Improving home energy efficiency with a new digital calculator

Designers can now see the effects of changing their construction methods and materials with the first interactive edition of the BRANZ *House insulation guide*. The free digital guide can demonstrate the thermal performance of house designs and explore options to improve energy efficiency.

The BRANZ *House insulation guide* has long been the go-to tool for calculating house thermal performance and the insulation needed to achieve a warm, dry and healthy home. The guide is backed by years of BRANZ's independent research in house energy efficiency. When used by designers, the guide provides assurance to building consent authorities that a house will meet the thermal performance requirements under the New Zealand Building Code.

Since November 2022, the new 6th edition has been available to download for free from the BRANZ website. It includes explanatory information and drawings, like the earlier editions, and a series of tables with changeable parameters to calculate the thermal efficiency of house designs.

Other revisions include thermal performance data for higher-performance construction types, updated climate zones and an upgraded feature to evaluate the percentage coverage of timber wall framing. This last feature encourages designers to consider the impact of excessive timber framing, which can cause thermal bridging and reduce thermal performance, by showing the mitigating effects of reducing the framing and/or increasing the insulation. It will help meet the higher overall thermal performance targets for new homes.

From the 1st edition in 1995 through to the 5th edition in 2014, the guide has been available in hardcopy as an essential reference guide for house designers. This year, the guide required an extensive update to meet the new higher thermal performance requirements under the H1 *Energy efficiency* clauses in the Building Code. Due to the exponential growth in construction options – from insulation types to roofing, flooring and walls – this year, there were too many to fit into one book. Instead, BRANZ researchers created an interactive digital solution.

BRANZ liaised with MBIE to ensure the guide aligned with the new H1 requirements. Key industry stakeholders such as insulation manufacturers, Concrete New Zealand, Insulation Association of New Zealand and the steel industry also provided input to ensure the guide included all the latest construction types.

At BRANZ, we are excited to offer this new-generation *House insulation guide* as part of our low-carbon toolbox to help the industry journey towards building for climate change. As new building methodologies and regulations evolve, the guide can nimbly incorporate new elements of building design and performance criteria.

Uptake of the new tool has been encouraging, with approximately 8,000 unique downloads as at 25 June 2023. Feedback so far on the new tool has been positive.

READ MORE

- BRANZ *House insulation guide* 6th edition. branz.co.nz/energy-efficiency/house-insulation-guide
- BRANZ *House insulation guide* goes digital. buildmagazine.org.nz/articles/show/branz-house-insulation-guide-goes-digital

IN THEIR **WORDS**

Bruce Sedcole, NZIA Registered Architect, Director of BSA Architects Ltd*

What do you think the benefits are of the *House insulation guide*?
The *House insulation guide* allows you to enter different variables into the tool's fields – for example, for insulation values, framing sizes and spacings – and get real-time results. You can evaluate lots of different design options quickly to come up with the optimum design for aesthetics and structural and thermal performance.

Has the guide becoming digital made a difference?
The old-school way was to run your finger along a line to get a value from a printed table. The digital version gives you so many different variables to evaluate and instant results.

Are there new features of the guide that you're particularly enjoying?
The interface is really user friendly and the guide booklet that comes with it is written in plain English, with clear informative diagrams, and provides all the theory behind the tool. It's a must-read for designers but is also accessible for builders, which means they can understand how designers are making decisions.

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When builders understand what contributes to thermal performance, they are better placed to advise designers on what might work best in practice. They know about product availability and cost and can feed that information into the design-build process much earlier. This can result in real cost efficiencies for the client.

What impact do you think the guide will have on reducing carbon emissions from buildings?
The guide is helping identify the best way to insulate homes to meet – and exceed – compliance with new thermal regulations. Better insulation means better heat retention, lower energy for heating and, consequently, reduced carbon emissions to run the home.

* Bruce is a principal writer at BRANZ but was not directly involved in the development of the *House insulation guide*. His opinions expressed here are his own in his capacity as a practising architect.