

guide to understanding fire ratings

Guide to Understanding Group Numbers for Interior Surface Finishes

Group Numbers are required for surface finishes in certain areas of some buildings. Often referred to as a fire rating, group numbers are a numeric representation of the reaction-to-fire of a surface finish using a scale rating. They represent how quickly a fire will spread across the surface.

Surface Finish

In the NZBC Handbook, a surface finish is defined as the combination of a surface coating and the substrate material for building elements that are exposed to view. It can be an applied decorative or protective coating, surface laminate, veneer or other material, or the uncoated building element itself.

Pressed decorative panels from Prime Panels, painted or unpainted MDF, particleboard and plywood all fall within the definition of a surface finish when used as a wall or ceiling panel.

Complying with the NZ Building Code Clause C3: Protection From Fire

Clause C requires that design and construction results in a low probability of injury or illness to people not in close proximity to a fire source, protecting other property from fire and assisting with firefighting and rescue operations.

Compliance with the Building Code can be demonstrated in the following ways:

1. Verification Method - tests or calculation methods that prescribe how to comply with the Building Code.
2. Acceptable Solution - simple step-by-step instructions that show one way of complying with the Building Code.
3. Alternative Solution - is a building solution that differs, in whole or part, from the solutions offered in the Acceptable Solution or Verification Method but achieves compliance with the performance requirements of the Building Code.

A design that complies with an Acceptable Solution or Verification Method must be accepted by a Building Consent Authority (BCA) as complying with the Building Code. Alternative Solutions require detailed supporting documentation to be approved and signed off by the BCA.

Group Numbers for NZPG panels are supported by Verification Methods and Acceptable Solutions.

Group Numbers

Using a scale rating system between 1 and 4 Group Numbers represent the measured time to 'flashover' in the ISO 9705 Room burn test.

Groups 1 and 2 may include an "S" suffix which indicates a lower smoke growth rate which means that a 1-s or 2-s group number can be used in buildings or areas not protected by a sprinkler system.

- **Group 1-s** is the best possible rating as it does not flashover within the 20-minute test duration and has a smoke growth rate of less than 5m²/s as indicated by the 's' suffix. **For use in buildings or areas without fire sprinklers.**
- **Group 1** does not flashover within the 20-minute test duration however the smoke growth rate is over 5m²/s and is therefore for use in buildings or areas **with fire sprinklers.**

- **Group 2-s** flashover is reached between 10 and 20 minutes of the test starting and has a smoke growth rate of less than 5m²/s as indicated by the 's' suffix. **For use in buildings or areas without fire sprinklers.**
- **Group 2** flashover is reached between 10 and 20 minutes of the test starting however the smoke growth rate is over 5m²/s and is therefore for use in buildings or areas **with fire sprinklers.**
- **Group 3** flashover is reached between 2 and 10 minutes of the test starting, there is no requirement for a smoke growth rate.
- **Group 4** flashover is reached within 2 minutes of the test starting and is the most combustible.

Where are Group Numbers Required?

Different areas within buildings require different Group Numbers based on use and occupancy, risk group and building importance level. Over-specification is permitted. The chart below shows some of the areas where our products may be used and the permitted group number(s) for these areas.

Area of Building	Group Number	
	Without Fire Sprinkler	With Fire Sprinkler
Wall/ceiling materials in sleeping areas where care or detention is provided	1-s	1 or 2
Wall/ceiling materials in exitways	1-s	1 or 2
Wall/ceiling materials in all occupied spaces in Importance Level 4 buildings	1-s	1 or 2
Ceiling materials in crowd and sleeping areas. Excludes where care and detention is provided and household units.	1-s or 2-s	1 or 2
Wall materials in crowd and sleeping areas. Excludes where care and detention is provided and household units.	1-s or 2-s	1, 2 or 3
Wall/ceiling materials in occupied spaces in all other locations in buildings including household units	1, 2 or 3	1, 2 or 3

Test Methods

In NZ the following tests are used to determine group numbers:

ISO 9705:1993 'Fire tests -The full-scale room test for surface products'

This test method is the benchmark for determining Group Numbers.

ISO 5660-1:2015, Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method) and smoke production rate (dynamic measurement). Results from this test are used to predict Group Numbers as if the surface finish was tested to ISO 9705.

Some products from Australia are tested to AS 3837. This is the same test as ISO 5660 but with a different end-of-test criteria, which may result in a different group number for some surface finishes.

In Europe, the same general scale of risk for surface flame spread is used. These are classified using the criteria and test methods described in UNE-EN 13501-1:2007+A1:2009. Commonly referred to as the Single Burning Item (SBI) test, results are classified alphabetically from A1 (non-combustible) to F (highly combustible) and referred to as Euroclass or Class.

These classifications have been correlated using a Fire Growth Rate (FIGRA ratio) to the ISO 9705 Group Numbers in the same manner as the ISO 5660 cone calorimeter test results. The resulting classifications are considered to be sufficiently similar to the Group Number requirements of NZBC Clause 3.4(a) and can be used for the purpose of compliance in NZ, without the need for re-testing. **Therefore Euroclass Classifications are an Acceptable Solution in New Zealand.**

The Chart Below Shows the Correlation:

NZ Group Numbers	European Classifications
1-s	A1, A2, B-s1, B-s2
1	A1, A2, B
2-s	C-s1, C-s2
2	C
3	D
4	E, F

NZPG Certified Group Numbers for Pressed Panels and Substrates

Group Numbers for Prime Panels Decorative Panels and Substrates

Pressed Panels	Thickness	NZ Group Number	Euroclass	Compliance	Certificate Number	Testing Laboratory
Prime Melamine on MDF FR Black	12mm	1-s	B-s1,d0	C/AS2	21/32307787-2	Applus - LGAI
Prime Veneer on MDF FR Black coated with a 2 pack polyurethane	12mm	1-s	B-s1,d0	C/AS2	21/32307785-2	Applus - LGAI
Prime Veneer on MDF FR MR (green) coated with a 2 pack polyurethane	12mm	1-s	B-s1,d0	C/AS2	21/32307786-2	Applus - LGAI
Prime Melamine on MDF FR MR (green)	12mm	2-s	C-s1,d0	C/AS2	21/32307784-2	Applus - LGAI
Prime Melamine on MDF Standard	12mm	3		C/VM2	22/32302142	Applus - LGAI
Prime Laminate on MDF Standard	12mm	3		C/VM2	22/32302143	Applus - LGAI
Prime Veneer on MDF Standard	12mm	3		C/VM2	FH13986-001-C1	BRANZ
Substrate Only	Thickness	NZ Group Number	Euroclass	Compliance	Certificate Number	Testing Laboratory
Prime MDF FR Black	10 -19mm	1-s	B-s2,d0	C/AS2	2761T14-2	AFITI LICOF
Prime MDF FR MR (green)	12mm	2-s		C/VM2	F113456-001-C1	BRANZ
Prime MDF Standard & MR	≥ 9mm	3		C/AS2	Certification not required	
Prime Standard & MR Particleboard	≥ 9mm	3		C/AS2	Certification not required	
Prime Plywood - Birch, Gaboon, Meranti	≥ 9mm	3		C/AS2	Certification not required	

Note: Prime Veneer on MDF FR Black and MDF FR MR was coated with a generic two pack low-yellowing polyurethane coating as typically used for factory finishing of veneer wall and ceiling panels prior to testing. The Group Number specified in the chart above only applies when coated with the same coating type. An intumescent coating is not required in this situation.

KEY:

C/AS2: Acceptable Solution Appendix C

C/VM2: Verification Method Appendix 2

Disclaimer

Please note that this advisory is prepared as a guide only. Always seek professional advice from a registered Fire Engineer and refer to the Building Code for detailed requirements.

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