
Contractors Perspective
Australia
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LSAA CONFERENCE 2018 -

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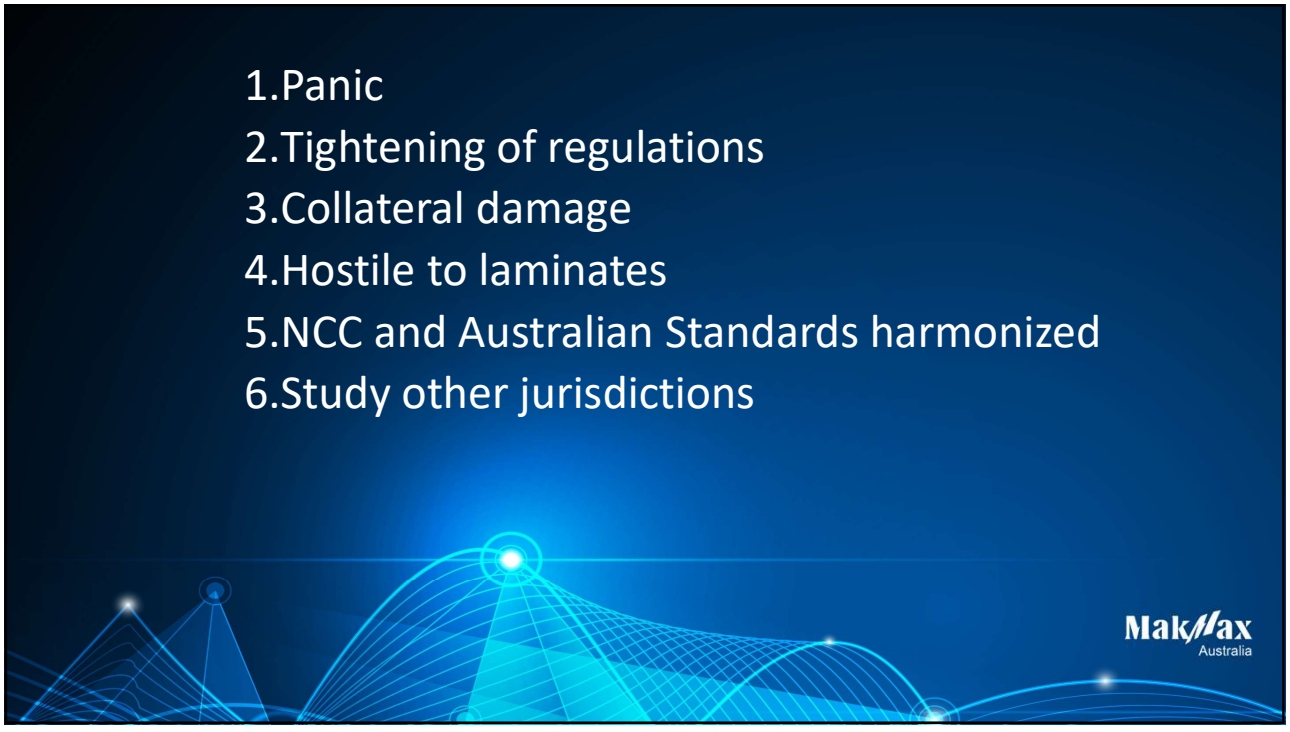
1.Panic
2.Tightening of regulations
3.Collateral damage
4.Hostile to laminates
5.NCC and Australian Standards harmonized
6.Study other jurisdictions
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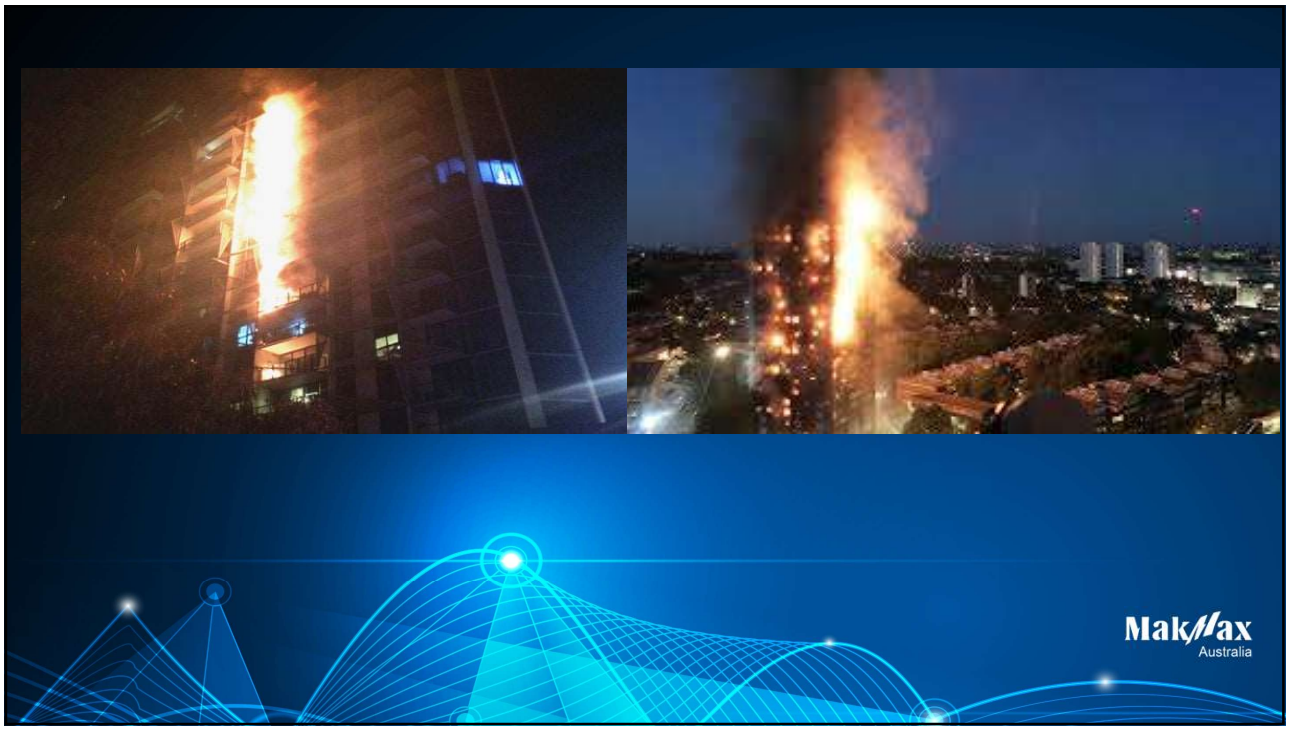

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The NCC path for the determination of fire requirements in a nutshell.

C1.1 Type of construction required

(a) The minimum Type of *fire-resisting construction* of a building must be determined in accordance with **Table C1.1**, except as allowed for—

(i) certain Class 2, 3 or 9c buildings in **C1.5**; and

(ii) a Class 4 part of a building located on the top *storey* in **C1.3(b)**; and

(iii) *open spectator stands* and indoor sports stadiums in **C1.7**.

SA C1.1(a)(iv)

(b) Each building element must comply with **Specification C1.1** as applicable.

Table C1.1 TYPE OF CONSTRUCTION REQUIRED

Rise in storeys	Class 2, 3 or 9 building	Class 5, 6, 7 or 8 building
4 or more	A	A
3	A	B
2	B	C
1	C	C

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The NCC path for the determination of fire requirements in a nutshell.

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 gaskets, caulking, sealants and 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) 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.

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The NCC path for the determination of fire requirements in a nutshell.

C1.14 Ancillary elements

An *ancillary element* must not be fixed, installed or attached to the internal parts or external face of an *external wall* that is *required* to be *non-combustible* unless it is one of the following:

(i) An awning, sunshade, canopy, blind or shading hood other than one provided under **(a)** that—

- (i) meets the requirements of **Table 4 of Specification C1.10** as for an internal element; and
- (ii) serves a *storey*—
  - (A) at ground level; or
  - (B) immediately above a *storey* at ground level; and
- (iii) does not serve an *exit*, where it would render the *exit* unusable in a fire.

7. Other materials

NSW Spec C1.10 NSW 7

Materials and assemblies in a Class 2 to 9 building not included in **Clauses 3, 4, 5 or 6** must not exceed the indices set out in **Table 4**.

Table 4 OTHER MATERIALS

Material or assembly location	Flammability Index	Spread-of-Flame Index	Smoke-Developed Index
Fire control rooms subject to **Specification E1.8** and fire-isolated *exits*, other than a *sarking-type material* used in a ceiling or used as an attachment or part of an attachment to a building element. Note 1	—	0	2
Class 9b buildings used as a theatre, public hall or the like:			
(a) Any part of fixed seating in the audience area or auditorium.	—	0	5
(b) A proscenium curtain *required* by **Specification H1.3**.	—	0	3
Escalators, moving walkways or non-*required* non-*fire-isolated stairways* or pedestrian ramps subject to **Specification D1.12**.	—	0	5
Sarking-type material:			
(a) In a fire control room subject to **Specification E1.8** or a fire-isolated *exit* or fire control room used in the form of an exposed wall or ceiling.	0	—	—
(b) In other locations. Note 2	5	—	—
Other materials or locations and insulation materials other than *sarking-type materials*. Notes 2 and 3	—	9	8 if the *Spread-of-Flame Index* is more than 5

Notes:

1. In a fire control room or *fire-isolated stairway*, a material used as an attachment or part of an attachment to a building element must, if *combustible*, be attached directly to a *non-combustible* substrate and not exceed 1 mm finished thickness.

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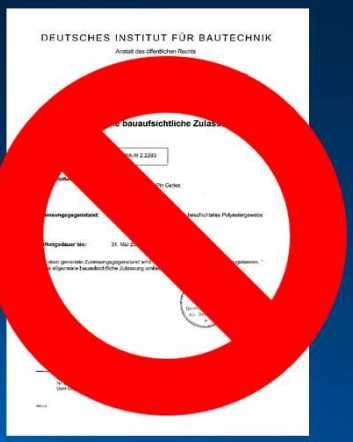
How do the NCC changes affect our industries

Ancillary Structure ?



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NCC and AS1530.1

Language not harmonized – gaps in the scope
Not suitable for coated, faced or laminated materials
No alternative test method specified
No recognition of degrees of combustibility

AS1530.1 = EN1882 ~ BS476.4 = ASTM E136

These standards are almost identical and all are not suitable for faced/coated/laminated/composite/non-homogenous materials

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European Classification System

EN13501-1:2007:Fire classification of construction products and building elements-Part1: Classification using data from reaction to fire tests

Reference Standards

EN 13823, Reaction to fire tests for building products. Building products excluding floorings exposed to the thermal **attack by a single burning item**

EN ISO 1182, Reaction to fire tests for building products. **Non-combustibility** test

EN ISO 1716, Reaction to fire tests for building products. Determination of the **heat of combustion**

EN ISO 9239-1, Reaction to fire tests for floorings. Part 1: Determination of the **burning behaviour** using a **radiant heat source**

EN ISO 11925-2, Reaction to fire tests. **Ignitability** of building products subjected to direct impingement of flame. Part 2: Single-flame source test

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	Classification according to European Standard EN 13501-1				
Definition	Construction products			Floorings	
	A1			$A1_{fl}$	
non-combustile materials	A2 - s1 d0 A2 - s2 d0 A2 - s3 d0	A2 - s1 d1 A2 - s2 d1 A2 - s3 d1	A2 - s1 d2 A2 - s2 d2 A2 - s3 d2	$A2_{fl}$ - s1	$A2_{fl}$ - s2
combustible materials - very limited contribution to fire	B - s1 d0 B - s2 d0 B - s3 d0	B - s1 d1 B - s2 d1 B - s3 d1	B - s1 d2 B - s2 d2 B - s3 d2	B_{fl} - s1	B_{fl} - s2
combustible materials - limited contribution to fire	C - s1 d0 C - s2 d0 C - s3 d0	C - s1 d1 C - s2 d1 C - s3 d1	C - s1 d2 C - s2 d2 C - s3 d2	C_{fl} - s1	C_{fl} - s1
combustible materials - medium contribution to fire	D - s1 d0 D - s2 d0 D - s3 d0	D - s1 d1 D - s2 d1 D - s3 d1	D - s1 d2 D - s2 d2 D - s3 d2	D_{fl} - s1	D_{fl} - s1
combustible materials - highly contribution to fire	E		E - d2	E_{fl}	
combustible materials - easily flammable	F			F_{fl}	

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"**s**" Smoke emission level:
values range from 1 (absent/weak) to 3 (high)

"**d**" flaming Droplets and/or particles production:
values range from 0 (absent) to 2 (high)

Additional class			Level definition
smoke emission during combustion	s	1	quantity/speed of emission absent or weak
		2	quantity/speed of emission of average intensity
		3	quantity/speed of emission of high intensity
production of flaming droplets/particles during combusiont	d	0	no dripping
		1	slow dripping
		2	high dripping

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USA Combustibility

Materials that meet the criteria of ASTM E 136, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace, are classified as being noncombustible. In this test, a material sample is placed in the test furnace and its flaming time and the furnace temperature are measured. This test method is for the base material only and does not cover any surface coverings or coatings. For materials that have a surface covering, the model **building codes** further define a noncombustible material as having a base material that meets the requirements of ASTM E 136 and a surface covering less than 1⁄8" (3mm) in thickness whose flame spread index is not greater than 50

IBC

703.5 Noncombustibility tests. The tests indicated in Sections 703.5.1 and 703.5.2 shall serve as criteria for acceptance of building materials as set forth in Sections 602.2, 602.3 and 602.4 in Type I, II, III and IV construction. The term "noncombustible" does not apply to the flame spread characteristics of interior finish or trim materials. A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions.

703.5.1 Elementary materials. Materials required to be noncombustible shall be tested in accordance with ASTM E 136.

703.5.2 Composite materials. Materials having a structural base of noncombustible material as determined in accordance with Section 703.5.1 with a surfacing not more than 0.125 inch (3.18 mm) thick that has a flame spread index not greater than 50 when tested in accordance with ASTM E 84 or UL 723 shall be acceptable as noncombustible materials.

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What I think

	Clarity of Result	Cost of Testing	New materials
Australia	3	3	3
Europe	1	1	1
USA	2	2	2

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