



H1 Code compliance



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GIVEN THE MANY OPTIONS FOR CODE COMPLIANCE WITH H1 *ENERGY EFFICIENCY*, A QUICK REVIEW OF THE CHOICES MAY BE HELPFUL.

NEW ZEALAND BUILDING CODE clause H1 *Energy efficiency* sets out the performance based energy efficiency requirements for buildings. Means of compliance are provided in the Acceptable Solution H1/AS1 and the Verification Method H1/VM1.

H1/AS1 cites NZS 4218:2004 *Energy efficiency – Small building envelope* as the Acceptable Solution for compliance with H1. This provides three options for compliance – the schedule method, calculation method and BPI using the Annual Loss Factor.

Schedule method

The schedule method may be used where:

- the total area of glazing of a building is 30% or less than the total wall area of the building, and
- the combined glazed area of the east, south and west walls is no more than 30% of the combined total area of these walls
- the total area of skylights is limited to 1.2 m².

This is a simple, straightforward means of determining minimum R-value requirements using replacement Tables 1, 2a, 2b and 3 in H1. However, it can be architecturally restrictive so there are other options.

Calculation method

The calculation method allows for greater construction flexibility such as where more than one type of wall construction or a mix of glazing types is to be used. It may be used where:

- the total area of glazing is up to 50% of the total wall area or
- the total area of skylights is greater than 1.2 m² or

- single glazing is to be used.

Using the calculation method allows the R-value in one part of the building envelope to be relaxed if it is compensated for in another part of the building. For each part of the building it compares the calculated heat loss of the proposed building to the heat loss of a reference building, using:

$$\text{heat loss (HL)} = \frac{\text{area}}{\text{R-value}}$$

If the heat loss of the proposed building is no more than that of the reference building, the proposed building complies with H1.

The tables used for the schedule method are used to determine the reference building R-values. The R-values for the proposed building must be no less than 60% of the reference building R-values.

Use replacement Table 4 in H1 to calculate the penalty R-values for areas of glazing over the base level of 30% for the reference building.

Building performance index (BPI)

BPI is a verification method for demonstrating compliance with Clause H1 is the requirement that buildings must have a maximum building performance index (BPI) of 1.55. The BPI or heating energy of a building is calculated using the formula:

$$\text{BPI} = \frac{\text{heating energy}}{\text{heating degrees total} \times (\text{floor area} + \text{total wall area})}$$

It may be determined using the BRANZ ALF 3.2 (Annual Loss Factor) tool, which is available on the BRANZ website at www.branz.co.nz/alf and

provides a solution to demonstrate compliance with clause H1.

Modelling method

If the proposed building does not meet the criteria required for the schedule or calculation methods, the modelling method must be used. This involves computer simulation to predict the energy use of a proposed building and compare it with a reference building. This is a verification method.

E3 has minimum R-values

E3/AS1 *Internal moisture* sets out minimum R-value requirements for ceilings and walls for the prevention of fungal growth. If the E3/AS1 minimum R-values are greater than those calculated using any of the three methods of compliance under NZS 4218, the construction R-values must be raised to E3/AS1 R-values. R-values below those in E3 are not permitted for any of the H1 compliance methods.

NZS 4218:2004 or 2009

The compliance document for clause H1 cites NZS 4218:2004 *Energy efficiency – Small building envelope*. The revised standard, NZS 4218:2009 *Thermal insulation – Housing and small buildings* supersedes the 2004 standard but, as the 2004 standard is currently still the cited standard, it is the Acceptable Solution.

BRANZ recommends designers use NZS 4218:2009 as it is easier to understand and apply but it must be used as an Alternative Solution. Do not mix and match the two standards. ◀