Nullifire Australia
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Interpretations of the NCC 2016 in Relation to Intumescent Fire Protection of Structural Steel

The information below aims to provide clarification on the interpretation of the NCC in regards to intumescent coating technologies.

How are intumescent coatings tested in accordance with AS1530.4 and how are FRL's determined in accordance with Specification A2.3?

The relationship between AS 4100 and AS 1530.4. with Regards to Determination of FRL's of Structural Steel Elements

In the NCC 2016 (as current) Volume One, Specification A2.3, clause 2(d)(i) references AS4100 as a method of determining the FRL of steel structures.

AS 4100, Section 12 further specifies a method of calculating the FRL of structural steel elements based on analytical methods using test results from tests which include AS1530.4.

The AS 4100 methodology specifies the testing regime, i.e. number and types of sections to be used.

AS 1530.4 then offers the test method but not the analytical method to be used. AS1530.4 also makes the statement that AS4100 can also be used to determine the fire resistance of an element of construction.

AS 4100 is therefore a standard specified in the NCC Volume One for determining the FRL of steel structure, and in AS 1530.4 for determining the fire resistance of an element of construction.

In that respect AS 4100 is the prime standard to determine the FRL of structural elements.

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How do intumescent coatings meet the 'Deemed to Satisfy' provision in accordance with Specifications A2.2 and A2.3?

A2.2 Evidence of suitability

(a) Subject to **A2.3** and **A2.4**, evidence to support that the use of a material, form of construction or design meets a *Performance Requirement* or a *Deemed-to-Satisfy Provision* may be in the form of one or a combination of the following:

(i) A report issued by a *Registered Testing Authority*, showing that the material or form of construction has been submitted to the tests listed in the report, and setting out the results of those tests and any other relevant information that demonstrates its suitability for use in the building.

A2.3 Fire-resistance of building elements

Where a *Deemed-to-Satisfy Provision* requires a building element to have an FRL, it must be determined in accordance with **Specification A2.3**.

(d) it is designed to achieve the FRL in accordance with—

(i) AS 2327.1, AS4100 and AISC Guidelines for Assessment of Fire Resistance of Structural Steel Members if it is a steel or composite structure;

Nullifire SC902 intumescent coating has been assessed in accordance with AS1530.4-2005 and AS4100-1998 by a Registered Testing Authority – refer to BRANZ reports FAR 3997,4257 and 4292.

BRANZ Fire Test Reports, Fire Assessment Reports and compliance with the Building Code of Australia

BRANZ fire test reports are prepared to meet or exceed the reporting requirements of the relevant test standard and the NCC (BCA) then calls up the fire test standard as a "Deemed to Satisfy Provision".

The BRANZ fire testing laboratory is registered by International Accreditation New Zealand (IANZ) and in Australia meets the criteria to be considered a Registered Testing Authority under the following BCA clause:

A 1.1 Registered Testing Authority (b) an organisation outside Australia recognised by NATA through a mutual recognitions agreement.

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IANZ and NATA have an agreement which provides for mutual recognition so that NATA accepts IANZ endorsed test documents as if they were NATA endorsed and vice-versa. This means that IANZ endorsed reports and test certificates may include both the IANZ and NATA logos along with the following statement:

IANZ has a mutual recognition agreement with the National Association of Testing Authorities, Australia (NATA) such that both organisations recognise accreditations by IANZ and NATA as being equivalent. Users of reports/test certificates are recommended to accept reports/test certificates in the name of either accrediting body.

BRANZ is thereby considered a Registered Testing Authority for providing fire testing to a range of test standards.

A BRANZ Fire Assessment Report is deemed acceptable under the NCC (BCA) General Provisions A2.3 and Specification A2.3 wherever it requires that the assessment is prepared by a Registered Testing Authority.

* A full copy of the BRANZ accreditation certificates and NATA Mutual Recognition Arrangements can be supplied on request

Load bearing structural steel protected with intumescent coatings requires a performance (FRL) in accordance to Spec C1.1 - 3 as referenced in Table 3

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	Class of building — FRL: (in minutes) *Structural adequacy/Integrity/Insulation*			
	2, 3 or 4 part	5, 7a or 9	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any *fire-source feature* to which it is exposed is—				
For *loadbearing* parts—				
less than 1.5 m	90/ 90/ 90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/ 60/ 60	120/ 90/ 90	180/180/120	240/240/180
3 m or more	90/ 60/ 30	120/ 60/ 30	180/120/ 90	240/180/ 90
For non-*loadbearing* parts—				
less than 1.5 m	–/ 90/ 90	–/120/120	–/180/180	–/240/240
1.5 to less than 3 m	–/ 60/ 60	–/ 90/ 90	–/180/120	–/240/180
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an *external wall*—				
For *loadbearing* columns—	90/–/–	120/–/–	180/–/–	240/–/–
For non-*loadbearing* columns—	–/–/–	–/–/–	–/–/–	–/–/–

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COMMON WALLS and FIRE WALLS—	90/ 90/ 90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS—				
Fire-resisting lift and stair *shafts*—				
Loadbearing	90/ 90/ 90	120/120/120	180/120/120	240/120/120
Non-*loadbearing*	–/ 90/ 90	–/120/120	–/120/120	–/120/120
Bounding *public corridors*, public lobbies and the like—				
Loadbearing	90/ 90/ 90	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—				
Loadbearing	90/ 90/ 90	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Ventilating, pipe, garbage, and like *shafts* not used for the discharge of hot products of combustion—				
Loadbearing	90/ 90/ 90	120/ 90/ 90	180/120/120	240/120/120
Non-*loadbearing*	–/ 90/ 90	–/ 90/ 90	–/120/120	–/120/120

***Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS** — continued*

Building element	**Class of building — FRL: (in minutes)** *Structural adequacy/Integrity/Insulation*			
	2, 3 or 4 part	**5, 7a or 9**	**6**	**7b or 8**
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS—	90/–/–	120/–/–	180/–/–	240/–/–
FLOORS	90/ 90/ 90	120/120/120	180/180/180	240/240/240
ROOFS	90/ 60/ 30	120/ 60/ 30	180/ 60/ 30	240/ 90/ 60