COMBUSTIBLE CLADDING AND THE STATE OF FACADE DESIGN

Network Architectural

Introduction

Lacrosse Tower, a 21-storey residential high-rise in Melbourne, Australia, caught fire on November 24, 2014. Originating on an eighth-floor balcony, the fire spread uncontrollably, rapidly climbing the exterior of the building, which was clad with an aluminum composite panel (ACP) with a core made from combustible plastic.

In 2017, the Grenfell tower fire incident in London was yet another landmark combustible cladding fire. Again, combustible ACPs used as exterior cladding were the primary cause of the fire's rapid spread across the building.

To this day, the Australian construction industry is still feeling the repercussions of the Lacrosse and Grenfell tower fires. A nationwide investigation as to the extent of combustible cladding on Australian buildings followed shortly thereafter, highlighting a widespread problem across the industry. In recent legal developments, the fire protection engineer, architect, and building certifier were collectively sued for $5.7 million for their contribution to specifying combustible cladding for the Lacrosse Tower building, indicating that design and construction professionals will be subject to greater legal liabilities going forward if they choose to use non-compliant building products.

Nearly ten years have passed since Lacrosse: some jurisdictions have quickly responded to address the problem, putting in place extensive cladding remediation initiatives, while other jurisdictions have taken longer to react. In this whitepaper, we look at combustible cladding and the state of facade design in Australia: where are we now, what the current issues are, and where we need to be in the future.

"Architects must be made aware of the significance of high-quality design and documentation, as well as the dire consequences that can arise for clients, end users, and themselves if professional standards are not met."

Where are we now?

Reports suggest that Australia has more than 3,400 buildings with combustible cladding, with only a small fraction of such defects having been fixed. Moves to rectify defective buildings have been inconsistent across the various states and territories.

In Queensland, for example, the Safer Buildings Taskforce was established in 2019 to advise the government on the necessary policies and actions to ensure the safety of Queensland buildings. The Northern Territory, on the other hand, has taken relatively few steps to assess and address the combustible cladding issue.

Other jurisdictions have established programs to assist homeowners and the building industry in paying for cladding remediation works. Financial assistance for replacing the cladding on buildings with an extreme or high South Australian Life Safety Assessment risk rating is available to building owners in South Australia through the Combustible Aluminium Composite Panel Cladding Limited Loan Scheme. The Victorian government provided funding of approximately $550 million over five years to rectify privately-owned residential buildings through Cladding Safety Victoria.

The most comprehensive cladding rectification scheme implemented in Australia was initiated in New South Wales. Project Remediate offers 10-year interest free loans for cladding rectification. The government also passed the *Design and Building Practitioners Act 2020*, which aims to restore confidence in the building industry by regulating the activities of practitioners who design and construct new buildings.

Project Remediate and the Design and Building Practitioners Act 2020

New South Wales' Project Remediate is still one of the most extensive cladding rectification programs in Australia. Project Remediate provides up to $139 million in funding for program management and quality assurance, in addition to 10-year interest-free loans for cladding rectification projects.

Products utilised in Project Remediate must be approved. Expert advice on the suitability of replacement cladding products and external wall assembly techniques is provided by the Cladding Product Safety Panel (CPSP) to the New South Wales Cladding Taskforce and the Cladding Support Unit. A list of four product categories that are deemed appropriate substitute options for Project Remediate's purposes was included in the CPSP's initial report, including: solid aluminum, solid metal sheets, fibre cement and non-combustible cement render.[1]

The Design and Building Practitioners Act 2020 (DBPA) serves as the foundation for the design and construction of the works covered by Project Remediate. The purpose of the DBPA is to ensure the structural integrity and safety of building facades, especially in public and high-rise buildings. Some of the key reforms under the legislation include:

- requirements for design and building practitioners to register and be named on a publicly accessible register of practitioners;
- regulated designs and requirements for the submission of "compliance declarations" stating whether a design or building work complies with the requirements of the Building Code of Australia; and
- a statutory duty of care regime to prevent economic loss to current and future owners caused by building defects.

The full scope of the application of the DBPA is still taking shape, with commenters noting that it is "fiendishly difficult" to interpret.[2] It has been observed in recent court cases that the Act's statutory duty in s 37 extends beyond Class 2 (multi-residential) buildings, and it is anticipated that claims from a wider variety of buildings may be brought.

What does NCC 2022 say?

In the years following Lacrosse and Grenfell, there was a flurry of changes to building codes and regulations, including the banning of the use of combustible materials on the exterior walls of high-rise buildings. There have been several iterations of the National Construction Code (NCC), each with updates to fire safety, testing and performance requirements.

The latest version of the NCC in 2022 included changes that aimed to make the code more accessible and practical. The concession for the use of bonded laminates, which includes cladding comprising a non-combustible core material 'sandwiched' between two thin aluminium sheets, is retained in the NCC 2022. The requirements include specified characteristics to prevent the use of ACPs with a combustible core.

There were also amendments providing additional concessions to non-combustibility requirements, and a new sub-clause added to specify non-combustible materials. Adding clarification to the list of deemed non-combustible materials helps designers and specifiers by simplifying the choice in relation to cladding materials.

There are still risks associated with vertical spread of fire in Australia because the NCC does not currently have any performance criteria that address this issue. Clause C1F2 in NCC 2022, which addresses fire spread prevention, does not specifically cover vertical spread of fire.[3]

Issues with weatherpoofing and condensation

Accompanying the increased regulatory focus on fire safety is a greater awareness of the commonplace nature of cladding defects in Australian buildings. In a study by Deakin University's Nicole Johnston and Griffith University's Sacha Reid analysing 212 building audit reports, 3,227 building defects were identified (an average of 14 defects per building).[4]

More than 40% of the defects identified in the 212 building audits were related to cladding, with common issues relating to fire protection, waterproofing, roof and rainwater disposal, and structural issues. These findings serve as an important reminder that facades serve a range of other purposes besides fire safety, all of which play a critical role in the lifespan and performance of the building.

Where do we need to be?

Raising awareness

Education and awareness of fire-safe facade design and the responsibilities of every stakeholder in the supply chain are more important than ever. Facade design was previously associated with large-scale developments, but now, under the DBPA, facade engineers must be engaged for Class 2 developments, working with stakeholders who may not have previous experience working with facade design services.

Architects must be made aware of the significance of high-quality design and documentation, as well as the dire consequences that can arise for clients, end users, and themselves if professional standards are not met.[5]

Component vs. large-scale testing

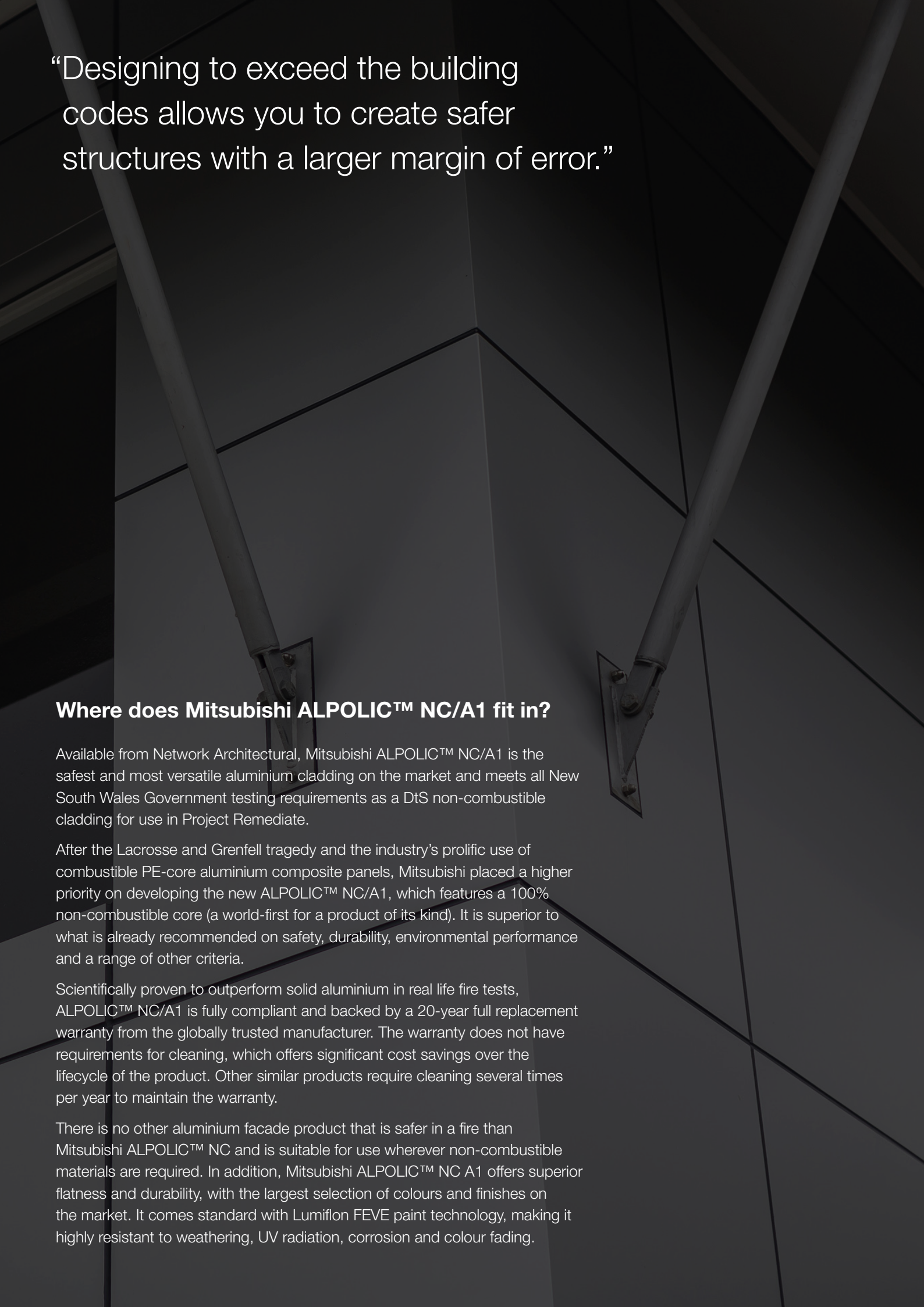
Instead of large-scale testing, current fire performance testing concentrates on small-scale component testing. This is due to the fact that small-scale fire tests are more affordable and readily reproducible, but they have a major flaw in that they are unable to replicate the intense heat generated by a large-scale fire, and therefore may provide misleading results.

Alternative testing methods are required in order to estimate all of the dynamic and related phenomena that contribute to the spread of fires.[6]

Emphasis on exceeding the minimum

Building to only meet the minimum standard raises the possibility that a mistake or oversight could cause non-compliance with the applicable performance requirements. Designing to exceed the building codes allows you to create safer structures with a larger margin of error.

Accordingly, it is important to encourage the use of best-practice design methods. An example of this is cavity barriers, which are included in the design requirements under Project Remediate, but are beyond what is required by the NCC. Cavity barriers, which are placed in strategic areas like between storeys of a building and around windows to stop the spread of fire and smoke, are physical barriers that seal off compartments.



“Designing to exceed the building codes allows you to create safer structures with a larger margin of error.”

Where does Mitsubishi ALPOLIC™ NC/A1 fit in?

Available from Network Architectural, Mitsubishi ALPOLIC™ NC/A1 is the safest and most versatile aluminium cladding on the market and meets all New South Wales Government testing requirements as a DtS non-combustible cladding for use in Project Remediate.

After the Lacrosse and Grenfell tragedy and the industry’s prolific use of combustible PE-core aluminium composite panels, Mitsubishi placed a higher priority on developing the new ALPOLIC™ NC/A1, which features a 100% non-combustible core (a world-first for a product of its kind). It is superior to what is already recommended on safety, durability, environmental performance and a range of other criteria.

Scientifically proven to outperform solid aluminium in real life fire tests, ALPOLIC™ NC/A1 is fully compliant and backed by a 20-year full replacement warranty from the globally trusted manufacturer. The warranty does not have requirements for cleaning, which offers significant cost savings over the lifecycle of the product. Other similar products require cleaning several times per year to maintain the warranty.

There is no other aluminium facade product that is safer in a fire than Mitsubishi ALPOLIC™ NC and is suitable for use wherever non-combustible materials are required. In addition, Mitsubishi ALPOLIC™ NC A1 offers superior flatness and durability, with the largest selection of colours and finishes on the market. It comes standard with Lumiflon FEVE paint technology, making it highly resistant to weathering, UV radiation, corrosion and colour fading.

REFERENCES

1 NSW Government. “Cladding Product Safety Panel.” NSW Government. https://www.nsw.gov.au/housing-and-construction/nsw-cladding-taskforce/cladding-product-safety-panel (accessed 18 December 2023).

2 Palmer, Mega. “Just how ‘fiendishly difficult’ is it to interpret the Design and Building Practitioners Act?” Moray & Agnew Lawyers. https://www.moray.com.au/insights-media-events/publications/commercial-directions/june-2022 (accessed 18 December 2023).

3 Van der Pump, Christian and Eric Scheepbouwer. “Australia’s Combustible Cladding Crisis—A Failure in Delegated Legislation?” *Buildings*, Vol. 13, No. 4 (2023): 1010.

4 Johnston, N and S Reid. “*An Examination of Building Defects in Residential Multi-owned Properties*.” Griffith University. https://www.griffith.edu.au/__data/assets/pdf_file/0022/831217/Examining-Building-Defects-Research-Report-S-Reid-N-Johnston.pdf (accessed 18 December 2023).

5 Victorian government. “Building defects, professional standards and compliance culture.” Victoria government. https://www.vic.gov.au/systemic-risks-australian-architecture-sector/building-defects-professional-standards-and (accessed 18 December 2023).

6 McLaggan, MS, JP Hidalgo, AF Osorio, MT Heitzmann, J Carrascal, D Lange, C Maluk and JL Torero. “Towards a better understanding of fire performance assessment of façade systems: Current situation and a proposed new assessment framework.” *Construction and Building Materials*, Vol. 300 (2021): 124301.

All information provided correct as of January 2024.

Network Architectural