

NAVIGATING THE BUILDING CODE THROUGH NON-COMBUSTIBLE CLADDING SELECTION: ACHIEVING COMPLIANCE WITH FIBRE CEMENT



INTRODUCTION

Several recent fire events caused by flammable cladding products in major cities across the globe, most notably the 2014 Lacrosse and 2017 Grenfell Tower fires, sent shockwaves through the building industry.¹ In Australia, swift action from government and industry bodies in response to the widespread use of flammable cladding has resulted in several independent inquiries, ongoing fire safety audits in every State and Territory, and changes to the *Building Code of Australia* (BCA) (comprising Volume One and Two of the *National Construction Code* (NCC)). Recent cases have also established the legal liability of builders and construction professionals who knowingly use non-compliant building products.

Against this backdrop, industry professionals are seeking building solutions that provide a simple, reliable and low risk pathway to compliance by meeting the Deemed-to-Satisfy (DTS) Solution requirements in the BCA relating to fire performance.

In this whitepaper, we examine the process that industry professionals must follow when specifying compliant, non-combustible cladding. We highlight the key considerations that must be accounted for during this process and present a tried and tested high performance cladding solution that provides an efficient, reliable path to compliance with the BCA.

A HOT TOPIC: HOW CLADDING SHAPED THE AUSTRALIAN FIRE SAFETY CONVERSATION

Investigations into the 2014 Lacrosse tower disaster in Melbourne revealed that flammable aluminium composite panel (ACP) cladding, which was not BCA-compliant, accelerated the spread of fire.² A Senate Standing Committee into Non-Conforming Building Products was established in October 2016 as a response to the use of non-conforming building products in Australia. The Australian government has since supported several reform measures, including:³

- amendments to NCC Volume One to implement a comprehensive package of measures to prevent non-compliant use of cladding on high-rise buildings;
- publication of the Australian Building Codes Board (ABCB) "Fire Performance of External Walls and Cladding Advisory

Note" to reflect the amended NCC provisions;

- publication of the *ABCB Evidence of Suitability Handbook*;
- banning of ACPs with a flammable polyethylene core on Class 2, 3 or 9 buildings of two or more storeys and Class 5, 6, 7, and 8 buildings of three or more storeys until compliance with *AS 5113:2016 Fire propagation testing and classification of external walls of buildings* is demonstrated and a new system of permanent product labelling is established to prevent substitution of cladding products; and
- inclusion of clause A5.0 in the NCC, which provides that a building must be constructed using materials, products and forms of construction 'fit for their intended purpose' and in an 'appropriate manner to meet the Performance Requirements.'



UNDERSTANDING COMPLIANCE PATHWAYS

In the NCC Volume One, Performance Requirement CP2 requires that ‘a building must have elements that will avoid the spread of fire in a building and between buildings, in a manner appropriate for that building.’⁴ There are two pathways for compliance with CP2, namely:

- satisfying the DTS requirements set out in C1.9 of the NCC Volume One (the prescriptive ‘Deemed-to-Satisfy’ approach); or
- demonstrating a proposed solution performs at a level equivalent to or better than the DTS solution and meets the requirements of CP2 (the ‘Performance Solution’ approach).

Deemed-to-Satisfy

Under DTS specification C1.9(a) of the NCC Volume One, external and common walls including façade covering, framing and insulation must be non-combustible in buildings of Type A or Type B construction (unless the building is relying on the fire protected timber concessions in C1.13).⁵ Certain exempt components are outlined in C1.9(d), and certain allowable materials for non-combustible construction are defined in C1.9(e). If all the components of the wall meet the requirements set out in C1.9, or are covered by C1.9(d) or C1.9(e), then compliance with the non-combustibility provisions is achieved.

The DTS approach is the easier of the two compliance pathways as the DTS provisions are prescriptive, providing professionals with clear instructions that set out the materials, components, design factors and construction methods that are deemed to satisfy the Performance Requirements in the NCC if used correctly.⁶ If a DTS Solution is changed, there is a risk that fire performance may be compromised and additional action must be taken to establish compliance.

Performance Solution

If one or more components of an external wall do not meet the requirements in C1.9, compliance is to be assessed on the basis of performance in the specific context of that individual situation. Under the Performance Solution compliance pathway, there is no clear instruction on how to achieve compliance - rigorous testing and expert sign-off is required.

Specifiers must consider whether a building component or material is exempt from further testing and sign-off via compliance with Clauses C1.9(d) and C1.9(e). If it is not exempt, a CP2 Performance Solution in accordance with *AS 5113:2016* testing and the findings of a Fire Safety Engineer, Level 1 Certifier and other bodies, such as the Metropolitan Fire Brigade, may be required. Processes for testing may differ between States and Territories.

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BEST PRACTICE CLADDING SPECIFICATION

Does your cladding need to be non-combustible?

According to the relevant 2016 ABCB advisory note, Performance Requirement CP2 can be met, in part, under a DTS Solution for buildings of Type A and Type B construction by non-combustible external walls (including cladding products).⁷ Cladding must be non-combustible for:

- residential buildings, hotels, aged care facilities and hospitals above two storeys; and
- retail and office buildings above three storeys.

Fibre cement cladding: A Deemed-to-Satisfy Solution

A key advantage of choosing a DTS Solution is that it can significantly streamline project delivery timelines. This is because a DTS Solution allows specifiers to bypass the multiple hurdles otherwise required to establish compliance for a Performance Solution. Deemed suitable for non-combustible applications under C1.9 of the NCC Volume One, fibre cement cladding offers a simple route to code compliance under the DTS provisions, while also delivering outstanding performance and design flexibility.

Fibre cement is a composite material that is comprised of sand, cement and cellulose fibres and is typically available in sheet form. Unlike ACPs, which can contain potentially flammable cores such as polyethylene, fibre cement is not a bonded laminate material and is inherently non-flammable.

Fibre cement is compliant with the non-combustibility requirements in the NCC, under 1.9; it will not ignite and does not allow fire spread as proven by *AS1530.3* testing. In installation contexts that require the utmost level of fire safety, such as mid- to high-rise facades, fibre cement is an ideal alternative to traditional cladding products.

Fibre cement is a homogenous material that can be cut without compromising structure and performance. Other cladding products are comprised of multiple materials bonded, glued or laminated together. The glues used for such products are typically flammable, giving rise to fire safety issues and increasing the risk of non-compliance. Similarly, cladding products comprised of plastic-based materials may fuel or accelerate fire and cause thermal movement and degradation issues.

continued from page 3

Fibre cement is also superior to magnesium oxide facades, which are potentially corrosive and water-sensitive. In addition, unlike real timber solutions, fibre cement is not susceptible to termites and fungal decay.

Cladding specification: Key considerations

Fit for purpose

While non-combustibility is a key consideration when specifying code-compliant cladding, specifiers should also consider other factors such as structural reliability and weather-tightness to ensure it is fit for purpose for the life of the building. Solutions that are long-lasting and low maintenance should also be preferred.

Fibre cement addresses these considerations, offering a highly durable, fire resistant solution suitable for external applications. Fibre cement is also easy to use with minimal maintenance requirements once painted and installed.

Not all 'fibre cement' is fibre cement

When specifying fibre cement, it is important for specifiers to ensure the cladding solution meets the relevant composition and manufacturing requirements. Products like cement-bonded fibrous composite board claim to be fibre-reinforced cement but do not offer the same performance. To be considered fibre cement, a product must comply in full with either AS/NZS 2908:2000

Cellulose-cement products or ISO 8663, including compositional and testing requirements. Specifiers should request StandardsMark Certificates and Product Conformity Statements to ensure that the cladding product meets the requirements for fibre cement as well as benchmarks for reliability, quality assurance and safety.

Request the right documentation

To ensure that a cladding product is code-compliant, specifiers should also request evidence that the product meets the relevant BCA Performance Requirements. Evidence may include CodeMark certification, or full system testing and an accompanying warranty. Reputable manufacturers should be able to provide evidence that their cladding product complies with the relevant BCA Performance Requirements.

Other characteristics of both the fibre cement cladding and a fit for purpose facade system are:

- high durability and resistance to corrosion and wear;
- weather tightness and resistance to harsh weather conditions including sun exposure, rain and extreme temperatures;
- thermal performance; and
- ability to resist condensation and other moisture-related damage.





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JAMES HARDIE

James Hardie pioneered the development of cellulose reinforced fibre cement in the early 1888, and is a global market leader in the design and manufacture of fibre cement products and systems. James Hardie's range of construction solutions respond to the heightened demand for code compliance and fire performance, and provide high levels of durability, structural resistance and weatherproofing. James Hardie fibre cement products are also Good Environmental Choice Australia certified.

All James Hardie products are meticulously designed and engineered to the highest level of performance. Their façade solutions showcase the company's commitment to quality and innovation. In response to the industry's growing concerns regarding fire safety, James Hardie offers non-combustible cladding solutions that meet increasingly stringent regulatory requirements without compromising aesthetics or versatility.

JAMES HARDIE FIBRE CEMENT SOLUTIONS

Used and trusted by builders Australia-wide, James Hardie offers a range of fibre cement products including external façade solutions. Low maintenance and resistant to rotting, fire, impact, moisture damage and termites, James Hardie™ ExoTec™, EasyLap™ and Scyon™ fibre cement cladding are CodeMark certified and suitable for a range of external building applications and architectural styles. Available in numerous profiles and finishes, fibre cement cladding can add depth and individuality to any building while delivering long-lasting performance and fire safety compliance. The CodeMark certification states the product meets BCA requirements for non-combustibility, structural reliability and weatherproofing.

All James Hardie™ and Scyon™ fibre cement products are suitable for use where non-combustible building materials are required by the BCA. Only products that meet the Australian standards for manufacturing, quality and composition as stated in either AS2908.2:2000 'Cellulose-Cement Products – Flat Sheets' or ISO 8336 can claim to be fibre cement. James Hardie holds StandardsMark certification for these standards.

The DTS provisions in C1.9 of the NCC Volume One indicate that fibre cement is suitable for use where non-combustible materials are required for residential and commercial buildings. James Hardie™ and Scyon™ cladding and weatherboards (6mm thick or greater) are also suitable in bushfire prone areas to help resist bushfire attack from burning embers, radiant heat and/or flame contact in accordance with AS 3959:2009 *Construction of Buildings in Bushfire Prone Areas*.

James Hardie™ and Scyon™ cladding products have also been tested in multiple wall system configurations under AS/NZS 1530.4 *Methods for fire tests on building materials, components and structures - Fire-resistance tests for elements of construction* to determine the respective Fire Resistance Levels of each system.

Proudly Australian-made, James Hardie™ fibre cement products are manufactured in James Hardie's advanced fibre cement manufacturing plants in Rosehill in New South Wales and Carole Park in Queensland. Committed to developing products that deliver increased value to its customers, James Hardie also operates a world class Research and Product Development Centre in Rosehill, which boasts inhouse testing facilities accredited by the National Association of Testing Authorities.

James Hardie™ fibre cement cladding comes with a 10-year warranty and is backed by extensive support documentation and world class customer service.

REFERENCES

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- ⁷ Ibid.