PROFESSIONAL FIRE SAFETY TESTING

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VIROC SHEET PANELLING

PRODUCT TESTING

BAL 29 EVALAUTION

IGNL-4057-03B I01 R00

Tested: 04.06.2020
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1 DOCUMENT REVISION HISTORY

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01	00	24.07.2020	Finalised	BHB	FW

SPONSOR

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TECHNICAL PERSONNEL

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SIGNATORY

Written and Authorised by
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CONTACT INFORMATION and LOCATION OF TESTING

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2 INTRODUCTION

2.1 GENERAL

The purpose of this report is to document the indicative tests undertaken by Ignis Labs on the Viroc sheet panelling of Modinex Group to establish their likely capacity to withstand a radiant heat level of 29kW/m^2 in line with the levels established by AS 3959 under a Bushfire Attack Level of 29 as well as AS 1530.8.1 being the process of testing. The testing was undertaken utilising a radiant heat panel as well as a rolling bed to move the sample from the radiate heat panel at the set distances of AS 3959. The tested panel is a cement bonded particle board with the nominal composition being compressed and dry mixture of pine wood particles and cement. The material is not considered to have a detrimental impact when subject to a pilot light or timber crib as established by AS 1530.8.1.

Ignis Labs follows the requirements of ISO 17025 in its testing procedures. Clause A5.2 of the Building Code of Australia establishes the evidence of suitability for buildings and details that the evidence to support that the use of a material or product meets a Deemed-to-Satisfy Provision may be in the form of any one, or any combination of the following.

- A report issued by an Accredited Testing Laboratory; or
- A certificate or report from a professional engineer.

Either of the documents listed above are to demonstrate or certify that a material or product fulfils specific requirements of the NCC; and sets out the basis on which it is given and the extent to which relevant standards, specifications, rules, codes of practice or other publications have been relied upon to demonstrate its suitability for use in the building.

Benjamin Hughes-Brown is a Chartered Professional Engineer and Fellow of Engineers Australia with over 15 years experience in fire safety engineering. Benjamin, satisfy the criteria established by BCA Clause A5.2 being a professional engineer.

2.2 COMPLIANCE

In accordance with the National Construction Code Volume One and Two, buildings located in bushfire prone areas are to comply with the requirements of AS 3959.

AS 3959 establishes requirements for the exposed components of external roof and walls to be non-combustible material which includes steel sheets and fibre cement sheets. AS 3959 provides no detail for insulation. It does require light weight wall and cladding systems to be fixed to a timber or steel frame.

Viroc sheet panelling is a cement bonded particle board with nominal composition of compressed and dry mixture of pine wood particles and cement.

AS 3959 Clause 3.8 establishes a performance pathway for wall structures to comply with BAL 12.5 to BAL 40 through testing to AS 1530.8.1. This assessment reviews the result of the radiation impact of each product when subjected to BAL 29 conditions set by AS 1530.8.1.

The wall compliance criteria set by AS 3959 requires the exposed components of a wall to be at least 90mm thick and consist of full masonry or masonry veneer walls, precast or in situ wall of concrete or ear wall. There is an option of timber logs with a density of 680 kg/m^3 or greater and nominal 90mm thick and minimum thickness 70mm. A third option is cladding that is fixed externally to a timber or steel frame wall that is sarked on the outside of the frame and is fibre cement sheet of 6mm thickness or steel sheet or bushfire resistant timber.

2.3 SPECIMEN

The Viroc Sheet Panelling specimen is a 1250×3000×8 cement bonded particle board with nominal composition of compressed and dry mixture of pine wood particles and cement. The nominal density of the tested specimen is 1350kg/m³ and nominal thickness varies from range of 8 to 22mm. The colour of tested specimen is grey. The sample can be applied indoor and outdoor façades walls.

2.4 SPONSOR

Modinex Group

150 Toongarra Rd,

Ipswich QLD 4305

2.5 TEST NUMBER

The Ignis Solutions reference test number is IGNS-4057-03B.

2.6 TEST DATE

The indicative radiant heat test was conducted on 04 June 2020.

3 DESCRIPTION OF SPECIMEN

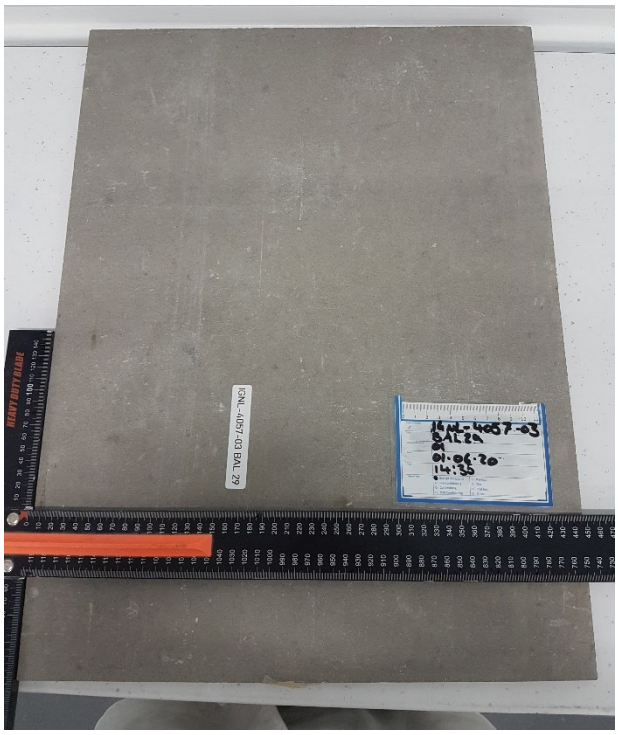
3.1 GENERAL

The Viroc Sheet Panelling specimen is a cement bonded particle board with a nominal composition of compressed and dry mixture of pine wood particles and cement. The nominal density of the tested specimen is 1350kg/m³ and nominal thickness varies from range of 8 to 22mm. The colour of tested specimen is grey. The sample can be applied indoor and outdoor façades walls.

The specimen is a grey homogeneous slate panel. The height is 600mm, width is 450mm and thickness is 7.99mm.

FIGURE 1:

SPECIMEN BEFORE TEST



3.2 ORIENTATION

The specimen was tested in a vertical position where the radiation was impacted centrally.

3.3 CONDITIONING

The specimens were kept in a dry and laboratory conditioned space being maintained at a temperature of 20±2°C and a relative humidity of 65±5% prior to the test being conducted.

3.4 SELECTION, CONSTRUCTION AND INSTALLATION OF THE SPECIMEN

The construction of the specimen within the test frame was organised and undertaken by Ignis Labs. Ignis Labs was not involved in the selection of the materials.

4 EQUIPMENT

4.1 RADIANT PANEL

The radiant panel was a 300mm x 300mm burner with a woven steel mesh and an air fuel mix of LPG.

4.2 RADIANT PROFILE

The radiant panel was heated to a point where at a distance of 180mm from the panel 29kW/m^2 was received on the specimen. The following table sets the radiation values and distances from the burner to receive the respective radiation value set in accordance with Table 14.2 of AS 1530.8.1. Calibration of the temperatures was undertaken prior to the test to ensure the distances replicated the heat flux set in AS 1530.8.1.

FIGURE 2:

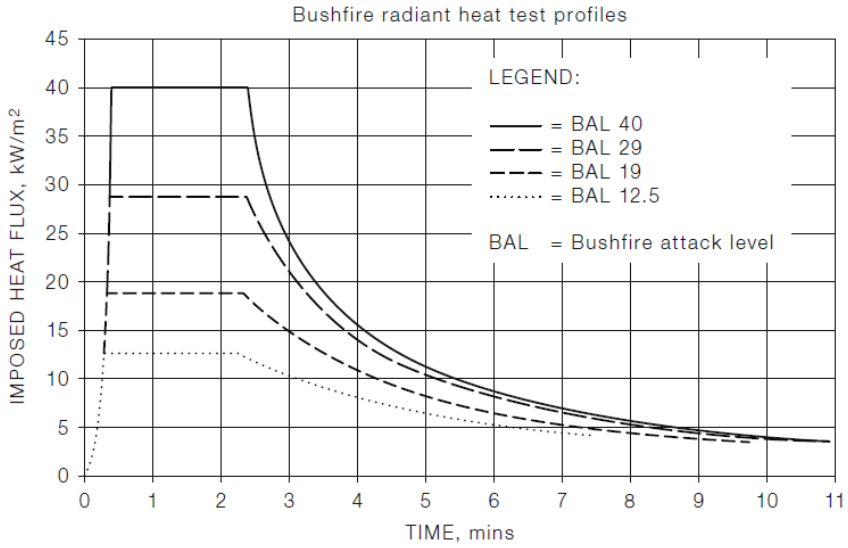
RADIANT IMPACT AND TIME

Bushfire Attack Level (BAL)	Incident Radiation	Time from start of test								
		20-140	140-180	180-240	240-300	300-360	360-420	420-480	480-540	540-600
Very High	29	Min 29	21	14	11	8	6.5	5	3.5	3
Temperature		597	531	451	409	356	325	289	239	221
Distance (mm)		180	235	315	365	442	497	570	695	750

The test profile for the bushfire testing is detailed below. After 11 minutes the panel is maintained for observation for up to 60 minutes. Piloted ignition sources were provided to areas which showed signs of releasing volatiles that may ignite. The following graph extracted from AS 1530.8.1 details the radiation profile.

FIGURE 3:

GRAPH OF RADIANT IMPACT OVER TIME



4.3 MEASUREMENT SYSTEM

The panels surface temperatures and rear temperature was measured by a radiant thermal probe and recorded within a table of notes to provide an indicative thermal impact.

Observations were undertaken of the panel as per the acceptance criteria.

5 ACCEPTANCE CRITERIA

Regards to AS 1530.8.1 Clause 14.4, the following conditions on the test performance of the specimen used as building exterior shall not be permitted:

- Gaps greater than 3mm
- Sustained flaming for 10s on the non-fire side
- Flaming on the fire exposed at end of 60 minute test period
- Mean and Max temperature rise greater than 140K and 180K on the non-fire side
- Mean and max temperature of internal face exceeding 250°C and 300°C between 20 min and 60 min after the commencement of test
- Radiant heat flux 365 mm from the non-fire side of the specimen in excess of 15 kW/m^2 from glazed and uninsulated areas during the 60 min test. This element has not been evaluated due to the size of the test apparatus.
- Radiant heat flux 250 mm from the fire-exposed face of the specimen greater than 3 kW/m^2 between 20 min and 60 min after the commencement of the test. This element has not been evaluated due to the size of the test apparatus.

6 AMBIENT TEMPERATURE

The temperature of the test area was 21.2°C at the commencement of the test.

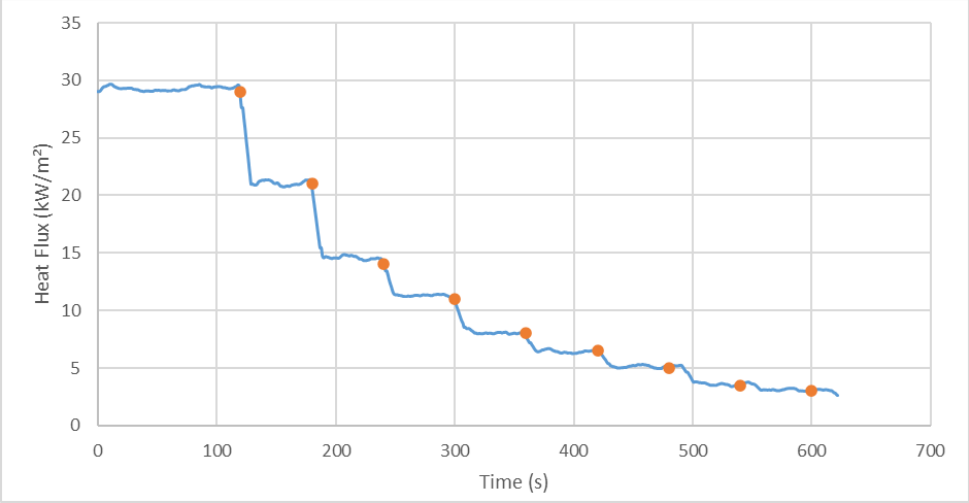
7 DEPARTURE FROM THE STANDARD

The burner size was 300mm x 300mm in lieu of 3m x 3m as established by AS 1530.8.1. The intent of the testing was to determine the likelihood of the panels having capacity to withstand a heat flux of 29kW/m^2 when simulated to the requirements of AS 1530.8.1.

The test process involved moving the specimen towards the radiant panel until 29 kW is received on the Specimen. The Specimen is then moved back away from the radiant panel. A graph of the process is detailed below. The heat flux is detailed below at the centre of the specimen.

FIGURE 4:

CALIBRATION OF RADIANT PANEL



8 TEST RESULTS

8.1 CRITICAL OBSERVATIONS

The test shows the capacity of the Viroc Sheet Panelling to withstand a radiant heat level 29kW/m^2 in line with the levels established by AS 3959 under a Bushfire Attack Level of 29 and demonstrate the impact of the particular level of radiation on the specimen.

No smoke, flashes or sustained flaming were observed. The specimen bended during the test towards the radiant panel. At the end of the test, the centre of the specimen had a bend distance of 18mm relative to the vertical.

Regards to the criteria set by AS 1530.8.1, the following observations were noted.

- There were no gaps greater than 3mm post-test.
- There was no sustained flaming for 10s observed on the non-fire side.
- There was no flaming observed on the fire exposed face at the end of 60 minutes period.
- The mean temperature of the specimen rose less than 140K and the maximum temperature of the specimen rose less than 180K on the non-fire side during the whole test.

As a result, the Viroc Sheet Panelling has satisfied the criteria established against BAL 29.

As the test is an indictive test, only one typical specimen was selected and tested. The following figures detail results of the tested specimen. In Figure 5, the thermocouple locations on the non-fire side can be noted.

FIGURE 5:

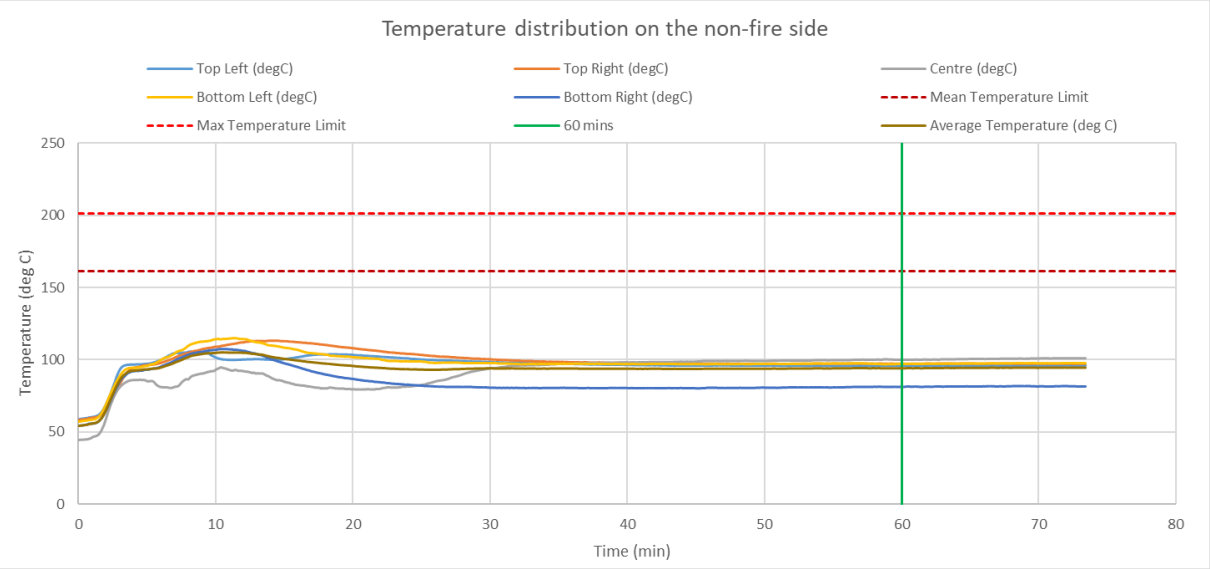
POST TEST – EXPOSED FACE AND UNEXPOSED FACE

The following graph shows the results of temperature measured from the fire non-exposed side. The Viroc Sheet Panelling on its own survived the test as the mean temperature of the specimen didn't

reach the temperature limit of 140K above ambient and the maximum temperature of the specimen didn't reach the temperature limit of 180K above ambient.

FIGURE 6:

TEMPERATURE ON THE NON-FIRE SIDE AT FIVE DIFFERENT LOCATIONS



9 TEST SUMMARY

The above details provide an indication of performance where the Virco Sheet Panelling are likely to have the capacity to perform satisfactorily within the full BAL 29 test.

10 FIELD OF DIRECT APPLICATION OF TEST RESULTS

The results of the fire test contained in this test report are directly applicable to similar constructions. The product was tested parallel to the heat source whilst it is expected that the panels will be installed at an angle away from the direct impact of the heat source when applied in a roof construction.

This report details methods of construction, the test conditions and the results obtained when specific element of construction described herein was tested following the procedure outlined above. Any significant variation with respect to size, constructional details, loads, stresses, edge or end conditions, other than those allowed under the field of direct application in the relevant test method, is not covered by this report based on the application of an indicative result.

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

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