



PROFESSIONAL FIRE SAFETY TESTING

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EchoPanel 12mm 80% Recycled

**TEST REPORT
AS ISO 9705:2003**

IGNL-8187-06-01R I01 R00

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SPONSOR

Woven Image
37 – 39 Chard Road
Brookvale, NSW 2100

TECHNICAL PERSONNEL

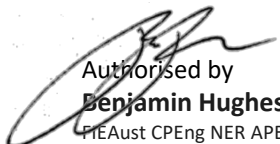


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This assessment report does not provide an endorsement by Ignis Labs Pty Ltd of the actual product evaluated.

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.

This report is prepared in good faith and with due care for information purposes only, and should not be relied upon as providing any warranty or guarantee. In particular, attention is drawn to the nature of the inspection and investigations undertaken and the limitations these impose in determining with accuracy the state of the building, its services or equipment and life safety.

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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 EchoPanel 12mm 80% Recycled 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 non-woven panel. It is composed of 100% PET, of which 80% is recycled. It has a nominal density of 2,400 g/m² and a nominal thickness of 12 mm. It is white in colour and its end use is as a wall and ceiling lining.

The received specimens were symmetrical white rigid insulation panels with a measured width of approximately 1200 mm and a measured length of approximately 2800 mm. They had a measured nominal thickness of 11.76 mm. At the request of the sponsor, the panels were fabricated to the dimensions suitable for the room test by Ignis Labs.

The panels were fixed to the test room using HB Fuller Max Bond Fast Grip adhesive applied in thin beads which were spaced approximately 200 mm apart across the width of unexposed face of each panel. The panels were installed vertically and allowed to cure for two days before testing.

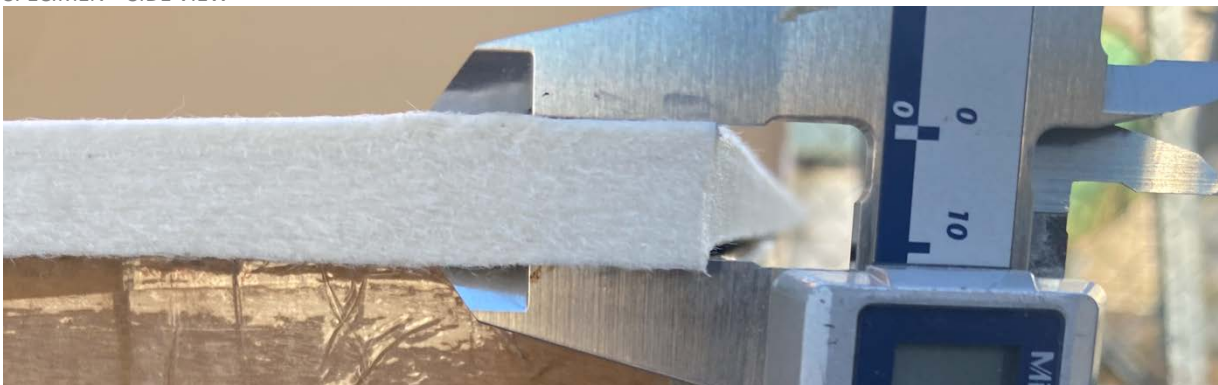
FIGURE 1:

SPECIMEN PANELS



FIGURE 2:

SPECIMEN – SIDE VIEW



1.3 Sponsor

Woven Image
37 – 39 Chard Road
Brookvale, NSW 2100

1.4 Test Number

The Ignis Labs reference test number is IGNL-8187-06-01R.

1.5 Test Date

The test was conducted on 23 May 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	1
SMOGR _{RC} (in m ² s ⁻² x 1000)	13.23

2 DESCRIPTION OF SPECIMEN

2.1 General

The test sponsor described the specimen as a non-woven panel. It is composed of 100% PET, of which 80% is recycled. It has a nominal density of 2,400 g/m² and a nominal thickness of 12 mm. It is white in colour and its end use is as a wall and ceiling lining.

The received specimens were white rigid insulation panels with a measured width of approximately 1200 mm and a measured length of approximately 2800 mm. They had a measured nominal thickness of 11.76 mm. At the request of the sponsor, the panels were fabricated to the dimensions suitable for the room test by Ignis Labs.

The panels were fixed to the test room using HB Fuller Max Bond Fast Grip adhesive applied in thin beads which were spaced approximately 200 mm apart across the width of unexposed face of each panel. 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 at the direction of the sponsor. Ignis Labs was not involved in the selection of the specimen.

FIGURE 3:

SPECIMEN INSTALLATION



3 TEST PROCEDURE

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 14.7 °C at the commencement of the test.

3.6 Test Duration

The specimen was tested until flashover was reached. This did not occur over the 20-minute test duration. 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 10 minutes of flaming of the burner at 300 kW.

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.

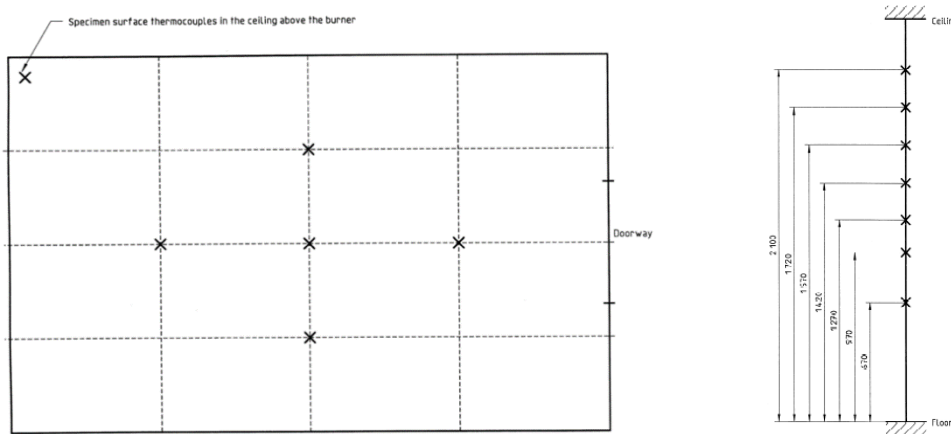
The ignition source was a propane gas fuelled box burner, whose specifications were in accordance with those given in AS ISO 9705:2003 R2016 Annex A. The burner was placed on the floor in the corner of the room, opposite the doorway, where two of the side walls of the burner were as close as possible 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 300 kW 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.

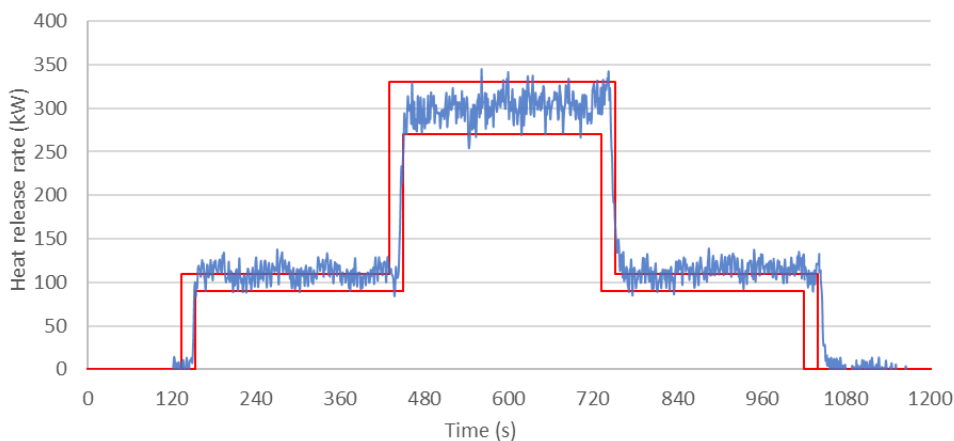
An exhaust sampling probe sampled the combustion products which were analysed by a Servomex Servopro 4000 series analyser. Oxygen concentration during the test was determined by the paramagnetic oxygen analyser, whilst the carbon monoxide and carbon dioxide concentrations were determined within the Servopro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

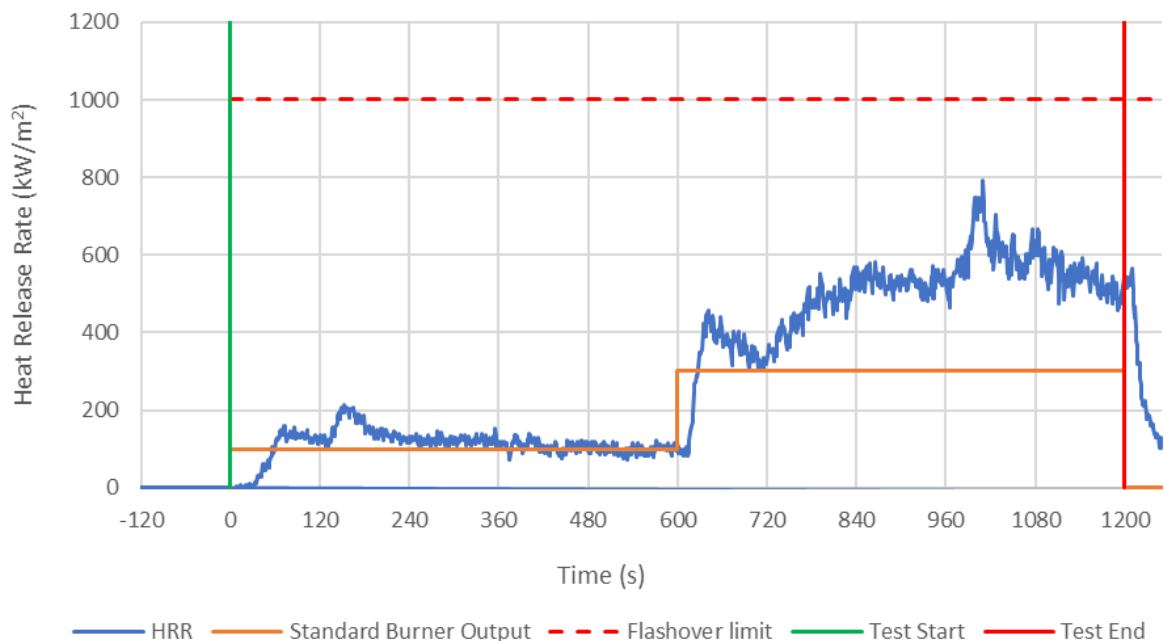
The horizontal wind speed at a horizontal distance of 1 m away from the door opening was measured just prior to the test and was found being 0 m/s which is less than 0.5 m/s and hence satisfies the requirements of AS ISO 9705:2003 R2016 Section 12.1.2. The ambient temperature in the region of the fire test room was 14.7 °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 did not exceed the flashover limit of 1 MW during 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. It should be noted that the temperature of the thermocouples installed at various points in the ceiling around the room do not significantly increase temperature until approximately 180 seconds after the burner is increased to 300 kW because there was a time lag between the spread of flame and the increase in burner temperature.

FIGURE 7:
THERMOCOUPLE MEASUREMENTS – CONCEALED CEILING

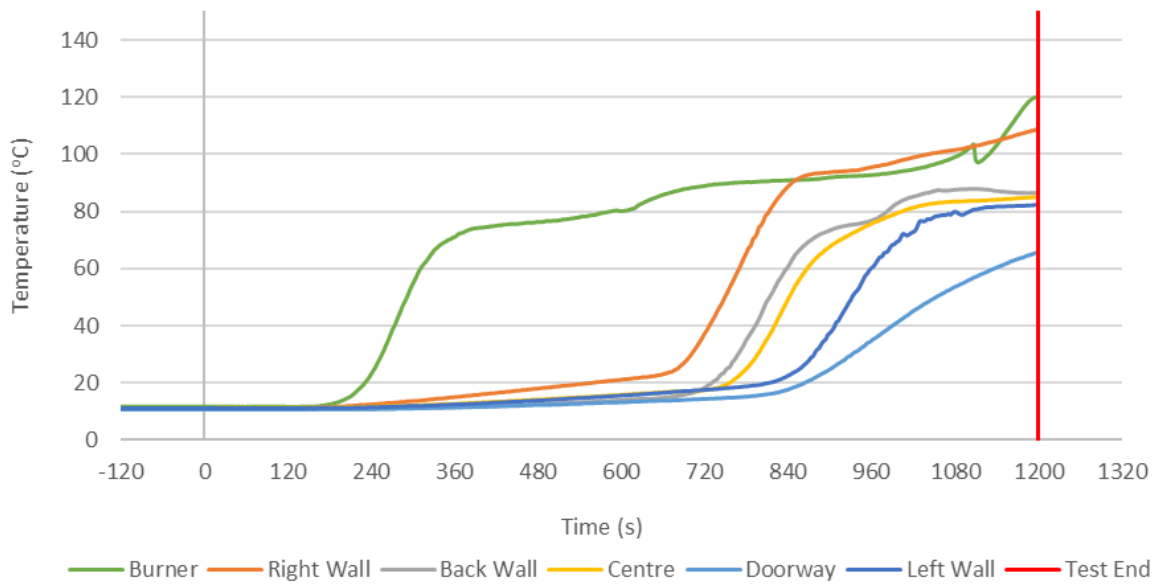
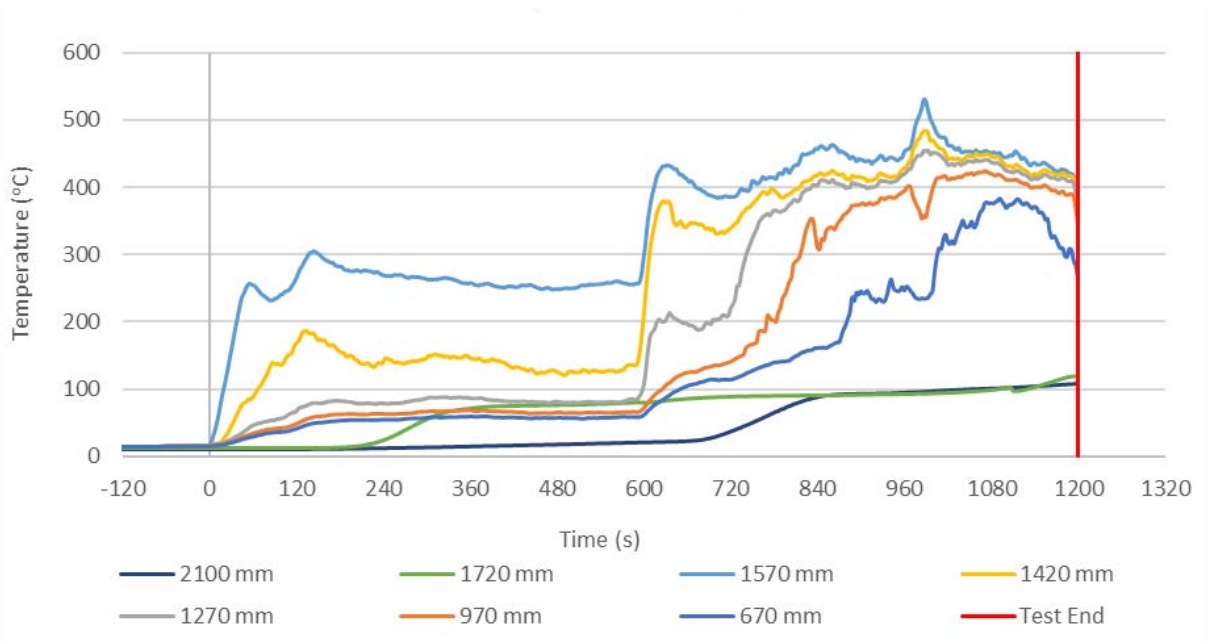


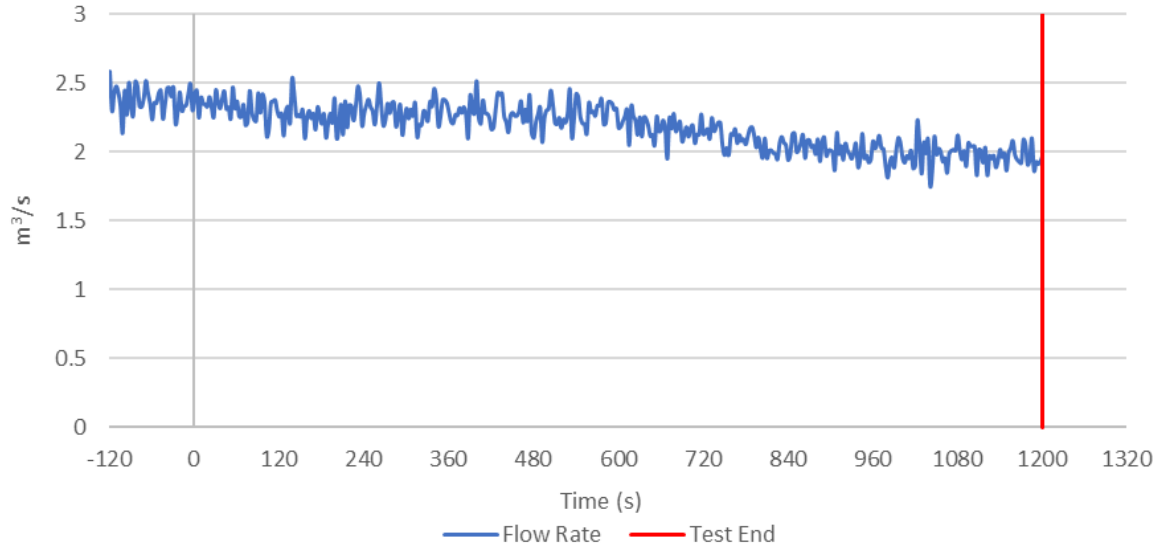
FIGURE 8:
THERMOCOUPLE MEASUREMENTS – THERMOCOUPLE TREE



4.4 Volume Flow Rate Measurements

FIGURE 9:

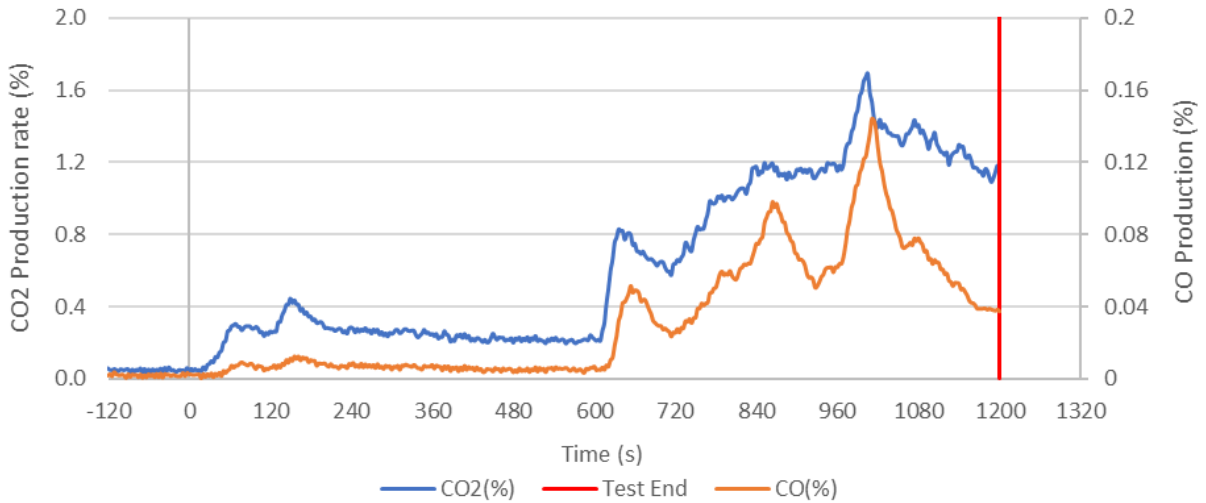
VOLUME FLOW RATE MEASUREMENTS



4.5 Carbon Monoxide and Carbon Dioxide Production

FIGURE 10:

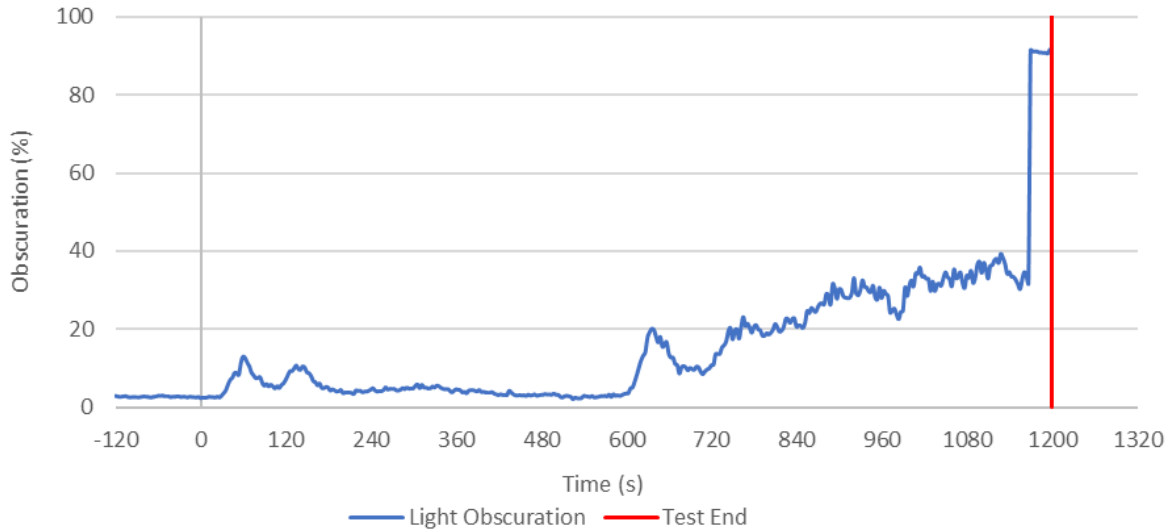
CARBON DIOXIDE AND CARBON MONOXIDE PRODUCTION



4.6 Light Obscuration Measurements

FIGURE 11:

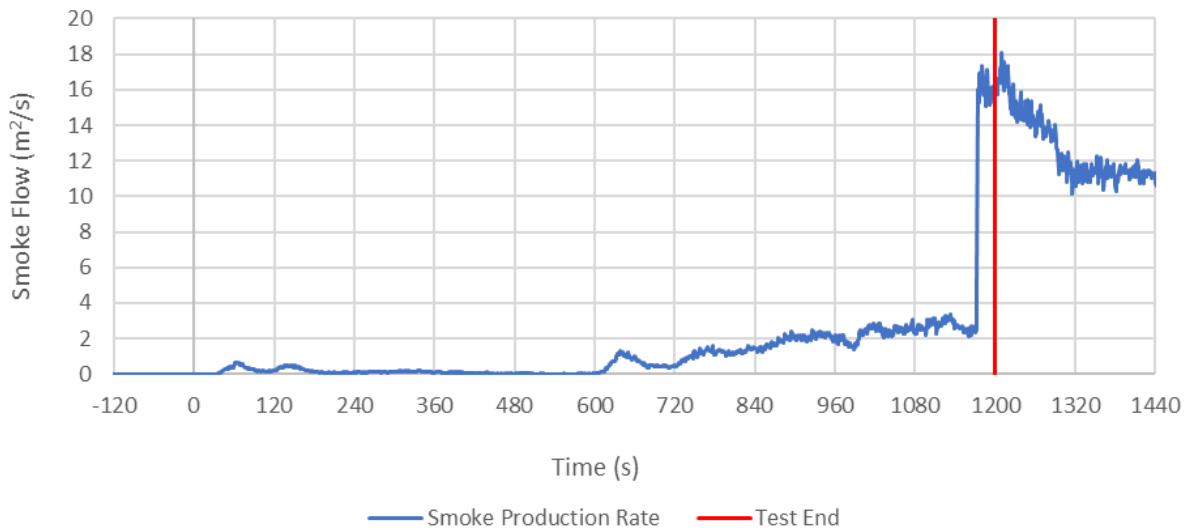
LIGHT OBSCURATION MEASUREMENTS



4.7 Smoke Production Measurements

FIGURE 12:

SMOKE PRODUCTION MEASUREMENTS



The smoke production and smoke obscuration measurements spiked approximately 19 minutes into the test. This may have been caused by debris getting caught in the detection system.

4.8 Critical Observations

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

Time	Observations
-00:30	Pilot light lit and gas program started
00:00	Start test timer and start test program.
02:10	Burner to 100 kW.
02:20	Charring in top right corner behind burner.
02:40	Smoke in room thickens and debris begins falling off ceiling.
03:05	Smoke emerges from room.
03:30	Panels begin to melt around burner and a puddle begins to form around burner.
04:20	Debris from the ceiling starts forming puddles on the floor.
05:00	Puddle fire forms around burner.
05:15	Wall on left hand side (towards the back of room) begins melting and back ceiling sheet begins falling.
06:00	Wall on left hand side back panel begins charring and begins to peel of the wall.
07:00	Melting across the top of the entire back wall.
07:30	Ceiling panels begin to bulge.
08:00	Glue lines in corner above burner become exposed.
09:40	Dripping from ceiling.
10:30	Glue lines exposed on right hand side wall (towards the back of the room).
10:40	Ceiling back panel collapses.
12:10	Burner set to 300 kW and ceiling continues to melt as fiery droplets fall from ceiling.
12:30	All sheets in room begin to bulge, heavy black smoke emerges from room and smoke inside room thickens.
13:00	Entire ceiling starts melting and glue lines along ceiling exposed.
13:30	All panels on left hand side of wall begin to melt and puddle fire around burner grows.
15:00	Puddle fire around burner continues growing and dripping in front of door.
15:15	Ceiling begins collapsing.
15:30	Right hand side wall on fire and fiery droplets begins falling from ceiling.
18:45	Flames present on ceiling and puddle fire around burner reaches halfway across the back of the room.

19:00	Smoke thickens to an even blacker colour and fiery droplets continue falling from ceiling.
19:30	Puddle fire forms in the middle of the floor (separate to puddle fire around burner).
22:10	Burner switched off.
23:20	Fire extinguished.

4.9 Test Images

FIGURE 13:

START OF TEST (0:00)



01:00 INTO THE TEST



FIGURE 14:

04:00 INTO THE TEST



04:26 INTO THE TEST



FIGURE 15:

07:05 INTO THE TEST



10:00 INTO THE TEST



FIGURE 16:

10:41 INTO THE TEST



12:25 INTO THE TEST



FIGURE 17:

13:12 INTO THE TEST



14:31 INTO THE TEST



FIGURE 18:

14:49 INTO THE TEST



16:28 INTO THE TEST



FIGURE 19:

16:44 INTO THE TEST



17:17 INTO THE TEST



FIGURE 20:

18:17 INTO THE TEST



20:30 INTO THE TEST

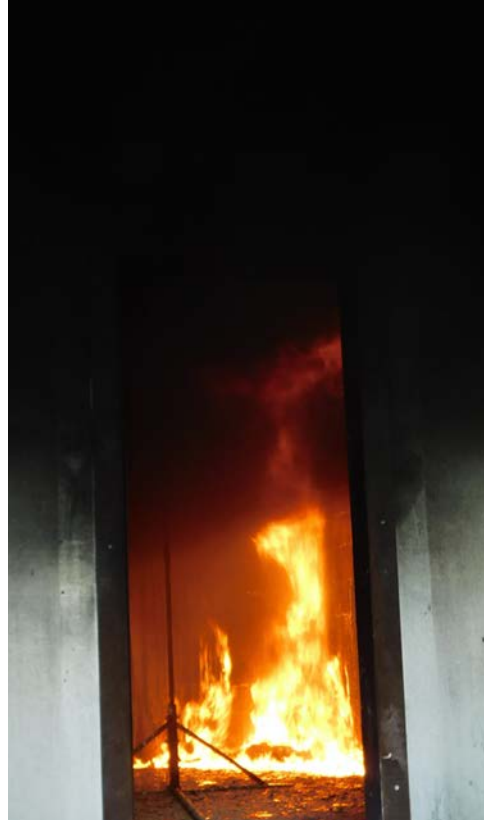


FIGURE 21:

22:01 INTO THE TEST



END OF TEST (23:23)



FIGURE 22:
POST TEST



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 (SMOGR_{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/m² 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	1
SMOGR _{RC} (in m ² s ⁻² x 1000)	13.23

6 APPLICATION OF TEST RESULTS

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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