



# ADVISORY NOTE

2016-3

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## Fire Performance of External Walls and Cladding

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***Application***

<i>NCC Volume:</i>	<i>One</i>
<i>Section/Part:</i>	<i>Various</i>
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## **Background**

At its meeting on 19 February 2016, the Building Ministers' Forum agreed to the development and implementation of a range of measures to help address risks associated with high risk cladding products on high rise buildings. This included a National Advisory Note on the subject. The purpose of this Advisory Note is to provide guidance on how the National Construction Code (NCC) should be interpreted to assist in future decisions on product selection, installation and certification.

## **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 is met, in part, under a Deemed-to-Satisfy Solution for buildings of Type A and Type B construction by non-combustible external walls (Specification C1.1 Clauses 3.1(b) and 4.1(b)). A non-combustible external wall inhibits fire spread via the external face 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 relating to the fire performance of external walls (including cladding products of external walls) 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:

1. when a building component is considered part of an external wall
2. which building components Specification C1.1 Clause 2.4 applies to
3. the fire hazard property requirements of Specification C1.1 Clause 2.4(a)(i)
4. the requirements of Specification C1.1 Clause 2.4(a)(ii) and (iii)
5. the requirements of Specification C1.1 Clause 2.4(b)
6. the characteristics required of bonded laminated materials subject to C1.12(f).

This Advisory Note also provides information on a new Australian Standard for testing of external wall assemblies (AS 5113) and on CodeMark Certificates of Conformity.



## **1. When a building component is considered part of 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 component is considered 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 part of an external wall:

- i) external cladding including masonry, concrete panels, composite panels and sheet materials
- ii) framing
- iii) spandrels
- iv) insulation
- v) internal lining (e.g. plasterboard) 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', Specification C1.1 Clauses 3.1(b) and 4.1(b)).

Therefore, building components determined to be a 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 a concession, such as C1.12, enables otherwise. The purpose of this Deemed-to-Satisfy requirement is to inhibit the spread of fire via the external wall of a building as required by Performance Requirement CP2.

## **2. Which building components Specification C1.1 Clause 2.4 applies to**

Clause 2.4 of Specification C1.1 is titled 'Attachments not to impair fire-resistance' and enables the attachment of certain combustible building components to various building elements providing certain conditions are met.

If the criteria of Clause 2.4(a) of Specification C1.1 cannot be met, a combustible attachment cannot be used as part of a Deemed-to-Satisfy Solution. Further, if a building component is deemed to be a part of an element (such as part of an external wall) rather than an attachment to that element, Specification C1.1 Clause 2.4(a) cannot be used to permit that component to be combustible.



The types of attachments identified in Specification C1.1 Clause 2.4(a) are:

- i) a finish or lining to a wall or roof
- ii) a sign, sunscreen, blind or awning (incidental attachments)
- iii) other attachments.

These are discussed below.

### **2.1 A finish or lining to a wall or roof**

The term 'finish' is intended to refer to a final coating applied to either the internal or external face of a wall or roof. Examples of finishes covered by Specification C1.1 Clause 2.4(a) include:

- i) paint applied to either the internal or external face of an external wall
- ii) coating applied to the external face of metal sheet roofing.

A 'lining' is a covering applied to a wall or roof. An example of a lining covered by Specification C1.1 Clause 2.4(a) is decorative panelling fixed to the internal or external surface of an external wall.

A combustible finish or lining is not permitted unless it complies with Specification C1.1 Clauses 2.4(a)(i), (ii) and (iii). These requirements are explained in Sections 3 and 4 of this Advisory Note.

### **2.2 Incidental and other attachments**

Besides a finish or lining to a wall or roof, Specification C1.1 Clause 2.4(a) refers to attachments that are incidental in nature such as a sign, sunscreen, blind or awning. Examples of other attachments covered by Specification C1.1 Clause 2.4(a) are:

- i) gutters and downpipes
- ii) light fittings fixed to an external wall.

A combustible attachment is not permitted unless it complies with Specification C1.1 Clause 2.4(a)(i), (ii) and (iii). These provisions are described in Sections 3 and 4 of this Advisory Note.

### **2.3 Achieving compliance with Performance Requirement CP2**

The nature of external combustible components covered by Specification C1.1 Clause 2.4(a), and the conditions imposed on them, are intended to inhibit the spread of fire via the external wall of a building as required by Performance Requirement CP2.



### 3. The fire hazard property requirements of Specification C1.1 Clause 2.4(a)(i)

As discussed under Section 2 of this Advisory Note, Specification C1.1 Clause 2.4(a) permits the attachment of certain combustible building components to building elements, subject to those components meeting certain conditions.

One condition is that the component is exempted under C1.10 or complies with the fire hazard property requirements of Specification C1.10. Table 1 of Specification C1.10 specifies which Clause of Specification C1.10 applies to various building components.

For the purposes of Specification C1.1 Clause 2.4(a)(i), if the material is deemed a lining then Clause 4 of Specification C1.10 applies and if the material is deemed an other attachment then Clause 7 of Specification C1.10 applies.

For the purposes of illustration, the following table contains a list of building components and the Clause of Specification C1.10 that applies, determined using Table 1 of the Specification.

**Building Components and Applicable Clause of Specification C1.10**

Component	Applicable Clause of Specification C1.10
External lining (e.g. decorative panel)	Clause 4
Wallpaper	Clause 4
Paint (other than nitro-cellulose lacquer)	Exempt*
Awning, sunscreen or similar shading device	Clause 7
Gutters and downpipes	Clause 7

*\*Refer Specification C1.1 Clause 2.4(a)(i) & C1.10(c)(viii)*

#### 3.1 Achieving compliance with Performance Requirement CP2

For permitted external combustible components, compliance with Performance Requirement CP2 is contributed to by limiting their fire hazard properties.

### 4. The requirements of Specification C1.1 Clause 2.4(a)(ii) and (iii)

As well as limiting the fire hazard properties of permitted combustible components, the other requirements of Specification C1.1 Clause 2.4(a) are:

- i) the component is not located near or directly above a required exit so as to make the exit unusable in a fire (Specification C1.1 Clause 2.4(a)(ii))



- ii) the component does not constitute an undue risk of fire spread via the façade of the building (Specification C1.1 Clause 2.4(a)(iii)).

These requirements are discussed below.

#### **4.1 Not located near or directly above a required exit**

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. For this reason Specification C1.1 Clause 2.4(a)(ii) requires that the installation of combustible components in these locations cannot result in an exit becoming unusable.

#### **4.2 Not constitute an undue risk of fire spread via the façade of the building**

A combustible component attached or applied to an external wall could give rise to fire spread via the façade of the building when its form and location propagate flame spread. For this reason Specification C1.1 Clause 2.4(a)(iii) requires that combustible elements must not constitute an undue risk of fire spread via the façade of the building.

It should be noted that compliance with Specification C1.1 Clause 2.4(a)(i) in respect of fire hazard properties does not, in itself, achieve compliance with Clause 2.4(a)(iii). Each of the requirements under (a) must be considered and complied with in their own right.

#### **4.3 Assessment of compliance with Specification C1.1 Clause 2.4(a)(ii) and (iii)**

The requirements of Specification C1.1 Clause 2.4(a)(ii) and (iii) are not specific on account of the wide variety of forms of construction and building configurations they must be applied to. Therefore, it is necessary to exercise judgement when assessing compliance. It may be necessary to use an NCC Assessment Method, or a combination of Assessment Methods, under A0.5 to determine that these requirements are met. For example, the services of an appropriately qualified person (e.g. a fire safety engineer) may need to be sought to obtain the appropriate evidence that demonstrates that the proposed façade design complies with Specification C1.1 Clause 2.4(a)(ii) and (iii).

### **5. The requirements of Specification C1.1 Clause 2.4(b)**

The attachment of a facing, finish or service can compromise the fire-resistance level (FRL) of a building element. For example, mechanical fixing bolts may penetrate a fire-resisting covering in a manner that impairs its performance. Specification C1.1



Clause 2.4(b) requires that the attachment of a facing, finish or service (such as ducting) does not modify the FRL of a building element below that required of it. It may be necessary to use an NCC Assessment Method, or a combination of Assessment Methods, under A0.5 to determine that this provision has been met.

## **6. The characteristics required of bonded laminated materials subject to C1.12(f)**

C1.12 contains a list of materials that, though combustible in entirety or part, may be used wherever a non-combustible material is required. Specifically C1.12(f) permits the use of bonded laminated materials where:

- i) each laminate is non-combustible (as determined under AS 1530.1); and
- ii) each adhesive layer does not exceed 1 mm in thickness; and
- iii) the total thickness of the adhesive layers does not exceed 2 mm; and
- iv) the Spread-of-Flame Index and the Smoke-Developed Index of the laminated material as a whole does not exceed 0 and 3 respectively.

For a bonded laminated material to receive the concession available under C1.12(f), every condition listed above must be satisfied. If one or more of the laminates is combustible, as determined 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 C1.12(f) and therefore cannot be used as part of a Deemed-to-Satisfy Solution where a non-combustible material is required.

## **7. New testing standard for external wall assemblies (AS 5113)**

Standards Australia, in consultation with the ABCBC, industry and the Australian Fire and Emergency Services Authority Council, has developed a new Australian Standard (AS 5113), that provides procedures for the fire propagation testing and classification of external walls of buildings according to their tendency to limit the spread of fire via the external wall and between adjacent buildings.

This standard has been developed based on international practice and is consistent with the testing criteria prescribed in ISO 13785.2 and BS 8414 Parts 1 and 2.

Whilst not currently referenced in the NCC, testing of external cladding and attachments to external walls of multi-storey buildings could be undertaken in accordance with AS 5113 as part of a Performance Solution.

It is likely AS 5113 will be referenced in a new NCC Volume One Verification Method in a future edition of the NCC, and will enable industry to verify the fire performance





of external cladding systems against the relevant Performance Requirements of the NCC. This will improve compliance, promote innovative solutions and ensure the required fire performance is achieved.

## **8. CodeMark Certificates of Conformity**

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

Currently, there 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 Certificate of Conformity, users of products and systems should be mindful of the information on the certificate including:

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

The ABCB is currently in the process of making a number of enhancements to the CodeMark scheme that includes a revised certificate template to enhance the clarity of Certificates of Conformity. Further details on the CodeMark Scheme are available at [www.abcb.gov.au](http://www.abcb.gov.au).