

# MODULAR HOUSING: THE PERFORMANCE GAP

Contemporary technological developments are changing perceptions on what modular buildings can provide and the massive benefits that can be gleaned from factory-controlled manufacture.



Traditionally - in the eyes of the general public - modular housing has often been seen as a temporary, inexpensive and poor performing option. This perception came from the historic post-war prefabricated housing boom between 1945 and 1955 when 20% of the housing stock, around 500,000 houses, were built using modular construction - a further 750,000 were built between 1955 and 1970.

After only a short period of time, some of these post-war houses started displaying problems. Of particular note was the inadequate thermal and noise insulation, as well as condensation, which in turn created mould and caused deterioration to the fabric of the building. This gave rise to the Housing Defects Act of 1984 which listed 26 different house designs as 'defective'. Although this Act was put in place to allow council funded grants to be awarded to enable refurbishment, it effectively meant that these houses were stigmatised and

unmortgageable. This set the scene for the public conception of modular housing and its association with poor quality, which to some extent still abides today.

Modular housing manufacturers and builders are changing this perception. Proving the performance of the design in the test laboratory environment is one step, however this needs to be endorsed with in-situ data. Where system testing at the design stage is crucial to obtain approval and to allow the system to be taken to market, the actual product performance once built is frequently neglected. Modular construction is only as good as the installation. Measuring the performance of a building once installed allows the manufacturer to assess the actual performance of the finished product against the expected performance, thus facilitating changes to processes or designs if required.

There are currently no specific standards or schemes available

that the end performance can be compared to. Building regulations give minimum design requirements, but there are no specific site-based tests to prove real life function. Schemes could be employed to check the critical performance of the building: thermal adequacy of the finished build (using thermal imaging cameras), acoustic performance, watertightness of the reveals, joints and any penetrations, and airtightness of the entire building. The results could be compared against the performance of a similar size traditional brick-block masonry build. Moving forwards, the industry must specify their own standards and requirements, which should be over and above any values set by building regulations.

The public needs to be confident that the house they are buying will still be performing on completion of a 25-year mortgage period. If they can see a saving in the cost of the building and improved energy efficiency, both of which a modular house can achieve, this will ensure that the modular housing sector will continue to grow.

Lucideon develops customised testing programs for both the design and site performance stages of modular houses to help manufacturers increase the confidence of both the insurance warranty provider and the potential purchaser.

**For more information visit:**  
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**Images:**  
01. Modern modular housing is a quantum leap away from legacy developments of the past