PROFESSIONAL FIRE SAFETY TESTING

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C-Coat IC-Grey

TEST REPORT
AS 1530.4:2014

IGNL-6093-04-01R I01 R00

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CONDITIONS AND LIMITATIONS

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.

Ignis Labs' involvement in the Project is limited to the role outlined in section 2 'Scope of Service' of the Letter. This report reflects that role. Any reliance on, or use of, this report for purposes outside the scope of service is at the user's own risk.

Ignis Labs shall not be held liable for any loss or damage resulting from any defect of the building or its services or equipment or for any non compliance of the building or its services or equipment with any legislative or operational requirement, whether or not such defect or non-compliance is referred to or reported upon in this report, unless such defect or non-compliance should have been apparent to a competent engineer undertaking the evaluation of the type undertaken for the purpose of preparation of this report.

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1 INTRODUCTION

1.1 General

The purpose of this report is to document the test undertaken by Ignis Labs on the c-Coat IC-Grey provided by C-Coat Insulation Australia P/L. The testing was undertaken in accordance with AS 1530.4:2014 with the exemption of the measurement of the heat flux.

1.2 Subject Test Specimen

The wall system was tested as a 995mm x 995mm wall specimen. The test wall system was sealed to the furnace by using plaster joint compound.

The construction of the panel from the unexposed face to the exposed face included the following:

- 9.0 mm fibre cement board. As described by the test sponsor, it is an intumescent coating. It had a measured thickness of 8.03 mm. It is grey in colour.
- 3.0 mm C-Coat NFS insulation. As described by the test sponsor, it is a water-based solution. It had a measured thickness of approximately 5 mm as measured at the edge of the specimen.
- 3.0 mm C-Coat IC Grey. It had a measured thickness of approximately 1 mm as measured at the edge of the specimen.

The layers of the specimen were fixed to the 92 mm wide galvanised steel test frame using 45 mm hex head screws at 200 mm spacings. The C-Coat IC Grey was applied to the C-Coat NFS insulation as a liquid in layers of approximately 1 mm.

FIGURE 1:

EXPOSED FACE OF SPECIMEN

UNEXPOSED FACE OF SPECIMEN

1.3 Sponsor

C-Coat Insulation Australia P/L

Unit 4, 128 Station Road

Seven Hills, NSW 2147

1.4 Manufacturer

The wall system was provided by C-Coat Insulation Australia P/L. The system was manufactured by the sponsor and installed to the test furnace by Ignis Labs Pty Ltd. Ignis Labs was not responsible for the sampling stage. All specimens were sampled and fabricated by the test sponsor. The test results apply to the specimens as received.

1.5 Test Number

The Ignis Labs reference test number is IGNL-6093-04-01.

1.6 Test date

The fire-resistance test was conducted on 27 May 2022.

2 DESCRIPTION OF SPECIMEN

2.1 General

The wall system was tested as a 995mm x 995mm wall specimen. The test wall system was sealed to the furnace by using plaster joint compound.

The construction of the panel from the unexposed face to the exposed face included the following:

- 9.0 mm fibre cement board. As described by the test sponsor, it is an intumescent coating. It had a measured thickness of 8.03 mm. It is grey in colour.
- 3.0 mm C-Coat NFS insulation. As described by the test sponsor, it is a water-based solution. It had a measured thickness of approximately 5 mm as measured at the edge of the specimen.
- 3.0 mm C-Coat IC Grey. It had a measured thickness of approximately 1 mm as measured at the edge of the specimen.

The layers of the specimen were fixed to the 92 mm wide galvanised steel test frame using 45 mm hex head screws at 200 mm spacings. The C-Coat IC Grey was applied to the C-Coat NFS insulation as a liquid in layers of approximately 1 mm.

A cross section of the specimen is shown below.

FIGURE 2:

SPECIMEN CROSS-SECTION

FIGURE 3:

EXPOSED FACE OF SPECIMEN

UNEXPOSED FACE OF SPECIMEN

Wall framing

The wall framing comprised a 92-mm deep 1.25 BMT steel frame with a central support secured by steel screws. Plasterboard was used to cover the outer perimeter of the steel frame and the fire un-exposed face around with fixing by steel screws.

Cavity Insulation

The specimen was composed of only one face and did not have a cavity.

2.2 Orientation

The specimen system was tested vertically.

2.3 Conditioning

The installed wall system was supplied by C-Coat Insulation Australia P/L and supplied to Ignis Labs and left to cure in a weatherproof environment until the test date.

2.4 Selection, construction and installation of the specimen

The wall was constructed by C-Coat Insulation Australia P/L and installed to test furnace by Ignis Labs.

Ignis Labs was not involved in the selection of all material used to construct the wall system.

3 EQUIPMENT

3.1 Furnace

The furnace had a nominal opening of 1.0 m x 1.0 m for attachment of specimens. The infill parts of the furnace included Bostic fire ban one fire grade mastic.

The furnace was lined with refractory bricks and materials with thermal properties as specified in AS 1530.4:2014 and was heated by combustion of a mixture of natural gas and air.

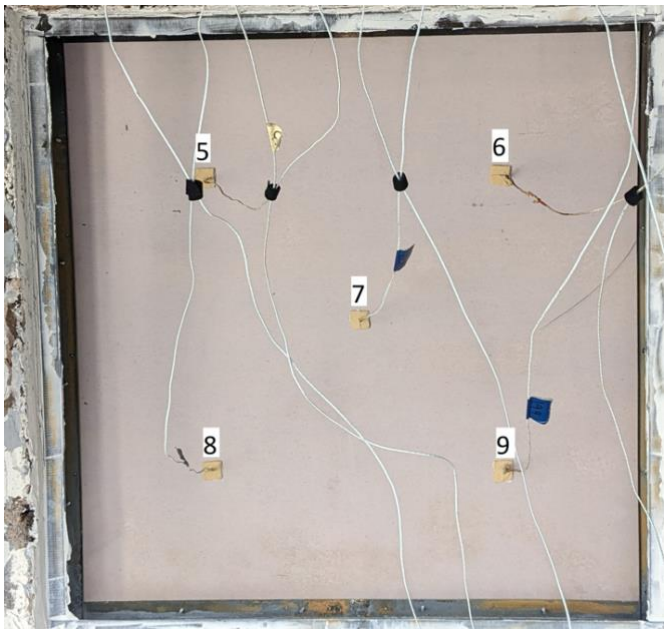
3.2 Temperature

The temperature in the furnace chamber was measured by two type K, Mineral Insulated Metal Sheathed (MIMS) thermocouples.

The temperature on the unexposed face of the specimen including baselines was measured using Type K copper disk thermocouples fixed at the required locations. Locations of the thermocouples on the unexposed face of the specimen are detailed below.

FIGURE 4:

TEST SPECIMEN THERMOCOUPLES



4 AMBIENT TEMPERATURE

The temperature of the test area was 13.0 °C at the commencement of the test.

5 DEPARTURE FROM THE STANDARD

The furnace size is 1.0m x 1.0m. In accordance with Clause 2.9.2 of AS 1530.4:2014 the test specimen may be less than 3000mm x 3000mm provided the specimen is full size and a clearance of at least 200mm (as per Clause 2.9.6) is achieved.

The test specimen was full size, with respect to the cross-section detail, but had a clearance less than 200mm.

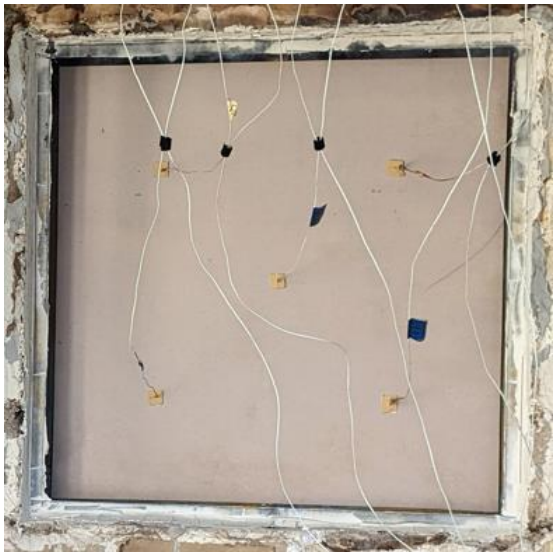
6 TEST RESULTS

6.1 Critical Observations

The test was ended at 90 mins. Smoke emission was observed from the bottom left corner of the specimen approximately 10 minutes into the test, after which intermittent smoke was observed. No significant changes related to charring, flaming, etc were observed. The specimen failed the insulation requirements at 41 minutes into the test, at which point small cracks were observed in the unexposed face of the specimen. The unexposed face of the specimen began discolouring around the edges one hour into the test. After the test the fire exposed face of the specimen was blistered and charred. The specimen maintained integrity for the duration of the 90 minute test.

FIGURE 5:

SPECIMEN 10 MIN INTO THE TEST (UN-EXPOSED FACE)



SPECIMEN 20 MIN INTO THE TEST (UN-EXPOSED FACE)

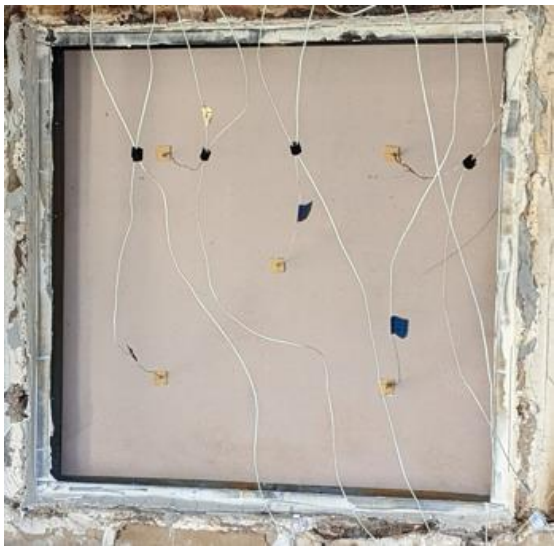
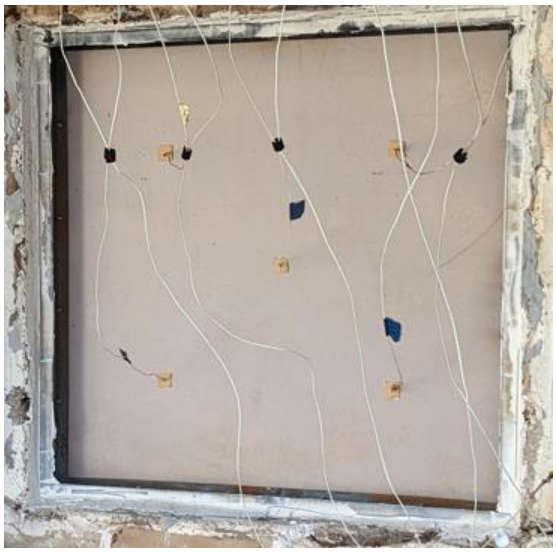


FIGURE 6:

SPECIMEN 40 MIN INTO THE TEST (UN-EXPOSED FACE)



SPECIMEN 60 MIN INTO THE TEST (UN-EXPOSED FACE)

FIGURE 7:

SPECIMEN 75 MIN INTO THE TEST (UN-EXPOSED FACE)

SPECIMEN 90 MIN INTO THE TEST (UN-EXPOSED FACE)

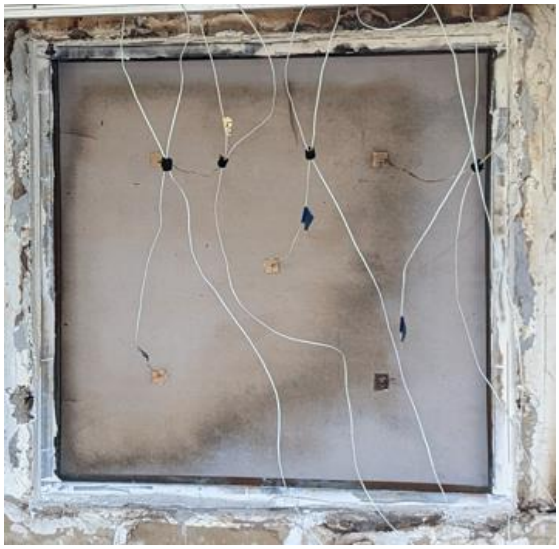


FIGURE 8:

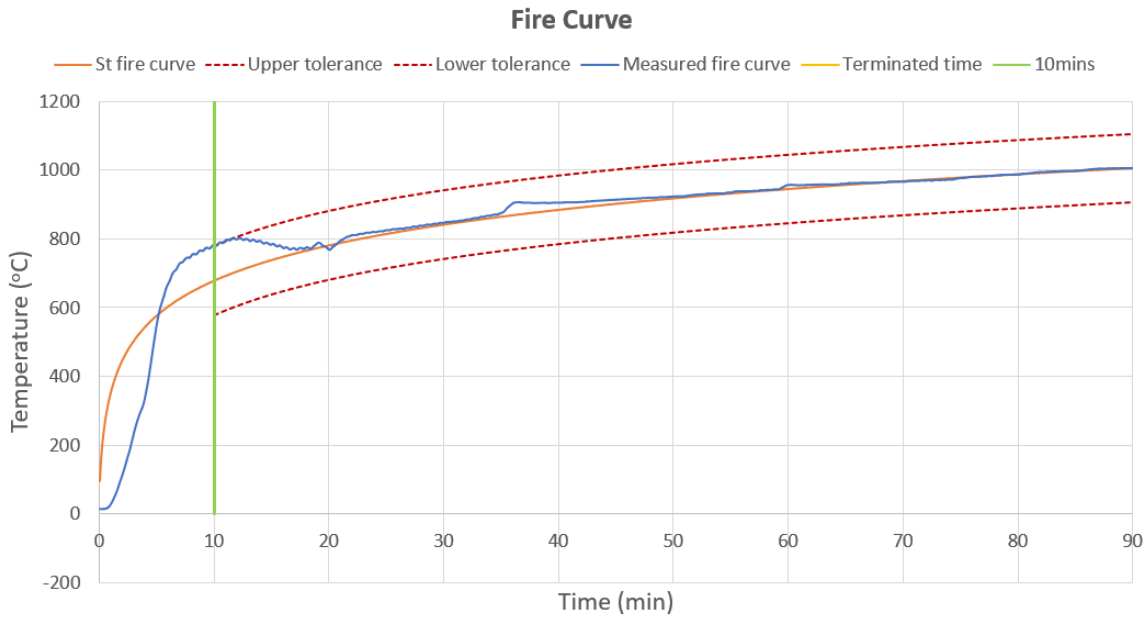
POST TEST SPECIMEN (EXPOSED FACE)

6.2 Furnace Temperature

The following figure shows the standard curves of temperature versus time for heating the furnace chamber and the actual curves of the average temperature and the tolerance limits. Despite being in line with the upper tolerance for the first two minutes of the test, the furnace temperature follows the standard fire curve within the range of tolerances during the whole test.

FIGURE 9:

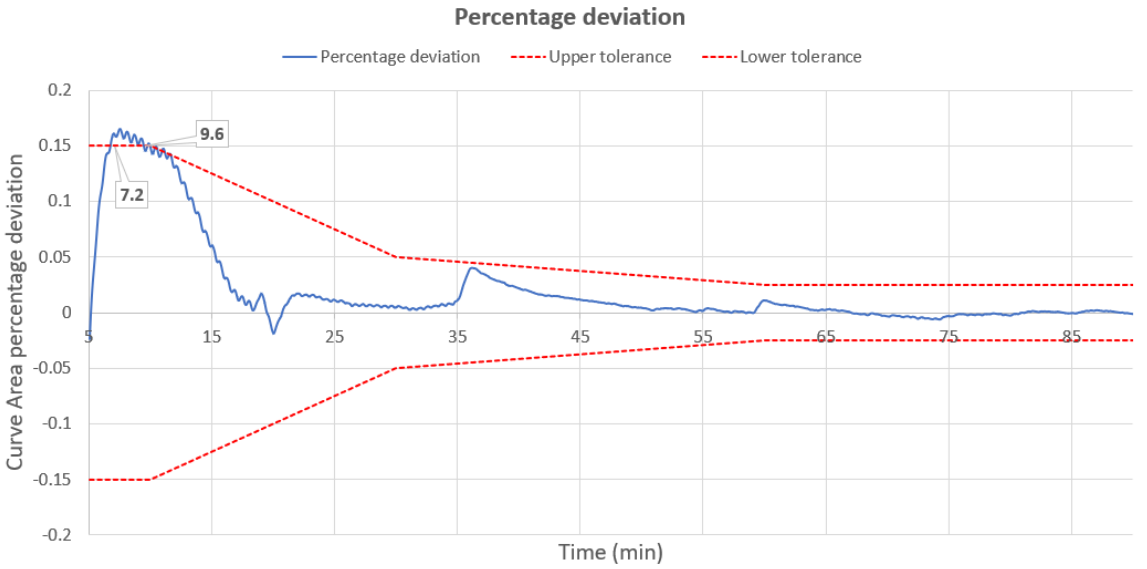
TEST FURNACE TEMPERATURES



The following figure shows the tolerance limits and the actual curve of the percentage deviation in the area of the curve of the average temperature versus for heating the furnace chamber. The percentage deviation was to be within the range from 5 minutes. The deviation percentage was outside the required range between 7.2 and 9.6 minutes into the test.

FIGURE 10:

THE PERCENTAGE DEVIATION IN THE AREA OF THE CURVE OF THE AVERAGE TEMPERATURE



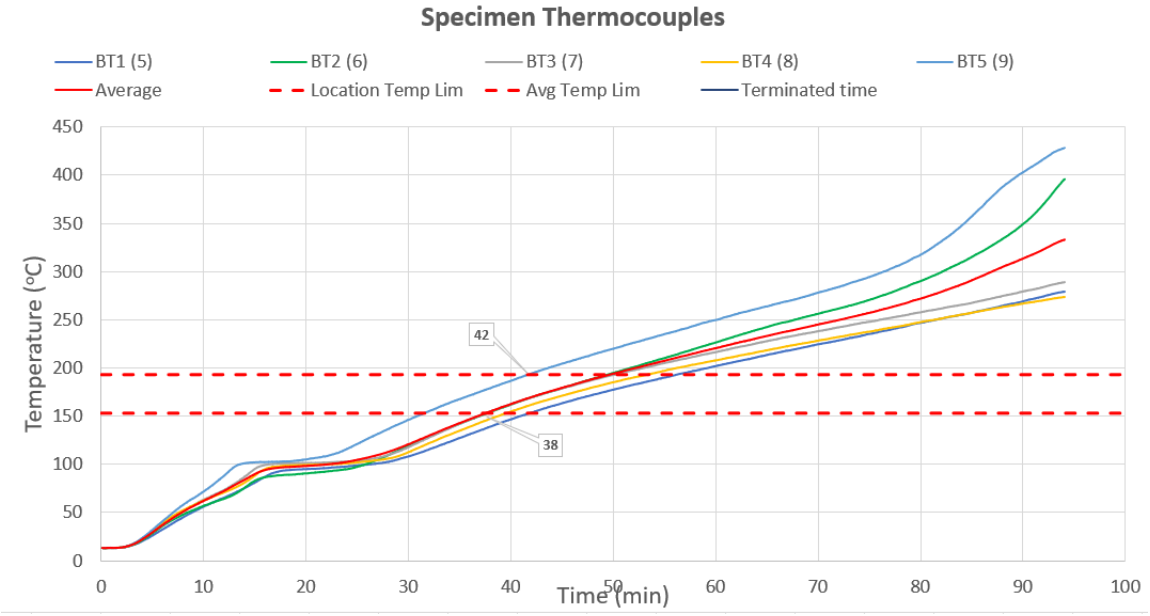
6.3 Specimen Temperature

The specimen temperature was monitored by five baseline thermocouples as shown in Figure 4. The specimen temperature at five locations of each panel is shown in the graphs below.

All thermocouples on the un-exposed face of the specimen exceed the permissible limit of 180 K above the initial temperature and the average baseline temperature exceeded the permissible limit of 140 K above the initial temperature at 42 and 39 minutes into the test respectively.

FIGURE 11:

UN-EXPOSED FACE BASELINE TEMPERATURES



6.4 Performance

The performance observed in respect of the following AS 1530.4-2014 criteria:

Criteria	FRL
Structural adequacy	-
Integrity	90 minutes
Insulation	38 minutes

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 in the standard. 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.

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.

7 FIRE-RESISTANCE LEVEL (FRL)

For the purpose of building regulations in Australia, the Fire Resistance Level (FRL) of the tested system is as follows.

-/90/30

The fire-resistance level of the wall system is applicable when the system is exposed to fire from the same direction as tested.

For the purposes of AS 1530.4:2014 the results of these fire tests may be used to directly assess fire hazard, but it should be noted that a single test method will not provide a full assessment of fire hazards under all fire conditions.

8 FIELD OF DIRECT APPLICATION OF TEST RESULTS

The results of the fire test contained in this test report are directly applicable to similar constructions of the subject wall. Variations in building elements that are not minor will require re-testing.

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