

## PROFESSIONAL FIRE SAFETY TESTING

t: (02) 6111 2909 | ABN: 36 620 256 617  
[mail@ignislabs.com.au](mailto:mail@ignislabs.com.au) | [www.ignislabs.com.au](http://www.ignislabs.com.au)  
3 Cooper Place, Queanbeyan, NSW 2620  
PO Box 5174 Braddon ACT 2612

Column Panels from Woven  
Image Pty Ltd

AS 5637.1 TEST REPORT  
TESTING TO AS ISO 9705:2003

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IGNL-8260-06-01R IO1 R00

Tested: 17.07.2024  
Issued: 01.10.2024  
Expiry: 30.09.2029

## DOCUMENT REVISION HISTORY

Issue	Revision	Date	Purpose of Issue	Prepared by	Reviewed by
01	00 D01	23.09.2024	Issued for internal review	NC	TL
01	00	01.10.2024	Finalised	TL	BHB

## SPONSOR

**Woven Image**  
37 – 39 Chard Road  
Brookvale, NSW 2085

## TECHNICAL PERSONNEL




**Darren Laker**  
Test Supervisor



**Tom Lewis** | BE(ANU)  
Technical Lead Engineer | GIEAust

## SIGNATORY



Authorised by  
**Benjamin Hughes-Brown** | FIEAust CPEng NER APEC Engineer IntPE(Aus)  
Chartered Professional Engineer  
CPEng, NER (Fire Safety / Mech) 2590091, RPEQ 11498, BDC-1875, PRE0000303, DEP0000317, PE0001872  
MFireSafety (UWS), Beng (UTS), GradDipBushFire (UWS), DipEngPrac (UTS), DipEng (CIT)

## CONTACT INFORMATION and LOCATION OF TESTING

**Ignis Labs Pty Ltd**  
t: (02) 6111 2909 | ABN: 36 620 256 617  
[mail@ignislabs.com.au](mailto:mail@ignislabs.com.au) | [www.ignislabs.com.au](http://www.ignislabs.com.au)  
3 Cooper Place, Queanbeyan, NSW 2620  
PO Box 5174 Braddon ACT 2612

Version: IGNL-FO-202 I01R00

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This assessment report does not provide an endorsement by Ignis Labs Pty Ltd of the actual product evaluated.

The conclusions of this assessment 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 hazards under all 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.

The assessment can therefore relate only to the actual prototype test specimens, testing conditions and methodology described in the referenced documents, 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.

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## 1 INTRODUCTION

### 1.1 General

The purpose of this report is to document the room test undertaken by Ignis Labs on the Column panels of Woven Image Pty Ltd. The testing was undertaken in accordance with AS ISO 9705:2003 R2016 and reported in accordance with AS 5637.1:2015 with the exception that heat flux at the floor was not measured.

### 1.2 Subject Test Specimen

The test sponsor described the specimen as a 3D formed acoustic panel. It is composed of 100% PET. It has a nominal density of 9.2 kg per panel and a nominal thickness of 9 mm. It is described with a colour code known as 573 mint and its end use is as a wall covering.

The received specimens were corrugated Polyester felt panels. They had a measured thickness of 8.1 mm. They had dimensions of 1 m in width and 2.8 m in length. The corrugations extended along the entire length of each panel, with a nominal height of 75 mm and spaced at 150 mm centre.

The panels were fixed to the test room using H.B. Fuller Max Bond adhesive applied on the back of the panels. The panels were installed vertically and allowed to cure for two days before testing.

FIGURE 1:

SPECIMEN PANELS



### 1.3 Sponsor

#### **Woven Image**

37 – 39 Chard Road

Brookvale, NSW 2085

### 1.4 Test Number

The Ignis Labs reference test number is IGNL-8260-06-01R.

### 1.5 Test Date

The test was conducted on 17 July 2024.

### 1.6 Test Results

The specimen achieved the following performance requirements as defined in AS ISO 9705:2003 R2016, AS 5637.1:2015.

Criteria	Result
Group Number	2
SMOGR <sub>RC</sub> (in m <sup>2</sup> s <sup>-2</sup> x 1000)	9.28

## 2 DESCRIPTION OF SPECIMEN

### 2.1 General

The test sponsor described the specimen as a 3D formed acoustic panel (Mura face laminated to Epsilon board). It is composed of 100% PET. It has a nominal density of 9.2 kg per panel and a nominal thickness of 9 mm. The sponsor described its colour as '573 mint' and its end use is as a wall covering.

The received specimens were corrugated Polyester felt panels. They had a measured thickness of 8.1 mm and dimensions of 1 m in width and 2.8 m in length. The panel was comprised of two layers, a white top layer with a measured thickness of 2.61 mm and a grey bottom layer with a measured thickness of approximately 5.5 mm. The corrugations extended along the entire length of each panel, with a nominal height of approximately 75 mm and width of approximately 150 mm.

The panels were fixed to the test room using H.B. Fuller Max Bond adhesive applied on the back of the panels. The panels were installed vertically and allowed to cure for two days before testing.

### 2.2 Selection, Construction and Installation of the Specimen

The construction of the specimen was conducted by Ignis Labs following the installing instructions provided by the test sponsor. Ignis Labs was not involved in the selection of the specimen.

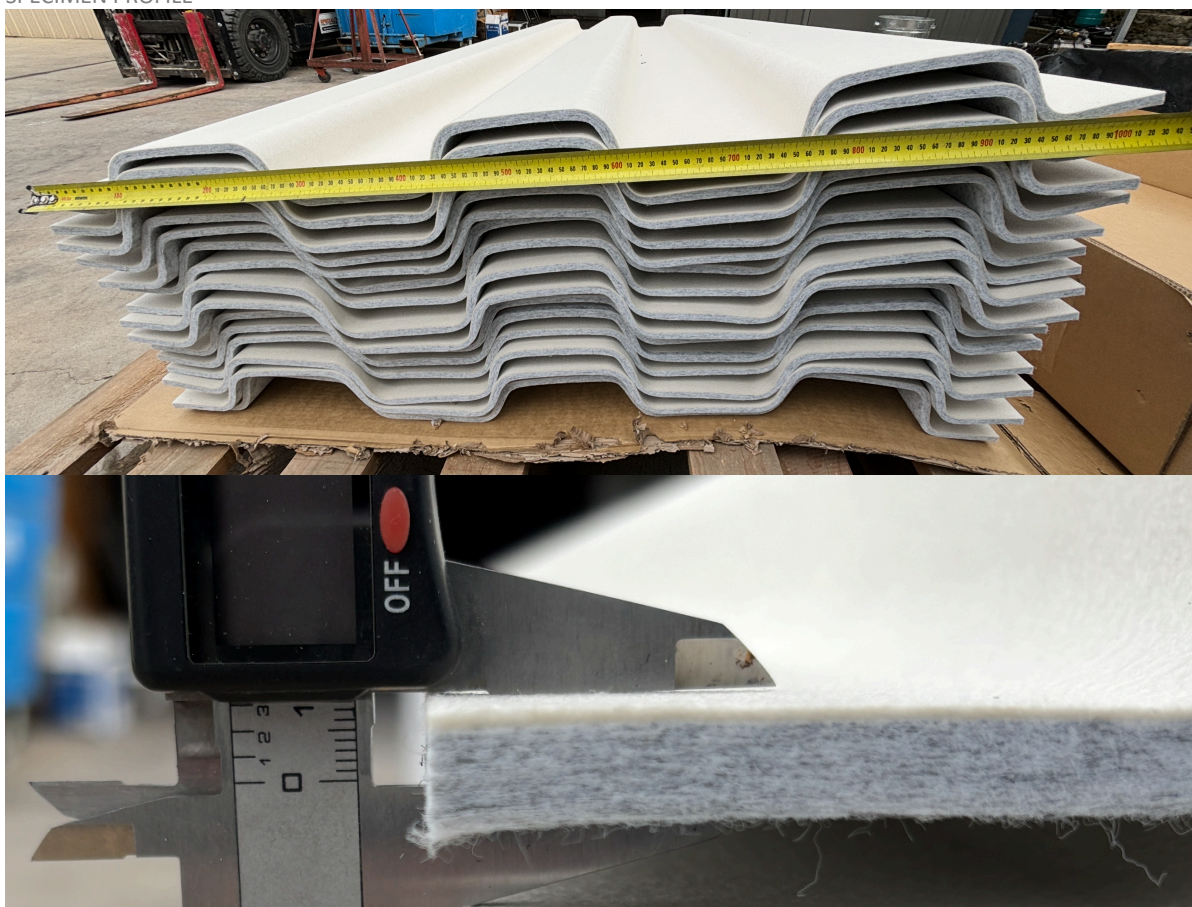
FIGURE 2:

SPECIMEN INSTALLATION





FIGURE 3:  
SPECIMEN PROFILE



### 3 TEST PROCEDURE

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#### 3.1 Statement of Compliance

The test was performance in accordance with the requirements of AS ISO 9705:2003 R2016 with the purpose of determining the fire spread risk of the tested panels.

#### 3.2 Variations to the Method

Heat flux at the floor was not measured. The optical density of the smoke was determined by measuring the light obscuration with a system consisting of a laser lighter, lenses, an aperture and a photocell. No other variations to the test criteria were recorded.

#### 3.3 Pre-test Conditioning

Prior to construction, the components of the wall system were subjected to normal temperatures and humidity. The sample materials were not subjected to any conditioning except for being stored within a dry storage shed prior to installation. The specimens were left in the test chamber for 24 hours prior to testing to allow the adhesive to cure.

#### 3.4 Sampling / Specimen Selection

Ignis Labs was not involved in the selection of the materials. Test sponsor provided the specimens for testing.

#### 3.5 Ambient Temperature

The temperature of the test area was 11.2 °C at the commencement of the test.

#### 3.6 Test Duration

The specimen was tested until flashover was reached. The test duration included 2 minutes period prior to the burner being ignited, 10 minutes of flaming of the burner at 100 kW and then an additional 6 minutes of flaming of the burner at 300 kW with the occurrence of flashover.

#### 3.7 Instrumentation and Equipment

The equipment used for the test was in accordance with AS ISO 9705:2003 R2016 and is as detailed below:

The fire test room consisted of Rondo 90 mm 1.15BMT steel studwork spaced at 600 mm centres and associated noggins at 600 mm. 75 mm thick 60 kg Rockwool insulation was friction filled within the studwork. The external side of the wall and ceiling was lined with two layers of 16 mm fire grade plasterboard. The internal side included 1 mm metal backpan, 15 mm thick plywood and two layers of 16 mm fire grade plasterboard. Without specimen lining, the room had an inner dimension of 3600 mm long x 2400 mm wide x 2400 mm high with a doorway 800 mm x 2000 mm high centrally located in one of the shorter walls.

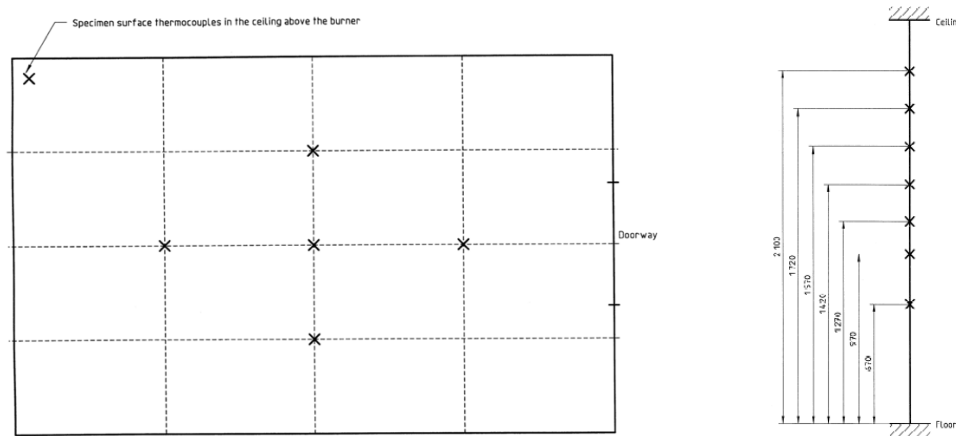
The ignition source was a propane gas fuelled box burner, whose specifications were in accordance with those given in AS ISO 9705:2003 R2016 Annex A. The burner was placed on the floor in the corner of the room, opposite the doorway, where two of the side walls of the burner were as close as possible to the specimen material. The gas flow during the test was controlled to provide an amount of gas equivalent to 100 kW of power during the first ten minutes of heat exposure and 300kW of power during the second ten minutes of heat exposure.

The temperature within the room was measured via a series of thermocouples located within a tree nature.

The location of the ceiling thermocouples as well as the thermocouple tree is detailed below.

FIGURE 4:

THERMOCOUPLE LOCATION



The products of combustion were collected in an exhaust hood adjacent to the doorway, outside of the test room. The hood was connected to an exhaust duct 400 mm in diameter, within the duct instruments to measure the conditions and properties of the combustion products during the test.

The volume flow rate was measured with a bidirectional pressure probe attached to a differential pressure transducer with a Type K thermocouple located adjacent to the probe.

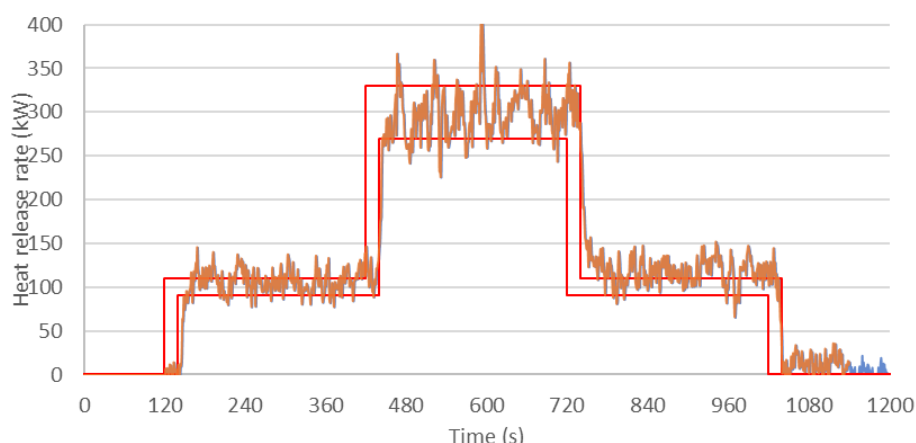
An exhaust sampling probe sampled the combustion products which were analysed by a Servomex Servopro 4000 series analyser. Oxygen concentration during the test was determined by the paramagnetic oxygen analyser, whilst the carbon monoxide and carbon dioxide concentrations were determined within the Servopro 4000 analyser.

### 3.8 Calibration Test

A calibration test was carried out prior to the testing of the specimen. The gas burner was placed directly under and 100 mm below the exhaust hood and the gas supply to the burner was adjusted such that the power output from the burner was 0 kW for 2 minutes, then 100 kW for five minutes then 300 kW for a further five minutes, then 100 kW for five minutes and finally 0 kW for two minutes, after which time the calibration test was stopped. Data from instruments was collected and analysed every second.

FIGURE 5:

CALIBRATION



## 4 TEST MEASUREMENTS

### 4.1 Initial Conditions

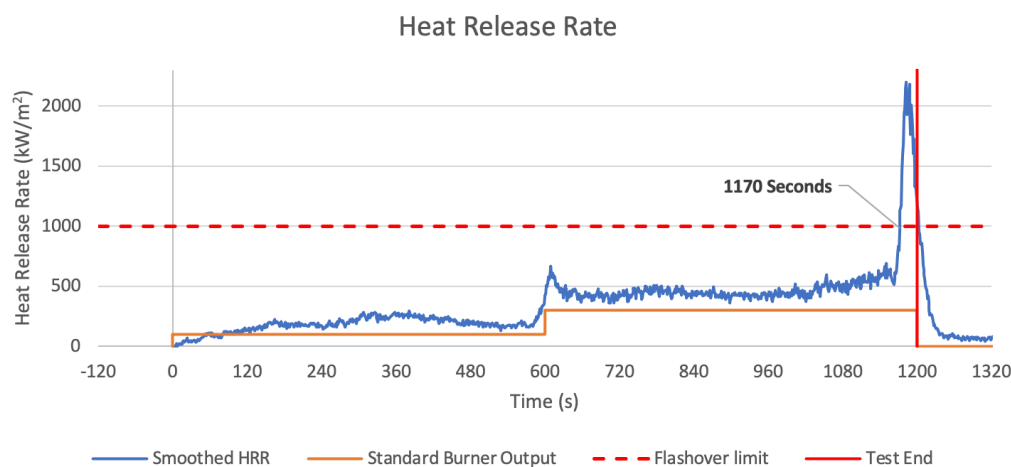
The horizontal wind speed at a horizontal distance of 1 m away from the door opening was measured just prior to the test and was found being 0 m/s which is less than 0.5 m/s and hence satisfies the requirements of AS ISO 9705:2003 R2016 Section 12.1.2. The ambient temperature in the region of the fire test room was 11.2 °C at the start of the test.

### 4.2 Heat Release Rate Measurements

The heat release rate during the test is shown in the figure below. The heat release exceeded the flashover limit of 1 MW 1170 seconds into the test.

FIGURE 6:

HEAT RELEASE RATE MEASUREMENTS



### 4.3 Test Thermocouples

Based on the nature and intent of the tests, the thermal conditions within the room as measured by the thermocouples. The temperatures in the room for the two trees are detailed below.

The thermocouple detail shows the impact of increasing the flame size.

FIGURE 7:

THERMOCOUPLE MEASUREMENTS – CONCEALED CEILING

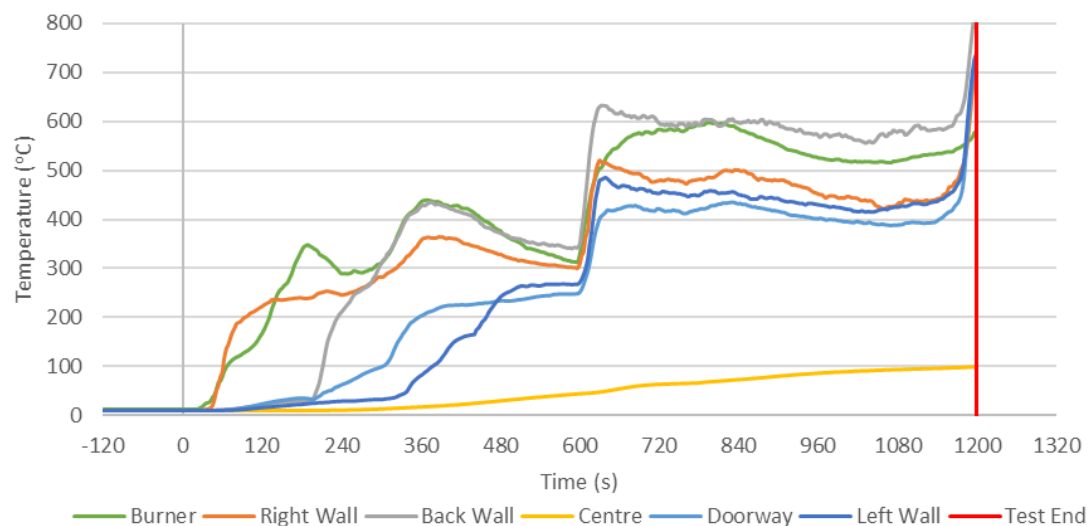
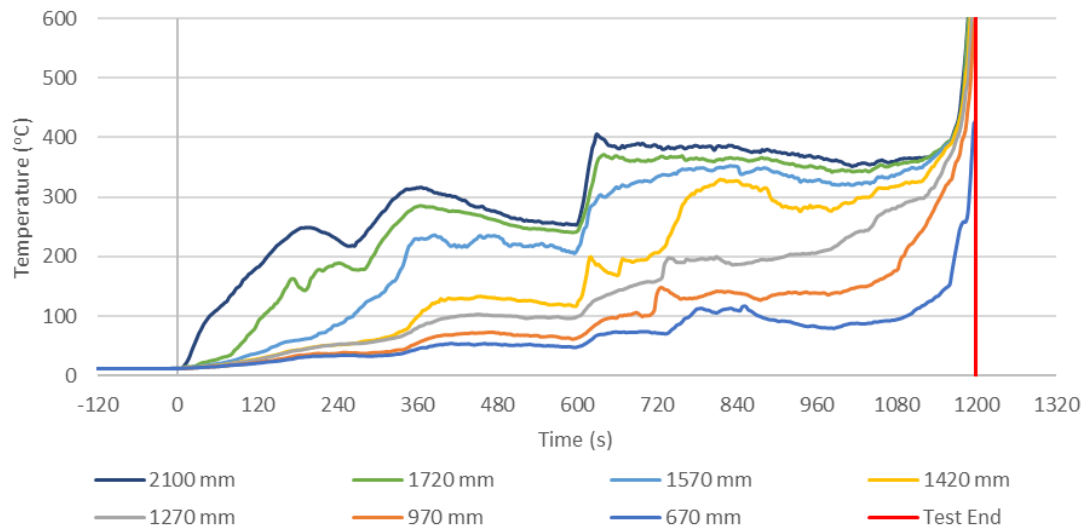




FIGURE 8:

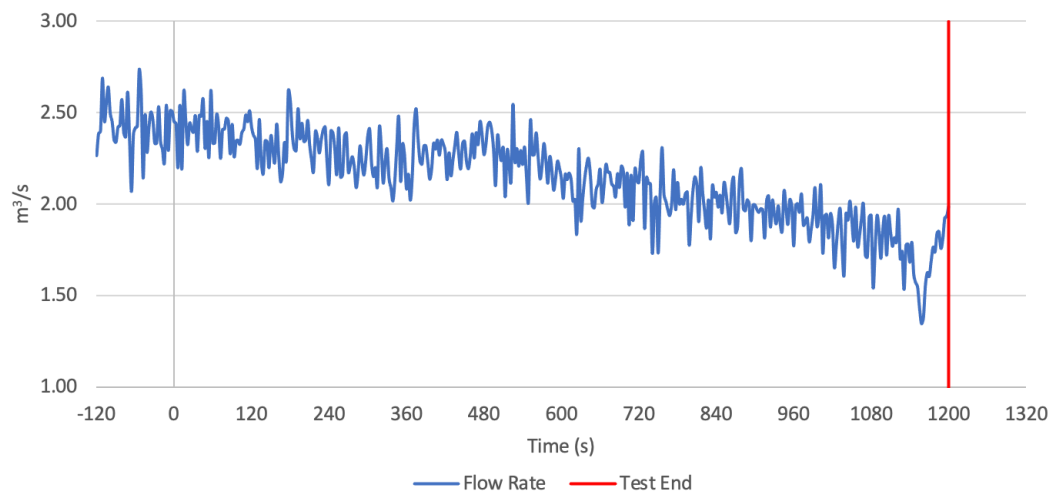
THERMOCOUPLE MEASUREMENTS – THERMOCOUPLE TREE



#### 4.4 Volume Flow Rate Measurements

FIGURE 9:

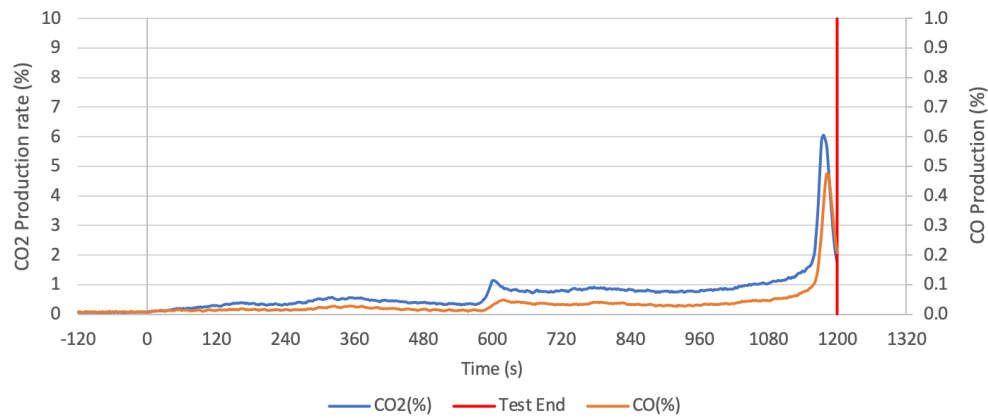
VOLUME FLOW RATE MEASUREMENTS



## 4.5 Carbon Monoxide and Carbon Dioxide Production

FIGURE 10:

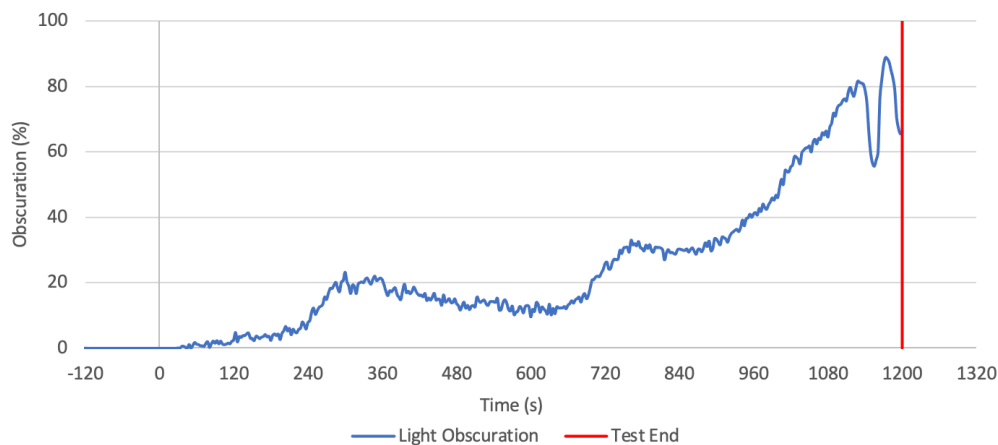
CARBON DIOXIDE AND CARBON MONOXIDE PRODUCTION



## 4.6 Light Obscuration Measurements

FIGURE 11:

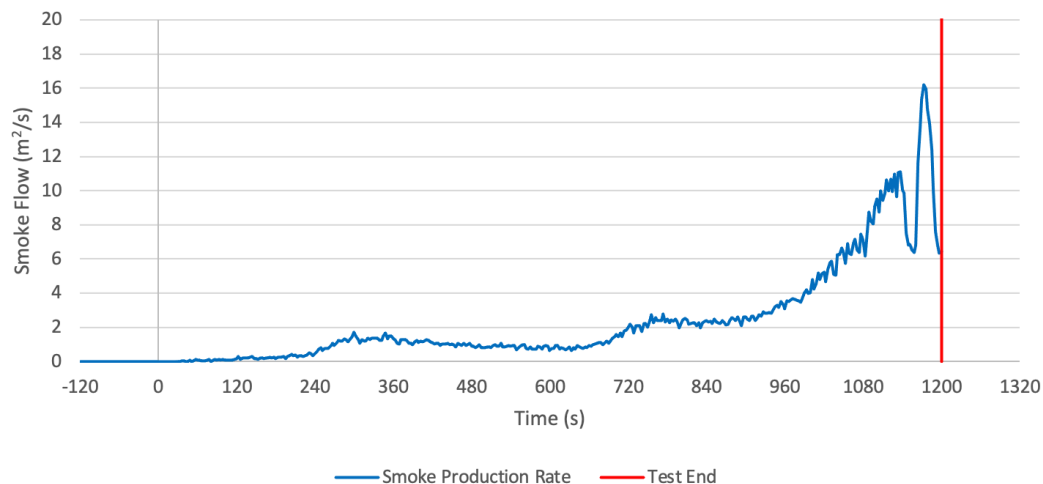
LIGHT OBSCURATION MEASUREMENTS



## 4.7 Smoke Production Measurements

FIGURE 12:

SMOKE PRODUCTION MEASUREMENTS



## 4.8 Critical Observations

The following observations were made during the fire-resistance test:

Time	Observations
-02:30	Camera recording started.
-02:00	Test recording started.
-01:00	Ignited pilot flame on burner, turned on LPG safety valve.
00:04	Burner output increased to 100 kW.
00:20	Charring was observed in burner corner. Droplets fell from the ceiling.
00:30	Flaming droplets fell from the ceiling. Melting was observed from the burner corner.
01:00	Plasterboard exposed in the burner corner; debris fell from the ceiling.
02:00	Panels peeled off the walls around the burner corner.
02:20	Puddle fire was observed under the burner.
04:00	Ceiling panels fell off.
04:30	Thick smoke was observed, and neutral plane was developed.
05:00	Independent flaming was observed on the back wall.
05:30	Left and right-side wall melted and peeled off wall at the top.
10:04	Burner output increased to 300 kW.
10:30	Left side wall melted; plasterboard exposed on the left side wall.
13:00	Puddle fire increased in size.
17:15	Puddle fire spread to fallen debris from left side wall.
17:30	Thick black smoke was observed, puddle fire spread to fallen debris from the right-side wall.
17:40	Puddle fire split into 2.
19:34	1 MW heat output exceeded; flashover reached
19:40	Flames was out of the door.
20:04	Test completed and burner off.
20:25	Fire extinguished.

## 4.9 Test Images

FIGURE 13:

START OF TEST (0:00)



02:30 INTO THE TEST



FIGURE 14:

07:06 INTO THE TEST



09:59 INTO THE TEST



FIGURE 15:

13:17 INTO THE TEST



18:37 INTO THE TEST





FIGURE 16:

18:43 INTO THE TEST (LEFT SIDE WALL)



19:51 INTO THE TEST



FIGURE 17:

END OF THE TEST



FIGURE 18:

POST-TEST (BACK WALL)



POST-TEST (CEILING)



FIGURE 19:

POST-TEST (LEFT SIDE WALL)



POST-TEST (RIGHT SIDE WALL)



## 5 PERFORMANCE CRITERIA AND TEST RESULTS

### 5.1 National Construction Code

The National Construction Code of Australia (NCC) and AS 5637.1:2015 detail the criteria of materials by Group Number, which indicates the amount of time taken for a material being tested to reach flashover under AS ISO 9705:2003 R2016 test conditions. AS 5637.1:2015 define flashover to be a heat release rate of 1000 kW.

### 5.2 AS 5637.1:2015

AS 5637 sets out procedures for the assessment of internal wall and ceiling linings according to—

- a) their tendency to ignite;
- b) their tendency to release heat once ignition has occurred;
- c) their tendency to cause flashover;
- d) their tendency to release smoke; and
- e) their contribution to fire growth,

and allows for determination of group number, smoke growth rate index ( $\text{SMOGR}_{\text{RC}}$ ) and, where required, average specific extinction area (ASEA).

The group number of a material shall be assigned as follows when tested in accordance with Clause 4.3 of the standard:

- a) Group 1—material that does not reach flashover when exposed to 100 kW for 600 s followed by exposure to 300 kW for 600 s.
- b) Group 2—material that reaches flashover following exposure to 300 kW within 600 s after not reaching flashover when exposed to 100 kW for 600 s.
- c) Group 3—material that reaches flashover in more than 120 s but within 600 s when exposed to 100 kW.
- d) Group 4—material that reaches flashover within 120 s when exposed to 100 kW.

The group number of a material shall be determined by either—

- a) physical testing in accordance with AS ISO 9705:2003 R2016; or
- b) if the material has a confirmed correlation, prediction in accordance with Clause 4.4 using data obtained by testing the material at 50 kW/m<sup>2</sup> irradiance in the horizontal orientation with edge frame in accordance with ISO 5660-1:2015 or AS/NZS 3837:1998, as appropriate to the test conducted.

In accordance with AS ISO 9705:2003 preface, the standard is identical with and has been reproduced from ISO 9705:1993, Fire tests – Full scale room test for surface products.

The specimen achieved the following performance requirements as defined in AS ISO 9705:2003 R2016, AS 5637.1:2015.

Criteria	Result
Group Number	2
$\text{SMOGR}_{\text{RC}}$ (in m <sup>2</sup> s <sup>-2</sup> x 1000)	9.28



## 6 APPLICATION OF TEST RESULTS

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### 6.1 Test Limitations

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. The results only relate to the behaviour of the specimen of the element of the construction under the particular conditions of the test, they are not intended to be the sole criteria for assessing the potential fire performance of the element in use nor do they necessarily reflect the actual behaviour in fires.

### 6.2 Variations from the Tested Specimen

This report details the methods of construction, test conditions and the results obtained when the specific element of construction described herein was tested following the procedure as outlined in AS ISO 9705:2003 R2016. Any significant variation with respect to size and construction details is not addressed by this report.

### 6.3 Uncertainty of Measurement

Because of the nature of fire hazard property testing and the consequent difficulty in quantifying the uncertainty of measurement of fire hazard properties, it is not possible to provide a stated degree of accuracy of the result.

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## **Ignis Labs Pty Ltd**

Laboratory reference No: IGNL-8260-06-01R

T: (02) 6111 2909

[www.ignislabs.com.au](http://www.ignislabs.com.au)

[mail@ignislabs.com.au](mailto:mail@ignislabs.com.au)

3 Cooper Place Queanbeyan East NSW 2620

PO Box 5174 Braddon ACT 2612

ABN: 36 620 256 617

