



Clarifying insulation changes

From 1 May 2023, housing and small buildings up to 300 m² will need to be better insulated. What does this mean in practice for wall, underfloor and ceiling insulation of these buildings when using the schedule method for compliance?

In *Housing insulation upgrade extension* on page 32, we summarise the changes to New Zealand Building Code clause H1 Energy efficiency insulation requirements from 1 May 2023.

These changes only affect new construction or existing properties undergoing changes to the external thermal envelope, which will require a building consent. Retrofit insulation standards are not included in the update.

Construction R-values in H1

An R-value is the measure used to determine the ability of a material or system to resist the transfer of heat. The higher the R-value, the better the thermal resistance.

There are two types of R-values commonly used in the construction industry:

- Insulation material R-values – the thermal performance of the individual insulation product.
- Construction R-values – the performance of an entire area of the building. This considers the type of construction, including cladding, insulation material and how much framing is used.

The Building Code clause H1 documents specify construction R-values, not the R-value of the insulation product to be installed.

This is an important difference. For example, an R5.0 thermal ceiling insulation blanket may be used but the construction value of the ceiling may only be R4.0 once the total ceiling construction design is accounted for. If the design includes a horizontal ceiling with a pitched roof, it may not be possible to get full insulation

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coverage and there will be thermal loss through the exposed framing. This thermal loss will reduce the overall construction R-value of the roof.

What do the changes mean?

Previously, New Zealand was divided into three climate zones – zones 1 and 2 for most of the North Island and zone 3 for the South Island and the central plateau. This changes to six climate zones across New Zealand and insulation requirements, are tied to the zones (see Table 1 on page 32).

Walls

From 1 May 2023, walls in housing across New Zealand will have to meet a minimum

construction R-value of R2.0. This is the same as applied to the previous zone 3 in the South Island. To achieve this, walls will require an insulation material with an R-value significantly higher than R2.0.

Wall insulation requirements are expected to be increased further by MBIE in coming years, which will require higher-density products or different wall designs. These will be addressed when the changes are introduced.

Floors

Floors will see some big changes and will differ over the climate zones. Table 1 (page 32) shows the construction R-value required. The previous R-value for the entire country was R1.3. See also *Slab floors under new H1 changes* on page 37.

We probably won't see a big shift in the types of products that can be used, but we will see a change in the installation methods.

Ceilings

New Zealand housing will require the same roof construction R-value of R6.6, which is a significant increase from the existing requirements (see Table 1 on page 32).

The insulation product R-values required will vary depending on the construction materials used in the project and the roof and ceiling designs. We will see a larger variety of products considered due to the type of roof and ceiling designs and the costs involved with various methods of installation.

What type of product can I use?

The types of products that can be used will vary depending on the manufacturer and where they are being installed.

In the walls, glass fibre and polyester insulation will be the main types of insulation used. The current wall construction will not have to change to accommodate the increases. A standard 90 mm timber frame can hold all main wall insulation types under the new standards.

In the underfloor, polyester insulation and rigid polystyrene panels will be common but will require some new installation techniques. Staples will no longer hold these materials in place due to their increased thickness.

The biggest change will be to the ceiling. Due to the large increase in the construction R-value required, we will see the introduction of some new products to the residential new-build market. Glass fibre and polyester insulation will remain the most common products, but these will be used in different ways.

Some manufacturers will recommend a double layer of insulation, and others will offer a single layer product. The key differences are the time it will take to install and the health and safety implications of installing a double layer. A local insulation expert can talk you through the options most suitable for your project.

We will also see the increased use of new products in the residential new-build market. PIR board and sprayed or blown-in products – both foam and fibre – will start to be used more.

Weigh up the cost and installation application to decide what best suits each project.

Where should you go for answers?

Depending on the products that you choose, refer to the manufacturer for guidance.

The H1 hub has more information about the H1 changes – see www.h1hub.branz.nz.

NOTE This article focuses on the schedule method for compliance. Use of the calculation or modelling methods may be a better way to optimise thermal performance. ◀