

Test on PVC board at 50-kW/m² irradiance in accordance with AS/NZS 3837:1998

Fire Testing Report

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Report Number: FNK 11295
Quote Number: NK7260

Date: 14 November 2014
Version: Revision B

Client: Commins Flooring Agency

Commercial-in-confidence

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Test Report Details

Document: Fire Testing Report Test Standard: AS/NZS 3837:1998 at 50-kW/m² irradiance
Client: Commins Flooring Agency Quote Number: NK7260

Test Report Status and Revision History

VERSION	STATUS	DATE	DISTRIBUTION	COMMENT	FORMAT
Revision A	Draft for internal review	21 October 2014	CSIRO	CSIRO	Word
Revision B	Final for issue	14 November 2014	CSIRO; Commins Flooring Agency		PDF

Test Report Authorisation

AUTHOR	REVIEWED BY	AUTHORISED BY
Heherson Alarde  14 November 2014	Russell Collins  14 November 2014	Brett Roddy  14 November 2014

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1 Summary

Sponsored Investigation Report Number FNK 11295

Test on PVC board at 50-kW/m² irradiance in accordance with AS/NZS 3837:1998

2 Test Details

2.1 Sample Identification

CFA - CFLOOR

2.2 Sponsor

Commins Flooring Agency
13 Gammon Court
GREENWITH SA 5125
AUSTRALIA

2.3 Manufacturer

Jinka Shanghai Flooring
2000 Judai Road, East Ind. District,
Wai-gang, Jia-ding
SHANGHAI 201806
CHINA

2.4 Job Number

NK7260

2.5 Test Date

21 October 2014

2.6 Description of Sample

The sponsor described the tested specimen as polyvinyl chloride (PVC) flooring board. The tested specimen was comprised of the following layers:

Layer 1: 0.55-mm thick PVC wear layer;
Layer 2: PVC print film;
Layer 3: PVC backing.

The PVC board was adhered to 10-mm thick paper-faced plasterboard using Polymer 265 adhesive using a 1.5-mm V-notch trowel.

Nominal total thickness of PVC board:	2.5-mm
Nominal mass of PVC board:	4.3 kg/m ²
Colour:	light brown (print film)

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 12 September 2014.

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 7 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 7 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 6 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.

4.2 Results of Tests

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

Test Details:

Date of test: 21/10/14
 Test Report Date: 27/10/14
 Ethanol burn ('C' factors): 0.039572

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	24	540	12.59	114.89	83.29	31.60	27.50	6.78	190.1	131.7	122.6	99.3	36.33	10.12	307.9
Sample 2	50	22	510	12.58	115.52	84.52	31.00	26.84	6.98	174.3	130.3	117.8	94.0	32.56	9.24	315.4
Sample 3	50	22	530	12.58	116.85	85.55	31.30	26.79	6.79	179.3	130.9	120.3	96.9	34.83	9.79	312.1
Mean		22.7	526.7		115.8	84.5	31.3	27.0	6.8	181.2	131.0	120.3	96.7	34.6	9.7	311.8
SD		1.2	15.3		1.0	1.1	0.3	0.4	0.1	8.1	0.7	2.4	2.6	1.9	0.4	3.8

Figure 1 Heat Release Rate (HRR)

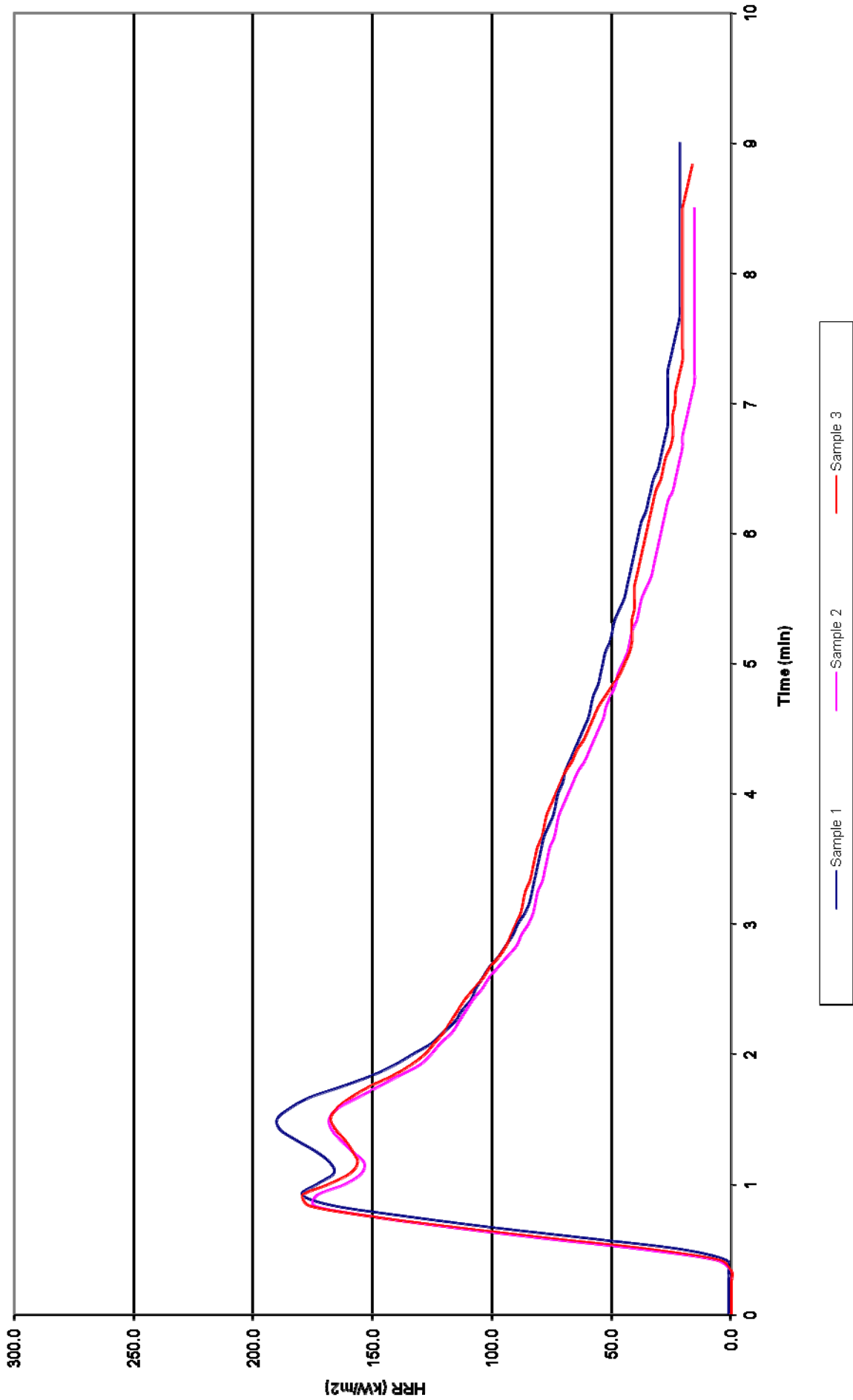
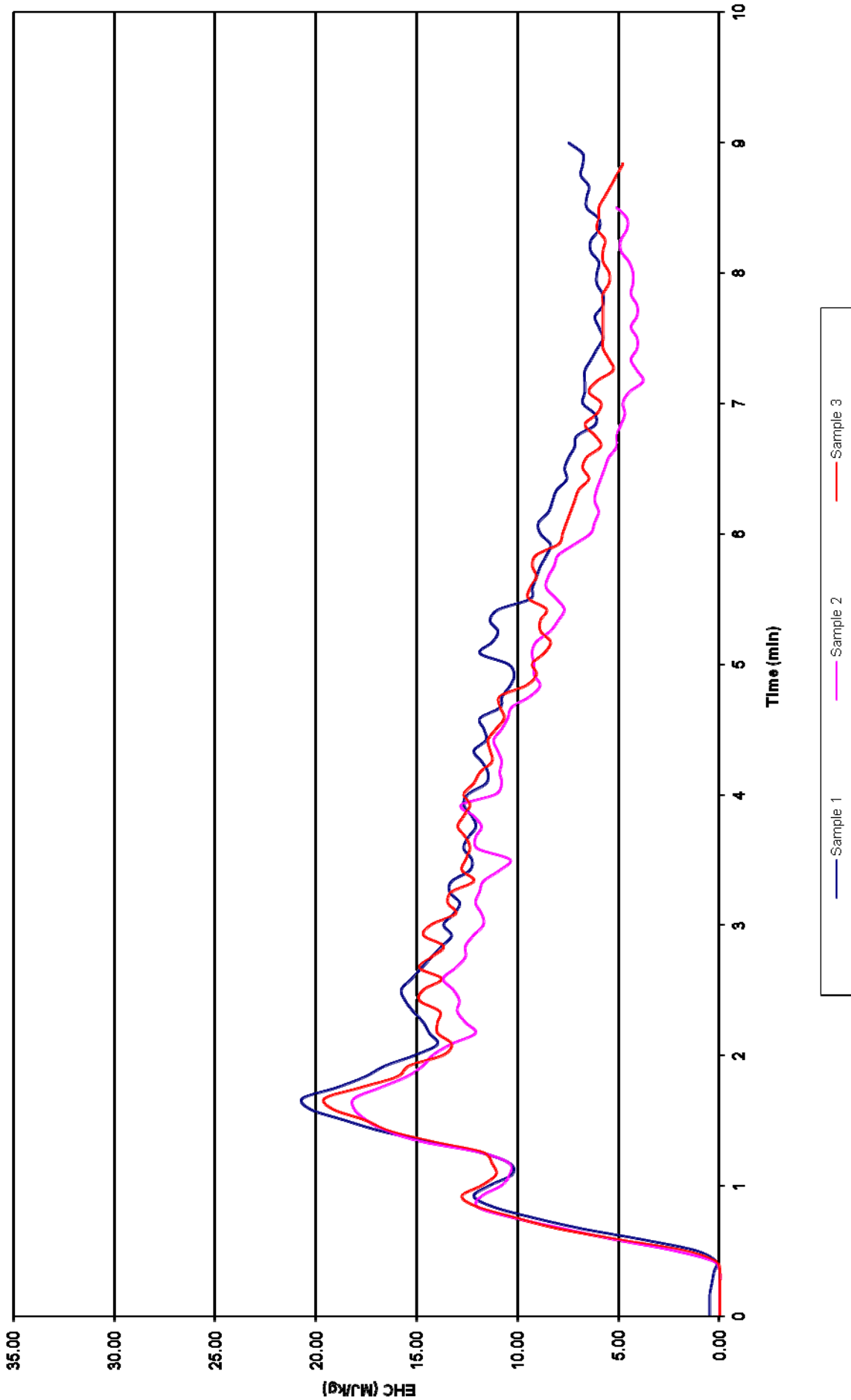


Figure 2 Effective Heat of Combustion (EHC)



5 Assessment Certificate

Figure 3 Certificate of Assessment 2143

Certificate of Assessment

Job No.: NK7260

No. 2143
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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:

Commins Flooring Agency
13 Gammon Court
GREENWITH SA 5125
AUSTRALIA

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FNK 11295.

SAMPLE IDENTIFICATION: CFA - CFLOOR

DESCRIPTION OF SAMPLE: The sponsor described the tested specimen as polyvinyl chloride (PVC) flooring board. The tested specimen was comprised of the following layers:

Layer 1: 0.55-mm thick PVC wear layer;
Layer 2: PVC print film;
Layer 3: PVC backing.

The PVC board was adhered to 10-mm thick paper-faced plasterboard using Polymer 265 adhesive using a 1.5-mm V-notch trowel.

Nominal total thickness of PVC board:	2.5-mm
Nominal mass of PVC board:	4.3 kg/m ²
Colour:	light brown (print film)

SAMPLE CLASSIFICATION: Group Number: Group 3
(In accordance with Specification A2.4 of the Building Code of Australia.)

Average specific extinction area: 311.8 m²/kg
(Refer to Specification C1.10 section 4(c) of the Building Code of Australia.)

Testing Officer: Heherson Alarde Date of Test: 21 October 2014

Issued on the 14th day of November 2014 without alterations or additions.


Brett Roddy
Team Leader, Fire Testing and Assessments



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FOR FURTHER INFORMATION

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