

## Achieving NZBC Group Numbers for surface finishes from tests to overseas standards

You can find requirements for internal surface finishes in Clause 3.4(a) of the New Zealand Building Code.

Published on 1 March 2015

1st edition

**Of interest to** Building consent authorities, Designers

The requirements are given as group numbers, which is the performance under the conditions described in ISO 9705:1993 'Fire tests – The full scale room test for surface products'.

The Group Number is a numeric representation of the performance achieved during the test and is used as a standardised benchmark for the assessment of surface finish performance. The Group Number requirements are repeated within the Acceptable Solutions C/AS1-C/AS7 relevant to each risk group.

The fire test procedure for establishing the Group Number is based on either:

- a. ISO 9705, which is a full-scale room corner-test, or
- b. ISO 5660, which is a bench-scale fire test on a small sample of the material.

The Group Number 1-4 (least to most combustible) provides a hierarchy for the risk of the spread of flame across the surface finish based on the measured or predicted 'time to flashover' in the ISO 9705 test.

In Australia and Europe the same general hierarchy of risk for surface flame spread for finishes is used. While differences exist in the small-scale or intermediate-scale fire test methods adopted in the different jurisdictions, the resulting classifications are considered to be sufficiently similar to the Group Number requirements of NZBC Clause 3.4(a) such that the results can be used directly for the purpose of compliance with Clause C3.4 of the New Zealand Building Code.

In Australia the Group Numbers are derived from AS ISO 9705:2003 which is an identical reproduction of ISO 9705:1993.

In Europe, the reaction to fire, of construction products and materials are classified using the criteria and test methods described in EN 13501-1:2007+A1:2009. The classification levels are A1, A2, B, C, D, E and F, from least to most combustible.

The Single Burning Item (SBI) as described in EN 13501-1:2007+A1:2009 is a test method for determining the reaction to fire behaviour of building products when exposed to the thermal attack by a propane burner. The results of this test, using a Fire Growth Rate (FIGRA ratio) have been correlated for MBIE to the ISO 9705 Group Numbers and the requirements of NZBC Clause 3.4(a) in the same manner as the ISO 5660 cone calorimeter test.

The co-relation of wall and ceiling surface finishes derived from Australian or European classifications to the Group Number requirements of NZBC Clause 3.4(a) can, without the need for further testing, be taken as described in the following table.

<b>New Zealand Group Number according to NZBC Clause C3.4(a) using ISO 9705:1993</b>	<b>Australian Group Number according to NCC Specification C1.10 Clause 4 using AS ISO 9705:2003</b>	<b>European Classification using to EN 13501-1:2007+A1:2009</b>
<b>Group Number 1-5</b>	<b>Group 1, and a smoke growth rate index not more than 100</b>	<b>Class A1, A2 or B and Smoke production rating s1 or s2</b>

Group Number 1 New Zealand Group Number according to NZBC Clause 3.4(a) using ISO 9705:1993	Group 1 Australian Group Number according to NCC Specification C10 Clause 4 using AS ISO 9705:2003	Class A1, A2 or B European Classification using EN 13501-1:2007+A1:2009 Class C smoke production rating s1 or s2
Group Number 2	Group 2	Class C
Group Number 3	Group 3	Class D
Group Number 4	Group 4	Class E and F

Some products, especially those from Australia, may have been tested to AS/NZS 3837. This is the same test as ISO 5660 but with different end-of-test criteria, which means for some materials this may affect the assessment of a Group Number.

A test result for a material or coating applied to a particular substrate may also be used for the same material or coating applied to another substrate of the same or less reactive type (refer Table A2 within Verification Method C/VM2) provided the new substrate is of equal or greater density. For solid timber, the material or coating may be used on other solid timber of equal or greater density and thickness.

All guidance related to C1 Objectives of Clauses C2 to C6 (<https://www.building.govt.nz/building-code-compliance/c-protection-from-fire/c-clauses-c1-c6/>)



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New Zealand Government

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