Industry Factsheet

Slip Resistance of Ramps

The purpose of this factsheet is to assist 'Do It Yourself' consumers and home modification providers to choose ramp materials that comply with the slip resistance requirements in the Building Code of Australia [BCA]. This can reduce the risk of slips and falls on ramps in homes.

The BCA has for many years required ramps to have a slip resistant floor surface. In the 2016 edition of the National Construction Code [NCC 2016], the BCA introduced the minimum slip resistance classifications that would be 'deemed-to-satisfy' this requirement for ramps in houses (Class 1 Buildings). This applies to all new ramps, in both new and existing housing. Some floor materials previously used for ramps might not yet have been tested for slip resistance and the manufacturers or importers may have insufficient evidence that their floor materials would meet the BCA requirements.

Slip resistance requirements for ramps in the BCA (NCC 2016)

In NCC 2016, the BCA requires slip resistant floor surfaces on all newly constructed and installed ramps in homes and in common areas of multi-dwelling (e.g. apartment) buildings. Floor surfaces that meet the applicable deemed-to-satisfy minimum slip resistance classification (Table 1) when tested to Australian Standard *AS 4586*, would satisfy this requirement.

Table 1 Minimum slip resistance classification 'deemed-to-satisfy' the BCA (NCC 2016) slip resistance requirements for newly constructed and installed ramps in dwellings and dwelling buildings

Ramps	Dry surface	Wet Surface
Building with apartments, units (Class 2-9 building)		
Ramp steeper than 1:14 but not steeper than 1:8	P4 or R11	P5 or R12
Ramp steeper than 1:20 but not steeper than 1:14	P3 or R10	P4 or R11
House, townhouse, villa (Class 1 building)		
Ramp with gradient not steeper than 1:8	P4 or R10	P5 or R12

Source: Adapted from the National Construction Code 2016. Australian Building Codes Board (ABCB) www.abcb.gov.au

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How do I choose a ramp floor material that will meet the slip resistance requirements in the BCA (NCC 2016)?

Some types of ramp floor materials, such as tiles, pavers and composite timber decking, are supplied with a slip resistance classification. This classification is the result of testing the slip resistance of the new floor material in accordance with Australian Standard *AS 4586*, and is used to indicate the risk of slipping on the floor surface when it is wet or dry. There are different types of slip resistance classification, based on different methods of testing the slipperiness of floor materials. For houses, townhouses and villas (Class 1 Buildings), the BCA (NCC 2016) specifies a high slip resistance classification: either P5 *or* R12, for all new ramps that would be wet.

The easiest way to check whether a ramp floor material will meet the BCA slip resistance requirements in NCC 2016, is to obtain the slip resistance test results from the supplier of the ramp floor material. The slip resistance classification will only apply to the floor material when it is the same material and has the same surface finish as what was tested. If any changes are made to the texture, gloss level or coating, the slip resistance classification will not be accurate.

Some floor materials can vary in how they are produced, making slip resistance testing difficult. Poured concrete ramps are produced on site, so they usually are not tested. However, research shows that concrete with a wood floated, broom finished, or exposed aggregate surface would usually achieve P5 or R13 slip resistance classification. These surfaces are likely to be a suitable alternative solution for a slip resistant house ramp exposed to weather. Timber decking is also usually not tested as the surface will vary depending on timber type, moisture content and machine finish, as well as onsite sanding and application of sealers or coatings. However, timber decking is unlikely to be sufficiently slip resistant without specialised coating or treatment. A range of floor materials that are likely to achieve the BCA (NCC 2016) slip resistance requirements for home ramps, are shown in Table 2.

Can surface treatments or coatings increase the slip resistance of a ramp floor material?

A range of surface coatings and treatments can be used to increase the slip resistance of a ramp floor material. Solid materials such as stone can be treated with abrasives or acid at the time of manufacture or installation, to increase the texture of the surface.

Floor coatings can provide increased slip resistance to timber, concrete, stone and porcelain, either through the texture of the coating, mixing a grit additive into a coating before it is applied, or sprinkling grit particles on top of the wet coating as it is applied. Some slip resistant coatings and grit additives have been tested to *AS 4586* and are available with a slip resistance classification. However, they need to be applied only to the approved floor materials and in accordance with the supplier's instructions, so the floor surface will achieve the same level of slip resistance as the test results. Examples of coatings are included in Table 2.

Slip resistant ramp floor materials

Common outdoor ramp floor materials that are likely to meet the deemed-to-satisfy slip resistance classifications for home ramps, are shown in Table 2. The slip resistance classification of the ramp floor material needs to be suited to the ramp gradient, and whether the ramp is likely to become wet. The *AS 4586* slip resistance classification for the material should be checked by obtaining the *AS 4586* test report from the material supplier. The *AS 4586* test report must be provided by a NATA accredited testing laboratory.

Table 2 Common outdoor ramp floor materials likely to meet the 'deemed-to-satisfy' minimum slip resistance classifications in the BCA (NCC 2016) for ramps in homes

Ramp floor material surface	Indicative *AS 4586* Slip resistance test results	
	Wet pendulum test	Oil-wet ramp test
Concrete[1]	**expected slip resistance**	
Concrete slab - wood floated, broom finished, or exposed aggregate surface	V*	R13
Stone	**check *AS 4586* slip resistance test results**	
Sandstone – natural, honed, or sawn surface	P5	
Limestone - sandblasted surface	P5	
Travertine - honed or tumbled surface	P5	
Granite - bush hammered or blasted surface	P5	
Bluestone - sawn surface	P5	
Porcelain	**check *AS 4586* slip resistance test results**	
Tile - matt or textured surface	P3 - P5	R10 - R12
Paver - matt or textured surface	P4 - P5	R10 - R12
Composite Timber Decking	**check *AS 4586* slip resistance test results**	
Decking boards - slip resistant	P4 - P5	R11
Fibreglass Grating	**check *AS 4586* slip resistance test results**	
Grating with grit surface	P5	R13
Colour Coatings	**check *AS 4586* slip resistance test results**	
Paving paint - textured, or 'non-slip'	P4 - P5	
Additives for Coatings	**check *AS 4586* slip resistance test results**	
Grip additive in timber coating	P4	R11
Grip additive in paving paint	P4	

*Tests conducted prior to the 2013 edition of Australian Standard *AS 4586* used a different classification. V indicates very low risk of slipping but the result does not directly correspond to Classification P5.

[1] Cement & Concrete Association of Australia http://59.167.233.142/publications/pdf/profSlip.pdf

Will a slip resistant ramp remain slip resistant?

The slip resistance classification for a floor material that is tested in accordance with Australian Standard *AS 4586*, only applies to the material when it is new and unused. Even ramp floor materials with a very high slip resistance classification when new, can become very slippery if they are covered in grime or become worn. Cleaning and maintaining the ramp floor surface are very important to prevent slipping.

When selecting a ramp floor material, you need to consider how often the floor material will need to be cleaned, and the correct method for cleaning to prevent surface wear. Some highly-textured slip resistant surfaces can trap dirt and require more frequent cleaning. It might be possible to reduce the amount of cleaning by having good drainage to avoid water pooling (ponding), and overhead cover to protect outdoor ramps from rain, ice and fallen tree leaves.

Some ramp floor materials might also need extra maintenance, like reapplying a slip resistant coating approximately every 3-5 years. If the cleaning or maintenance requirements of a ramp surface would be difficult for residents and they would not have someone to assist with this, an alternative type of ramp floor material might be more suitable.

What else needs to be considered when choosing a slip resistant ramp floor material?

With many options slip resistant floor materials for home ramps, factors to consider in selection include:

- whether the ramp will be protected from weather and falling leaves;
- cost and frequency of cleaning and maintenance to keep the ramp floor slip resistant;
- the durability of the surface, especially if the ramp will be heavily used;
- appearance of the ramp being compatible with the style of the home and landscaping;
- comfort of the ramp floor surface underfoot if the residents are likely to be barefoot;
- temperature of the ramp floor surface if the residents are likely to be barefoot; and
- cost of the ramp materials and construction.

Where can I find more information?

- Home Modification & Maintenance service providers
- Occupational Therapists
- Architects or builders
- Other home modification resources on the www.homemods.info website

***This information was correct at time of printing.*