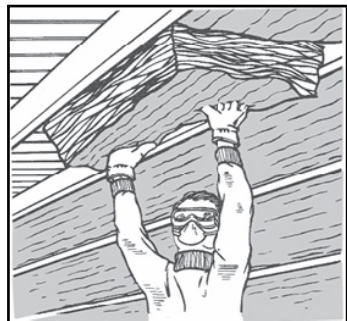


The Importance Of Being Insulated

Improving the thermal performance of your house by increasing the level of insulation is one of the most cost effective ways of reducing the amount of energy you need. The amount of heat that passes through an element of the building envelope is determined by its thermal resistance. The better the insulation, the slower the heat escapes, and the less energy you need to heat your building. The envelope of a building is made up of its roof, walls (including windows and doors) and floor. All these can be improved to reduce the amount of energy your house uses.

Roofs



Roofs can be split basically into pitched and flat. In technical terms, a pitched roof is probably a roof greater in pitch than six degrees and is constructed on a structural frame usually of timber but occasionally of steel. If

timber, it will either be a trussed rafter system or purlins and rafters. The insulation, if it exists, will usually be found on top of the ceiling rafters. To conserve energy it should be a minimum of 200mm, but ideally around 300mm. It is a relatively easy process to increase it as any existing insulation can simply be overlaid. The best product to use is Thermafleecce sheep's wool insulation (all contact details below). However, if this is too expensive, the most readily available material is mineral wool such as that produced by Rockwool.

When upgrading the insulation in a roof at ceiling level, it is necessary not to compromise the ventilation, which is essential for keeping the timber members of the roof free from rot. If the insulation is in the pitch of the roof, it can be increased by using rigid board insulation such as Kingspan, which has to be fixed to inside of the

rafters usually by timber battens. This is the way insulation will have to be applied if you are converting your loft space into additional rooms. Converting your loft is one of the best ways of increasing the thermal performance of your house, though it is an expensive option.

Flat roofs can also be improved. In recent years insulation products have come on the market, which allow you to overlay externally. This is particularly useful with three layer felt roofs that have reached the end of their life. Insulation, such as Kingspan products, is laid first on the existing roof and then the new waterproof membrane is applied. Applying the insulation to the underside of a flat roof is also feasible, but you have to be careful where you position the vapour barrier and where the ventilation is.

Green and Brown Roofs

Green roofs are vegetated roofs or roofs with vegetated spaces. They can be extensive, which are lightweight and easily maintained, made of low growing plants such as sedum, or intensive which have a greater depth of growing medium allowing the growth of lawns shrubs and even trees and are therefore impractical in almost all domestic situations. Green roof systems are recognised as providing greater thermal performance and roof insulation for the buildings they are laid on; keeping the heat in during the winter, and in the summer providing a relatively cool environment. A green roof is usually composed of a waterproof membrane followed by a root barrier, a layer of insulation, a drainage layer, the growing medium or soil substrate and the plant material therefore providing continuous uninterrupted layers of protection and drainage. Flat roofs lend themselves most readily to being greened but it is possible to green other types such as pitched, domed and barrel roofs. However, in these cases, restraints are needed to ensure that the growing medium does not slide off. According to Dusty Gedge (urban ecologist) it is possible for an experienced DIYer to create a green roof on their Garage or shed (for instructions see Living Roofs

Website). But for a bigger job always go to the professionals, preferably someone who works within the German FLL guidelines. The cost will vary depending on the size of your roof, but a professional job could cost you from around £55 to £120 per square meter. An evolution of the extensive roof is the "brown roof", designed to replicate the original ecology of a site through the use of recycled site material and self seeding.

Walls

The method for improving the thermal performance of your wall will depend on its construction. Cavity brick and blockwork, depending on their age, may not have insulation in the cavity. If this is the case, insulation products can be blown into the cavity. These are predominantly urethane foams or granules. However, probably the better method is to apply insulation externally or internally, as you would have to for a solid wall. Externally, a product such as that supplied by Knauf Insulation is possible but this then has to be waterproofed with a spray on render. This may be fine where a render finish is acceptable, but on historic buildings or those in conservation areas this may not be acceptable. Perhaps the easier method is to line your walls internally. This requires fixing a timber or metal batten system on to the walls. The space between the battens is then filled with insulation such as Thermafleece or Rockwool as in the roof improvements. This again will be finished in plasterboard. The downside of this method is that it reduces the size of the rooms, and all doors and windows have to have new timber work. A simpler method of improving the thermal performance of your walls is to improve the weakest points, the doors and the windows. By changing your windows and doors to timber double-glazed airtight windows, you will have a relatively quick payback. You should avoid UPVC but if you cannot use timber, mill finish aluminium could be used, as it is recyclable.

Floors

Floors are the hardest to retrofit insulation, unless you have a suspended wooden floor. With these the floorboards will need to be lifted and netting slung between the joists to carry the insulation. Solid floors are more complicated, as all skirting boards will have to be lifted, doors reduced in height, and architraves shortened before the insulation has been overlaid on the existing floor. In addition, a new rigid finish such as plywood will have to be overlaid prior to laying your floor finish. Kingspan products provide the right options.

Conclusions

The actions described above will all improve the thermal performance of your home or other building. Some, such as overlaying additional insulation in your loft can be a DIY item, while others, such as overlaying your floor or lining your wall, may benefit from the involvement of a competent carpenter.

Work on flat roofs is best left to specialist contractors, and may benefit from the involvement of an architect or surveyor. These methods are the best starting point for decreasing your carbon footprint. Following these actions, introducing technology like solar water heating and photovoltaics, wind turbines and ground thermal heat pumps may be considered. However, it is always best to start with decreasing your energy use by improving your insulation.

Contacts:

Kingspan Group plc

Construction systems and insulation

www.kingspan.com

Knauf Insulation

Range of insulation products

www.knaufinsulation.co.uk

Rockwool Ltd

Stone wool insulation for homes and buildings

info@rockwool.co.uk

Second Nature Ltd:

Manufacturers of Thermafleece

info@secondnatureuk.com

Living Roofs

www.livingroofs.org

All recommendations within this leaflet are offered in good faith, with the benefit of related experience and knowledge. However, if you choose to carry any of them out, you do so entirely at your own risk. REN are unable to accept any responsibility for any loss or damage resulting from such action.

Richmond Environment Network

Linking, supporting, developing & promoting local environmental and sustainability activities.

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