

# NOVIION ENGINEERING

## ACP LABORATORY RESULTS

SP 67851: 200 WILLIAM STREET, WOOLLOOMOOLOO NSW 2011


JULY 13, 2021

W: [NOVIION.COM.AU](http://NOVIION.COM.AU)  
E: [ADMIN@NOVIION.COM.AU](mailto:ADMIN@NOVIION.COM.AU)  
T: 02 9635 9789  
ABN: 63 607 716 772

## Summary

|                              |                                   |
|------------------------------|-----------------------------------|
| <b>Client</b>                | SP 67851                          |
| <b>Client Address</b>        | 200 William Street, Woolloomooloo |
| <b>Client Representative</b> | Strata Title Management Group     |
| <b>Attention</b>             | Raeleen Marsh                     |
| <b>Job #</b>                 | 21288                             |

## Revision History

| Revision | Date          | Author  |
|----------|---------------|---|
| 1        | July 13, 2021 | George Dahrie<br>BE(Civil & Env) CPEng(IEAust)<br> |

## Building Description

The building is a multi-storey structure with reinforced concrete slabs and an underground basement.

## Building Classification:

The building is classified in accordance with Section A3.2 of the Building Code of Australia as:

*Class 2: a building containing 2 or more sole-occupancy units each being a separate dwelling*

*Class 5: a building which is an office building used for professional or commercial purposes*

*Class 6: a building which is a shop or other building used for the sale of goods by retail or the supply of services direct to the public*

*Class 7a: a building which is a carpark*

## Scope

Noviion Engineering were provided with a Combustible Cladding Report prepared by Solutions in Engineering dated 20 February 2019 (Report ref: Marquis Combustible Cladding Report).

An inspection was undertaken on the 23<sup>rd</sup> of June 2021 to undertake intrusive investigations of the façade cladding. Following the intrusive investigations, two samples of the ACP panel were taken and sent for laboratory testing.

## Inspection Information

The inspection was undertaken during fine weather conditions.

For the purpose of this report, the front of the building faces south.

## Limitation of the Report

See section 4 Report Conditions

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# 1 Assessment

Aluminium Composite Panels (ACPs) are manufactured with various cores ranging from the flammable Polyethylene (PE) core up to the fully non-combustible Aluminium honeycomb core.

The inspection consisted of an initial walkaround of the building to determine the presence of cladding panels. Access was limited to the council footpath around the perimeter of the building.

The complex was found to consist of a concrete framed structure with a combination of face render walls and ACP panels. Grey/silver coloured cladding panels were observed on the south-eastern and south-western corners of the building and on the ground level of the western elevation. No information has been provided regarding the installation or type of panels on the façade of the structure. The observed cladding makes up approximately 10% of the external façade.

## 1.1 Intrusive Investigation

Samples of the external cladding were taken on the 23<sup>rd</sup> of June 2021, to identify the type of cladding which has been installed to the building façade. The samples of the external cladding mentioned above were taken from the ground level awning at the western elevation of the building and the south-western corner of Level 1 of the building, as shown in **Photograph 1** and **Photograph 3**.

Following the removal of the samples of aluminium panels, a core material was identified between the two aluminium sheets to make up the ACP. The core material could not be identified; however, colour of the core was white.

## 1.2 Laboratory Testing

Subsequent laboratory testing was approved to identify the unknown core material found during the intrusive investigation. Samples of the ACP cladding were removed from the ground level awning at the western elevation of the building and the south-western corner of Level 1 of the building, as shown in **Photograph 2** and **Photograph 4**.

The testing was undertaken by the University of New South Wales in accordance with the Insurance Industry Aluminium Composite Panel and Other Combustible Façade Materials, Residual Hazard Identification/Reporting Protocol.

The testing protocol categorises the samples into four general categories defined by the composition of the core material, ranging from A – High fire risk, through to D – non-combustible as follows:

| Category | Polymer Percentage   | Polymer% | Inert Filler % |
|----------|--|----------|----------------|
| <b>A</b> | 30-100% Polymer and 0-70% inert materials                                | 30-100%  | 0-70%          |
| <b>B</b> | 8-29% Polymer and 71-92% inert materials                                 | 8-29%    | 71-92%         |
| <b>C</b> | 1-7% Polymer and 93-99% inert materials                                  | 1-7%     | 93-99%         |
| <b>D</b> | 0% Polymer and 100% inert materials or deemed non-combustible by the NCC | 0%       | 100%           |

The sample was analysed using the following two methods:

### 1.1.1 Fourier-Transform Infrared (FTIR) Spectroscopy

The sample was analysed using FTIR. Infrared analysis provides fundamental characteristic vibrations which can be used to determine the molecular structure.

Molecular bonds are vibrated by stretching or by bending in a number of ways. The wavelength of IR light interacts with these vibrations.

The sample was found to have characteristics which are consistent with low density polyethylene. The results are displayed in Annexure A.

### 1.1.2 Ashing Residue Test

In accordance with ASTM D 5630 - 13 "Standard Test Method for Ash", the sample was burned to produce ash and the burning characteristics were recorded.

When ash is produced, its elemental composition is determined, and the identity and level of inert filler is calculated. From the results, the cladding core sample is categorised giving % polymer, identity of polymer, % inert filler, identity of inert filler and assessed in terms of Insurance Council of Australia as to its fire-retardant properties.

The sample was found to have characteristics which are consistent with low density polyethylene. The results are displayed in Annexure A.



**Photograph 1 – Location of sample (Ground Level Awning on the Western Elevation) taken for laboratory testing**



**Photograph 2 – Sample of ACP cladding taken from the Awning on the Western Elevation**



**Photograph 3 – Location of sample (SW corner of the building) taken for laboratory testing**



**Photograph 4 – Sample of ACP cladding taken from the SW corner of the facade**

### 1.1.3 Summary of Results

The following is a summary of the results attached in annexure A

| Sample # | Location                                | % of polyethylene | ICA Classification |
|----------|---|-------------------|--------------------|
| Sample 1 | Western Elevation (Ground Level Awning) | 29%               | B                  |
| Sample 2 | South-western Corner of the Building    | 28%               | B                  |



## 2 Recommendation

Based on the laboratory results provided, it is interpolated that approximately 29% of the core material is low density polyethylene. Polyethylene cores typically are not fire-rated and the panels themselves would therefore not conform with current Australian Standards.

Under section 9(1) of the *Building Products (Safety) Act 2017*, the act prohibits the use of aluminium composite panels (ACP) with a core comprised of greater than 30% polyethylene (PE) by mass in any external cladding and wall. That act states the installation of non-compliant cladding in accordance with the act is retrospective and as such requires to be adequately remediated.

The laboratory results have identified the Aluminium Composite Panels to have a polyethylene core slightly less than 30% by mass. However, based on the high combustibility and unknown manufacturer of the installed product, it is recommended that all ACP cladding to the façade be replaced with a suitable non-combustible material.

This assessment has only considered the likelihood of Aluminium Composite Panels (ACP) panelling being installed on the building facade.

# 3 Annexure A: Testing Results



Report prepared by

**MARK WAINWRIGHT ANALYTICAL CENTRE**

**ANALYSIS OF ALUMINIUM  
CLADDING CORES**

by

D D'ADAM

for

***Company:***  
***Contact:***

***Noviion Engineering Pty Ltd***  
***George Dahrie***

**09 July 2021**

Project No 2021208

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## **ANALYSIS OF ALUMINIUM CLADDING CORES**

### **1.0 SAMPLE**

Two plastic sachets each containing a polymeric core sample were received for analysis. The samples were identified as follows:

*Sample 1*      *William St, Woolloomooloo – Front Entrance Ceiling*

*Sample 2*      *William St, Woolloomooloo – First Level Façade under window*

I have been asked to identify the cladding material by FT/IR and classify it in accordance with Insurance Council of Australia guidelines.

### **2.0 METHODOLOGY AND RESULTS**

The aluminium metal was removed from the cladding polymer and the flat surface of the polymer samples was abraded to remove any surface adhesive.

The samples were then analysed directly by ATR/FTIR.

The core samples were then ashed to determine their percentage mineral content.

The ash (where sufficient) was then analysed by X ray fluorescence spectroscopy.



### 3.0 COMPOSITION OF FILLER

The composition of the ash from the sample was as follows:

|                                  | #1     | #2     |
|----------------------------------|--------|--------|
| <i>Mineral content</i>           | 47.8%  | 48.7%  |
| <i>Alumina</i>                   | 93.1%  | 90.8%  |
| <i>Sodium oxide</i>              | 0.47%  | 0.38%  |
| <i>Iron oxide</i>                | <0.01% | <0.01% |
| <i>Titanium dioxide</i>          | <0.01% | <0.01% |
| <i>Calcium oxide</i>             | <0.01% | 0.05%  |
| <i>Nickel oxide</i>              | <0.01% | <0.01% |
| <i>Magnesium oxide</i>           | 0.16%  | <0.01% |
| <i>Silica</i>                    | <0.01% | <0.01% |
| <i>Sulphur trioxide</i>          | <0.01% | <0.01% |
| <i>Phosphorus pentoxide</i>      | <0.01% | <0.01% |
| <i>Potassium oxide</i>           | <0.01% | <0.01% |
| <i>Zinc oxide</i>                | <0.01% | <0.01% |
| <i>Barium oxide</i>              | <0.01% | <0.01% |
| <i>Manganese oxide</i>           | <0.01% | <0.01% |
| <i>Copper oxide</i>              | <0.01% | <0.01% |
| <i>Chromium oxide</i>            | <0.01% | <0.01% |
| <i>Lead oxide</i>                | <0.01% | <0.01% |
| <i>Loss on ignition (1050°C)</i> | n.d    | n.d    |

*nd = not determined due to insufficient mass of ash*



#### **4.0 CONCLUSION**

The core #1 consisted of 68.1% aluminium trihydrate, 3.3% other mineral matter and approximately 29% polyethylene polymer.

**The cladding sample #1 is classified as ICA Category B.**

The core #2 consisted of 67.6% aluminium trihydrate, 4.5% other mineral matter and approximately 28% polyethylene polymer.

**The cladding sample #2 is classified as ICA Category B.**

**The ICA Classifications assigned are correct as per the September 2020 revision of the ICA Guidelines.**

Dominic D'adam, BSc/BE(Hons)

Technical Officer, Chemical Consulting Laboratory

Mark Wainwright Analytical Centre, UNSW

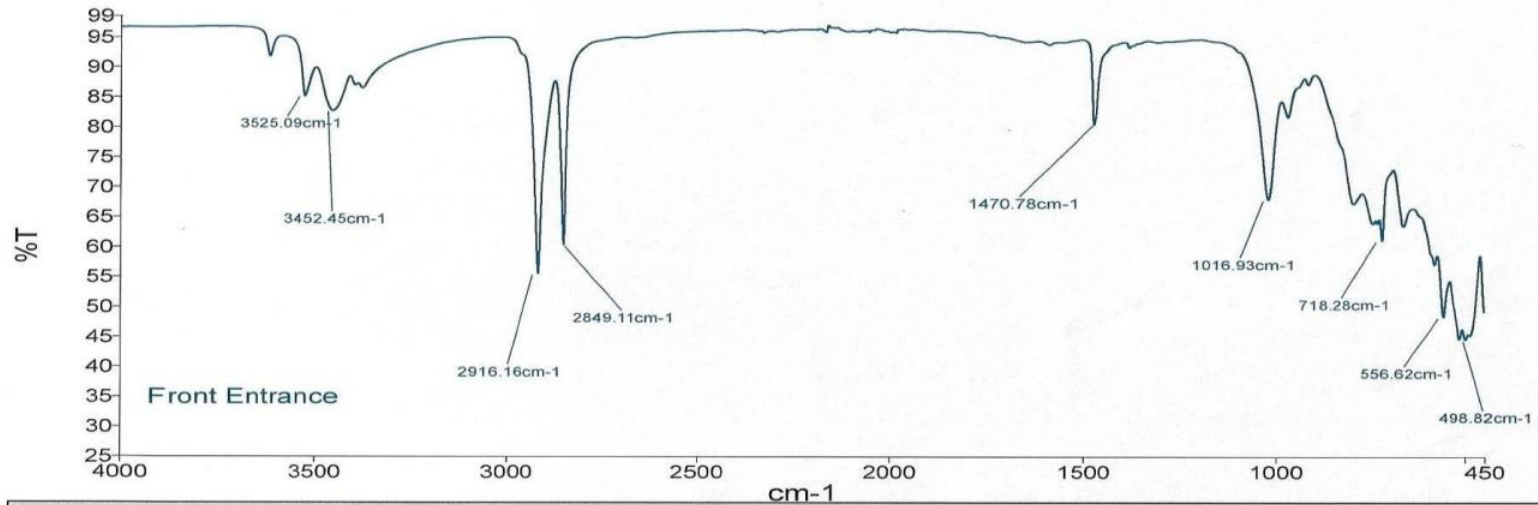
09 July 2021



PerkinElmer Spectrum IR Version 10.6.1  
Friday, 9 July 2021 1:17 PM

Analyst  
Date

Administrator  
Friday, 9 July 2021 1:17 PM

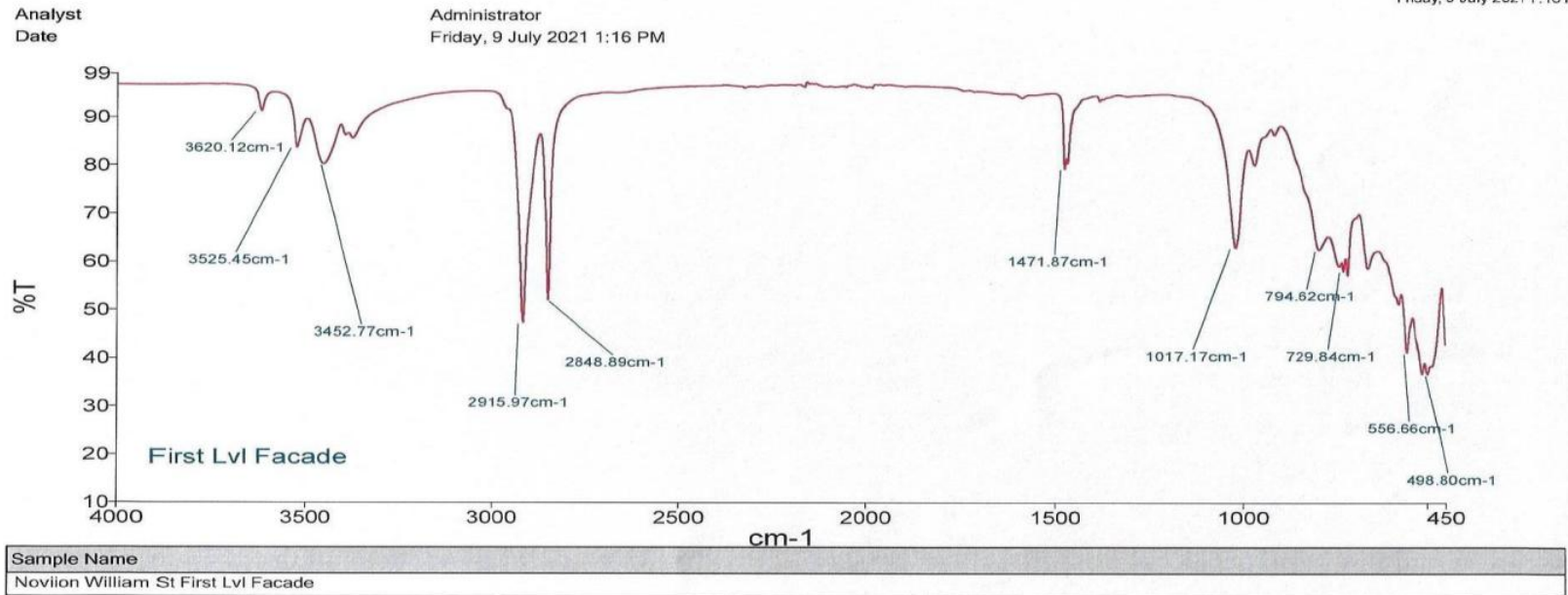


Front Entrance

|                                  |
|----------------------------------|
| Sample Name                      |
| Novion William St Front entrance |



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## 4 Report Conditions

1. Noviiion Engineering has been engaged by the above client to produce a report in accordance with the terms and conditions for the inspection as per the fee proposal and/or our standard terms and conditions.
2. This report is based upon a visual inspection of the property and, limited to the scope of works mentioned above.
3. The works are limited to those described above. This report has been prepared for "The Client", and should not be relied upon by any third party.
4. No responsibility is undertaken to any third party in the use of this report.
5. No detailed calculations or quantitative assessments of the adequacy or compliance of the building to current design codes or the Building Code of Australia (BCA) were carried out as part of this survey, nor was any physical materials testing carried out or enquiries made of statutory authorities in connection with the building.
6. Note that while all reasonable effort was made to access all areas of concern, some areas were difficult to access. We have not inspected those parts of the building or its services which are built in, covered up or otherwise made inaccessible in the normal course of construction or occupation and we are, therefore, unable to state that such parts are free from rot, beetle, corrosion or any other defect whatsoever.
7. Whilst this report is based on a reasonably detailed visual inspection of the building described in this report, we do not purport to have discovered or seen every hidden defect or structural condition in existence and as such, defects or structural conditions should not be inferred from the descriptions or photographs forming this report.
8. Our inspection was related to strictly the identified in the fee proposal and excludes defects, which are not reasonably detectable during a visual inspection.
9. We did not inspect drainage systems, hydraulic services, ventilation systems, fire protection systems, or other elements, which would require opening up of the structure fabric.
10. Our services do not extend to advising on asbestos and We shall have no liability for any claims arising out of or in connection with asbestos.
11. Noviiion Engineering Pty Ltd provides no warranty for its contents to any client or third Party. We take no responsibility for any loss or damages due to any assumptions or comments made in this report.
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13. For any information or recommendation no guarantee is given that the above information will solve the issues identified.
14. Noviiion Engineering Pty Ltd retains full copyright ownership in this Report. Once full payment for the completion of this Report is received, We provide a license to the Client to use this Report only for the purposes under which Noviiion Engineering Pty Ltd was instructed to prepare it.
15. Our observations and comments are made based on our experience. These observations may or may not be the actual cause of the issue, given the nature of remedial engineering's. The identified issues may be the result of a combination of multiple sources. As such no guarantee or liability is given that the above information will solve the issues identified.
16. Information in this report is based on our visual observations which are in line with our previous experience dealing with similar issues. Unless noted otherwise, no destructive investigations were undertaken. Noviiion Engineering Pty Ltd (ABN 63 607716 772) cannot accept any responsibility or liability for any use of or reliance on the contents of this report by any third party
17. Except to the extent noted in this report, we have not made enquiries of any statutory authorities concerning the present arrangements within the building or the likely effect of any proposed occupation. We should advise that the complexity of the Building Codes and other statutory enactments can have a material effect on the way in which building may be planned and used and upon the cost on consequential work. It is assumed that professional advice will be sought at the appropriate stage to determine any works which may be necessary due to any planned occupation.
18. We have not, except to the extent mentioned in this report, carried out any tests or made any enquiries concerning particular materials.
19. In cases where suppliers or contractors or consultants are instructed to carry out tests or prepare reports, it should be noted, whilst we will take every care in instructing these suppliers or contractors or consultants, we cannot accept responsibility for their report and shall not be liable for error or omission therein. In appointing such suppliers or contractors or consultants we act only as an agent on behalf of the client, and the contractual rights and obligations lie directly between the client and the relevant suppliers or contractors or consultants.

20. This assessment has only considered the likelihood of ACP panelling being used on site. It has not considered the flammability of the building or made any recommendations about the overall fireproofing and material choice of the structure.
21. This assessment has only considered the likelihood of ACP panelling being used as a general façade and cladding material on the building. We cannot confirm if isolated instances of differing products with similar appearances have been used.
22. Novion Engineering does not state, affirm, imply, endorse, or otherwise by any action, express or implied, indicate that the use of the words in this report intends to convey any meaning of guarantee nor assumes any responsibility for the fireproofing of the building inspected and documented by the inspector.