The benefits of insulating your home

Some of the main reasons for insulating your home are:

- Insulation, correctly installed, allows your home to stay considerably warmer in winter and cooler in summer, making it much more comfortable to live in.
- It is an important element of an energy efficient house design.
- It will save you money on your heating and cooling bills.
- It helps the environment by reducing the amount of energy required to heat and cool your home and therefore less greenhouse gas will be emitted.

Appropriate insulation will result in reduced energy bills, additional comfort and lower greenhouse gas emissions

What is insulation?

Insulation is the material that is used to reduce the rate of heat transfer through external surfaces in the home. Basically, when you insulate your home you are wrapping it in a “protective blanket” which reduces the transfer of heat into and out of the house. Heat always flows from a warm object or area to a cold one and the rate of that flow depends on the materials used. In winter it reduces the rate at which heat is lost from the home, and in summer it reduces the rate of heat entry into the home. You will probably be surprised at how much heat a house can absorb in summer or lose in winter. For example, in an uninsulated house on a hot day, heat is conducted easily through your roof, windows and walls from outside, raising the temperature inside.

As a generalisation, in an uninsulated house, 40% of the heat loss from the house takes place through the roof; another 35% through the walls and floor while the remaining 25% escapes from windows or draughts.

What is an insulation ‘R–value’?

The level or performance of an insulation product is measured by its Thermal Resistance or ‘R-value’. This is a measurement of the insulation’s resistance to heat transfer and is expressed as a number normally between 1 and 4. The greater the ‘R-value’, the more effective is the insulation at resisting conducted heat flow into the building in summer, and out of it in winter. Therefore the ‘R-value’ is actually a measure of performance. One brand of insulation may be thicker or thinner than another, but if they both show the same ‘R-value’, they will perform equally.

What is the recommended ‘R-value’ for your location?

The recommendations for the correct ‘R-value’ are based on the climatic conditions in particular locations. These values are recommended in Australian Standard AS 2627.1 1993. In South Australia the recommended ‘R-value’ for a house in the Adelaide plains is R 3.0 on the ceiling, and R 1.5 (brick veneer) or R 1.0 (double brick) in walls.

Please check the map inside for details of your area.

Note that the recommended ‘R-value’ of the ceiling is approximately double that of the walls and varies with change of climate.

What types of insulation are there?

There are two basic types of insulation - bulk insulation and reflective foil insulation. Some insulation products also use a combination of bulk insulation and reflective foil to achieve their insulating effect.
Bulk insulation
This is the type of insulation that most people are familiar with. The insulation material itself is usually fibreglass mineral wool (also called rockwool), synthetic fibre or sheep’s wool. These products come in two forms, either in long rolls (called blankets) which must be cut to fit the length of space, or in precut lengths (called batts).

Blankets usually come with a moisture barrier, foil or plain paper backing and batts can come with or without backing. If there’s easy access to the space needing insulation, batts are a common choice material. In vertical stud walls, blankets are cut and stapled in place or batts are fitted into the stud wall spaces.

In a horizontal space like a roof space, blankets or batts are simply laid between the timber joists.

Loose fill
Loose fill insulation has no backing and is supplied loose. It is simply poured or pumped into a wall cavity or the roof space. Since there’s no cutting, fitting or stapling it’s one of the fastest and easiest forms of insulation to install. A water resistant grade of loose fill should be used to insulate external cavity walls. Loose fill materials include mineral wool and cellulose. Cellulose fibre is made from recycled paper which has been chemically treated to resist fire, rot and vermin. The advantage of loose fill insulation is that it is not restricted to standard sizes or shapes. The areas between the ceiling joists are filled, blocking gaps and preventing any seepage of heat.

Rigid insulation
Rigid insulation comes in precut boards that are used primarily in new home construction. They are also ideal for insulating areas such as raked ceilings, solid brick external walls, under wooden floors and around concrete slabs. Extruded polystyrene boards are most commonly used because of their rigidity and strength. Although the boards are good insulators, they lose effectiveness if installed without a tight seal between them.

Reflective foil insulation
Reflective foil insulation has an ability to minimise radiant heat transfer. It can also act as a water proofing membrane under a roof and as a moisture barrier in roofs and walls. Foil is often bonded to rockwool batts, foam batts or plasterboard, providing insulation benefits in both directions. Foil is available in single or multi-layered forms. In the multi-layered form, the air pocket between the layers provides some extra insulating benefit. When using single layer reflective foil under a tiled or metal roof, bulk insulation may still be needed at the ceiling level to achieve a good level of insulation through all seasons.

Hints and tips when buying insulation
1. Buy by the ‘R - Value’ only!
The level or performance of an insulation product is measured by its Thermal Resistance or R – Value. The greater the R-value, the more effective is the insulation at resisting conducted heat flow into the building in summer, and out of it in winter. Insulations with the same R-value have the same insulation performance no matter what materials are used. Batts of an R-value of 2.5, for example, will perform exactly the same as loose fill insulation with an R - value of 2.5.

2. Always get multiple quotes
Always get multiple quotes and ensure they all stipulate the correct R-value and relevant certification. As long as they are installed correctly, insulations with the same R-value have the same insulation performance.

3. Beware of the hot box syndrome
If insulation is installed without adequate window shading, heat can build-up inside the home until inside temperatures are higher than outside temperatures. In this case, the insulation will help to keep the heat inside, creating an oven effect. Always provide adequate shading for these windows first.

4. Fire Protection
Make sure your insulation has been properly treated or is a non combustible product. If this is not the case, some insulation materials may be combustible and a fire hazard. This is identified by its Fire Rating according to AS 1530.3.
How should insulation be installed?

The insulation should be installed allowing batts to expand to their natural thickness, cut neatly to fit snugly between ceiling joists, and kept clear of recessed light fittings. Blow in insulation should be sprayed with a solution that prevents disturbance from breezes within the ceiling spaces.

Make sure your insulation is certified in writing by the installer as being to Australian Standard AS3999.
FAQ’s

Save money and cool global warming!

It is important that we all contribute to minimising Greenhouse Gas Emissions. Each of us can take the lead in reducing our own household’s use of energy through:

- Energy efficient housing design
- Selection of the most appropriate energy fuel source
- Selection of energy efficient appliances and technology
- Minimising our need for energy use

**Q** What is the best type of insulation?

**A** There are many types of insulation to choose from, however the R-value is a direct, standardised comparison of insulation effectiveness. There may be some other factors that influence your choice of insulation product, for example limited roof space or other installation difficulties. Talk to several insulation suppliers about their products before committing to purchase, and remember that the R-value is a direct comparison of insulation performance.

**Q** Is ‘foil’ under the roof an advantage?

**A** Foil under the roof has advantages in providing waterproofing and also helps to reduce radiant heat transfer into the home. This can mean a reduction in the temperatures inside your home during summer. It is important to also use insulation to prevent heat loss during winter or convective heat entry in summer.

**Q** Does old insulation lose its efficiency?

**A** Most forms of insulation decrease in efficiency over time. Energy SA’s recommended R-values for various areas in South Australia take this reduction in efficiency into account.

**Q** Will a roof ventilator reduce temperatures inside my house?

**A** While these devices undoubtedly allow hot air to escape from your roof space, there is little clear evidence that they significantly affect the internal room temperatures in rooms below, when ceilings are insulated to the recommended levels. They may assist in removing moist air from bathroom exhaust fans, although this is likely to be of more concern in winter.

**Q** I am getting a lot of conflicting information about insulation from different suppliers. Who do I believe?

**A** The insulation market is very competitive, and there are many claims regarding the relative performances and safety of various products. We suggest:

1. Treat bold claims from suppliers cautiously.
2. Identify any installation difficulties and discuss with the supplier.
3. Get three quotes from reputable companies, and if you are satisfied with the company and the price and its performance, choose accordingly. Remember that it is the R value that determines the performance of the product, not what it is made from.

For further energy efficiency advice?

Log on to the Energy Division website for information and advice through the ‘Advisory - Residential’ links @ www.energy.sa.gov.au

Call our Advisory Service on 8204 1888 (Freecall™ for country callers 1800 671 907)

email us at energy.sa@sa.gov.au