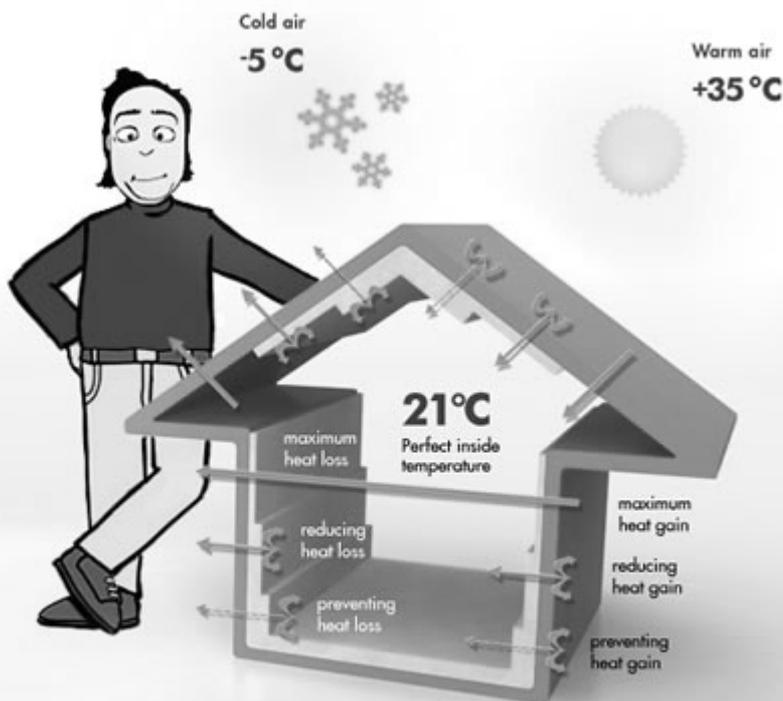


## Why Insulation?

Here are five good reasons to insulate your home.

1. Insulation saves energy and money. Insulation in an empty loft can pay for itself in just over 1 year because you don't need to put your heating or air-conditioning (or more likely fans) on as much which lowers your energy bills. Insulating both walls and lofts can save a household around £200 every year in heating costs.
2. It helps fight global warming and climate change. If every home in the UK installed cavity wall and loft insulation CO<sub>2</sub> emissions would be cut by 10.8 million tonnes.
3. It makes your house more comfortable to live in. Your home will be warmer in winter and cooler in summer.
4. It's important to choose the right kind of insulation. For instance, insulation made out of glass wool (such as Space Blanket or Space Combi-Roll) is made from up to 15% recycled glass bottles per roll, making it even better for the environment.
5. It increases resistance of your home to fire. Insulation made out of glass wool and stone wool can protect your home from fire. They both have an unbeatable A1 fire classification making them highly fire resistant.

## How insulation works



Insulation is fantastic. Not only does it make your home warmer in winter, it also helps keep it cooler in summer. This is because insulation traps air inside, warm in winter and cool in summer. This slows down the speed the outside temperature affects your house. The bigger the temperature difference between the outside and the inside of your house, the more insulation you need.

This also means of course that you do not need to have the heating on as much during the colder months, and can go easy on air-conditioning and fans in the hotter months. Long term this benefits both the environment and your finances. As a general rule - if you currently have no insulation in your

loft at all, installing it will pay for itself in a year. There are many different figures quoted for how much money insulation will save you. The answer is that it depends on a number of different factors, such as how much insulation you currently have, the average temperature difference between the outside and the inside of your property and the type of fuel you use to heat or cool your property.

Unlike a boiler or double-glazing, insulation requires no maintenance or replacement. It works as good as the day it was installed.

### Types of insulation

The most familiar forms of insulation are the commonly used glass wool or mineral wool. Glass wool and rock mineral wool are extremely versatile lightweight materials which can be used in a wide range of buildings. They are very similar products and are very good at maintaining a comfortable indoor temperature, and keeping noise levels down. Both are suitable for many different applications, most common of which are in lofts, floors and walls.

It can be produced in rolls of different widths and thicknesses for quick and simple installation between the rafters in a roof or joists in floors for lofts and rooms in a roof. It can also be moulded into lightweight, semi-rigid or rigid 'slabs' which are water-repellent for inserting in cavity walls. Mineral Wool is a non metallic, inorganic product manufactured from glass or rock, both of which perform similar functions. Its discovery was first made in Hawaii.

It is a very versatile material, and can be manufactured to many different densities to give varying properties, formed in various shapes and faced with a variety of sheet materials. The range of products includes loose granular material used for injected insulation of cavity walls, slabs for walls, rolls for loft insulation through to pre-formed and faced pipe sections, ceiling tiles and acoustic panels.

Mineral wool has a unique range of properties combining high thermal resistance with long-term stability. It is made from molten glass, stone or slag that is spun into a fibre-like structure.

Glass wool and rock mineral wool are also the ideal fire protection materials as they do not burn and they can prevent fire spreading. Both have unbeatable A1 fire classification – in fact, rock mineral wool can resist temperatures above 1000°C.

As glass mineral wool is made from pure silica sand, it will not support combustion even in direct, prolonged contact with flames. What's more, it emits no toxic fumes or smoke, the two biggest hazards to health and life in the event of a fire. This rating system is now written into the UK Building Regulations offering building occupants more peace of mind. Other methods of insulation available are:

### PIR rigid board – Polyisocyanurate.

Polyisocyanurate (PIR) is an improved type of rigid polyurethane.

The production process creates strong isocyanurate linkages in the molecular structure. Chemical breakdown of the foam occurs at higher temperatures than PUR, so it is much more difficult to ignite.

True polyisocyanurate foam contains about 50% or more isocyanurate linkages.

Usually available as rigid boards, it is easy to cut and shape. This is the most suitable for use under floors, but can also be used in walls and roofs if it is not essential to control noise and fire resistance.

Degradation of PIR commences at a higher temperature than PUR. A fire would need to be much more seriously developed before PIR foam might significantly contribute to the spread of the fire through a building.

PIR also forms a surface char, helping to insulate the underlying foam from the fire.

There are many different permutations of this rigid insulation, the most familiar having foil type facings both sides. Well known names for this type of insulation are Celotex and Kingspan, but there are several other manufacturers.

### Multi-layered foil

Comprising of many thin woven layers, these are:

External reflective foils

Wadding layers

Foam layers

Internal reflective foils.

On average the overall thickness of the material is no more than 30mm

This form of insulation although not widespread in its use here has been adopted on a couple of new build jobs. It is a form of insulation that may well become popular in the future owing to the fact that it comes in rolls, can be easily fixed and provides substantial insulation compared to its thickness. As an example, one particular brand when tested independently was found to have the insulation qualities equivalent to 210mm of mineral wool.

Effective both in summer and winter:

In winter it helps retain heat within the building

In summer it reflects radiation preventing overheating of attic rooms

Space saving

Clean and free from irritant fibres

Durable and should not sag. It is moisture resistant

Quick and easy to install. It is flexible and can be cut with scissors or specialist cutter, is secured by stapling.

Some specific makes of multi-layered foil insulation actually incorporate a vapour membrane into one of the external faces which means it can be used without further vapour membrane in a timber framed construction.

### Potential problems associated with insulation

Generally speaking there are no problems associated with insulation providing it is installed strictly in accordance with the manufacturer's instructions.

There are a couple of associated issues to bear in mind however. These are:

1. Where glass or mineral wool is to be placed in a roof void at ceiling level, it is advisable to provide some form of ventilation to that roof void. Condensation can on occasions form on the surface of the insulation especially in the winter. In the worst cases it can cause the insulation to become sodden when it does not function to its full capacity, pattern staining will eventually become visible on the ceiling below. Ultimately if allowed to continue undiagnosed the timbers in the roof space can rot and lose their structural capabilities.
2. If down-lighters are to be incorporated into a ceiling with insulation above, care must be taken not to cover the top of the down-lighter. As they can get quite hot it is advisable to either clear a gap around the fitting or provide a purpose made cover to the unit and run the insulation over the top of that.
3. Always try to maintain a continuity of insulation around the building envelope. For example insulation in the roof void should overlap wall insulation at soffit level wherever possible. This avoids the creation of what is termed a cold-bridge. In other words a potential cold spot in an

otherwise insulated element of the building. Again, in the worst case if there is an excess of moisture in the building, condensation and subsequently mould can form in the area of the cold-bridge.

4. Don't be tempted to squeeze mineral wool insulation into a void that is too small for its design thickness. For example compressing 150mm of insulation into a 100mm timber frame could actually reduce the insulating properties of the product rather than increase it. It is the air trapped in the body of the insulant in this material which helps give the insulating properties.
5. Placing insulation over electrical wiring especially old wiring could in some instances lead to over-heating. This in turn could cause further problems including the threat of a fire starting in a concealed void.