



Centre for
Alternative
Technology

SHEEP'S WOOL INSULATION

Information Department, Centre for Alternative Technology, Machynlleth, Powys, SY20 9AZ
Tel: 0845 330 8373 or 01654 705989; Fax: 01654 702782; e-mail: info@cat.org.uk
For more information sheets, see our web site: www.cat.org.uk/information

Background

For thousands of years wool has been used by humans for warmth, and using it for insulating houses is not a new idea – there is evidence of it having been used in Wales, and elsewhere, for many centuries.

More recently, wool insulation was being made in Austria and New Zealand and sold in the UK. With so much UK wool available, it seemed obvious that the development of locally produced insulation would be beneficial. Wool has outstanding physical properties and environmental benefits:

- Strong, durable and easy to handle
- Good thermal performance
- A local, renewable resource
- Low embodied energy (very little energy used in the manufacturing process)
- Reusable and recyclable
- Naturally resistant to fire
- Can be made resistant to fungal and insect attack
- Helps to regulate moisture levels in buildings

Welsh hill sheep have coarse, rough wool, mainly used in the carpet industry because of its strength and thickness. However, it has less value than wool used for clothing and prices have recently been very low. All wool is bought and sold via the British Wool Marketing Board, and about 75% exported.

Using wool in CAT's Information Centre

We wanted to use local wool as insulation because of its enormous environmental advantages, and because it gave us the chance to demonstrate it in a real situation. The wool, from the British Wool Marketing Board, had already been scoured (washed three or four times to clean it and remove the lanolin) and carded (teased and thinned out). It was delivered to us in hanks and we installed it in the wall cavity at a density of around 25kg per cubic metre. The wool was sprayed with Borax, a salt based solution

derived from the naturally occurring mineral salt, boron, which increases its resistance to fire, moths, and other insects. We used a 10:1 mix of water and boron.

Suitability of wool insulation

Wool has good insulating properties and can be used to insulate lofts and sloping ceilings, timber frame walls and suspended timber floors. Like other fibre based quilts, it is only suitable where it can be kept dry, as if wet the extra weight will cause it to slump and sag, eliminating air pockets and affecting its insulating value. We used it in timber frame cavity walls as part of a 'breathing' wall construction, allowing moisture to pass through rather than becoming trapped within the construction.

Sheep dips

One of the few problems with promoting wool as an insulation product is in the routine use of sheep dips in the UK. Tests were done to determine whether any chemical residues were present in washed and unwashed wool, and in general levels of chemical contamination were found to be extremely low and not of concern.

However, there are wider implications from the use of sheep dip, concerning disposal and health risks to farmers, which need to be considered. Not all sheep are dipped, and it may be possible to source wool from organic flocks or from farms that don't dip.

Feasibility of a commercial product

CAT also produced a study on the suitability of local wool as a commercial insulation product, in partnership with Newidiem of Aberystwyth. It was commissioned by Cymad (see below). The study concluded that wool was inherently a good insulator with certain health advantages over other materials, and that the establishment of a local wool processing centre, adding value to local wool, could be viable. Since we

used wool here, some companies have started producing sheep's wool insulation products (see below).

Cost

As it is still a 'niche' product made on a small scale, wool insulation is likely to be many times more expensive than mineral wool. However, with so many advantages for health, the local economy and the wider environment, it is well worth considering. The energy used to manufacture sheep's wool insulation is only about 15% of that used to make mineral fibre insulation.

DIY wool insulation

Manufactured insulation materials have been tested for their properties, and so have certification to show they satisfy standards such as fire retardancy. As long as the material is installed in the way laid out in the certificate, its use will be accepted by Building Control.

If you want to use sheep's wool insulation in a DIY way, it's basically up to you to show Building Control that your approach will meet standards (as opposed to using a certified product which does that work for you). This shouldn't be a problem but will involve extra work and time. Building Control's main interest will be twofold:

Firstly, meeting the requirements of Part L, (relating to thermal performance) of the Building Regulations. This is technically possible as sheep's wool has a similar thermal performance to other fibrous insulation materials, and provided there is the thickness necessary to achieve the values needed for current Building Regs the requirement should be met. But the onus is on you to demonstrate this to your Building Control officer - installing more than the minimum thickness required is a good start.

Secondly, you need to show Building Control how your material will perform in relation to aspects such as fire safety. Read more about Building Regulations & Building Control at www.planningportal.gov.uk

You do need to be more careful with a DIY approach. The wool we used was cleaned and sprayed thoroughly with borax and installed in a sealed cavity, and we haven't

experienced any problems - but we have heard of sheep's wool in lofts becoming infested with moths, possibly because it wasn't sprayed well with borax. Action to address any problems would be disruptive (i.e. opening the construction to treat the wool again or remove it altogether).

Further Information

See our 'AtEIC photo diary' for images of the construction of our information centre and shop building: www.cat.org.uk/media
You can also visit us in mid-Wales to see the centre and other examples of low-impact building: www.cat.org.uk/visitus

For detailed information about choosing building materials and designing a healthy, efficient, and low-impact home, see **The Whole House Book** (by Cindy Harris & Pat Borer). Details at www.cat.org.uk/catpubs

CAT mail order supply many other books on eco-building and energy efficiency: <http://store.cat.org.uk> or 01654 705959

CAT runs **residential courses** on environmental building and refurbishment. www.cat.org.uk/courses or 01654 704952

Contacts

Second Nature UK Tel: 01768 486285
Web: www.secondnatureuk.com

Manufacture and supply Thermafleece insulation from British sheep's wool.

Black Mountain Insulation

Tel: 01745 361 911

Web: www.blackmountaininsulation.com
Manufacture sheep's wool insulation from British fleeces at their North Wales factory.

British Wool Marketing Board

01274 688666 or www.britishwool.org.uk

Centrally arranges collection, grading, sales and promotion of British wool.

CYMAP

Tel: 01766 512300; Web: www.cymad.org

Community development body that has been researching sheep's wool insulation.

Please note: mention of a company does not necessarily constitute recommendation. Potential customers should contact several companies to compare products and prices.