

Home Insulation – Overview



The best way to save on your energy costs, and keep warm and healthy is to make sure your home is properly insulated. Insulation that is installed correctly and is the right thickness is key to creating and maintaining an energy efficient and healthy home environment.

A well-insulated home provides comfort all year; cooler in the summer and warmer in the winter.

The thermal envelope

The ‘thermal envelope’ describes the building elements that separate inside from outside. These elements are where heat can be lost - ceilings, walls, windows, floors and air leakages. As ceiling and floor spaces are accessible in most homes this is where the most cost effective insulation upgrades can be made.

Insulation must be installed correctly, otherwise it cannot perform properly and will not last as long as manufacturer guidelines.

It should be installed in all accessible areas, completely free from gaps, tucks, folds, compression, bends and moisture. See New Zealand Standards for installing insulation

NZS:4246 (2016) for full details and guidance.

Ceiling insulation thickness

Up to 35% of heat in an un-insulated house is lost through the ceiling.

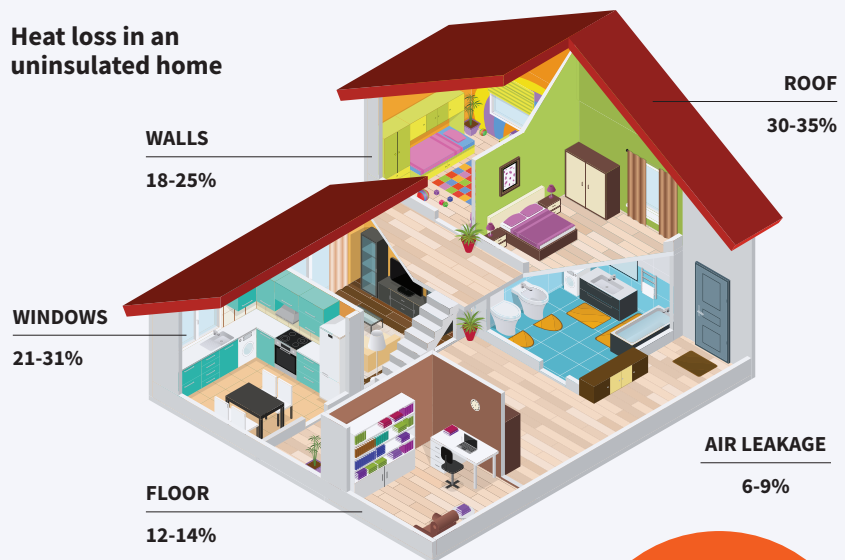
NZ Building code for the Wellington region states ceilings should be insulated to R2.9 (around 200mm thick depending on the material). Best practice is blanket insulation that covers the joists and caps heat loss through the wooden framing.

Old or poor quality insulation settles, thinning like an old blanket. If the insulation in your ceiling is less than 200mm thick (or more than 10 years old) it could benefit from a top-up.

Insulation

- Makes your home easier and cheaper to heat
- Reduces the risk of mould and mildew growth
- Makes your home healthier and more comfortable to live in
- Can last up to 50 years depending on material and installation

Heat loss in an uninsulated home



Did you know? When insulation became mandatory in 1978 the minimum recommended thickness was R1.9 (70-100mm depending on material). It's now R2.9 (around 200mm) because building research proves homes need thick, properly installed, insulation to be warm and energy efficient.

Downlights

Downlights often prevent ceiling insulation performing well. They are a fire risk and need around 100mm clearance to prevent heat damage. Heat and energy escape out of gaps in insulation, so one downlight per 10 square metre area negates insulation by up to 18%.

The ideal solution is to replace old downlights with insulation-coverable rated LED downlights. LEDs use up to 90% less energy than standard downlights and insulation can cover them safely – creating a consistent layer of ceiling insulation for your thermal envelope.

Underfloor insulation

Between 12-14% of the heat in an uninsulated house is lost through the floor. Gaps and breaks in existing underfloor insulation allow heat to

escape and moisture to rise through the flooring into the home. It can also cause uncomfortable draughts to come up through the floor boards.

Underfloors should be insulated to minimum R1.4. The thickness varies depending on the density of the product. If your underfloor is exposed to high wind flow (i.e. suspended floor on stilts) then consider a high density underfloor product that will perform better in high wind conditions.

Old foil insulation should be replaced with bulk insulation because it loses its reflective properties and thermal value over time.

Did you know? New insulation is much better quality than pre-2006 standards, with manufacturer guarantees of around 50 years.

Ground vapour barrier

If damp soil beneath a house is exposed, moisture will rise into the house and raise the inside relative humidity. Up to 40 litres of water a day is released from exposed soil under a 100sqm home.

'Rising damp' can allow mould to grow and cause moisture problems such as condensation on walls and windows. A house with a high

moisture content is often colder and more expensive to heat.

A ground vapour barrier can block damp rising into the house. Thick black polythene 250 microns thick is ideal – especially if you have a fully enclosed underfloor (4 solid walls).

A poorly insulated home can be so expensive to heat to healthy temperatures that some people give up entirely. But cold air temperatures can lead to serious health issues like asthma, bronchitis and rheumatic fever.

Did you know? Research proves the benefit-cost of retrofit insulation is 6:1 for children and older people, and 4:1 for everyone else. That means for every dollar spent, \$4-6 is saved.

Top tips

- Use NZ made polyester or fibreglass insulation. They are high quality, contain recycled materials and create jobs for kiwis
- Use a professional installer like Sustainability Trust for best fit to building standards
- If your insulation was installed 10 years ago or more, get it checked
- Lots of people can get 50% off insulation with Government funding for homes and rentals - ask us for details
- The Greater Wellington rates loan scheme provides long term, low cost finance for insulation linked to property rates - ask us for details



Sustainability Trust provides advice and sells products which result in drier, healthier homes. All profits are invested in our award-winning community programmes that empower everyone to live more sustainably.

