



**UNDERSTANDING ACM
FIRE COMPLIANCE**



FAIRVIEW™

DEFINING ARCHITECTURE SINCE 1963

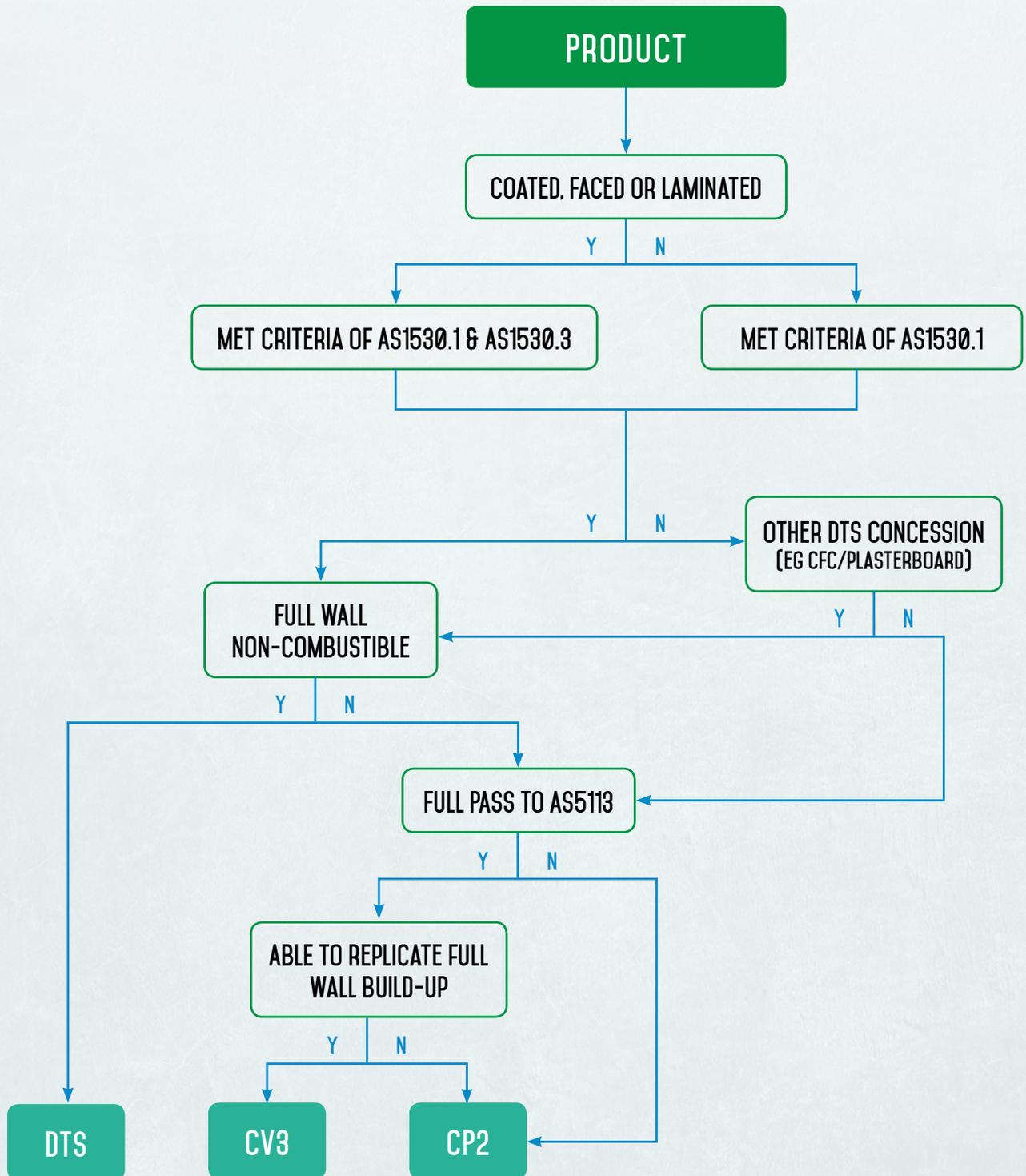
KEY POINTS SUMMARY:

- **ACM** stands for Aluminium Composite Material. Also known as Aluminium Composite Panels (ACP).
- There are 3 routes (of equal significance) to compliance when it comes to any ACM:
 1. **Deemed to Satisfy (DtS)**
 2. **Performance Based Solution (CP2)**
 3. **Verification Method 3 (CV3) – AS5113 testing and other requirements**
- **DtS** requires all elements of the system to be DtS compliant (ie non-combustible). If this is achieved, compliancy is achieved in every application.
- **Performance Solution** requires a fire engineered solution. This solution is typically used for the “FR” bracket of ACM’s for Type A and B construction.
- **Performance Solution to CV3** requires a full and complete pass to the large scale test AS5113 (including pass to debris criteria), noting sprinkler requirements and cavity protection. As we know any aluminium product will fail on the debris criteria, however, a fire engineer can use this data to conduct a traditional **performance solution. Please also see Fairview’s Vitrashield for full pass to AS5113.**

QUICK PRODUCT MATRIX

PE CORES	“FR” CORES	“A2” CORES	ALUMINIUM CORES
Vitrabond PE Alucobond PE Probond Signage panel ETC.	Vitrabond FR Alucobond + Alpolic FR Larson FR ETC.	Vitrabond A2 Alucobond A2 Alpolic A2 ETC.	Vitracore Vitracore G2 Lacore Alucore ETC.

ROUTES TO COMPLIANCE



WHAT IS “PE” CORE ACM?

PE ACM is where the core make-up is mostly, if not completely, combustible. Typically, this is polyethylene but this can also comprise of other compounds. The core colour is generally black or dark grey.



WHERE CAN “PE” BE USED?

PE ACM is only compliant on Type C construction where there are no combustibility requirements for external walls. However, it is not suitable in applications requiring a bushfire rating.

NSW Fair Trading has prohibited the use of products containing “greater than 30% PE” on all Type A and B construction as of August 2018.

WHAT IS “FR” AND “A2” CORE ACM?

A panel typically made up of a 70-75% inert mineral fibre and 25-30% combustible binding mixture will often be referred to as an “FR” product.

However, it is important to note that the term “FR” be it “fire resistant”, “fire retardant”, “Plus” or any other variation on the wording, meets no set standard. It is therefore imperative to check with your supplier what the mixture of combustible content is on a product specific basis, as this may also vary.



“A2” will typically refer to a mixture of around 90-93% inert mineral and 7-10% combustible binder. This is not as commonly used in Australia as our testing standards cause A2 and FR to effectively fall into the same category for compliance.

Both of the above products are combustible as the core DOES NOT pass the AS1530.1 small scale test. However, they can be considered not to spread fire if installed in the right configuration and can be fire-engineered based on their full-scale performance. **(Performance Solution)**

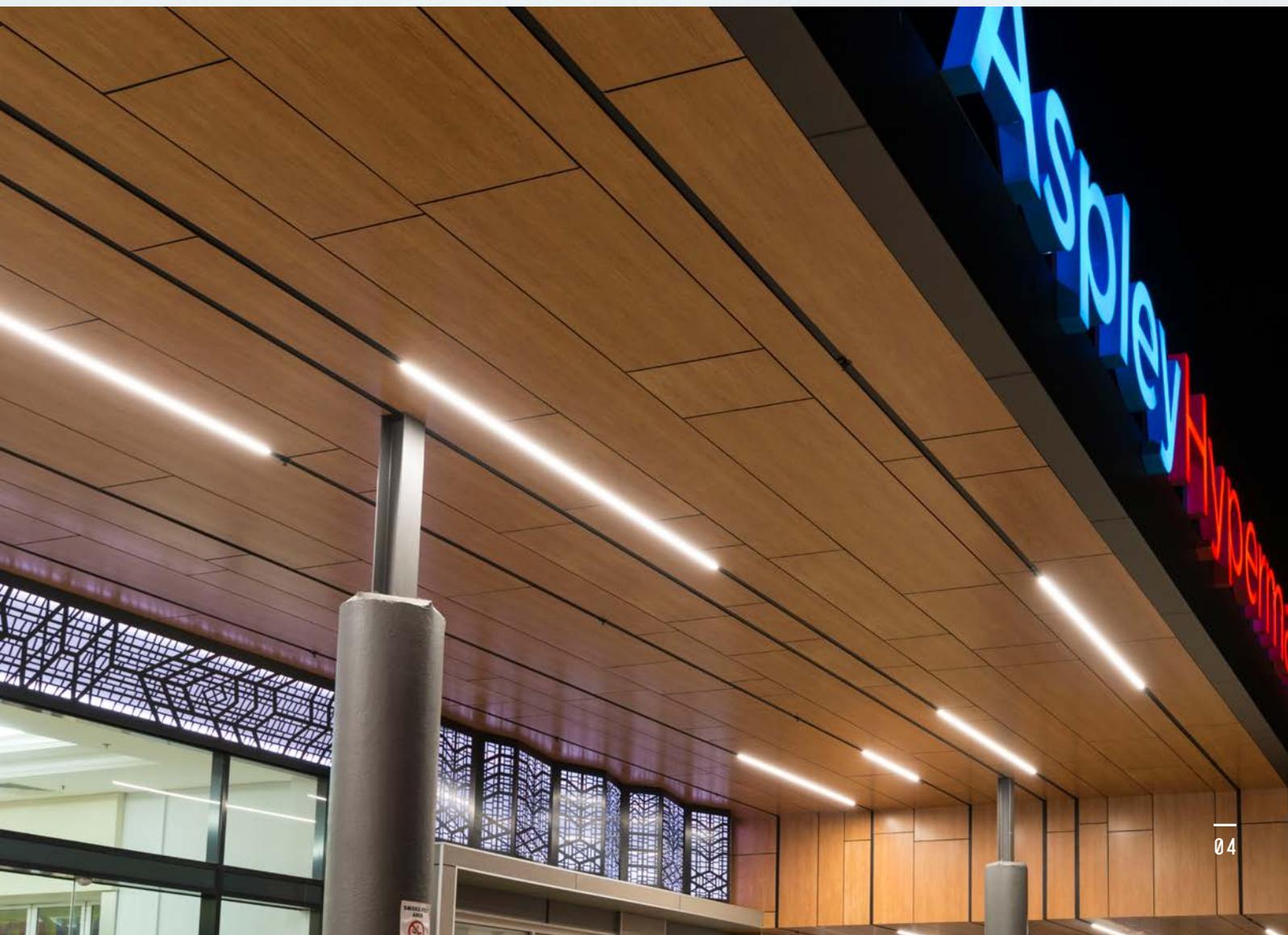
WHERE CAN “FR/A2” BE USED?

FR or A2 panels can be used in Type A and Type B construction only if there is a full fire engineering report provided by a quality engineer, based on full-scale testing.

Note: In addition to the above, in Victoria, FR core panels need to be signed off by the Building Appeals Board on a project basis for determination of suitability prior to use.

FR and A2 panels can be used in Type C construction with no fire engineering required (unless there are bushfire requirements).

For internal use, FR and A2 are generally fine. This performance is defined by testing to the ‘room burn test’ ISO 9705 which provides a group rating of 1 to 4. FR and A2 mostly achieve either a group 1 or a group 2 rating. Group 1 is fine for all internal applications, group 2 excludes fire escapes and fire isolated exits. Make sure that you request a copy of the full test report including installation detailing as this testing cannot be transferred to different installation systems.



WHAT IS ALUMINIUM CORED ACM?

Aluminium cored ACM is typically made of an external layer of prefinished aluminium sheet, followed by an internal aluminium core (this can be in the traditional honeycomb pattern or dimpled) then followed by another flat layer of rear skin.

If this type of product has passed and can present certificates for AS1530.1 (skins and core) and AS1530.3 (complete panel including coatings and adhesive) as well as meeting the adhesive requirements of C1.9e, this would fall into the **DtS** category for compliance.

If large scale testing demonstrates the panel does not spread fire up or across a facade, a **Performance Solution** can equally be used.



WHERE CAN ALUMINIUM CORE ACM BE USED?

Aluminium core can be used where non-combustible materials are required by the Building Code of Australia (BCA) (provided they meet AS1530.1 and AS1530.3). This allows for unrestricted use wherever necessary based on the **DtS** provision of the BCA.

Below is an excerpt from *NCC 2019 Vol 1*

C1.9 Non-combustible building elements

- (a) In a building *required* to be of Type A or B construction, the following building elements and their components must be *non-combustible*:
 - (i) *External walls and common walls*, including all components incorporated in them including the facade covering, framing and insulation.
 - (ii) The flooring and floor framing of lift pits.
 - (iii) *Non-loadbearing internal walls* where they are *required* to be *fire-resisting*.
- (b) A *shaft*, being a lift, ventilating, pipe, garbage, or similar *shaft* that is not for the discharge of hot products of combustion, that is *non-loadbearing*, must be of *non-combustible* construction in—
 - (i) a building *required* to be of Type A construction; and
 - (ii) a building *required* to be of Type B construction, subject to C2.10, in—
 - (A) a Class 2, 3 or 9 building; and
 - (B) a Class 5, 6, 7 or 8 building if the *shaft* connects more than 2 *storeys*.
- (c) A *loadbearing internal wall* and a *loadbearing fire wall*, including those that are part of a *loadbearing shaft*, must comply with Specification C1.1.
- (d) The requirements of (a) and (b) do not apply to the following:
 - (i) Gaskets.
 - (ii) Caulking.
 - (iii) Sealants.
 - (iv) Termite management systems.
 - (v) Glass, including laminated glass.
 - (vi) Thermal breaks associated with glazing systems.
 - (vii) Damp-proof courses.
- (e) The following materials may be used wherever a *non-combustible* material is *required*:
 - (i) Plasterboard.
 - (ii) Perforated gypsum lath with a normal paper finish.
 - (iii) Fibrous-plaster sheet.
 - (iv) Fibre-reinforced cement sheeting.
 - (v) Pre-finished metal sheeting having a *combustible* surface finish not exceeding 1 mm thickness and where the *Spread-of-Flame Index* of the product is not greater than 0.
 - (vi) *Sarking-type materials* that do not exceed 1 mm in thickness and have a *Flammability Index* not greater than 5.
 - (vii) Bonded laminated materials where—
 - (A) each lamina, including any core, is *non-combustible*; and
 - (B) each adhesive layer does not exceed 1 mm in thickness and the total thickness of the adhesive layers does not exceed 2 mm; and
 - (C) the *Spread-of-Flame Index* and the *Smoke-Developed Index* of the bonded laminated material as a whole do not exceed 0 and 3 respectively.

WHAT IS DEEMED-TO-SATISFY (DTS)?

Deemed-to-Satisfy, is a prescriptive building code requirement that automatically deems a panel compliant without the need for a fire engineer. In the context of composite panels, it involves determining combustibility in accordance with C1.9, referencing 2 tests.

The AS1530.1 test is a small furnace test, to determine combustibility. The testing process requires the product to be broken down into separate elements, removing any protective coating, paint and adhesive (provided it meets the pre-determined tolerances). If the specimens do not flame for more than <5> seconds and the furnace does not increase in temperature by <50> degrees, then it passes and is deemed non-combustible.

The AS1530.3 test is of a slightly larger scale. For this test you are required to subject a complete specimen (as delivered inclusive of any adhesive and paint) to radiant heat and flame. This test provides the following indices; smoke developed, heat evolved, ignitability and spread of flame.

The DtS method of compliance requires all products in the external wall build-up to be deemed non-combustible.

WHAT IS CV3?

CV3 is a verification method - essentially a prescriptive form of performance solution. To achieve compliance using verification method CV3, requires a full and complete pass of all fields of the AS5113 testing including the debris field. This will provide an 'EW' (External Wall) classification. CV3 requires the installation system to be identical to the method and wall build up used in the AS5113 test, as well as specifying extra sprinklers and cavity barriers and compliance with CV1 and CV2 (fire spread to/from a fire source feature).

The AS5113 appendix suggests this method of compliance should not be applicable to buildings over 100m in total height.

Note: CV3 still requires a fire engineers report to approve the use of the ACM cladding to verify that it meets the requirements of CV3 including CV1 and CV2.

WHAT IS A PERFORMANCE-BASED SOLUTION?

A **performance-based solution** requires an appropriately qualified person to assess the performance of the external wall system based on large-scale testing with a focus on the raw data outcome of these tests. These tests can not only be to Australian standards but to any available international standard. The qualified person will provide a report setting out in detail how and where the product conforms with the performance requirements of the BCA and the specific application of the project.

Usually this method of compliance comes with some restrictions or additional requirements. For example, a fire engineer may deem a certain product safe provided there are extra sprinklers in the building or if the product is not used above fire exits etc.

BCA clauses A0.5 and A2.2 set out options for a performance solution, including:

- A verification method
- Expert judgement
- Comparison with DtS
- Codemark certificate of conformity
- Other certification
- Reports from a test laboratory or engineer
- Other forms of documentary evidence demonstrating how & why a product complies



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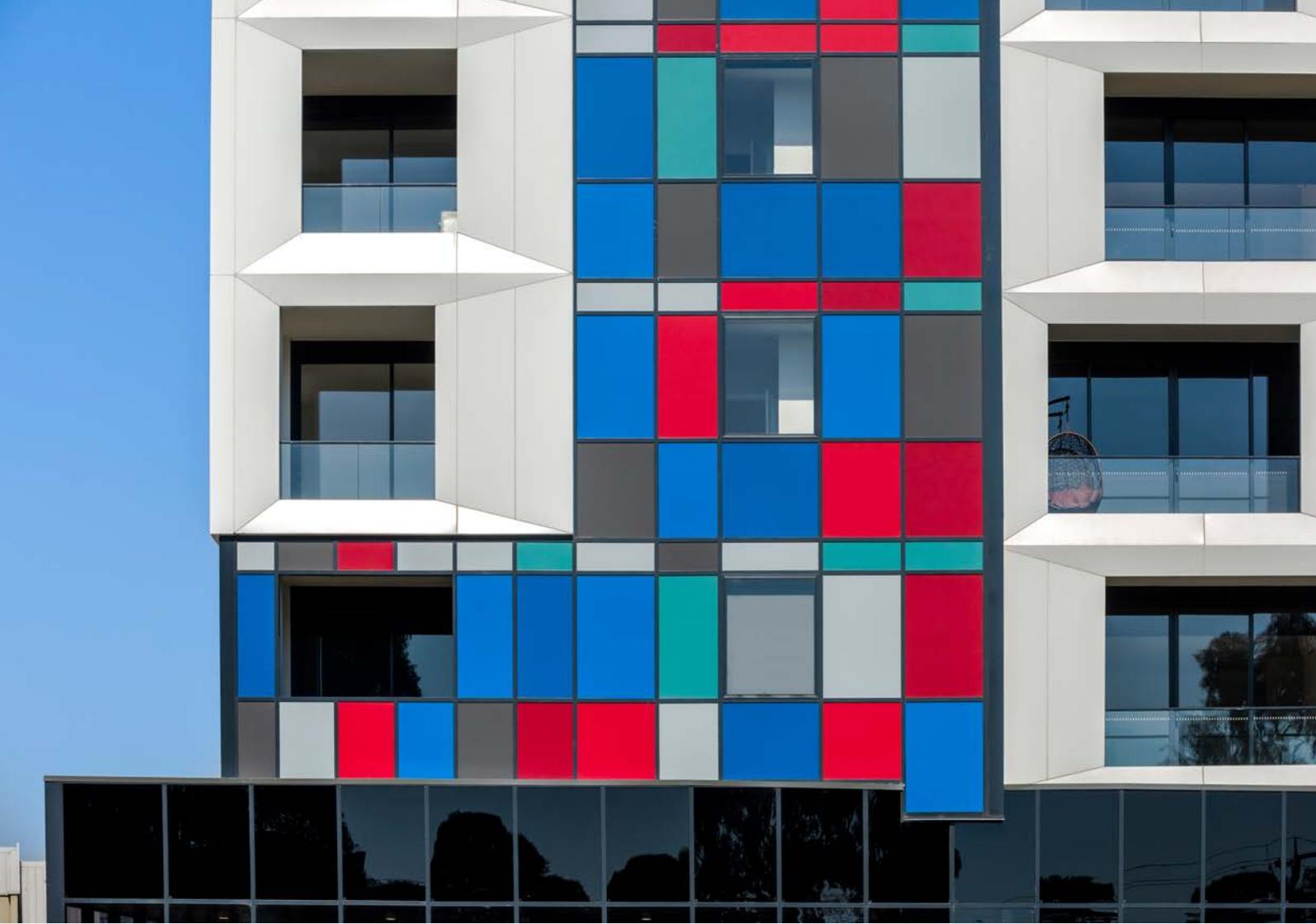
The information contained in the document is accurate as per the 2019 National Construction Code Volume One.

For projects utilizing an older version of the NCC please contact Fairview for more information.

OTHER CONSIDERATIONS FOR COMPLIANCE

1. If a DtS solution is being used, no other combustible products should be present in the wall build-up (unless otherwise allowed for in C1.9). If CV3 or a performance-based solution is used, all products must be incorporated into the testing and fire engineers report.
2. Relevant Building Code - the Building Code relevant to a project is not necessarily the current Building Code. In VIC and QLD it is the current code at the time of 'substantial design' of the project. In NSW it is when the Development Approval is issued.
3. Fire compliance is not the only factor to consider for external walls. Other requirements such as watertightness/condensation requirements and structural performance also need to be considered. There are no DtS options for the weather-proof properties of external walls, so these walls always require a Performance Solution or a CodeMark certificate.

This guide is provided to assist building stakeholders in identifying the classification of their building. It is a rule of thumb guide only, and compliance must be checked with the building certifier/surveyor on your specific construction. This guide does not confirm compliance or non-compliance of the cladding – other factors may apply such as Bushfire Attack Levels. There are some concessions under the NCC which are not included.



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