



ADVISORY NOTE

2016-3

Fire Performance of External Walls and Cladding

Application

<i>NCC Volume:</i>	<i>One</i>
<i>Section/Part:</i>	<i>Various</i>
<i>Date first issued:</i>	<i>August 2016</i>
<i>Date revised:</i>	<i>March 2018</i>

Copyright and licence notice

© 2018 Commonwealth of Australia and States and Territories of Australia
Ownership of intellectual property rights

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is jointly owned by the Commonwealth, States and Territories of Australia.

**Creative Commons
licence Attribution
CC BY-NC-ND 4.0**



All material in this publication is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International Licence, save for logos. Attribution-NonCommercial-NoDerivatives 4.0 International Licence is a standard form licence agreement that does not permit any commercial use or derivatives of the original work. Under this licence: you may only distribute a verbatim copy of the work and must not adapt or change the work in any way. You must give appropriate credit and provide a link to the licence. You may do so in any reasonable manner, but not in any way that suggests the Commonwealth of Australia, States and Territories of Australia or Australian Building Codes Board endorses you or your use. You may not use the material for commercial purposes. If you remix, transform, or build upon the material for your own use, you may not distribute the modified material.

The full licence terms are available from <http://creativecommons.org/licenses/by-nc-nd/4.0/legalcode>.

Content contained herein should be attributed as:

The Fire Performance of External Walls and Cladding Advisory Note[©] as released by the Australian Building Codes Board on behalf of the Commonwealth of Australia and States and Territories of Australia

Disclaimer

This Advisory Note is intended to be used as guidance material to assist in interpreting the National Construction Code (NCC). It is in no way a substitute for the NCC and related State and Territory legislation and does not in any way constitute the provision of professional advice. Users must carefully evaluate the accuracy, currency, completeness and relevance of the material within the Advisory Note for their own purposes.

The Chief Executive Officer of the Australian Buildings Code Board, as agent for the Commonwealth of Australia and States and Territories of Australia, does not accept any liability howsoever arising from or connected to the use or reliance on any information in this publication except in accordance with this Important Notice and Disclaimer.

Published by: Australian Building Codes Board
GPO Box 2013
CANBERRA ACT 2601
Phone: 1300 134 631
Email: ncc@abcb.gov.au
www.abcb.gov.au

First published: August 2016
Print version: 2.0
Release date: March 2018



Background

At its meeting on 19 February 2016, the Building Ministers' Forum (BMF) agreed to the development and implementation of a range of measures to help address risks associated with external cladding products on high rise buildings. This included a National Advisory Note on the subject that was issued in August 2016. The purpose of the National Advisory Note is to provide guidance on interpreting the National Construction Code (NCC) relating to the fire performance of external walls. It aims to assist practitioners in future decisions on product selection, installation and certification.

After the Grenfell Tower fire in London that occurred in June 2017, the BMF directed the ABCB to 'expedite progress in the implementation of measures through the NCC that will prevent the non-compliant use of cladding from occurring in the future.' Given this direction, the range of measures that involved changes to the NCC were progressed through an out-of-cycle NCC amendment (NCC 2016 Volume One Amendment 1) that has effect from 12 March 2018. This Advisory Note has been updated to reflect changes made to the NCC fire safety provisions by this amendment.

Introduction

Performance Requirement CP2 of NCC Volume One requires, among other things, 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. This requirement can be met, in part, under a Deemed-to-Satisfy Solution for buildings of Type A and Type B construction by non-combustible external walls (C1.9). A non-combustible external wall inhibits fire spread via the external wall of the building, thereby contributing to a building's compliance with Performance Requirement CP2.

This Advisory Note provides information to help clarify the application of Deemed-to-Satisfy Provisions and Verification Method relating to the fire performance of external walls (including cladding products) of buildings of Type A and Type B construction. This clarification is predicated on the intent of Performance Requirement CP2 (in part); that external walls (including cladding products) must not contribute to the spread of fire in a building and between buildings.

Specifically, the following items are addressed:

- When a building component is considered part of an external wall
- The definition and Deemed-to-Satisfy Provision for ancillary elements
- The characteristics required of bonded laminated materials subject to C1.9(e)(vi)



- The Australian Standard for automatic fire sprinkler systems (AS 2118.1: 2017 / Amdt 1: 2017)
- Verification Method CV3 including the Australian Standard for testing and classification of external walls (AS 5113: 2016).

This Advisory Note also provides information on CodeMark Australia and CodeMark Certificates of Conformity.

1. Building components considered to be part of an external wall

1.1. Achieving compliance with Performance Requirement CP2

Under the Deemed-to-Satisfy Provisions of NCC Volume One, external walls of buildings of Type A and Type B construction must be constructed wholly of materials that are not deemed combustible as determined by testing in accordance with AS 1530.1 (A1.1 – definitions of ‘combustible’ and ‘non-combustible’ and C1.9). In the case of an external wall that is required to have no fire rating, the external wall must still be non-combustible.

Therefore building components determined to be part of an external wall in buildings of Type A and Type B construction must be non-combustible under a Deemed-to-Satisfy Solution, unless the requirements of C1.9(d), C1.9(e), C1.10 and C1.14 apply. The purpose of these Deemed-to-Satisfy requirements is to inhibit the spread of fire via the external wall of a building as required by Performance Requirement CP2.

1.2. What is an external wall?

The term ‘external wall’ is defined in NCC Volume One as ‘an outer wall of a building which is not a common wall’. A ‘common wall’ is defined in NCC Volume One as ‘a wall that is common to adjoining buildings’.

A building element is considered to be part of an external wall if it is integral (i.e. is not ancillary) to the construction of the wall. For example, the following elements are considered to be part of an external wall:

- Facade covering (e.g. external cladding)
- Framing
- Insulation
- Sarking
- Spandrels
- Internal lining (e.g. plasterboard) of an external wall.

In most instances, a curtain wall system would be considered to be an external wall.



1.3. What is an ancillary element?

1.3.1. Defined term

A definition for ‘ancillary element’ has been introduced in NCC Volume One. It is defined as ‘an element that is secondary to and not an integral part of another element to which it is attached’.

It is necessary to exercise judgement when assessing whether an element is ancillary or integral to another element. For example, a sunshade that is auxiliary in nature can be considered to be ancillary to an external wall. However, a protrusion of a wall near a window that also acts as a sunshade may be considered integral to the wall.

1.3.2. Permitted ancillary elements

C1.14(a) permits any ancillary element that is non-combustible, as determined by testing in accordance with AS 1530.1, to be fixed, installed or attached to the internal parts or external face of an external wall required to be non-combustible.

The ancillary elements listed in C1.14(b) to (m), even though combustible, can also be fixed, installed or attached to an external wall required to be non-combustible, provided they comply with any specified limitations or conditions. Some of these limitations or conditions are explained in sections 1.3.3 and 1.3.4 below.

It should be noted that–

- Clause 2.4 of Specification C1.1 regarding methods of attachment of ancillary elements must also be complied with. This requirement is explained in Section 1.4 of this Advisory Note.
- C1.9(e) contains a list of materials that, though combustible in entirety or part, may be used wherever a non-combustible material is required.
- C1.13 allows fire-protected timber to be used where an element is required to be non-combustible.

1.3.3. Combustible signs

C1.14(g) permits signs that may contain combustible materials to be fixed, installed or attached to external walls that are required to be non-combustible if the signs are required under the Deemed-to-Satisfy Provisions of NCC Volume One. For example a sign required by D3.6(e) to provide direction to an accessible building entrance is permitted and is not restricted in number, size, location or proximity to another sign.

C1.14(h) allows other signs (such as building identification signs, vehicle carpark entry signs, and advertisements), that may contain combustible materials, to be



fixed, installed or attached to an external wall required to be non-combustible where the sign–

- achieves a group number of 1 or 2; and
- does not extend beyond one storey; and
- does not extend beyond a single fire compartment; and
- is separated from other combustible signs by at least two storeys in the vertical direction.

For a combustible sign to be fixed, installed or attached to an external wall required to be non-combustible, every condition listed under C1.14(h) must be satisfied.

1.3.4. Combustible awnings, sunshades, canopies, blinds and shading hoods

C1.14(i) allows an awning, sunshade, canopy, blind or shading hood that is combustible in entirety or part to be fixed, installed or attached to an external wall required to be non-combustible where:

- it meets the relevant requirements of Table 4 of Specification C1.10, as if it were an internal element; and
- it is situated at ground level or the storey directly above ground level; and
- it does not serve an exit, where it would render the exit unusable in a fire.

For example, an awning that contains sarking and is located above a ground floor window needs to meet the required fire hazard properties. For the awning to meet the required fire hazard properties, the sarking-type material must have a maximum Flammability Index of 5 as specified in Table 4 of Specification C1.10. The other materials in the awning must have a maximum Spread-of-Flame Index of 9 and, if the Spread-of-Flame Index is greater than 5, it must also have a maximum Smoke-Developed Index of 8.

C1.14(i)(iii) requires that an awning, sunshade, canopy, blind or shading hood that contains combustible materials must not serve an exit, where it would render the exit unusable in a fire. A combustible component that catches fire near or directly above an exit could render that exit unusable through radiant heat, falling debris or other effects of fire. The requirement of C1.14(i)(iii) is not specific on account of the wide variety of forms of construction and building configurations that it applies to.

Therefore, it is necessary to exercise judgement when assessing compliance.

1.4. The method of attaching building components to various building elements

Specification C1.1 Clause 2.4 requires that the method of attaching a finish, lining, ancillary element or service must not compromise the fire-resistance of the building element it is being attached to. For example, mechanical fixing bolts may penetrate a



fire-resisting covering in a manner that impairs its performance, thereby reducing the fire-resistance level (FRL) of the building element.

Specification C1.1 Clause 2.4 only applies to the method of attachment, not the component being attached.

2. Bonded laminated materials subject to C1.9(e)(vi)

C1.9(e) contains a list of materials that, although combustible in entirety or part, may be used wherever a non-combustible material is required. Specifically C1.9(e)(vi) permits the use of bonded laminated materials where:

- each lamina, including any core, is non-combustible (as determined by testing in accordance with AS 1530.1); and
- each adhesive layer does not exceed 1 mm in thickness; and
- the total thickness of the adhesive layers does not exceed 2 mm; and
- 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.

It should be noted that the core of a composite material is not an adhesive layer; it is one of the laminae.

For a bonded laminated material to receive the concession available under C1.9(e)(vi), every condition listed above must be satisfied. If one or more of the laminae is combustible, as determined by testing in accordance with AS 1530.1, the concession cannot apply. For example, an aluminium composite panel with a core deemed combustible in accordance with AS 1530.1 is not permitted by C1.9(e)(vi) and therefore cannot be used as part of a Deemed-to-Satisfy Solution where a non-combustible material is required.

3. Australian Standard for automatic fire sprinkler systems (AS 2118.1)

Australian Standard AS 2118.1 specifies requirements for the design, installation and commissioning of automatic fire sprinkler systems in buildings.

The 2017 edition, including Amendment 1, of AS 2118.1 includes changes to the requirements for sprinkler protection of covered balconies. Covered balconies must now be sprinkler protected if they are more than 6 m² in floor area or are greater than 2 m in depth when measured from the external wall. Under the previous edition, both conditions needed to be exceeded before sprinklers were required. This is in recognition that, particularly in residential buildings, balconies can often be used for



storage, which can be the source of or contribute to the spread of fire via the external wall of a building.

NCC Volume One references the 2017 edition, including Amendment 1, of AS 2118.1. The 1999 edition of AS 2118.1 has been retained for a transitional period ending on 11 March 2019, however Clause 5.6.13 of the 1999 edition must be replaced with Clause 5.9.10 of the 2017 edition. Therefore, the increased level of stringency for the sprinkler protection of covered balconies has been adopted, even when using the 1999 edition of AS 2118.1.

4. Verification Method for testing of external wall assemblies for fire spread (CV3)

4.1. Verification Method CV3

Verification Method CV3 enables verification of the fire performance of external wall systems against the relevant Performance Requirements of the NCC.

CV3(b)(i) requires that an external wall system be tested in accordance with Australian Standard AS 5113. AS 5113 is described in section 4.2 below.

In addition to testing to AS 5113, CV3 requires the external wall system to be verified against CV1 or CV2, as well as meeting certain other fire safety measures, including ones specific to buildings of Type A and Type B construction. These measures are imposed in recognition that an external wall system tested to AS 5113 may contain combustible elements that still present a risk that needs to be mitigated in order to inhibit the spread of fire via the external wall of a building as required by Performance Requirement CP2. Some of these conditions are discussed further in 4.3-4.5 of this Advisory Note.

It should be noted that CV3 is one method of verifying compliance with the relevant Performance Requirements. It need not be used if a Deemed-to-Satisfy Solution is proposed or if using another method of verifying compliance with the relevant Performance Requirements, as specified in A0.5 of NCC Volume One.

4.2. Australian Standard for external wall assemblies (AS 5113)

The Australian Standard AS 5113 sets out the procedures for the fire propagation testing and classification of external walls of buildings according to their ability to limit the spread of fire via the external wall and to adjacent buildings.

AS 5113 is based on international standards and adopts testing criteria prescribed in ISO 13785.2 and BS 8414 Parts 1 and 2. AS 5113 provides the option for an external wall to be tested to either ISO 13785.2 or BS 8414 Parts 1 and 2.



The specimen or form of construction being subject to the test needs to be representative of the proposed on-site installation, including any cavities and cavity barriers, treatment of penetrations and fixing methods.

4.3. Classification EW and cavity barriers

For an external wall system to be used under CV3, CV3(b)(ii) requires an EW classification as determined in accordance with AS 5113.

Under CV3(b)(iii), if the external wall system contains a cavity, it must have cavity barriers at the perimeter of each floor and these cavity barriers must have been included in the external wall system tested to AS 5113. The intent of specifically requiring cavity barriers at the perimeter of each floor is to minimise the risk of fire spread between floor levels through concealed spaces within the external wall.

4.4. Buildings of Type A construction

In a building of Type A construction, in order to comply with CV3:

- The building must be sprinkler protected throughout.
- All balconies, patios and terraces must be sprinkler protected irrespective of size. However, CV3(c)(i) permits sidewall sprinkler heads to be installed to achieve sprinkler coverage if overhead sprinklers cannot be installed in these locations.

For example, sidewall sprinklers are appropriate for a balcony that does not have a roof or covering. The sidewall sprinklers provide sprinkler protection to the external wall that the open balcony is attached to with the intent of reducing the risk of floor-to-floor fire spread.

- In buildings greater than 25 m effective height, the sprinkler system must contain additional features. These comprise the inclusion of monitored stop valves at each floor level and, except in certain circumstances, the capability to operate sprinklers serving the design area required by AS 2118.1 for the relevant hazard class on each floor plus the design area for the floor level above.

Monitored stop valves improve the reliability of sprinklers and reduce system failure during maintenance. When provided to each floor level, individual floors may be isolated when required for maintenance or other purposes while maintaining sprinkler protection to the remainder of the building.

The capability to operate sprinklers in the design areas of two floor levels at the same time is to address the risk of a fire breaking out on one level and re-entering the building on the floor above, without overrunning the sprinkler system.



4.5. Buildings of Type B construction

There are two options when using CV3 for a Class 2, 3 or 9 building of Type B construction. The building must either be protected throughout by a sprinkler system complying with Specification E1.5 or have any openings in the external wall separated by a slab or other horizontal construction. The slab or horizontal construction must comply with the requirements of C2.6(a)(iv), as for buildings of Type A construction.

A Class 5, 6, 7 or 8 building or Class 4 part of a building, that is required to be of Type B construction, need not be provided with additional measures.

5. CodeMark Australia or CodeMark Certificates of Conformity

A current Certificate of Conformity issued under the ABCB's voluntary CodeMark Australia or CodeMark Scheme is evidence that a building material, method of construction or design fulfils specific requirements of the NCC.

The NCC refers to both the current CodeMark Australia Scheme, which was progressively implemented from 1 August 2017, and the previous CodeMark Scheme. The continued reference to the previous Scheme recognises that Certificates of Conformity issued under it may still be valid forms of evidence of compliance with the NCC.

Currently there are a number of external wall products on the market, including some aluminium composite panels that have a CodeMark Certificate of Conformity. Before relying on a CodeMark Australia or CodeMark Certificate of Conformity, users of products and systems should be mindful of the information on the certificate including:

- the provisions of the NCC against which the product or system has been assessed
- the approved application of the product or system
- any conditions of the certificate
- any limitations of the certificate
- the certificate's currency, including against which edition of the NCC certification has been given.

Further details on the CodeMark Australia Scheme are available at www.abcb.gov.au.