

# The past, present and future of external cladding

The Grenfell Tower tragedy in London drew a line in the sand regarding the use of external cladding on buildings. The fire, which occurred on June 14 2017, is believed to have been caused by a faulty fridge freezer on the fourth floor. It quickly spread up the sides of the building via the external cladding that had only recently been added as part of a refurbishment. The definitive death toll was finally confirmed in November as 71.

An inquiry was established after the fire and is yet to be completed. Early indications are that there will be a number of factors that ultimately combined to cause this tragedy, however, authorities were quick to point out one of the main contributing factors were the new aluminium composite panels added to the building in 2012 to improve its appearance.

## What is ACP?

Aluminium composite panels (or ACP) are a form of external building cladding using two thin skins of aluminium panels bonded to a non-aluminium core. While there are numerous types, generally speaking they can be split into three more commonly recognised categories:

- **PE Cores** – these contain a 100% polyethylene (PE) core
- **FR Cores** - these contain a composite material made up of a higher percentage (between 70% and 90%) of fire retardant mineral wool, with the balance being polyethylene. They are commonly known as Fire Retardant (or FR) panels.
- **Aluminium Cores** – generally these contain an aluminium honeycomb core, but there are also panels made of solid aluminium as well.

ACP is a non-load bearing material that is used in construction to provide a degree of thermal insulation and weather resistance, but is ultimately used to improve the appearance of buildings. It is very popular with architects and designers because of the inherent architectural features, ease of application, and also its comparative cost to other materials.

ACP should not be confused with other types of cladding such as EPS (Sandwich Boards), Exterior Insulation and Finishing Systems (EIFS), or Greenboard, which are based on an expanded polystyrene or polyurethane core. However, these other panel types do fall under the broad umbrella of plastics and carry many of the issues discussed in more detail later.

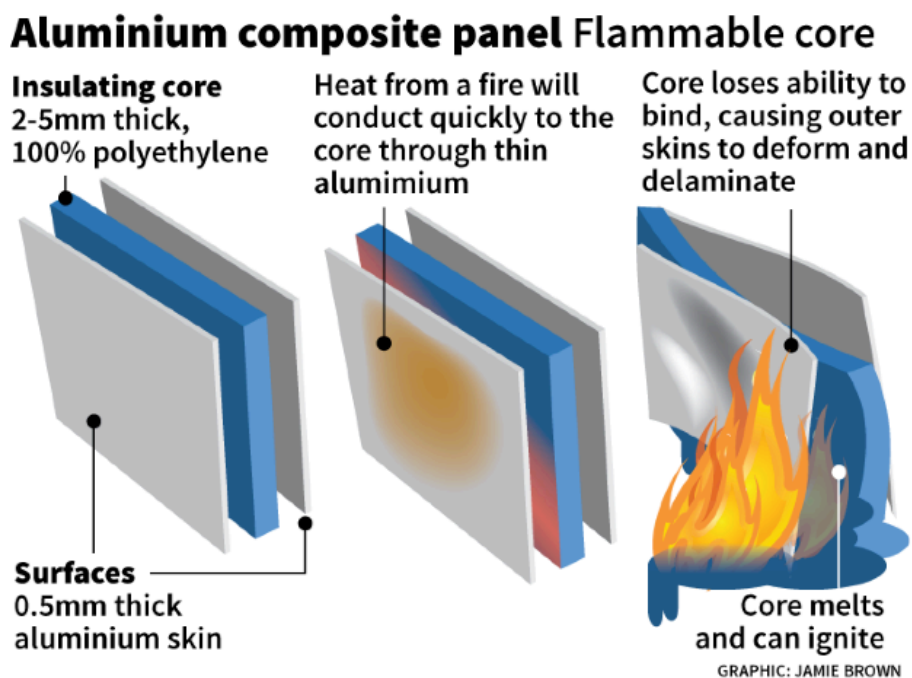
## A brief history

These types of building materials have been around since the 1960s, however, it has only been since the early 1990s that the material began to appear in residential and commercial buildings to improve architectural performance and reduce costs. In fact, it wasn't until the significant build-up of high rise residential developments from 2010 and the more recent Lacrosse tower fire in Melbourne in 2014 that the issue came to the fore in Australia.

While Grenfell brought the cladding issue to a head, it was really only the most recent event resulting in multiple deaths, as it followed a number of building fires globally that the fire safety industry, risk engineers and others had been warning about for many years. Below is a table of other fires where there has been a direct connection to the use of ACP.

YEAR	BUILDING/CITY/COUNTRY	FATALITIES
1991	Liverpool, UK	None
1999	Garnock, Scotland	None
2004	Television Cultural Ctr, Beijing, China	7 injured
2010	Shanghai, China	58 / 70 injured
2010	Roubaix, France	7
2012	Saif Belhasa Building, Dubai	2 injured
2012	Tamweel Tower, Dubai	None
2014	Lacrosse, Melbourne, Australia	None
Feb, 2015	The Torch, Dubai	None
Nov, 2015	The Torch, Dubai	None
2016	The Address, Dubai	None

## ACP and fire



The graphic above demonstrates how an ACP panel will perform in the event of a fire, with delamination of the skin and core material melting often resulting in material falling to the ground or igniting other parts of the building as they detach and fall. Experts have found that a 1m x 1m section of polyethylene cladding is equivalent to 5 litres of petrol, and that 1kg of polyethylene cladding has the same burning capacity as 1.5 litres of petrol.

### Identification and regulation

The number of brand names available in the market are extensive and are imported from a range of countries such as China, Germany, and Turkey. While a certain product type may be specified by an architect for the project, it has been discovered the actual material found on the building is a different inferior product often selected in order to reduce project costs.

The Australian Building Codes Board (ABCB) provide a CodeMark Scheme that will issue a certificate of conformity, however this is currently a voluntary third party building product certification scheme and as such not all ACP products are certified via this scheme.

#### – Building Code of Australia (BCA)

Building legislation varies from State to State, however,

the Building Code of Australia was developed back in 1988 as part of a concerted effort to have all States reference a uniform set of technical requirements for the design and construction of buildings in Australia. The BCA is produced and maintained by the ABCB and given legal effect via The Building Act 1975. The BCA has more recently been incorporated under the National Construction Code.

Acceptable building solutions are set out in the BCA as “Deemed to Satisfy”(DtS) solutions or “Alternative Solutions”. Although the Australian Standards are a non-government, not for profit organisation, the BCA typically references the Australian Standards as DtS solutions which means that the Australian Standards are then endorsed within the regulations.

During the early 1990s most States deregulated construction certification which allowed for the introduction of private building certifiers. Peak industry bodies have viewed this move as a flaw as it has eroded the checks and balances in building certification and allowed for a level of interpretation with respect to the application of the BCA and subsequently the associated Australian Standard required for compliance.

#### – The BCA and ACP

This evolution has implications when it comes to the status of building cladding. For example the MFB Post Incident

Analysis report in the Lacrosse fire in Melbourne stated that:

*In accordance with the deemed-to-satisfy requirements of Specification C1.1 of the BCA, external walls of Type A buildings must be non-combustible, notwithstanding any requirement for fire rating. Non-combustible is a defined term in the BCA and is defined as the following:*

*Applied to a material – not deemed combustible as determined by AS1530.1 -Combustibility Test for Materials; Applied to construction or part of a building - constructed wholly of materials that are not deemed combustible.*

*Additionally, a material may be considered non-combustible under C1.12 of the BCA, if it meets the defined criteria within that clause. Standard grade Alucobest aluminium/polyethylene composite panel does not meet the criteria and nor is it likely that it has been successfully tested in accordance with AS1530.1.*

However, it has been found on other occasions that the certifier has approved the use of the material based on the view that the cladding is deemed an “attachment” to the building and as such only needs to comply with BCA specification C1.1, Clause 2.4(a):

*2.4 Attachments not to Impair fire-resistance*

*Clause 2.4 amended by Amdt No. 13*

*(a) A combustible material may be used as a finish or lining to a wall or roof, or in a sign, sunscreen or blind, awning or other attachment to a building element which has the required FRL...*

Based on the above interpretation of the BCA the certification of the cladding would only need to comply with AS1530.3 - *Simultaneous determination of ignitability, flame propagation, heat release and smoke release.* This test does not determine whether the material is non-combustible.

All Polyethylene (PE) panels will meet AS 1530.3 but not AS 1530.1. Many Fire Retardant (FR) panels will also not meet AS 1530.1. In addition, many Fire Safety experts have concerns that even products that state in their Material Safety Data Sheets that the product is “deemed to comply with 1530.1”, like aluminium honeycomb core panels, may not have been fully tested with the inclusion of all their componentry parts such as the binding glues and resins.

There is a new Australian Standard based on the British Standard for external walls, AS 5113 2016 – *Fire propagation testing and classification of external walls of buildings*, which will come into effect under the NCC in 2018, but again Fire Safety experts have been quick to point out that no current products, irrespective of core type, will pass this test mainly due to the debris issues that all cladding produce when tested under fire conditions.

One final point to make in respect to the BCA is that its primary aims are to “protect life safety” as opposed to building resilience. This means that all Fire Safety requirements including the application of automatic sprinkler protection installed in high rise developments are aimed at providing safe evacuation of the building but not necessarily protection of the physical asset itself.

This can be evidenced by the MFB report into the Lacrosse fire which stated:

**Sprinkler System operated well beyond its designed capability**

*Had the combined fire hydrant/fire sprinkler system not exceeded its designed capability, it is likely that significant fire development and spread would have occurred in some of the subject apartments on Levels 6 to 21. Spread beyond the subject apartments to adjacent apartments and common areas may also have occurred.*

**What should owners do?**

Following the Lacrosse fire in Melbourne, the Victorian Building Authority conducted an audit of buildings in the CBD which resulted in the identification of 170 buildings that had potential non-compliant cladding. This led to a taskforce set up by the Victorian government which recently released its findings including a decision to ban the use of PE core cladding on all buildings over two levels as it has deemed it to be a major safety risk. This will now potentially affect approximately 1400 residential and commercial buildings in that state which have been identified as being clad in polyethylene or expanded polystyrene.

In NSW, an inter-office Fire Safety and External Wall Cladding Taskforce has been established to address fire safety requirements for residential buildings,

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and has already written out to approximately 1,000 buildings based on document research and visual identification. This has resulted in the "Building Products (Safety) Bill 2017" which was passed by NSW Parliament and took effect on November 23rd, 2017. It not only seeks to address the issues around non-compliant cladding but is also a much broader document that will encompass other types of non-conforming and unsafe building materials. The significance of this piece of legislation to Owners Corporations in NSW should not be underestimated as it will empower the Office of Fair Trading to issue rectification notices which would likely trigger further rectification orders from other relevant authorities such as local councils.

All states and territories other than the Northern Territory are also conducting similar inquiries. Whilst it is good to see governments taking a pro-active approach, there should be no complacency on the part of owners of strata buildings.

#### – Know the obligations

The Owners Corporation or Body Corporate in every State and Territory has an obligation to maintain and repair the common property and to insure the strata scheme. In addition, each owner has an unlimited liability in respect of the strata scheme.

When it comes to insurance there is a fundamental insurance requirement that anything that an insured may reasonably be expected to know that would affect the insurer's decision to insure the strata scheme and on what terms must be declared to the insurer.

For these reasons it is now paramount that if owners on strata committees believe their building may contain cladding in some form they will have a duty to ascertain what the material is and whether it is compliant (and safe?) under both their statutory strata obligations and their insurance requirements.

Owners should consult with their Strata Manager and follow a three step process:

- a. Identification
- b. Evaluation and Analysis
- c. Treatment/Remediation

#### – Identify and evaluate

Ideally the first stage of identification would occur via a search of existing documentation from the original owner/developer, however, this may not be readily available, or more often than not, the materials specified in the architects' or construction documents are not what has actually been used in the final construction. The second

option would be to utilize the services of qualified fire safety or risk engineers to investigate the material, which may even incorporate invasive methods such as taking away and testing a sample of the existing cladding. There are a number of specialist service providers that are now offering these types of services for strata schemes. This information should then also be provided to the insurer as soon as possible in order to avoid issues at the time of renewal.

During the evaluation stage it will be necessary to understand what exposure the type of ACP creates to the property itself. For example, how much of the building surface is covered by the ACP? Is it all the building, one façade, or some sort of minor decorative feature? Are there openings near the areas where the ACP exists such as open balconies? What other fire safety measures already exist? For example is the building fully sprinklered?

These will all have an impact on what the final mitigation measures to be undertaken will need to be in order for the building to be deemed safe to both persons and property.

#### – Treatment/remediation

Grenfell and Lacrosse both contained 100% PE core paneling, and provided a tragic demonstration of how quickly this material reacts under fire conditions. That, together with other elements such as the installation methodology and presence of combustible insulation material, further assisted in the propagation of the fire.

It is clear that this type of paneling, if found in buildings and depending on other factors, may require significant additional fire safety measures or potentially complete removal from the building if alternative solutions cannot be found. At the time of writing, the Lacrosse Owners Corporation has been ordered by the City of Melbourne to replace the existing ACP by the end of July 2018, even though they are currently in litigation with the original developer.

Whilst all panels have combustible qualities due to many of the already mentioned issues such as installation, cavities, and other introduced insulation materials, paneling that contains 7% or no PE content will generally require minimal mitigation or remediation action. Nevertheless, insurers will want to be satisfied in such cases that any issues have been addressed and appropriate consultation has been undertaken.

It is important to note that the Insurance Council of Australia (ICA) via its Property Working Group is currently working on a material identification register as well as a protocol for material testing for combustibility in order to provide assistance to brokers, their clients and insurers with the evaluation and treatment step of this process.

### **Insurers and the cover available**

Insurers are currently reviewing their underwriting criteria and appetite as new information emerges, and this will have a material impact on acceptability, insurance premiums, and the terms and conditions, such as higher excesses or reduced coverage. As a result, the more information the strata scheme can provide the insurers - including any proposed mitigation strategies - the better off they will be when it comes time to sit down and discuss the insurances of the strata scheme with their strata manager or broker and insurer.

With respect to Longitude, we do consider providing coverage to buildings that have cladding, which is done on a case by case basis. In other words, Longitude does not automatically decline to quote or decline to offer renewal terms just because a building has cladding, instead, we work with our key broker partners to gather as much information as practicable to find a resolution.



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