



# Assessment of the group number and average specific extinction area (ASEA) for FIRECRUNCH FCA-10 in accordance with AS 5637.1-2015

## Assessment Report

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**Client:** FireCrunch Australasia Pty Ltd

Commercial-in-confidence

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# Contents

1	Introduction .....	5
2	Supporting Data .....	5
3	Proposed Variations .....	5
4	Referenced Standards .....	5
5	Conclusion .....	6
6	Direct Field of Application of Results .....	6
7	Requirements .....	6
8	Term of Validity .....	6
9	Limitations.....	6
Appendix A	Supporting Test Data .....	8
Appendix B	Analysis of Variations .....	10

# 1 Introduction

This report is an assessment of the *Group Number* and *Average Specific Extinction Area (ASEA)* for FIRECRUNCH FCA-10 in accordance with AS 5637.1-2015.

This report reviews and confirms the extent to which the reference fire resistance tests listed in section 2 meet the requirements of the standard fire test standards listed in section 4 of the report. The proposed variations to the tested construction presented in section 3 are subject to an analysis in Appendix B and the conclusions are presented in Section 5 of this report.

The field of applicability of the results of this assessment report is presented in Section 6.

## 2 Supporting Data

This assessment report refers to the following report(s) to support the analysis and conclusions of this report.

Report Reference	Test Standard	Outline of Test Specimen
FNK 9471 Rev A	AS/NZS 3837:1998	Product stated by the manufacturer to be identical to FIRECRUNCH FCA-10 a board with an uncoated fibreglass mesh backing and a core made from magnesium oxide, magnesium sulphate, wood shavings and fibreglass.
.FNC 12169 Rev A	AS 1530.1-1994	Product stated by the manufacturer to be identical to FIRECRUNCH FCA-10 a board with an uncoated fibreglass mesh backing and a core made from magnesium oxide, magnesium sulphate, wood shavings and fibreglass.

The referenced tests were conducted CSIRO and sponsored by Fire Crunch Australia and FireCrunch Australasia Pty Ltd who have provided permission for CSIRO to use the referenced test data to prepare this report. Details of the referenced test are presented in Appendix A

## 3 Proposed Construction

The proposed construction shall be the wall and ceiling lining as tested in FNK 9471 Rev A and its Group number and ASEA performance shall be evaluated in accordance with AS 5637-2015.

## 4 Referenced Standards

Standards:

AS/NZS 3837-1998	Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter
AS 5637.1-2015	Determination of fire hazard properties – Wall and ceiling linings

## 5 Conclusion

On the basis of the analysis presented in this report, it is the opinion of this Accredited Testing Laboratory that the tested prototypes described in Section 2 when varied as described in Section 3 will achieve the performance stated below when submitted to a standard fire test in accordance with the test methods referenced in Section 4 and subject to the requirements of section 7, the validity of section 8 and limitation of section 9.

<b>Group Number</b>	<b>1</b>
<b>Average Specific Extinction Area</b>	<b>2.2 m<sup>2</sup>/Kg</b>

## 6 Direct Field of Application of Results

The results of this assessment are applicable to wall and ceiling linings as defined in the NCC.

## 7 Requirements

This report details the test conditions and expected results that specific elements of the construction described herein would achieve when tested in accordance with the referenced tests in section 4 and the group number and AS 5637.1-2015.

Any further variations with respect to size, surface characteristics, symmetry, composition or joints other than those identified in this report, may invalidate the conclusions drawn in this report

## 8 Term of Validity

This assessment report will lapse on 31<sup>st</sup> July 2025. Should you wish us to re-examine this report with a view to the possible extension of its term of validity, would you please apply to us three to four months before the date of expiry. This Division reserves the right at any time to amend or withdraw this assessment in the light of new knowledge.

## 9 Limitations

The conclusions of this assessment report may be used to directly assess the fire resistance performance under such conditions, but it should be recognised that a single test method will not provide a full assessment of the fire hazard under all fire conditions.

Because of the nature of fire testing, and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy. The inherent variability in test procedures, materials and methods of construction, and installation may lead to variations in performance between elements of similar construction.

This assessment report does not provide an endorsement by CSIRO of the actual products supplied to industry. The referenced assessment can therefore only relate only to the actual prototype test

specimens, testing conditions and methodology described in the supporting data, and does not imply any performance abilities of constructions of subsequent manufacture.

This assessment is based on information and experience available at the time of preparation. The published procedures for the conduct of tests and the assessment of test results are the subject of constant review and improvement and it is recommended that this report is reviewed on or, before, the stated expiry date.

The information contained in this assessment report shall not be used for the assessment of variations other than those stated in the conclusions above. The assessment is valid provided no modifications are made to the systems detailed in this report. All details of construction should be consistent with the requirements stated in the relevant test reports and all referenced documents.

# Appendix A Supporting Test Data

## A.1. CSIRO Sponsored Investigation report numbered FNK 9471 Rev A

On 29 July 2009, CSIRO conducted a cone calorimeter test in accordance with AS/NZS 3837-1998 on a specimen that the test sponsor described as magnesium oxide (MgO) glass-fibre mesh reinforced composite.

Nominal thickness: 10 mm

Nominal mass: 2.38 kg/m<sup>2</sup>

Colour: white

The product tested is stated by the manufacturer to be identical to FIRECRUNCH FCA-10.

All test specimens were exposed in the horizontal orientation with the standard pilot operating. Nominally 100 x 100-mm specimens were tested as supplied. The edge frame reduces the test surface area to 0.0088-m<sup>2</sup>, 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/m<sup>2</sup>.

The nominal exhaust system flow rate for all tests was 0.024-m<sup>3</sup>/s.

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

### A summary of the results obtained from the specimens

Criteria	Sample 1	Sample 2	Sample 3	Mean	SD
Irradiance (kW/m <sup>2</sup> )	50	50	50		
Time to sustained burning (s)	0	0	0	0	0
Test duration (s)	600	600	600	600	0
Thickness (mm)	10.52	10.63	10.16		
Specimen mass (g)	91.46	92.14	102.41	95.3	6.1
Mass remaining (g)	0	0	0	0	0
Mass loss (g)	91.46	92.14	102.41	95.3	6.1
Percent of mass pyrolysed (%)	100	100	100	100	0
Average rate of mass loss (g/m <sup>2</sup> .s)	3.84	3.95	3.85	3.9	0.1
Peak HRR (kW/m <sup>2</sup> )	5.3	5.2	10.4	7	3
Average HRR (first 60s after ignition)	0	0	0	0	0
Average HRR (first 180s after ignition )	0	0	0	0	0
Average HRR (first 300s after ignition)	0	0	0.8	0.3	0.4
Total heat released (MJ/m <sup>2</sup> )	1.37	1.04	2.11	1.5	0.5
Average EHC (MJ/kg)	0.13	0.1	0.18	0.1	0
Average specific extinction area (m <sup>2</sup> /kg)	0.4	3.6	2.6	2.2	1.6

## A.2. CSIRO Sponsored Investigation report numbered FNC 12169 Rev A

On 15 June 2018, CSIRO conducted a combustibility test for materials in accordance with AS 1530.1-1994 on a specimen described by the test sponsor as magnesium oxide board (MgO) with an uncoated fibreglass mesh backing comprised of magnesium oxide, magnesium sulphate, wood shavings and fibreglass

Nominal thickness: 10 mm (loose laid to form 50 mm for the test)

Nominal density: 1.15 g/cm<sup>3</sup>

Colour: grey and white

The product tested is stated by the manufacturer to be identical to FIRECRUNCH FCA-10.

Five (5) samples were tested in accordance with Australian Standard 1530 Methods for fire tests on building materials, components and structures, Part 1- 1994: Combustibility Test for Materials.

### The results of the test are as follows

Measurement	Result
Mean furnace thermocouple temperature rise	2.6°C
Mean specimen centre thermocouple temperature rise	162.2°C
Mean specimen surface thermocouple temperature rise	4.0°C
Mean duration of sustained flaming	0 seconds
Mean mass loss	42.62%

The material was NOT deemed COMBUSTIBLE according to the test criteria specified in Clause 3.4 of AS 1530.1-1994.



# Appendix B Analysis of Variations

## B.1 Assessment of FIRECRUNCH FCA-10 group number and ASEA

In accordance with AS 5637.1-2015, section 5 which states that only materials for which there are correlations between cone calorimeter results and room test results shall be tested in the cone calorimeter for the purpose of determining a group number. If the material has a confirmed correlation, the group number shall be determined by prediction in accordance with clause 4.4 using data obtained by testing the material in accordance with AS/NZS 3837.

Where products are tested in accordance with AS 1530.1-1994 and meet the criteria for non-combustible materials in that standard, based on our testing experience it is considered by this accredited testing laboratory there is sufficient confidence in there being a correlation between the group number performance predicted from testing accordance with AS/NZS 3837 and the group number determined in accordance with AS/ISO 9705.1-2003 at a group 1 level of performance.

Clause	Requirement	Result	Is the requirement met?
AS 5637.1-2015 clause 5.1	Can the group number in the room test (AS ISO 9705—2003) be confidently predicted by using data from the cone calorimeter (ISO 5660-1 or AS/NZS 3837) and applying an appropriate mathematical model, then such a prediction may be used as an alternative to conducting the room test.	Yes	✓
AS 5637.1-2015 clause 5.3.1	Is the material homogeneous or multi-layered?	Primarily Homogeneous	✓
AS 5637.1-2015 clause 5.3.2 and AS/NZS 3837 clause 2.2.1	Does the specimen material include profiled facings not allowed by AS/NZS 3837 clause 2.2.2.1?	No	✓
	Was the specimen made from materials that melt or shrink away from a flame?	No	✓
	Does the specimen material include joints or openings?	No	✓
	Does the specimen material have a reflective surface?	No	✓
	AS/NZS 3837 clause 2.2.1.4 - Does the specimen material have faces which differ from each other or contain laminations of different materials that would require a test from each side?	No	✓
<b>Suitability of use of Cone Calorimeter results</b>			✓

### ***Determination of group number of tested specimens***

Tests of the material in FNK 9471 Rev A were conducted in accordance with AS/NZS 3837 at 50kW/m<sup>2</sup>. Following the procedures of the prediction method in AS 5637.1-2015 clause 8, it was calculated that the samples achieved Group 1 performance.

### ***Determination of average specific extinction area***

The tested samples in FNK 9471 Rev A achieved Average Specific Extinction Area of 2.2 m<sup>2</sup>/kg in accordance with AS/NZS 3837.

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