

**Test on magnesium oxide glass-fibre mesh composite at
50-kW/m² irradiance in accordance with AS/NZS 3837:1998**

Report number FNK 9471 Revision A

CSIRO job number NK6016

Date of Issue: 22 June 2020

Client

FireCrunch Australasia Pty Ltd t/a FireCrunch Australia

Commercial-in-confidence



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SUMMARY

SPONSORED INVESTIGATION REPORT No. FNK 9471 Revision A

TEST ON MAGNESIUM OXIDE GLASS-FIBRE MESH COMPOSITE AT
50-kW/m² IRRADIANCE IN ACCORDANCE WITH AS/NZS 3837:1998

Sample Identification:

Product stated by the manufacturer to be identical to FIRECRUNCH FCA-10

Sponsor:

Firecrunch Australasia Pty Ltd
Suite 19, Level 44, MLC Centre
19 Martin Place, Sydney NSW 2000

Manufacturer:

Modak Australia Pty Ltd
Quarry Master Drive
PYRMONT NSW
AUSTRALIA

Job Number:

NK6016

Test Date:

29 July 2009

Description of Sample:

The sponsor described the tested specimen as magnesium oxide (MgO) glass-fibre mesh reinforced composite.

Nominal thickness: 10 mm

Nominal mass: 2.38 kg/m²

Colour: white

Documentation:

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

Test Agreement and form FTAF33 dated 16 July 2009. Keith should we include Firecrunch document here which references new trade name Yes

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 $50 \pm 10\%$.

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, and this is the area used in calculations. The specimen was restrained using a wire grid.

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/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.

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.

Observations:

Specimen 1

The specimen began to smoke after 11 seconds exposure to the test. The specimen failed to ignite during the test. The test was terminated when the specimen failed to ignite after a 10 minute exposure.

Specimen 2

The specimen began to smoke after 10 seconds exposure to the test. The specimen failed to ignite during the test. The test was terminated when the specimen failed to ignite after a 10 minute exposure.

Specimen 3

The specimen began to smoke after 7 seconds exposure to the test. The specimen failed to ignite during the test. The test was terminated when the specimen failed to ignite after a 10 minute exposure.

Results:

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

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TESTED BY:

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Testing Officer

Brett Roddy
Group Leader | Infrastructure Technologies North Ryde

22 June 2020

Test Details:

Date of test: 29/07/09

Date of Issue: 22 June 2020

Ethanol burn ('C' factors): 0.043219

	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	0	600	10.52	91.46	0.00	91.46	100.00	3.84	5.3	0.0	0.0	0.0	1.37	0.13	0.4
Sample 2	50	0	600	10.63	92.14	0.00	92.14	100.00	3.95	5.2	0.0	0.0	0.0	1.04	0.10	3.6
Sample 3	50	0	600	10.16	102.41	0.00	102.41	100.00	3.85	10.4	0.0	0.0	0.8	2.11	0.18	2.6
Mean		0.0	600.0		95.3	0.0	95.3	100.0	3.9	7.0	0.0	0.0	0.3	1.5	0.1	2.2
SD		0.0	0.0		6.1	0.0	6.1	0.0	0.1	3.0	0.0	0.0	0.4	0.5	0.0	1.6

Table 1- Results of tests

Figure 1 - Heat Release Rate

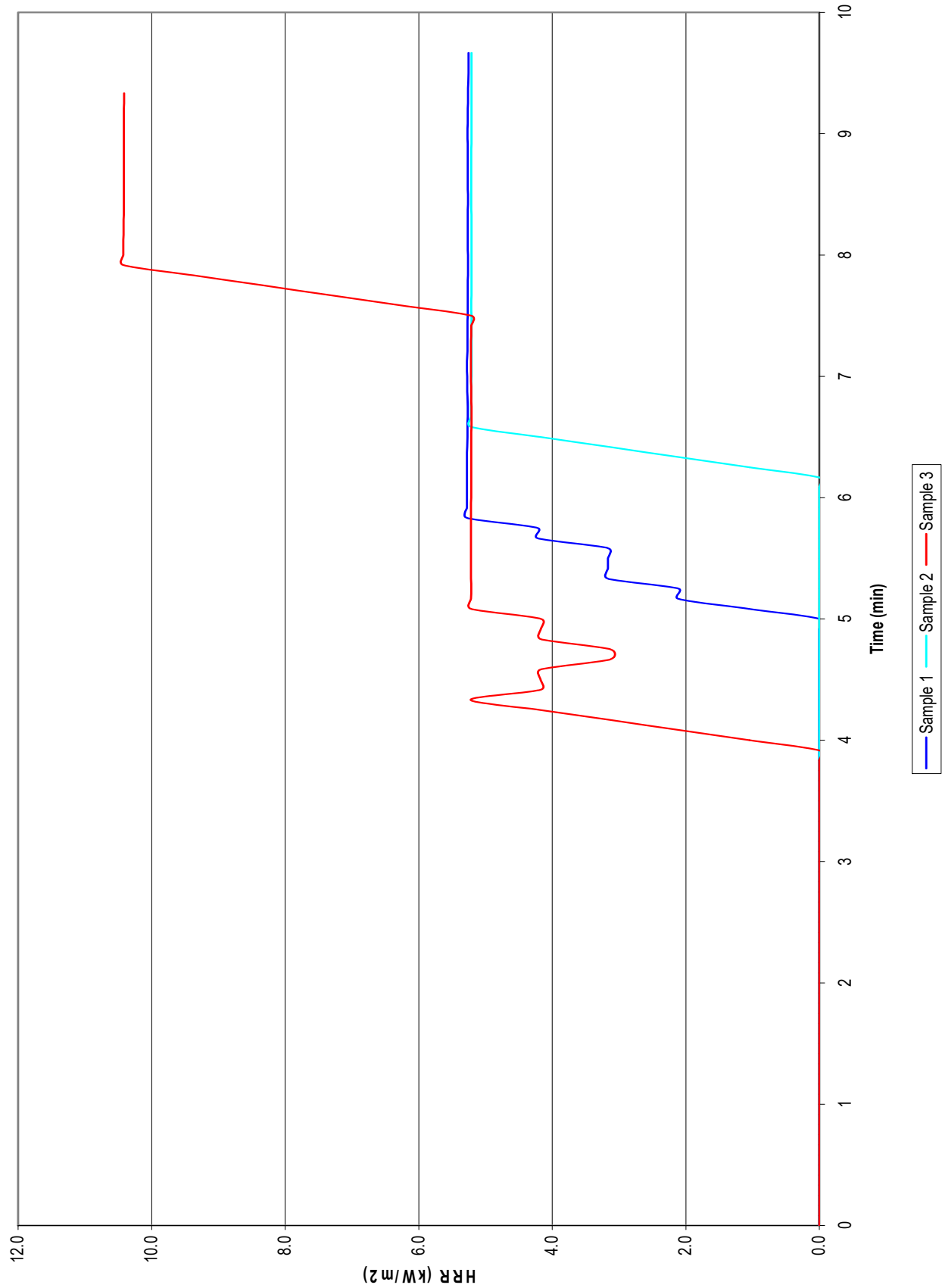


Figure 2 - Effective Heat of Combustion

