

Fact Sheet

Non-Deemed-to-Satisfy External Wall Cladding Systems

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1. PREFACE

The National Construction Code (NCC) is an initiative of the Council of Australian Governments (COAG) developed to incorporate all on-site construction requirements into a single code. The NCC comprises the Building Code of Australia (BCA), Volumes One and Two; and the Plumbing Code of Australia (PCA), as Volume Three.

This Fact Sheet refers to the BCA Volumes One and Two and focuses on all buildings (Class 1 –10 buildings) with the purpose of promoting weatherproof construction methods.

2. INTRODUCTION

In recent years, residential and commercial buildings in Australia have seen a dramatic increase in the use of innovative, external wall cladding products and/or systems which are not dealt with in the BCA as Deemed-to-Satisfy (DTS) building solutions.

External cladding systems which are currently allowed under a DTS approach include;

- Masonry
- Weatherboards
- Fibre-cement sheets
- Metal sheets
- Plywood sheets.

The purpose of this Fact Sheet is to provide advice as to the processes required to be undertaken when external wall cladding products and/or cladding systems which are not

DTS building solutions, and are proposed to be incorporated into the design of a building. These are hereafter referred to as 'non-DTS' cladding systems.

Examples of non-DTS cladding systems include, but are not limited to, the following:

autoclaved aerated concrete
aluminium composite panels
architectural insulated panels
external insulation & finish (rendered)
systems:

- expanded polystyrene panels
- extruded polystyrene panels
- phenolic insulation panels
- polyisocyanurate panels.

When non-DTS cladding systems are included in a design they are required to be presented to the relevant building surveyor (RBS) as an Alternative Solution.

The Alternative Solution is to include information/evidence that allows the RBS to determine that the material, form of construction and design meets the Performance Requirements of the BCA.

Additionally for Class 2-9 buildings, practitioners are also required to reference all relevant provisions of NCC Volume One – BCA, in particular, Performance Requirements relating to fire-resistance and combustibility.

The RBS is required to ensure that the Assessment Method outlined in the BCA is followed to comply with the Performance Requirements.

3. BACKGROUND

In Australia, building design and construction must comply with Commonwealth, State and Territory building legislation, including the NCC Series. The RBS may not issue a building permit unless they are satisfied the building design and construction meet these legislative requirements.

Non-DTS cladding systems are required to follow the Alternative Solution assessment process specified in the BCA. The Alternative Solution should demonstrate that it complies with the Performance Requirements of the BCA, or that the Alternative Solution is equivalent to, or better than the DTS provisions. A combination of both methods may also be used. The RBS may seek evidence to support that the use of the material, form of construction and design meets a Performance Requirement or a DTS provision as described in the BCA.

These requirements are set out in the following clauses:

Volume One, clauses A0.5, A0.8, A0.9 and A0.10

Volume Two, clauses 1.0.5, 1.0.8, 1.0.9 and 1.0.10

4. DUTIES OF APPLICANTS/DESIGNERS

Architects and building designers should take care when specifying non-DTS cladding systems. Where an alternative is specified, the RBS will require applicants for a building permit to ensure their application contains sufficient evidence/information to show that the building work will comply with the Building Act 1993 and Building Regulations 2018.

To assist the RBS in determining whether the non DTS system is an acceptable Alternative Solution, relevant certificates, reports and forms should be submitted at the design stage, including all details of the Alternative Solution concerned.

5. THE RELEVANT BUILDING SURVEYOR (RBS)

The RBS is required to ensure that the process specified for an Alternative Solution the Assessment Method and the relevant Performance Requirements of the BCA is followed.

Flexibility is provided in these provisions such as Expert Judgement. This allows for the use of a report from an expert who has the qualifications and experience to determine whether a Building Solution complies with the Performance Requirements.

Otherwise, manufacturers of non-DTS cladding systems can opt to have their products assessed and reported on by a Registered Testing Authority.

These reports may be used as evidence to support that the use of a material, form of construction or design meets a Performance Requirement as described in the BCA. Another option is CodeMark product certification. This scheme gives the RBS and building practitioner's confidence of legislative compliance. Certification bodies are accredited through the Joint Accreditation System of Australia and New Zealand (JASANZ) who in turn evaluate and certify building products/systems. RBS are obliged to accept CodeMark certified cladding systems.

However, practitioners should note that a CodeMark certificate applying to a product only (ie. not a building system) is not in itself evidence of compliance with the Performance Requirements of the BCA. A complying product by itself may not address weather-tightness of the building system. Therefore, care is needed when reviewing the scope of the certificate.

It may be of assistance to building practitioners to note that there are a number of external wall cladding systems that have been accredited by the Victorian Building Regulations Advisory Committee acting in its capacity as an Accreditation Authority. The current list of such accredited systems can be found by referring to the Victorian Building Authority website: www.vba.vic.gov.au

Once on the website, click on 'Practitioners', then click on 'Building Product Accreditation'.

As far as practicable, relevant certificates, reports and forms should be submitted at design stage including all details of Alternative Solutions.

The RBS should be aware of the conditions or limitations of any report presented.

All relevant design issues should be considered, including but not limited to; articulation joints, fasteners, flashings, weather-proofing, condensation, fire-resistance levels (FRL), bending and shear strength. Expansion and construction joint provisions and flashing details in addition to bending, shear and fastening considerations may need to be determined using engineering principles.

It is important to check that appraisals, certificates and technical reports cover all relevant BCA Performance Requirements of the cladding system proposed. They must be current and relevant to the Alternative Solution.

When assessing an application for a building approval an RBS should be satisfied that the applicant has provided appropriate evidence that all relevant Performance Requirements will be met. The RBS should also give due consideration to the conditions or limitation of any material or system provided to them by the applicant.

The RBS should only accept documentation that is sufficient to enable proper assessment for compliance with the BCA.

6. POTENTIAL CONSEQUENCES OF FAILURE OF NON-DTS EXTERNAL WALL CLADDING SYSTEMS

External cladding systems must be able to resist actions that they may be reasonably subject to including (but not limited to): live and dead loads, rainwater, wind, earthquake, thermal actions.

In particular, consideration must be given to the prevention of the penetration of water into a building which may cause unhealthy or dangerous conditions, loss of amenity for occupants and undue dampness or deterioration of building elements risking the life safety of building occupants.

Examples of other issues that need to be considered include:

Timber framed balustrades to balconies where inadequate detailing and poor weatherproofing, may lead to undetected decay of the timber structure causing structural failure.

Hidden fungal growth may affect the health of occupants, causing respiratory and skin problems. The young, old and those with weakened immune systems are most at risk. Dampness may also encourage dust mites.

When bulk thermal insulation becomes damp, it will reduce its effectiveness. This, in turn, will reduce the energy efficiency of the building concerned.

Water may accumulate around horizontal members (bottom plates, heads, sills, deck joists, nogging, and parapets) with potential to cause deterioration of the building elements.

Where the possibility exists that moisture will penetrate or collect on the inside face of the external cladding, this moisture must be able to escape the building fabric, either by natural drainage or ventilation of a cavity.

7. SOURCES OF WATER PENETRATION

Wind Forces

Wind forces, even at low pressures, can be higher than those inside the building assisting rainwater to enter through unsealed penetrations, gaps and joints. Localised pressure at corners and exposed edges require particular attention. As exposed external caulking cannot be guaranteed for the life of the building, a regular maintenance program is required. Non-DTS cladding systems should be able to demonstrate adequate weather proofing details.

Condensation

If proper consideration is not given to the placement of vapour barriers, condensation may occur in the external wall frame. Warm air inside a building may condense as it cools, causing moisture droplets to form in insulation, on the framework surface, and the internal face of the cladding.

Proposals for the use of non-DTS cladding systems should account for the climate. Buildings in cooler climates tend to be closed and sealed over the winter period allowing higher levels of air-borne moisture to be retained in a building. Particular attention should be given to where dew points are likely to occur within these cladding systems. In warmer climates, buildings tend to be aired more often and temperature differences from inside to outside the building will not be as severe, however practitioners should still use caution.

Poor design and installation

Experience of poorly designed and incorrectly installed cladding systems in various parts of the world, highlights the need for non-DTS cladding systems to be designed correctly for watertightness, wind loading and potential condensation.

8. CONCLUSION

International experience over a number of years indicates special care and consideration is necessary in the use of all external wall cladding systems. There is an obligation on the RBS to be satisfied that the material, form of construction and design meets the Performance Requirements of the BCA.

Care should be taken that all issues have been addressed, including, where appropriate, further assessment by qualified experts. Any system should be constructed in accordance with the specified details. Mixing and matching of cladding systems will invalidate available test results and reports.