Test on a Dekodur high pressure laminate at 50-kW/m² irradiance in accordance with AS/NZS 3837:1998

Fire Testing Report

Author: Heherson Alarde
Report Number: FNK 11804
Quote Number: NK7545

Date: 21 October 2016
Version: A

Client: Surteco Australia Pty Limited

Commercial-in-confidence

NATA Accredited Laboratory
Number: 165
Corporate Site No 3625
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Enquiries

Enquiries should be addressed to:

Team Leader, Fire Testing and Assessments	Author	Client
Infrastructure Technologies 14 Julius Avenue North Ryde, NSW 2113 Australia Telephone +61 2 94905444	Infrastructure Technologies 14 Julius Avenue North Ryde, NSW 2113 Australia Telephone +61 2 94905445	Surteco Australia Pty Limited 7-11 Penelope Crescent Arndell Park NSW 2148 Australia

Test Report Details

Document: Fire Testing Report

Test Standard: AS/NZS 3837:1998 at 50-kW/m² irradiance

Client: Surteco Australia Pty Limited

Quote Number: NK7545

Test Report Status and Revision History

VERSION	STATUS	DATE	DISTRIBUTION	COMMENT	ISSUE NO.
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A	Final for issue	21 October 2016	CSIRO; Surteco Australia Pty Limited		FNK 11804

Test Report Authorisation

AUTHOR	REVIEWED BY	AUTHORISED BY
Heherson Alarde	Russell Collins	Brett Roddy
21 October 2016	21 October 2016	21 October 2016

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Sponsored Investigation Report Number FNK 11804

Test on a Dekodur high pressure laminate at 50-kW/m² irradiance in accordance with AS/NZS 3837:1998

2 Test Details

2.1 Sample Identification

Dekodur Laminate

2.2 Sponsor

Surteco Australia Pty Limited
7-11 Penelope Crescent
ARNDELL PARK NSW 2148
AUSTRALIA

2.3 Manufacturer

Dekodur GmbH + Co.KG
Langenthaler Straße 4
D-69434 HIRSCHHORN/NECKAR
GERMANY

2.4 Job Number

NK7545

2.5 Test Date

6 October 2016

2.6 Description of Sample

The sponsor described the tested specimen as a high pressure laminate with a reflective aluminium surface and a backing of 10 layers of Kraft stabilising paper.

Nominal thickness of laminate:	0.8-mm
Nominal mass of Kraft paper backing:	800-g/m² to 1200-g/m²
Nominal total mass:	1100-g/m²
Colour:	reflective silver

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 14 July 2016.

3 Method

3.1 Conditioning of Specimens

Prior to the test, the specimens were conditioned to constant mass at a temperature of 23 ± 2°C and a relative humidity of 50 ± 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-m². The specimens were restrained with a wire grid which further reduced the test surface area to 0.0081-m², and this is the area used in calculations.

Three specimens were tested at an irradiance level of 50-kW/m².

The nominal exhaust system flow rate for all tests was 0.024-m³/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/m²;
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 29 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 30 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 31 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: 06/10/16
Test Report Date: 19/10/16
Ethanol burn ('C' factors): 0.037020

Table 1 Results of test

	IRRADIANCE (kW/m²)	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/m².s)	PEAK HRR (kW/m²)	AVERAGE HRR (FIRST 60s AFTER IGN)	AVERAGE HRR (FIRST 180s AFTER IGN)	AVERAGE HRR (FIRST 300s AFTER IGN)	TOTAL HEAT RELEASED (MJ/m²)	AVERAGE EHC (MJ/kg)	AVERAGE SPECIFIC EXTINCTION AREA (m²/kg
Sample 1	50	77	275	0.76	11.35	4.95	6.40	56.39	4.50	143.4	77.2	32.6	n/a	6.03	7.63	97.9
Sample 2	50	74	290	0.78	11.5	5.40	6.10	53.04	4.30	146.5	71.5	37.0	n/a	6.84	9.09	77.7
Sample 3	50	84	325	0.82	11.61	5.91	5.70	49.10	3.82	120.5	68.1	38.7	n/a	7.15	10.17	120.2
Mean		78.3	296.7		11.5	5.4	6.1	52.8	4.2	136.8	72.3	36.1		6.7	9.0	98.6
SD		5.1	25.7		0.1	0.5	0.4	3.7	0.3	14.2	4.6	3.1		0.6	1.3	21.2

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. Clause 5.3.2 of AS 5637.1:2015 states that the empirical correlation shall not be used for products or assemblies with a reflective surface

3. As per Clause 9 (s) of AS 5637.1:2015, THE RESULTS REPORTED HEREIN SHALL NOT BE USED TO DETERMINE A GROUP NUMBER.

Figure 1 Heat Release Rate (HRR)

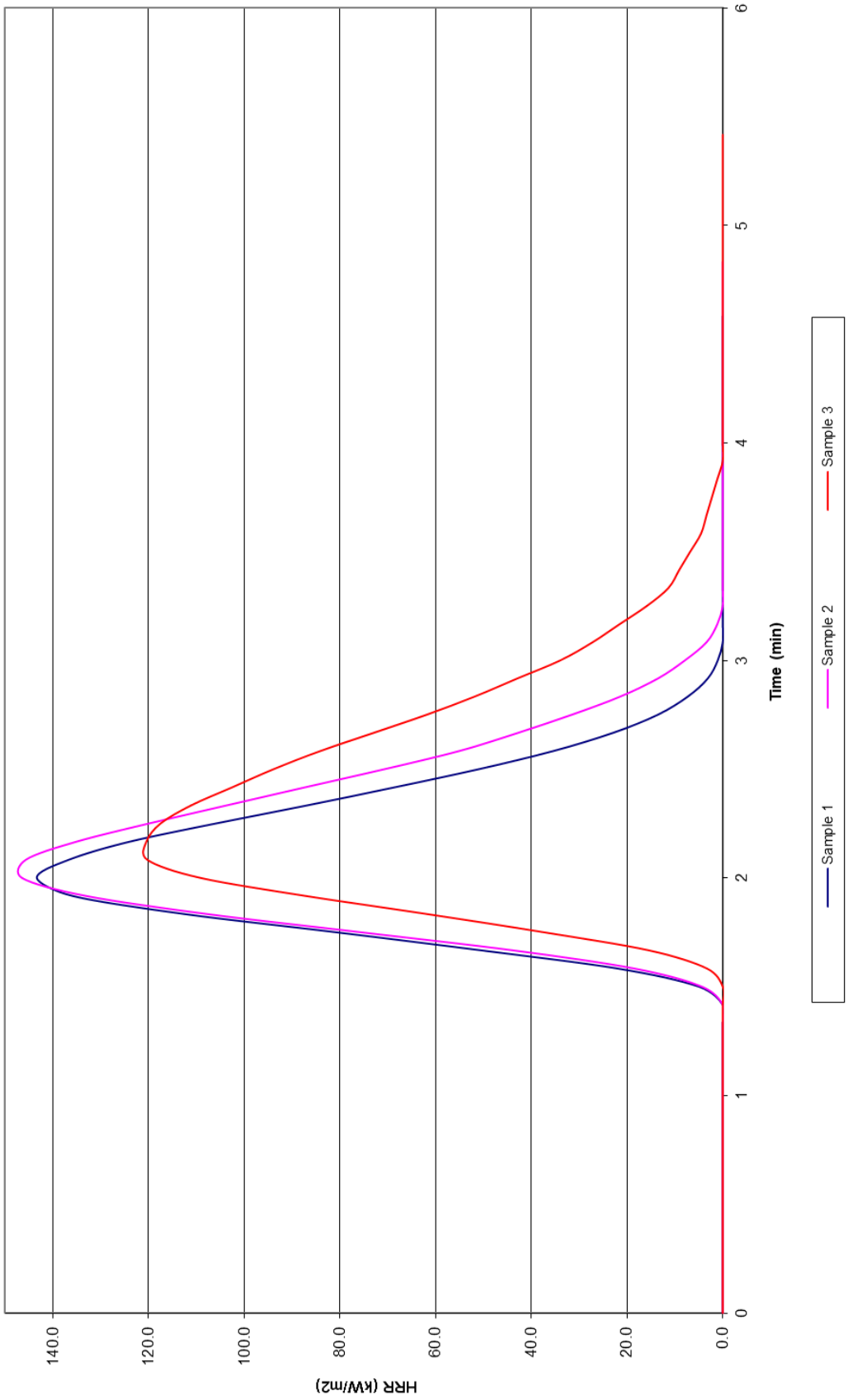
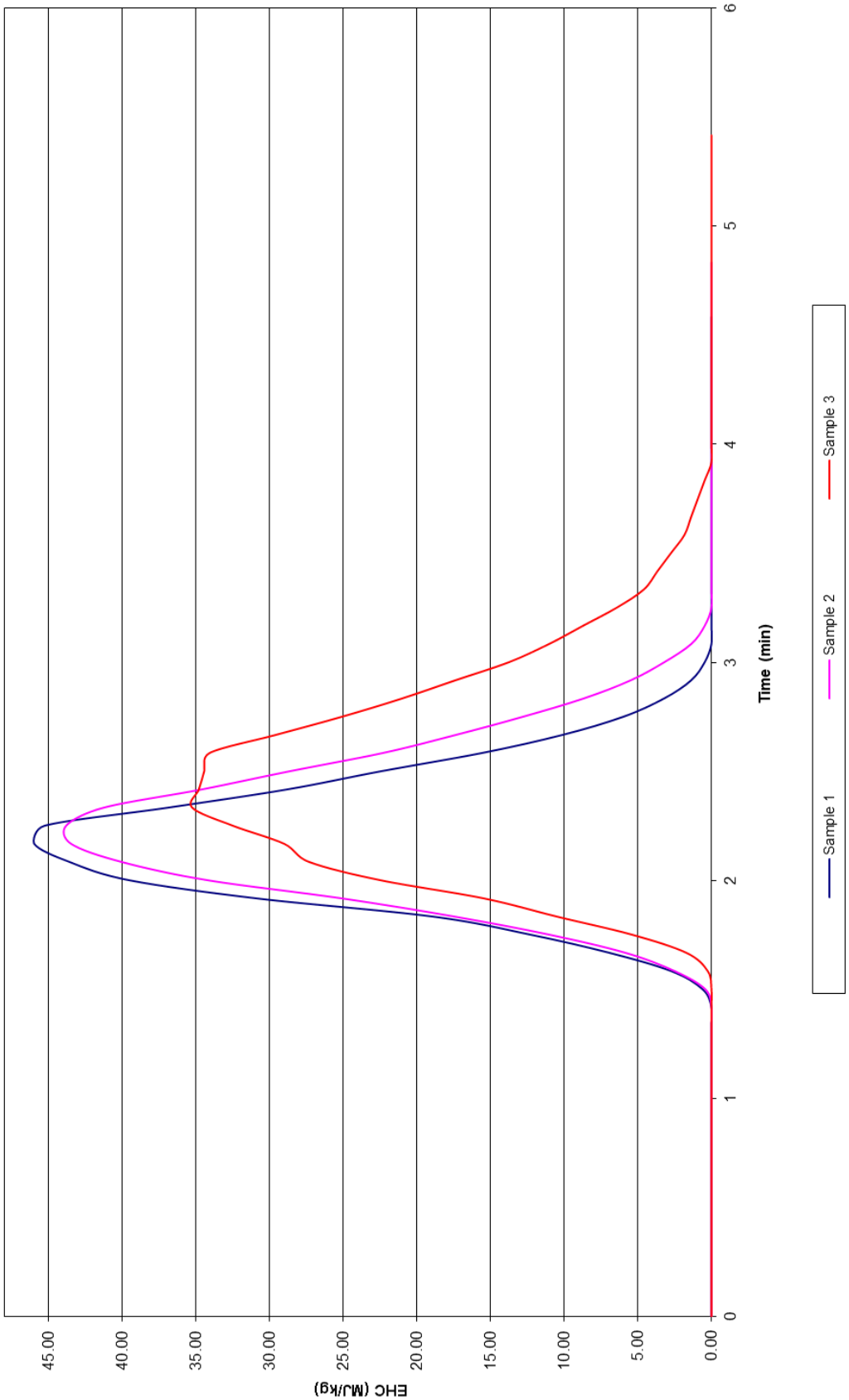


Figure 2 Effective Heat of Combustion (EHC)



CONTACT US

t 1300 363 400
+61 3 9252 6000
e enquiries@csiro.au
w www.csiro.au

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FOR FURTHER INFORMATION

Infrastructure Technologies
Heherson Alarde
Fire Testing Engineer
t +61 2 9490 5445
e heherson.alarde@csiro.au
w www.csiro.au/en/Do-business/Services/Materials-infrastructure/Fire-safety

Infrastructure Technologies
Brett Roddy
Team Leader, Fire Testing and Assessments
t +61 2 94905449
e brett.roddy@csiro.au
w www.csiro.au/en/Do-business/Services/Materials-infrastructure/Fire-safety