



RESIDENTIAL INSULATION

By taking advantage of concrete's thermal mass, in combination with an appropriate level of roof insulation and glazing, the Litecrete external walls regulate internal temperatures to provide a healthy and energy efficient living environment throughout the year.

These benefits are achieved during winter as, when the sun is at its lowest angle, the Litecrete walls directly absorb the sun's energy. As the sun goes down towards evening, the accumulated heat is gradually released back into the house to maintain a constant temperature.

During summer the reverse takes place. In combination with shading to prevent the high-angled sun from directly entering the house, the Litecrete walls absorb excess heat to balance the internal temperature. At night, opened windows purge the Litecrete walls of heat build-up, enabling them to cool and become ready to again absorb excess heat the following day.

Lower energy bills

The same qualities that bring you the quiet and comfort of a Litecrete home also brings the peace of mind of saving money. Litecrete homes can often reduce energy bills by up to 40% compared to timber framed homes.

The thermal mass of Litecrete will:

- optimise benefits of solar gain; reduce energy use by up to 40%
- smooth out fluctuations in internal temperatures
- with night time ventilation eliminate the need for day time cooling
- when combined with air-conditioning, reduce the energy used for cooling by up to 50%
- make use of low-temperature heat sources such as heat pumps
- help to reduce emissions of CO₂, the main greenhouse gas

Thermal mass is particularly beneficial where there is a big difference between day and night outdoor temperatures.

WHERE DOES THE HEAT GO?



NZBC Clause H1 – Energy Efficiency to NZS 4218:2009

The Building Code Clause H1 Energy Efficiency is defined in the revised New Zealand Standard 4218:2009. Residential construction categories are changed to:

1. Non-solid Construction; eg (timber framing with various types of exterior cladding), or
2. Solid Timber Walls (such as "Lockwood" type system), or
3. Solid Construction – excluding timber (concrete or masonry)

Litecrete falls under the definition of Solid Construction – excluding timber. Because of the benefits of the thermal mass of the concrete (its ability to absorb and slowly dissipate energy) this category has been allocated a dispensation in R-value requirements compared to Categories 1 and 2. Following are Category 3 requirements for the various climate zones:



Zone 1: Northland, Auckland and Coromandel, Option 1 (a)	R0.8	Solid Construction – excluding timber 220 mm thick panels (R0.8)
Zone 2: Rest of North Island except Volcanic Plateau, Option 2 (a)	R1.0	Solid Construction – excluding timber 280 mm thick panels (R1.0)
Zone 3: South Island and Volcanic Plateau, Option 3 (a)	R1.2	Solid Construction – excluding timber 330 mm thick panels (R1.2)

The Standard provides for three methods of compliance:

1. The Schedule Method shall only be used where:
 - (a) The glazing area is 30% or less of the total wall area;
 - (b) The combined area of glazing on the east, south and west-facing walls is 30% or less of the combined total area of these walls;
 - (c) The skylight area is no more than 1.2 m² or 1.2% of the total roof area (whichever is the greater);
 - (d) The total area of decorative glazing and louvers is 3 m² or less
2. The Calculation Method shall only be used where:
The glazing area is 40% or less of the total wall area
3. The Modelling Method shall only be used where:
The glazing area is more than 40% of the total wall area

* Note that installing insulation on the internal face of standard precast concrete or masonry negates the benefits of thermal mass.