CARPET INSTITUTE OF AUSTRALIA LIMITED

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FREQUENTLY ASKED QUESTIONS ON

Testing to AS ISO 9239-1 for the National Construction Code

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Administered by the Carpet Institute of Australia Limited
ABN 11 006 829 303

PO Box 7172, St Kilda Road, Melbourne 3004
Tel: (03) 9804 5559
Email: info@carpetoz.com.au • Web: www.carpetinstitute.com.au

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Unless specifically stated to the contrary, the comments in this document refer to the Deemed-to-Satisfy provisions of the Building Code of Australia.

This document should be read in conjunction with the National Construction Code and particular reference should be made to the State and Territory variations at the end of the NCC.

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Contents

What is the National Construction Code (NCC)

- The NCC National Construction Code is produced and maintained by the Australian Building Codes Board (ABCB) on behalf of the Australian Government and State and Territory Governments. The NCC has been given the status of building regulations by all States and Territories.
- The goals of the NCC are to enable the achievement and maintenance of acceptable standards of structural sufficiency, safety (including safety from fire), health and amenity for the benefit of the community now and in the future.
- The NCC contains technical provisions for the design and construction of buildings and other structures, covering such matters as structure, fire resistance, access and egress, services and equipment, and certain aspects of health and amenity.

What are the relevant NCC 2022 provisions, related to floor linings and floor coverings?

- The relevant provisions are contained in Section S7C3, Fire Resistance, Volume 1, Building Code of Australia, NCC 2022 (refer to S7C3) and Specification 7 Deemed to Satisfy Provisions.

What is the difference between a Deemed-to-Satisfy solution and an Alternative solution in the NCC?

- The NCC sets minimum Performance Requirements which define the level of performance that a Building Solution must meet.
- Building Solutions are the means by which the Performance Requirements in the NCC are met.
- There are three ways of meeting these Performance Requirements:
  - a solution which complies with the Deemed-to-Satisfy provisions;
  - an Alternative Solution; or
  - a combination of (a) and (b)
- A Deemed-to-Satisfy solution is one which if met is deemed to comply with the Performance Requirements of the NCC. The Deemed-to-Satisfy requirements are, in general, set out in the clauses and specifications of the NCC marked as Deemed-to-Satisfy.
- This is the normal route followed by most manufacturers of carpet when submitting products for testing.
- An Alternative Solution means a Building Solution which complies with the Performance Requirements other than by means of satisfying the Deemed-to-Satisfy provisions.
- Expert advice should be sought prior to offering alternative solutions for the Performance Requirements of the NCC.
- Unless specifically stated to the contrary, the comments in this document refer to the Deemed-to-Satisfy provision of the NCC.

What are the State and Territory variations of the NCC?

- Each State's and Territory's legislation adopts the NCC subject to the variation or deletion of some of its provisions or addition of extra provisions. These variations, deletions and additions are contained in Appendices to the NCC and are noted in the main body of the NCC.
- These provisions should always be consulted when developing a Building Solution.

What are the important features of the AS ISO 9239-1 test?

- The AS ISO 9239-1 test specimen is horizontal.
- The AS ISO 9239-1 test measures the performance of the "total floor lining and floor covering systems", not just the carpet. Any underlays or adhesives should be part of the test assembly
- If a floor lining and floor covering system is installed on a wall, then it must be tested in accordance with AS ISO 9705 or AS/NZS 3837 and meet the requirements of Specification S7C4 of the NCC.

How is the AS ISO 9239-1 test conducted?

- The test specimen reproduces the total flooring assembly including carpet, underlay, glues and substrate as appropriate, laid horizontally.
- The sample is heated along its length (~1m) using an inclined radiant panel. The sample receives about 11kW/m^2 of heat energy from the panel at one end and about 1kW/m^2 at the other end.
- A pilot burner is applied to the specimen for the initial 10 minutes of the test.
- The sample is allowed to burn until the flame goes out (extinction).
- The heat energy measured at the point of extinction is the Critical Heat Flux at extinguishment (CHF), also called the Critical Radiant Flux (CRF) in the NCC. The Critical Radiant/Heat Flux is the lowest heat power a fire requires to keep burning hence the higher the value the better.
- Smoke is measured over the duration of the test. The total amount of light extinction (measured as a percentage) due to the smoke obscuring a light beam in the flue is multiplied by the time of the test to give the result (in percent minutes).

What is a Flooring System/Flooring Assembly?

- This is the total assembly of flooring components including the substrate, any underlay, any glues and the carpet (or other wear surface).
- The substrate used is chosen from a list given in the European Standard EN 13238 depending on the actual subfloor to be used. If the sub floor is non-combustible the sample is tested over cement sheet. If the sub floor is combustible testing will be required over particle board.

What is the difference between Critical Heat Flux and Critical Radiant Flux?

In relation to this test method and the NCC – nothing. The two terms have the same meaning.

I have a result quoting HF-30. Is this equivalent to CHF?

No. HF-30 is the heat flux 30 minutes after ignition of the sample and can be very different to the CHF value (which is measured at self-extinction of burning).

I have a report from overseas. Is that accepted here?

To be acceptable for compliance with the Deemed-to-Satisfy requirements of the NCC the test must measure Critical Heat Flux to AS ISO 9239-1 (or equivalent, e.g. ISO 9239-1). Other tests may be acceptable under the Alternative Solution provisions.

Can I just test a component (e.g. underlay) alone?

- While the test can be performed, the result is meaningless in relation to compliance with the NCC as it cannot predict the result of a test on a flooring system containing that component (see clause 5.3 of AS ISO 9239-1).
- In some cases, the result of testing the components of a flooring assembly individually can be very misleading as the test on the assembly can be substantially worse than the result on any of the individual components.

Who decides if the test report is acceptable?

- In the first instance it is the NCC representative (e.g. building certifier or the local council) that makes the decision based on the NCC requirements.

What are the various classes of buildings in the BCA?

The BCA classifies buildings into 10 classes and a number of sub-classes. These are listed below.

- **Class 1** – one or more buildings which in association constitute –

  Class 1a a single dwelling being

  (i) a detached house; or

  (ii) one of a group of two or more attached dwellings each being a building, separated by a fire-resisting wall, including a row house, terrace house, town house or villa unit; or

  Class 1b

  (i) a boarding house, guesthouse, hostel or the like, with a total area of all floors not exceeding 300m2 measured over the enclosing walls of the Class 1b and in which not more than 12 persons would ordinarily be resident; or

  (ii) 4 or more single dwellings located on one allotment and used for short term holiday accommodation which are not located above or below another dwelling or another class of building other than a private garage.

- **Class 2** – a building ordinarily containing 2 or more sole occupancy units each being a separate dwelling.
- **Class 3** – a residential building, other than a building of Class 1 or 2, which is a common place of long term or transient living for a number of unrelated persons, including:

  (a) a boarding house, guest house, hostel, lodging house or backpackers' accommodation; or

  (b) a residential part of a hotel or motel; or

  (c) a residential part of a school; or

  (d) accommodation for the aged, children or people with disabilities; or

  (e) a residential part of a health-care building which accommodates members of staff; or

  (f) a residential part of a detention centre.

- **Class 4** – a dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building.
- **Class 5** – an office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.
- **Class 6** – a shop, or other building for the sale of goods by retail or the supply of services direct to the public, including

  (i) an eating room, café, restaurant, milk or soft-drink bar; or

  (ii) a dining room, bar area that is not an assembly building, shop or kiosk part of a hotel or motel; or

  (iii) a hairdresser's or barber's shop, public laundry, or undertaker's establishment; or

  (iv) market or sale room, showroom or service station.

- **Class 7** – a building which is

  Class 7a – a car park; or

  Class 7b – for storage, or display of goods or produce for sale by wholesale.

- **Class 8** – a laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing packing, finishing, or cleaning of goods or produce is carried on for trade, sale or gain.

- **Class 9** – a building of a public nature-

  Class 9a – a health-care building; including those parts of the building set aside as a laboratory; or

  Class 9b – an assembly building, including a trade workshop, laboratory or the like in a primary or secondary school, but excluding any other parts of the building that are of another class; or

  Class 9c – an aged care building.

- **Class 10** – a non-habitable building or structure

  Class 10a – a non-habitable building being a private garage, carport, shed or the like; or

  Class 10b – a structure being a fence, mast, antenna, retaining or free-standing wall, swimming pool, or the like; or

  Class 10c – private bushfire shelter

Critical Radiant Flux (CRF in kW/m2 of Floor Materials and Floor Coverings

Table S7C3 Critical radiant flux (CHF in kW/m^2) of floor linings and floor coverings

Class of Building	Buildings **not** fitted with a sprinkler system (other than a FPAA101D of FPAA101H system complying with Specification 17	Buildings fitted with a sprinkler system (other than a FPAA101D of FPAA101H system complying with Specification 17	Fire-isocilated exists and fire control rooms
Class 2,3,5,6,7,8 or 9b Excluding Class 3 accommodation for the aged and Class 9b as specified below	2.2 kW/m^2	1.2 kW/m^2	2.2 kW/m^2
Class 3 accommodation for the aged	4.5 kW/m^2	2.2 kW/m^2	4.5 kW/m^2
Class 9a patient care areas	4.5 kW/m^2	2.2 kW/m^2	4.5 kW/m^2
Class 9a other than patient care areas	2.2 kW/m^2	1.2 kW/m^2	4.5 kW/m^2
Class 9b auditorium or audience seating area used mainly for indoor swimming or ice skating	1.2 kW/m^2	1.2 kW/m^2	2.2 kW/m^2
Class 9b auditorium or audience seating area used mainly for other sports or multipurpose functions	2.2 kW/m^2	1.2 kW/m^2	2.2 kW/m^2
Class 9c resident use area	N/A	2.2 kW/m^2	4.5 kW/m^2
Class 9c areas other than resident use areas	N/A	1.2 kW/m^2	4.5 kW/m^2

- The Critical Radiant Flux must be recorded at burnout (self-extinction of burning).
- In a building not protected by a sprinkler system complying with Specification 17 the floor or flooring assembly must have a maximum smoke development rate of 750 percent-minutes.
- Further requirements may be imposed by the specifying body (e.g. a hotel chain may have more stringent requirements than the NCC).

What are the requirements for lift cars?

- Section S7C6 of Specification 7 states that floors and floor-coverings in lift cars must have a Critical Radiant Flux of not less than 2.2kW/m2. There is no smoke requirement for lift cars.
- There are also requirements for the wall and ceiling linings of Lift Cars that relate to carpet if it is installed in those locations.

Does a refurbishment need to adapt to the NCC?

- Provisions vary from State to State. Check State and Territory variations appended to BCA. In the first instance queries should be directed to the Building Control Authority (eg local council or building certifier.)
- If the refurbishment is substantial enough to require a building permit, then it is likely that all components installed with the refurbishment must meet the requirements of the BCA.
- Contact details for the State and Territory Building Control Administrations are given in the appendix to this document. These bodies can assist with the local rules applicable in each State and Territory.

Floating floors – does an assembly require to be tested?

- Yes. A floating floor is a floor covering and therefore must meet the requirements of the NCC.

What about carpet tiles?

- Carpet tiles are treated exactly the same as broadloom carpet and the carpet tile assembly must comply with the requirements of the NCC.

Do I need a complying smoke result (ie. maximum smoke development rate of 750 percent-minutes) if the carpet is being used in a sprinklered area complying with Specification 17 of the NCC?

- No. The smoke requirements in the NCC only apply to spaces not complying with Specification 17.

Whose responsibility is it to provide a complying test report?

- Responsibility rests with the person who has applied for the building permit/approval and is overseeing the project. This person would normally be relying on the flooring assembly supplier to provide this information.

What are the implications if carpet is installed without a complying test report?

- For Deemed-to-Satisfy solutions, the Building Control Authority (e.g. local council or building certifier) may take enforcement action, which could require non-complying carpet to be replaced with complying carpet.
- This would not be necessary when an Alternative Solution is proposed and approved.

Notes

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PO Box 7172, St Kilda Road, Melbourne 3004
Tel: (03) 9804 5559
Email: info@carpetoz.com.au • Web: www.carpetinstitute.com.au

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Carpets338 (2023) Design and Print Management: Richard McKellar Design 0409 351 508