

How to insulate the walls of your home.



(weatherboard
or cladded wall
frames)

The need.

The need for better insulation of Tasmanian homes is now well recognised and all new homes have to comply with at least 5-star energy rating.

But what about all those thousands of existing homes, where most of us live?

All around our nation, home owners have been gradually insulating ceilings, windows and floors – because these are relatively easy to do. And that leaves just the walls. And we don't know what to do!

Yet much heat escapes through our walls. As this diagram shows, up to one quarter of all heat loss in a typical home.

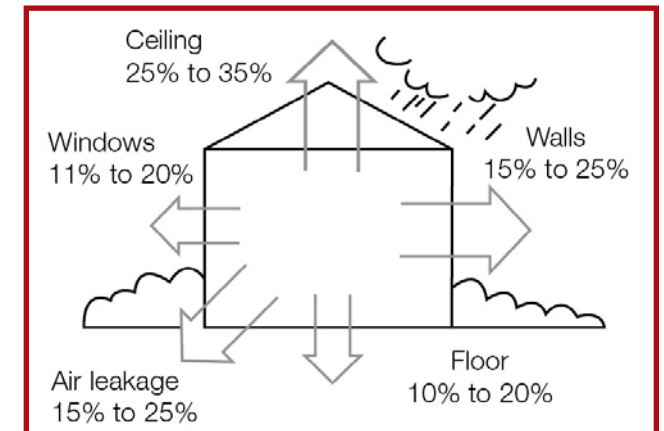
What's worse... when we insulate our other surfaces even more heat then escapes through our walls.

Many remedies.

Lack of access does make wall insulation somewhat more difficult (or expensive) to do, but this need not deter us from improving the wall insulation of our homes.

So let's look at what walls are most worth insulating and various remedies that can be applied.

Keep in mind that a totally uninsulated wall provides very little protection at all – so anything you do to stop heat escaping will have a big impact.



Safety Warning



When insulating any part of your home, note the location of any wiring and electrical fittings.

It is prudent to turn off those electrical circuits at the meter box before attempting to do any work in that area.

Is insulation already in there?

If your home is many decades old than most likely there will be no wall insulation at all. If built within 20 years and it will most likely have just a layer of builders' foil stapled to the studs.

Using a digital thermometer you can easily check the temperature of your wall lining (best done on a cold night).

If the wall is more than one degree colder than your room temperature than you don't have much insulation in there. If the difference is above 2 degrees then you are losing a lot of heat.



Alternatively, ask an electrician to remove a power point and use a torch and small mirror to look inside the wall cavity to see what's in there.

Which walls need to be insulated?

Retrofitting all your walls with insulation can be a very costly exercise, so it is sensible to focus on those walls that lose most heat.

Your primary focus should be your main living area. Most householders sensibly 'zone' their home – i.e. the main living area is heated more than the remainder of the house is.

Then there are specific 'problem' walls – those that lose much heat day and night because they are on the southern or weather-exposed side of your home. Fixing up one such problem wall can make a lot of difference.

R-values

All materials have an R-value. This indicates its resistance to heat flow.

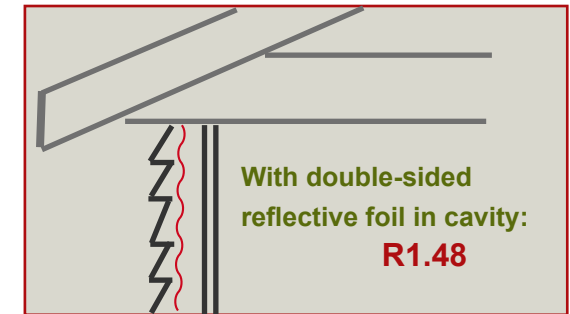
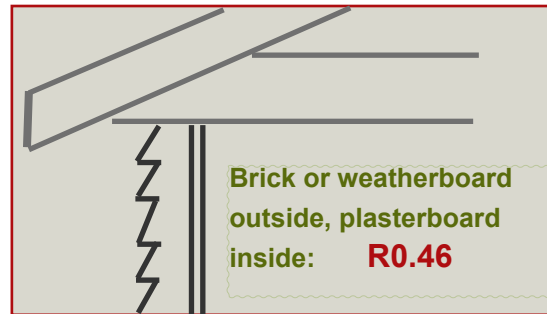
The higher the R-value, the higher the level of insulation the material provides.

Products marked with the same R-value will provide the same insulating performance – if installed correctly.

As shown on the right, an uninsulated wall provides minimal protection from the weather.

The total R-value of a wall is a combination of the R-rating of the materials making up the wall – including still air gaps that are created.

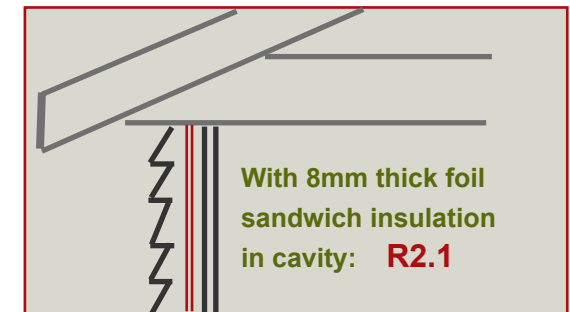
What R-rating should I aim for?



To comply with 5-star performance, homes in Tasmania should try to achieve a minimum wall standard of R2.4.

This may not be feasible in an already constructed wall, but any improvement in a wall's R-rating will greatly improve comfort levels and save you money.

Where practical, it is a good idea to try to exceed the minimum standards, – especially if you are going to the trouble of removing cladding to gain access to the wall cavity.



Paint additives

Some paint additives now on the market claim to help insulate your walls.



Be wary of these, they are very expensive and do not live up to their claims.

Simple ways to add R-value to a wall.

Heat loss through walls can be partially reduced without having to expend a lot of effort or money. Why not try these methods?

- When installing curtains, consider extending the curtained area beyond the windows so that your curtains also cover part of the wall lining. Or you can just hang a curtain over a blank wall, as if it's a window.
- Alternatively, a large wall hanging, backed with felt, can be attached to a problem wall, providing both a decorative and insulating effect.
- Carpet, cork tiles or similar material can be used to make a complete 'feature wall', helping to deaden noise as well as reduce heat losses.
- Where in-built closets or cupboards are attached to a perimeter wall, glue a reflective insulation product onto the back lining of the cupboard. It won't be seen and can add reflected light to the interior of the cupboard.
- Where appearance is not so critical (utility room, child's room) add a lining of caneite, sea grass matting, cork tiles, pin board or foil board to the existing wall lining. The imagination is yours!



Rear of kitchen cupboard lined with spare cork tiles on exterior wall.

Moisture warning.

It is unwise to install soft insulation into timber clad walls without adding a moisture barrier as well.

Most types of soft insulation (batts or loose fill) will transmit moisture, and this can cause serious water stains on your plaster lining, and also lead to rotting of structural timbers.

Some products – styrofoam beads or insulation foams – do not transmit moisture in this way.

Some insulation batts (like *Anticon*) have foil adhered to one side.

Types of wall insulation.

Bulk insulation (like batts) reduces the amount of conductive heat escaping from your home. Its R-value is limited by the thickness of the wall cavity, usually about 90mm.

(Loose fill is less common in walls because it tends to slump over time, leaving a gap at the top.)



Reflective insulation (like builders' foil) prevents 95% of radiated heat from escaping. Its R-value depends on having an air gap next to it.

For wall cavities, it's best to buy 'breather' foil – this has tiny pin hole perforations to prevent moisture build up in the wall cavity.



Some insulation products are sandwiched together (foil is glued to one or both sides) thus reducing both conductive and radiated heat losses.

This is a convenient product for retrofitting into walls because it is fairly rigid and can be readily pushed into place.



Putting insulation inside your walls.

Doing a thorough wall insulation job, means making decisions. What insulation material is best to use? How to get it into the wall?

If either your inner or outer wall cladding is in poor condition:

Then it is sometimes viable to entirely remove the cladding and replace it after insulating – but this requires a lot of work.

If your wall cladding in good condition:

Then it is rarely worth damaging either of these by trying to remove them entirely – invariably there will be damage and waste of materials, aside from the cost and effort required.

In most situations insulation can be successfully inserted into a wall:

1. Carefully remove a couple of boards and feed insulation up and down into the wall cavity (can do it yourself). See next page for method.
2. Cut a number of holes in either the interior or exterior lining and pump in bulk insulation or foam between the studs (this is done commercially).

You would need to get quotes and make sure the installer properly patches up all the holes as part of the quote. A house job like this will typically cost a few thousand dollars.



Removing the existing wall lining (or outer cladding) allows for a total insulation job – adding bulk insulation as well as reflective foil.



Hint

To remove weatherboards or fibro boards without splitting or cracking them you will need to gently prize one up just a few millimetres.

Then, by inserting a hacksaw cut through all the nails that are holding the board to the studs.



With a bit of care and luck, the board will lift off without too much trouble. All you will need is some touch-up paint to restore it at end of job.

Doing it yourself.

Firstly, note how a stud framed wall is constructed. About half way up the wall pieces of wood (nogging) are nailed between the studs.

Since it is hard to get insulation past the nogging, it is best to first remove one weatherboard about half way up the wall. You should then be able to see precisely where the nogging is located.

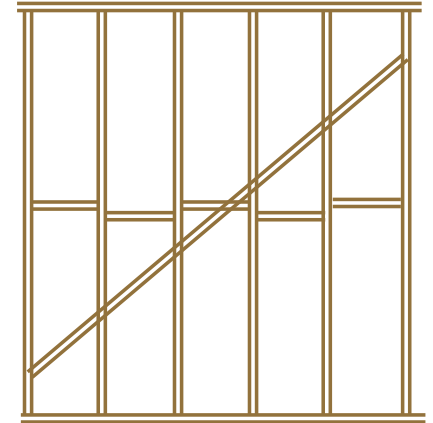
Now remove a second weatherboard so that there is enough gap above and below the nogging to feed the insulation in. With a head torch you can check to see if there is any electrical wiring or other obstruction within the wall cavity.

It should now be possible to feed in insulation material to the top and bottom plates of the wall frame.

If using a foil sandwich product (*pictured*), simply push it in until it stops. It will fit snugly against the studs. If using batts, you will need to use a bendable stick or piece of hose pipe to try to make sure it completely fills the cavity.

Studs are normally spaced 420 mm apart and insulation comes in standard width. However, where studs are placed closer to each other you may need to cut the insulation to correct width.

Snuggly fitted insulation will stay in place by friction, but do use a couple of staples or small nails to prevent it from slipping down.



Hints

- If using a loose fill product, you will need to take off one weatherboard (at the top of the framed wall, just below the top wall plate) and work the insulation down between the studs as best you can.
- If using batts in conjunction with reflective foil, try to keep an air space of at least 25 mm between the batts and the foil – or the R-value will be reduced.

This educational resource was produced by Waterworks Community as part of its Climate Connect project.

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Where to get insulation products (Hobart).

There are at least two brands of foil sandwich insulation on the market: [E-Therm](#) and [Air-Cell](#). E-Therm can be purchased from *The Fibreglass Shop*, 202 Argyle Street. Larger rolls can be obtained at *Cool or Cosy* 116 Gormanston Rd, Moonah.

[Anticon](#) (fibreglass blanket with foil on one side) is available from *Bunnings*.

Rolls of reflective foil, including perforated foil, can be obtained at any hardware store.

[Concertina foil](#) is a useful product, available at *Bunnings Hardware* stores.

Wool insulation batts (70% wool) can be obtained from *Thermowool*, Ph 6272 3189.

Plaster board with foil adhered to the reverse side is available from most plaster board suppliers.

Pumped-in foam can be installed by [Eco Foam](#), based in Melbourne. (Earlier foam products used to be highly toxic, however these newer foams are purported to be non-toxic.)

Digital thermometers (to diagnose heat losses) can be bought at *Jaycar*, 245 Main Rd Derwent Park. Or you can borrow one from *Sustainable Living Tasmania*, ph 6234 5566.

Recommended reading.

From *Your Home Technical Manual*. [Insulation overview](#) & [Installing insulation](#)

From *Sustainability Victoria* [Insulation guide](#)

From *Choice Magazine*: [Insulation buying guide](#)

From *Sustainable Living Tasmania*: [Insulation fact sheet](#)