

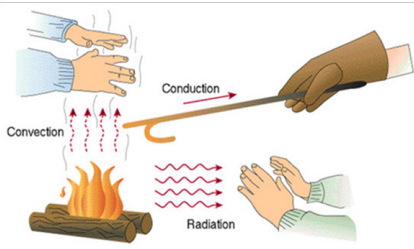
Principles of Insulation

Heat travels from a warmer place to a cooler place, and the rate at which it moves is determined by the temperature difference between the two places and the thermal resistance between them, or how easily the heat energy can move. To keep a room at a comfortable temperature you have to counter this flow of energy, replacing heat lost in Winter and heat gained in Summer.

There are three methods of heat transfer :

1. Conduction

Conduction is heat travelling through a solid object e.g. heat transferring through your ceiling plaster



2. Convection

Convection is heat travelling via fluid

motion, which is primarily air movement in houses. This includes the 'hot air rises, cool air falls' principle but also the movement of air through draughts.

3. Radiation

Radiation is the transfer of heat as infra-red energy. This can be clearly felt as heat radiating off a hot brick wall in summer, and is significant in many ways around the home.

Insulating a house is about controlling these methods of heat flow by increasing the thermal resistance. Air is a very good insulator if it can be held still to stop convection. This is how insulation batts work, by trapping lots of air in small pockets, and is also the principle behind double glazing.

Thermal resistance in insulation is measured by the R-value, with higher being better. It is a standardised measurement, so you can compare different types of insulation. R4 means R4, whether it's polyester batts or a bunch of chicken roosting in your roof. This applies best to conduction and batts, but is also used to compare reflective insulation. Be aware that the R value of reflective insulation may not indicate it's true effectiveness in a given situation. e.g. it is very effective under a hot tin roof.

The recommended minimum for ceilings in Melbourne is R3, but we recommend R4 - R4.5 as the sweet spot, with prices increasing after that for little extra practical insulation difference.

The EnviroShop stocks a range of insulation options, and we have the knowledge to help you choose the right product for your situation.

Ask us for a free estimate for improving the insulation value of your home.



Shop locations

253 High Street
Northcote, VIC
(03) 8395 3030

49 Lyons Street
Newstead, VIC
(03) 5472 4160

email enquiries : insulation@enviroshop.com.au
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INSULATION



Insulation is one of the best things you can do to improve the comfort and sustainability of your home

Insulation is the perfect tool for making your home sustainable, because not only does it make you feel all warm and fuzzy on the inside by reducing your environmental impact and saving you significant amounts of money, it also makes you feel all warm and fuzzy on the outside by keeping your home more comfortable. Without good insulation your heating and cooling systems are wasting energy, no matter how efficient they are.

Insulation Installation



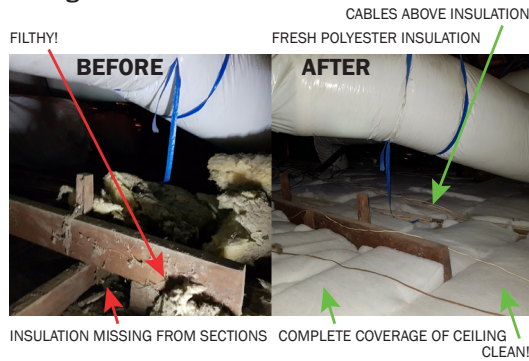
Thermal image showing clearance around downlight and missing batts.

Getting a good installer is critical to having good insulation. Gaps and incomplete coverage will severely compromise the insulation value more than you would think, with 5% gaps resulting in around 20% loss of insulation value. There are also possible dangers, like keeping appropriate safety clearances around downlights and keeping electrical cables clear of insulation.

Like any good tradie, a good installer will take care of your home and clean up after themselves. A reputable installer will also have proper insurance to cover the possibility of any damage to your home.

What about existing insulation?

Insulation degrades over time, with different types having varying lifespans. Loose fill insulation, especially paper-based cellulose, is the shortest, with polyester generally lasting the longest.



If your insulation is too far gone, we recommend replacing it and getting your roof cavity cleaned to remove all the dust and other debris that builds up.

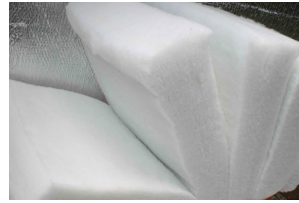
Sometimes your existing insulation is still in good condition, but has been poorly installed or not replaced properly after trades have worked in your roof. We can also organise a re-install and top-up with some fresh batts, if that is the best solution.

What about a flat roof?

Flat roofs or cathedral ceilings are difficult. They're rarely well insulated and the smaller gap between roof and ceiling means greater heat transfer. Insulating them requires getting a roof plumber to lift the roof, install insulation and then replace it. This can be expensive, but is usually well worth it for the improvement in comfort and efficiency.

Bulk Insulation - Batts

Polyester Batts



Our recommended type of batt, they are made from up to 85% recycled content, are irritant-free, unaffected by mould, mildew and rot, resistant to vermin, naturally fire retardant and recyclable at end of life. They contain no chemical binders, insect repellents or fire retardants and have excellent long term stability. Our recommended brands are made in Australia under strict quality and environmental controls.

Some rodents like glass fibre batts for nesting material, which is one reason why we prefer polyester. Another reason is that polyester is more stable with time and gravity, with less of a tendency to sag and compress.

Glass / Mineral Fibre Batts

Traditional insulation batts are made from melted glass or rock spun into fibres and held together with binders. These binders are usually resins that are not very sustainable and can off-gas formaldehyde and other toxins. Our preferred glass fibre batt is made from recycled glass bottles and sand using a sustainable binder which makes it much nicer to handle than traditional glasswool insulation.



Glass fibre insulation has a higher R value per cm of thickness than polyester, which makes it useful for situations with limited space such as cathedral ceilings or tiny houses.

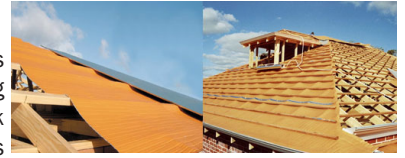
Other types of bulk insulation

Blow-in or loose-fill insulation is quicker and cheaper to install than batts, but also tends to move around and settle over time, resulting in uneven coverage and reducing insulation value. It can also move around downlights and wiring, causing safety issues.

There are several other types of insulation available, including 'natural' fibres such as sheeps wool and cellulose. While they initially seem like a good idea we don't recommend them. The great thing about these materials is that they're bio-degradable and bio-compatible, which means they tend to break down quickly and attract mould, insects and rodents that eat them and build nests. This can mean that they're pumped full of insecticides and other chemicals such as fire retardants, leaving them not very natural. Keep the natural materials near you where you can look after them and enjoy their beauty, put recycled plastic and glass in your ceiling to last for decades instead of into landfill.

Reflective Insulation

Reflective insulation works like a mirror, reflecting infra-red radiation back to it's source. It requires an air gap so the heat gets turned into radiation, otherwise it will simply conduct the heat. It also helps in winter by reflecting the heat from the interior back inside. Sarking is one form of reflective insulation, but there are improved versions with a few mm of insulation between the two reflective layers. Reflective insulation is vastly more effective when it is an airtight layer, acting like a foil hot food bag. One side is usually coloured, but it is just as reflective in the infra-red range as the shiny side. It is coloured to reduce glare as a safety measure for the installers.



Reflective insulation should be installed under any exterior cladding, particularly roofing material.

Underfloor insulation

Underfloor insulation can be very effective for improving the comfort of homes. We mostly recommend polyester insulation for underfloor, because it is permeable for moisture management, strong and won't sag or fall apart under it's own weight and usually won't attract rodents to nest in it. We also recommend some reflective insulation products for underfloor use. Underfloor insulation can be very difficult and expensive to install if access is limited, but if you have good clearance it can be an easy DIY job.

Wall insulation

Walls also should be insulated, but retrofitting existing walls is very difficult and expensive to do effectively. If you are removing cladding for repairs or renovation,



definitely get some batts and reflective insulation into the wall while you have the opportunity, but in our opinion there are other things you can spend the money on that will make a bigger difference to your home than attempting to retrofit wall insulation. One example is windows, they are a much bigger hole in the thermal envelope of your house than a solid wall.

Draught proofing

We need to briefly mention draught-proofing here as part of insulating your home. A well insulated home with significant gaps around doors and windows and other air leakages will not perform well or be comfortable. Before improving your insulation, look at sealing off all the sources of draughts.