

EVALUATING THE DURABILITY OF NEW MATERIALS

New innovative building materials can offer a range of benefits over traditional options, but will they stand the test of time? Proving the durability of a new material is a requirement under the Building Code and a complex task, so in February, BRANZ launched a simple framework that can be used to evaluate the durability of any new building material. This is the trailblazing result of 5 years of in-depth research, equipping the whole industry with an elegant and simplified solution.

The building and construction industry uses a vast array of materials: metals, ceramics, polymers, composites and natural materials. For many of these traditional building materials, durability is a proven, with some having been in use for decades – even centuries.

Today, new materials are engineered to be low-carbon, fire resistant, earthquake resilient or even self-healing. Proving the durability of such materials is a challenging requirement under the Building Code. With emphasis now on achieving industry zero-carbon targets, it has never been more critical, because assessing durability is a key factor in determining a building's whole-of-life carbon emissions.

Identifying the industry need for a consistent and systematic approach to testing, BRANZ pioneered a framework that can be used to evaluate the durability of any new material.

The framework is made up of two interconnected parts: a structurally phased evaluation procedure and a general approach for developing testing schemes. Technical support for users includes evaluation factors, methods, models and material service-life datasets.

We also developed a specialist testing facility, with advice from the University of Auckland. This involved building a weathering rig designed to test materials under simulated, adjustable conditions within an accelerated time period. Materials can be rotated to follow the sun and sprayed with a variety of solutions to test their reaction to solar irradiation and common air contaminants.

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This comprehensive framework covers a wide range of building materials. It will be very useful for professionals working in the building and construction industry and a valuable reference for a wide range of people in New Zealand.”

PROFESSOR WEI GAO, DEPARTMENT OF CHEMICAL & MATERIALS ENGINEERING, UNIVERSITY OF AUCKLAND

BRANZ's innovative new framework has broad application. It will be used by our building scientists to appraise new products and is available for free on our website. This means manufacturers can test their own products before going to market – ultimately giving consumers confidence that their building materials have been built to last.

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- » [BRANZ Study Report SR464 \(2022\) *Durability evaluation framework for new building materials*](#)
- » [BRANZ Research Now: Materials #1 *Durability evaluation framework for new building materials*](#)