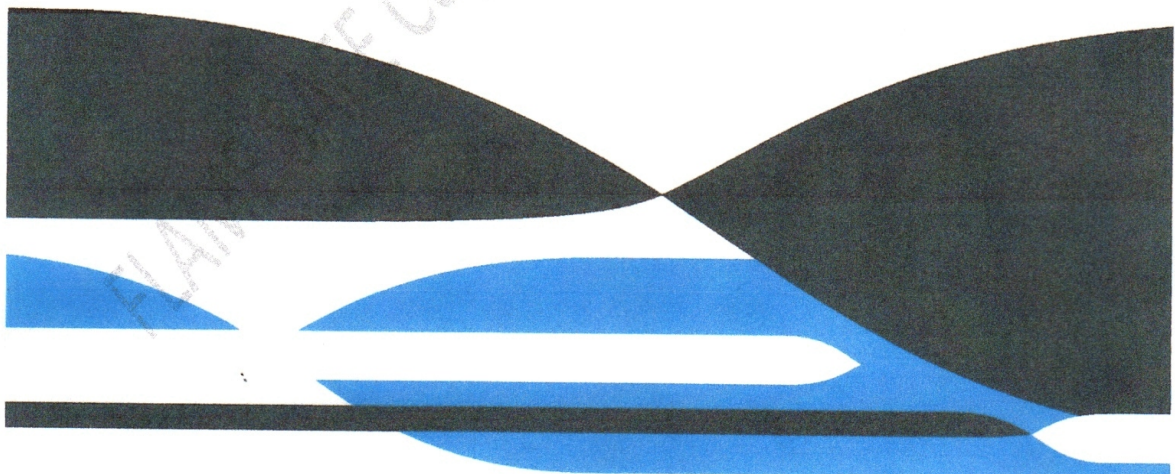
Fire Testing Report

Author: Alarde, Heherson
Report Number: FNK 11758
Quote Number: NK7585

Date: 15 September 2016
Version: A

Client: Doorpac trading as Timothy D & Alison G Trimmer

Commercial-in-confidence



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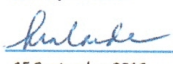


Test Report Details

Document: Fire Testing Report	Test Standard: AS/NZS 3837:1998 at 50-kW/m ² irradiance
Client: Doorpac trading as Timothy D & Alison G Trimmer	Quote Number: NK7585

Test Report Status and Revision History

VERSION	STATUS	DATE	DISTRIBUTION	COMMENT	ISSUE NO.
Draft	Draft for Internal review	11 Jul 2016	CSIRO	CSIRO	Draft
A	Final for issue	15 September 2016	Doorpac trading as Timothy D & Alison G Trimmer		FNK 11758

Test Report Authorisation

AUTHOR	REVIEWED BY	AUTHORISED BY
Alarde, Heherson 	Russell Collins 	Brett Roddy 
15 September 2016	15 September 2016	15 September 2016

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1 Summary

Sponsored Investigation Report Number FNK 11758

Test on flame-retardant treated OVL/BTR grade exterior hardwood plywood at 50-kW/m² irradiance in accordance with AS/NZS 3837:1998

2 Test Details

2.1 Sample Identification

Doorpac Flame Safe X-T Ply

2.2 Sponsor

Doorpac trading as Timothy D & Alison G Trimmer
31 Pile Road
SOMERSBY NSW 2250
AUSTRALIA

2.3 Manufacturer

Kayu Lapis Indonesia. PT
JL Sibayak 11-13, Candisari,
SEMARANG 50236
INDONESIA

2.4 Job Number

NK7585

2.5 Test Date

11 July 2016

2.6 Description of Sample

The sponsor described the tested specimen as an OVL/BTR (Overlay and Better) exterior hardwood plywood. The plywood was treated with Flame Safe X-T flame-retardant additive.

Nominal total thickness:	3.6 mm
Nominal total mass:	2 kg/m ²
Colour:	light brown (timber)

2.7 Documentation

The following documents were supplied by the sponsor as a full and complete description of the sample:

- Test Agreement and form FTAF33 dated 9 March 2016.

3 Method

3.1 Conditioning of Specimens

Prior to the test, the specimens were conditioned to constant mass at a temperature of $23 \pm 2^\circ\text{C}$ and a relative humidity of $50 \pm 10\%$.

3.2 Test Method

Tests were performed in accordance with Australian/New Zealand Standard 3837:1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter. All test specimens were exposed in the horizontal orientation with the standard pilot operating.

Nominally 100 x 100-mm specimens were tested as supplied. Specimens were tested with the use of an edge frame. The edge frame reduces the test surface area to 0.0088-m^2 , and this is the area used in calculations.

For the test, specimens were wrapped in aluminium foil so that the four edges and the bottom of the specimen were covered. The foil formed a shallow tray that retained any molten material during testing.

Three specimens were tested at an irradiance level of 50-kW/m^2 .

The nominal exhaust system flow rate for all tests was $0.024\text{-m}^3/\text{s}$.

A measured quantity of ethanol was burnt to obtain a C factor to be used in the Heat Release calculations.

3.3 Departure from Standard

In performing heat release rate calibration to determine the orifice constant, C , an alternative procedure was employed as specified in Clause 10.2.4 of ISO 5660-1:2002(E) by burning a measured quantity of absolute ethanol.

3.4 Duration of Test

The test is terminated when any one of the following is applicable:

1. 2 minutes have passed since all flaming from the specimen ceased; and
2. the average mass loss over a 1 minute period has dropped below 150-g/m^2 ;
3. 60 minutes have elapsed; or
4. the specimen fails to ignite after a 10 minute exposure.

Note: The mass loss test end criterion was not used for this test.

4 Results and Observations

Observations

4.1.1 SPECIMEN 1

The specimen began to smoke after 4 seconds exposure to the test. The specimen ignited during the test. The test was terminated when two minutes had passed since all flaming from the specimen ceased.

4.1.2 SPECIMEN 2

The specimen began to smoke after 4 seconds exposure to the test. The specimen ignited during the test. The test was terminated when two minutes had passed since all flaming from the specimen ceased.

4.1.3 SPECIMEN 3

The specimen began to smoke after 3 seconds exposure to the test. The specimen ignited during the test. The test was terminated when two minutes had passed since all flaming from the specimen ceased.

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4.2 Results of Tests

The results of tests as specified in the Standard are summarised in Table 1.

Test Details:

Date of test: 11/7/16
 Test Report Date: 15/9/16
 Ethanol burn ('C' factors): 0.037915

Table 1 Results of test

	IRRADIANCE (kW/m ²)	TIME TO SUSTAINED BURNING (s)	TEST DURATION (s)	THICKNESS (mm)	SPECIMEN MASS (g)	MASS REMAINING (g)	MASS LOSS (g)	PERCENT OF MASS PYROLYSED (%)	AVERAGE RATE OF MASS LOSS (g/m ² .s)	PEAK HRR (kW/m ²)	AVERAGE HRR (FIRST 60s AFTER IGN)	AVERAGE HRR (FIRST 180s AFTER IGN)	AVERAGE HRR (FIRST 300s AFTER IGN)	TOTAL HEAT RELEASED (MJ/m ²)	AVERAGE EHC (MJ/kg)	AVERAGE SPECIFIC EXTINCTION AREA (m ² /kg)
Sample 1	50	38	1060	3.62	19.27	0.57	18.70	97.04	3.31	191.9	56.7	88.2	68.0	36.88	17.36	38
Sample 2	50	47	735	3.63	19.44	0.84	18.60	95.68	3.90	242.5	102.9	100.3	75.0	33.72	15.95	47
Sample 3	50	69	1115	3.62	22.35	0.05	22.30	99.78	3.48	285.9	80.4	105.0	77.5	37.19	14.68	69
Mean		51.3	970.0		20.4	0.5	19.9	97.5	3.6	240.1	80.0	97.9	73.5	35.9	16.0	51.3
SD		15.9	205.4		1.7	0.4	2.1	2.1	0.3	47.0	23.1	8.7	4.9	1.9	1.3	15.9

Notes:

1. The results of this fire test 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 fire conditions.
2. As per Section 9 (n) of AS 5637.1:2015, the determination of the group number was based on the AS/NZS 3837:1998 test, and was deemed valid in the cone calorimeter for the assignment of National Construction Code (NCC) group number.

Figure 2 Effective Heat of Combustion (EHC)

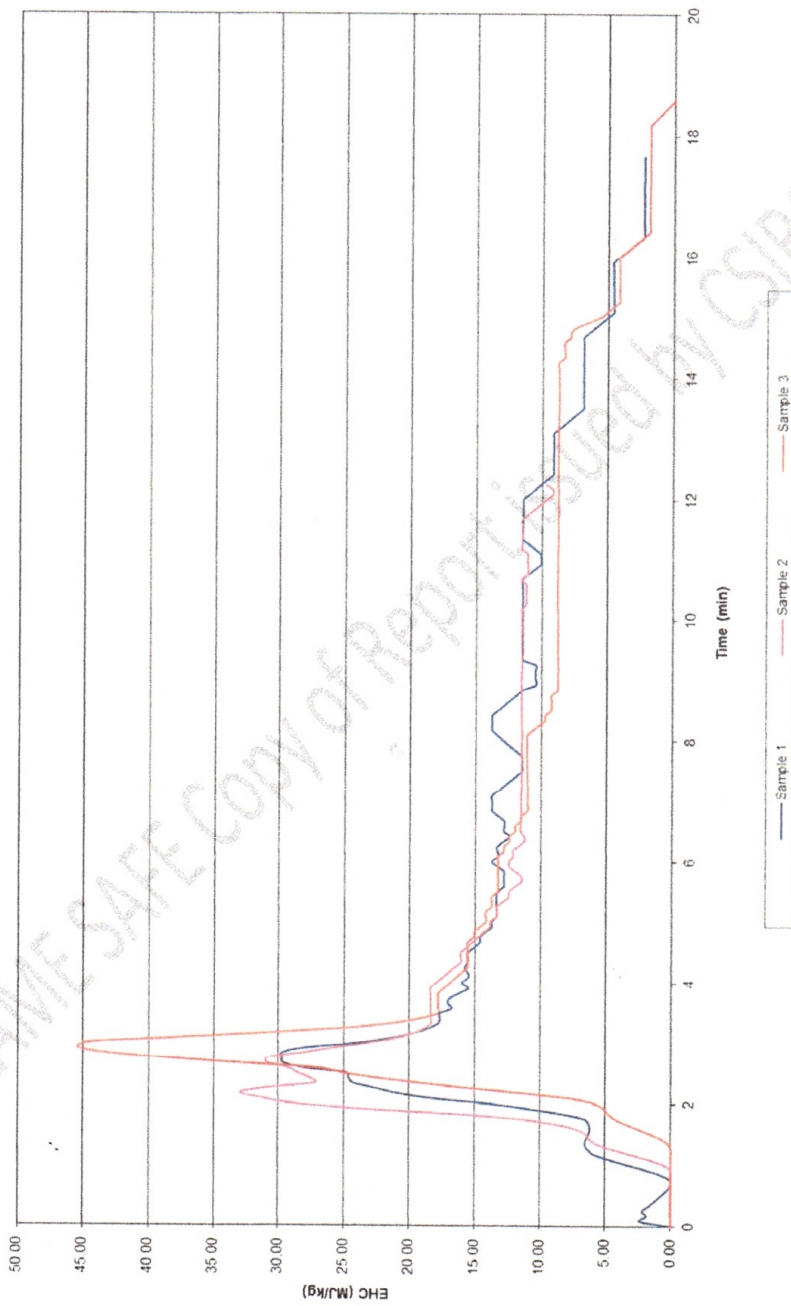
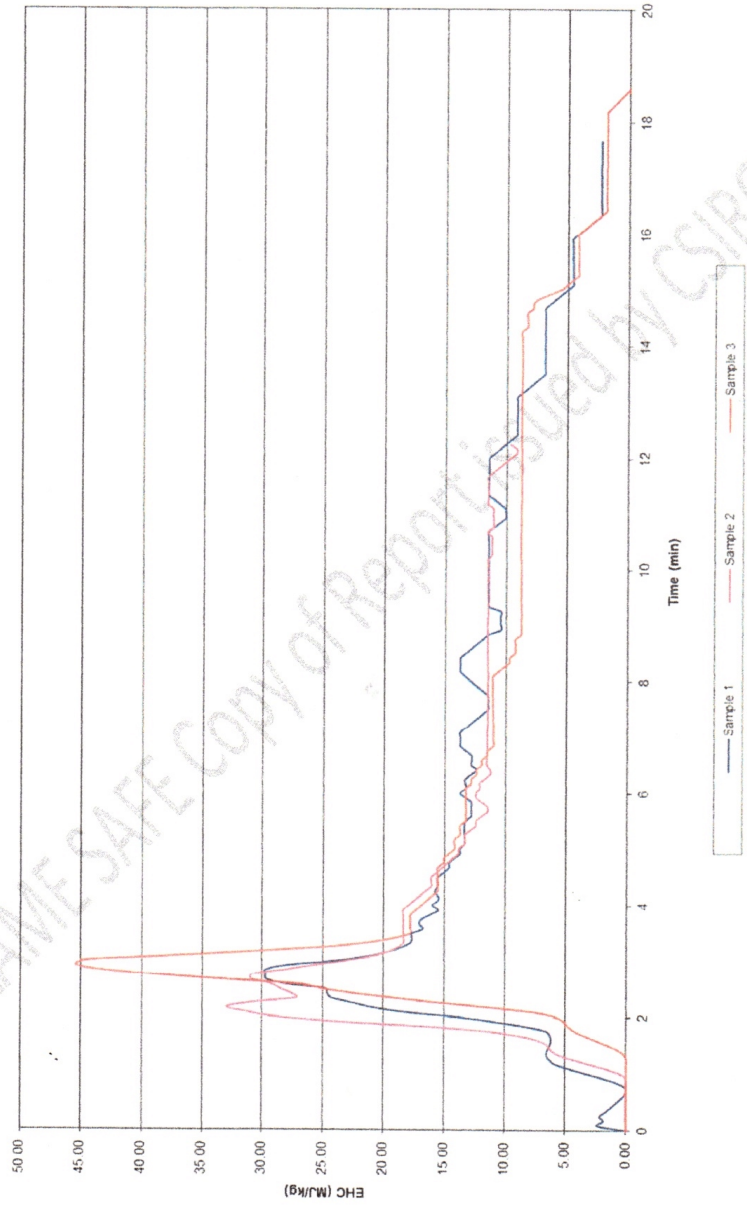


Figure 2 Effective Heat of Combustion (EHC)



5 Assessment Certificate

Figure 3 Certificate of Assessment 2309

Certificate of Assessment

Job No.: NK7585 **No. 2309**

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This is to certify that the specimen described below was tested by the CSIRO Infrastructure Technologies in accordance with Australian/ New Zealand Standard 3837, Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter, 1998, at 50 kW/m², on behalf of:

Doorpac trading as Timothy D & Alison G Trimmer
31 Pile Road
SOMERSBY NSW 2250
AUSTRALIA

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FNK 11758.

SAMPLE IDENTIFICATION: Doorpac Flame Safe X-T Ply

DESCRIPTION OF SAMPLE: The sponsor described the tested specimen as an OVL/BTR (Overlay and Better) exterior hardwood plywood. The plywood was treated with Flame Safe X-T flame-retardant additive.

Nominal total thickness: 3.6 mm
Nominal total mass: 2 kg/m²
Colour: light brown (timber)

SAMPLE CLASSIFICATION: Group Number: Group 3
(In accordance with Specification C1.10 Section 4 of the Building Code of Australia.)^{1,2}

Average specific extinction area: 46.4 m²/kg
(Refer to Specification C1.10 Section 4 of the Building Code of Australia.)^{1,2}


Notes:

- The results of this fire test 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 fire conditions.
- As per Section 9 (n) of AS 5637.1:2015, the determination of the group number was based on the AS/NZS 3837:1998 test, and was deemed valid in the cone calorimeter for the assignment of National Construction Code (NCC) group number.

Testing Officer: Heherson Alarde **Date of Test:** 11 July 2016

Issued on the 15th day of September 2016 without alterations or additions.


Brett Roddy
Team Leader, Fire Testing and Assessments



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