

Test on a wood plastic composite panel at 50-kW/m² irradiance in accordance with AS/NZS 3837:1998

Fire Testing Report

Author: Heherson Alarde
Report Number: FNK 12015
Quote Number: NK7841

Date: 16 August 2017
Version: A

Client: Perma Composites Pty Ltd

Commercial-in-confidence



NATA Accredited Laboratory
Number: 165
Corporate Site No 3625
Accredited for compliance with ISO/IEC 17025 - Testing.

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Test Report Details

Document: Fire Testing Report	Test Standard: AS/NZS 3837:1998 at 50-kW/m ² irradiance
Client: Perma Composites Pty Ltd	Quote Number: NK7841

Test Report Status and Revision History

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Test Report Authorisation

AUTHOR	REVIEWED BY	AUTHORISED BY
Heherson Alarde  16 August 2017	Russell Collins  16 August 2017	Brett Roddy  16 August 2017

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1 Summary

Sponsored Investigation Report Number FNK 12015

Test on wood plastic composite panel at 50-kW/m² irradiance in accordance with AS/NZS 3837:1998

2 Test Details

2.1 Sample Identification

PermaTimber CX Eco Cladding

2.2 Sponsor

Perma Composites Pty Ltd
14 Garino Rise
WANGARA WA 6065
AUSTRALIA

2.3 Manufacturer

Perma Composites Pty Ltd
14 Garino Rise
WANGARA WA 6065
AUSTRALIA

2.4 Job Number

NK7841

2.5 Test Date

7 August 2017

2.6 Description of Sample

The sponsor described the tested specimen as a wood plastic composite panel (WPC) with a coextruded recycled high-density polyethylene (HDPE) surface layer. The wood plastic composite core is comprised of wood fibres, recycled HDPE and other materials. The surface layer and core are bonded through co-extrusion. The cladding has a hollow, ribbed cross-sectional profile.

Nominal thickness of HDPE surface layer:	< 1 mm
Nominal total thickness:	21 mm
Nominal total density:	1350 kg/m ³ to 1400 kg/m ³
Nominal total mass:	15.5 kg/m ²
Colours:	brown spotted gum (surface) / light brown (core)

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 5 July 2017.

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 . The specimens were restrained with a wire grid which further reduced the test surface area to 0.0081-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 5660-1:2015(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 18 seconds exposure to the test. The specimen ignited during the test. The test was terminated when 2 minutes have passed since all flaming from the specimen ceased.

4.1.2 SPECIMEN 2

The specimen began to smoke after 18 seconds exposure to the test. The specimen ignited during the test. The test was terminated when 2 minutes have passed since all flaming from the specimen ceased.

4.1.3 SPECIMEN 3

The specimen began to smoke after 16 seconds exposure to the test. The specimen ignited during the test. The test was terminated when 2 minutes have passed since all flaming from the specimen ceased.

4.2 Results of Tests

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

Test Details:

Date of test: 07/08/17
 Test Report Date: 16/08/17
 Ethanol burn ('C' factors): 0.036439

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	55	2370	20.41	131.56	38.16	93.40	70.99	5.34	422.8	168.8	256.3	236.6	287.06	24.89	114.6
Sample 2	50	52	2520	20.66	133.04	38.24	94.80	71.26	5.07	414.9	187.1	255.5	233.9	297.49	25.42	119.3
Sample 3	50	50	980	20.88	135.29	66.49	68.80	50.85	5.55	434.7	180.8	270.2	252.7	311.23	36.64	182.9
Mean		52.3	1956.7		133.3	47.6	85.7	64.4	5.3	424.1	178.9	260.7	241.1	298.6	29.0	138.9
SD		2.5	849.1		1.9	16.3	14.6	11.7	0.2	10.0	9.3	8.2	10.2	12.1	6.6	38.1

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 1 Heat Release Rate (HRR)

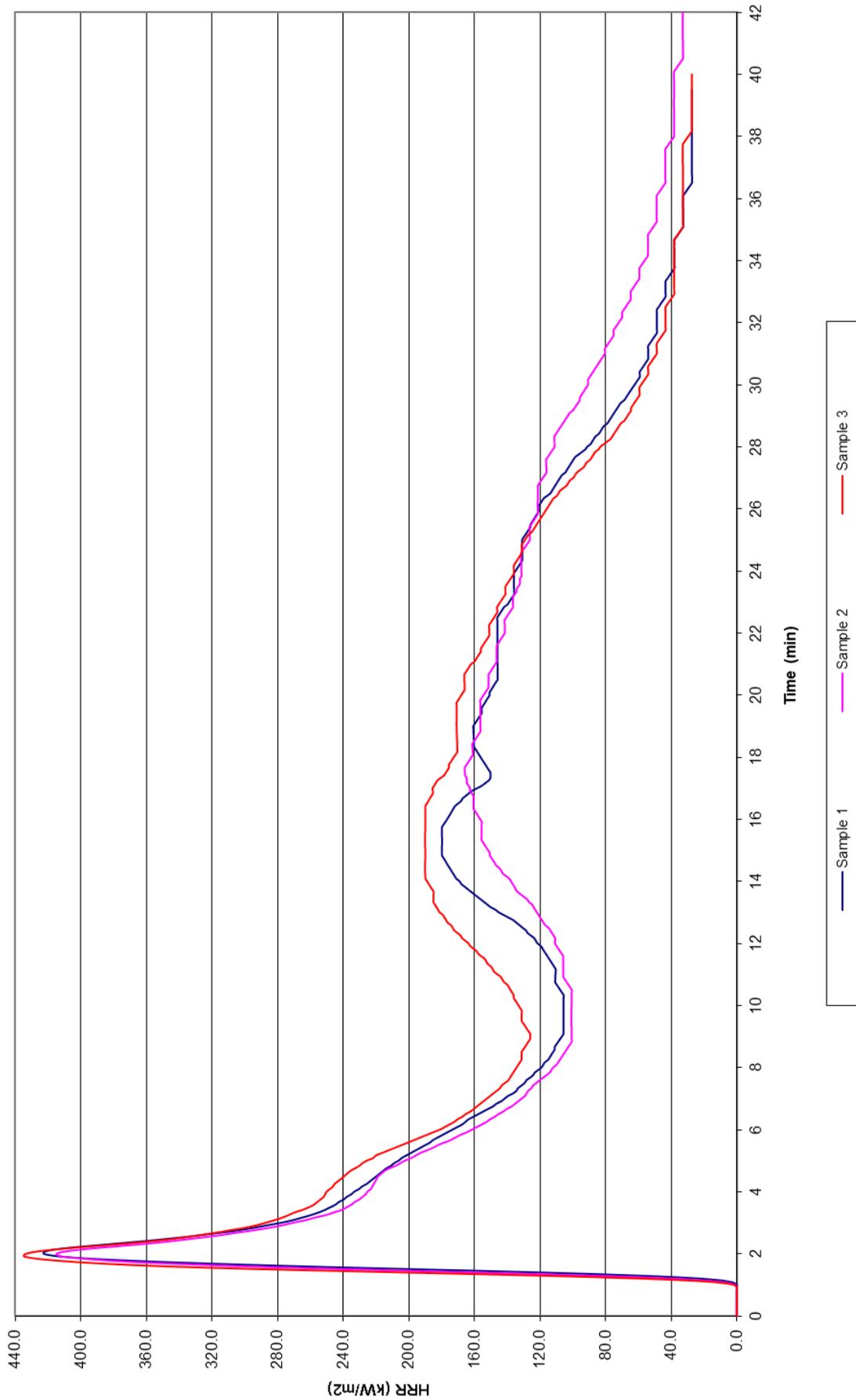
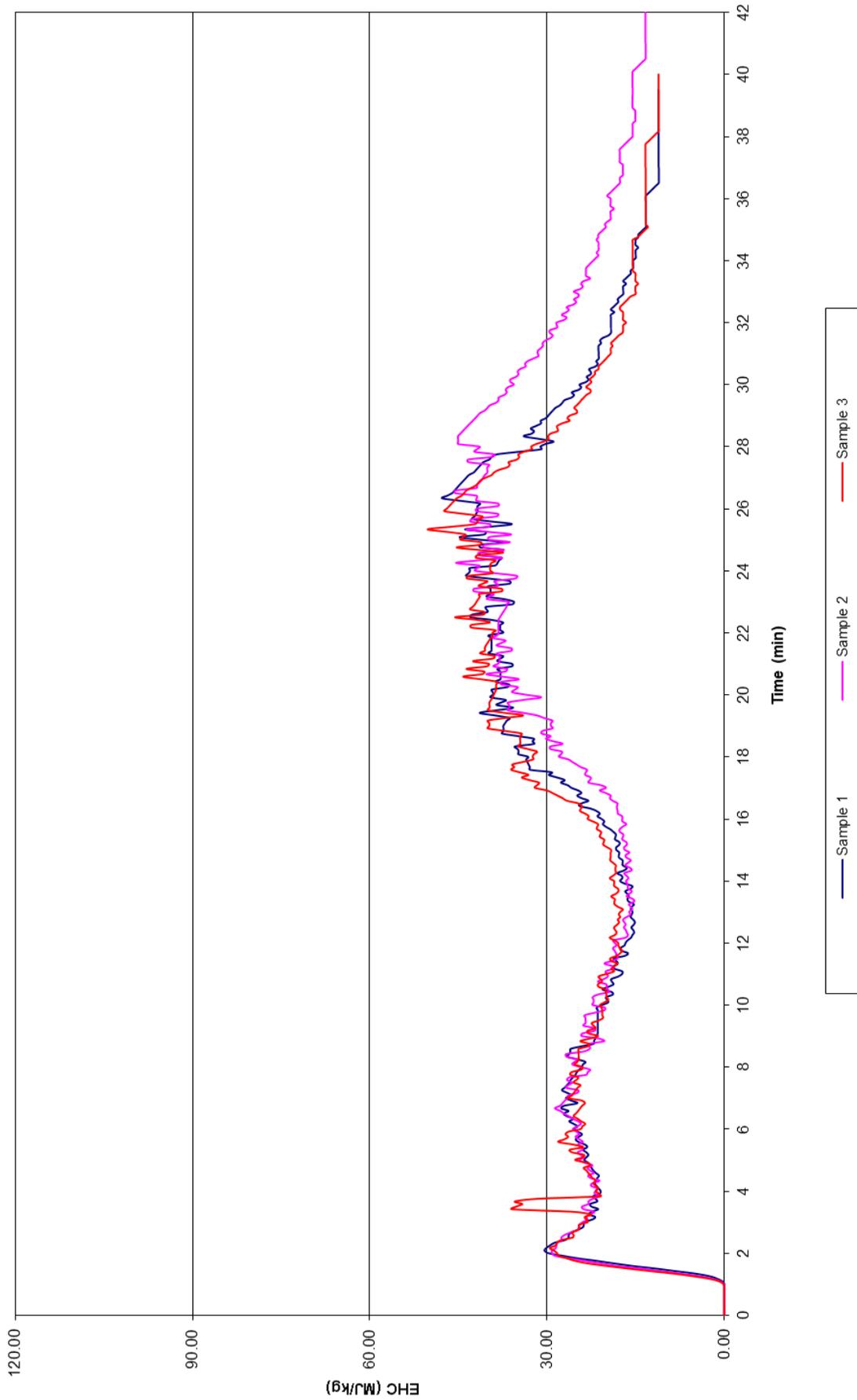


Figure 2 Effective Heat of Combustion (EHC)



5 Assessment Certificate

Figure 3 Certificate of Assessment 2436

Certificate of Assessment

Job No.: NK7841**No. 2436**

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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:

Perma Composites Pty Ltd
14 Garino Rise
WANGARA WA 6065
AUSTRALIA

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FNK 12015.

SAMPLE IDENTIFICATION: PermaTimber CX Eco Cladding

DESCRIPTION OF SAMPLE:

The sponsor described the tested specimen as a wood plastic composite panel (WPC) with a coextruded recycled high-density polyethylene (HDPE) surface layer. The wood plastic composite core is comprised of wood fibres, recycled HDPE and other materials. The surface layer and core are bonded through co-extrusion. The cladding has a hollow, ribbed cross-sectional profile.

Nominal thickness of HDPE surface layer:	< 1 mm
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Nominal total density:	1350 kg/m ³ to 1400 kg/m ³
Nominal total mass:	15.5 kg/m ²
Colours:	brown spotted gum (surface) / light brown (core)

SAMPLE CLASSIFICATION:

Group Number:	Group 4
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(In accordance with Specification A2.4 of the Building Code of Australia.) ^{1,2}

Average specific extinction area:	138.9 m ² /kg
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(Refer to Specification C1.10 section 4 of the Building Code of Australia.) ^{1,2}

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.

Testing Officer: Heherson AlardeDate of Test: 7 August 2017

Issued on the 16th day of August 2017 without alterations or additions.

Brett Roddy
Team Leader, Fire Testing and Assessments

NATA Accredited Laboratory
Number: 165
Corporate Site No 3625
Accredited for compliance with ISO/IEC 17025 - Testing.

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End of Report

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Certificate of Assessment

Job No.: NK7841

No. 2436

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Perma Composites Pty Ltd
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SAMPLE

IDENTIFICATION: PermaTimber CX Eco Cladding

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SAMPLE

CLASSIFICATION: Group Number: Group 4
(In accordance with Specification A2.4 of the Building Code of Australia.) ^{1,2}
Average specific extinction area: 138.9 m²/kg
(Refer to Specification C1.10 section 4 of the Building Code of Australia.) ^{1,2}

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.

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