

Concerned consumer, Christine Armstrong has just launched 'Thermafleece' - a natural and environmentally-friendly insulation product that uses a renewable resource abundant on Britain's damp, cloudy hillsides - wool. Christine's boldly simple idea was that what wool does naturally for sheep, it could also do for buildings - but turning this idea into a reality has involved years of research, development and sheer persistence, that have taken Christine and Thermafleece a

Living in and around a Cumbrian farming community all of her working life, Christine had already set up and developed a successful mail-order interior accessories business, which gave her the confidence and experience to move into this new venture.

With the support of her partner, David, who farms sheep on the windswept Cumbrian fells, Christine made a few phone calls to establish the potential of her idea. A few weeks later and to the amazement of her friends, she had sold her beloved first business and embarked upon an exciting new enterprise. Christine's new company - Second Nature UK Ltd - was set up with the intention of creating an environmentally-friendly and entirely British wool insulation product. However, that initial enthusiasm and commitment was to be much needed in the coming months and years

Consumer turns producer





First, understand your market

The first few months were spent gathering as much information as possible about the wool industry, its marketplace and the competition in order to establish the sales potential for the new product. Help and advice was sought from acknowledged experts at The Centre for Alternative Technology, The National Trust, and the roofing products specialists, Klobber Ltd, as well as from family and friends.

Second, build a team

Armed with the necessary background information and determined to see if a product could be manufactured, Christine began to draw together her network of contacts into a broad development team.

Technical analysis of existing insulation products, the specifications for the new product and in-depth knowledge of manufacturing techniques were provided by Stephen Russell, a lecturer in textile development, with his expert team at the Non-Woven Research Group at Leeds University. The Department of Textiles at UMIST in Manchester provided additional information.

Mike Davis, a highly qualified engineering consultant for Business Link, was able to put his skills to good use in overcoming some of the novel manufacturing problems posed by the new material.

Ian Palmer, a specialist Patent Agent, was to provide invaluable help in ensuring that both the finished product and manufacturing process would be patent-protected.

Last but not least, a local design consultancy headed by the appropriately named Mike Shepherd was appointed to create a strong corporate identity for the fledgling Second Nature Ltd as well as a memorable product brand - Thermafleece.

Third, make friends

The British Board of Agreement had to be consulted to ensure the product would meet the stringent requirements of its certification scheme, whilst the British Wool

Board were asked to provide details about obtaining the same coveted Wool Mark that you find inside a quality sweater.

You can't buy wool from just anyone – there are registered wool merchants, who are contracted to buy from the British Wool Marketing Board at their monthly auctions. Christine had to find suppliers who could meet her requirements on price, quantity and quality and who were willing to deal with a new (and female!) entrant to the marketplace.

Fourth, make a product...

To begin manufacture of Thermafleece, Christine produced a laboratory prototype but what seemed to be a fairly simple process soon turned out to be far more complex than she had ever imagined.

For raw wool to be transformed into a usable material it has to first be cleaned through a wet scouring system, where it is successively immersed in at least eight vats of cleansing agents that remove the accumulated dirt, lanolin, twigs and other debris. These by-products are turned into such substances as fertilisers, hand creams etc., or rendered innocuous and disposed of.

Thermafleece is made from the wool of British hill sheep such as the Herdwick and Swaledale breeds. These have relatively coarse fleeces that find little demand in the modern textile industry, but with the right blend are perfect as an insulation material. During the cleaning process the different types of wool are mixed using the precise percentages identified during the research programme, so that the finished product has consistent and predictable characteristics. The blend is then dried and compressed, under many tonnes of pressure, into 200kg blocks.

The cleaned wool then goes through a separate and special textile manufacturing process to attain the uniform thickness and strand length necessary for it to retain its structure and unique physical characteristics.

...get someone else to make it!

Christine quickly realised that buying her own machinery, even second-hand, to carry out this process, and finding premises and staff to operate it would be prohibitively expensive. The only alternative was find an existing manufacturer to take on the work – but how does a new, small company with no track record and an unfamiliar manufacturing process persuade some of Britain's largest textile manufacturers to let them use their multi-million pound machinery? Christine sees, as the most significant landmark for Second Nature, the day when she persuaded a major manufacturer, used only to processing and distributing synthetic products throughout the world, to take on home-grown Thermafleece.

Fifth, iron out the bugs

To meet the strict requirements of building regulations and British Standards the Thermafleece had to be capable of resisting insect attack as well as being fire resistant. Most wool insulants use Boron salts to perform this task - a chemical additive which often costs as much to use as the wool itself and because its toxicity creates major waste-treatment problems. It soon became clear that finding a low-cost, effective but environmentally-friendly alternative insecticide was going to be essential to the success of Thermafleece.

Approaches to various research bodies finally produced the holy grail - a dry, environmentally-friendly alternative to insecticide, that is now the company's patented secret 'pixie dust'. This is a naturally-occurring and inert mineral, that because of its electrostatic properties acts as a desiccant, creating a thoroughly hostile environment for insect larvae. Because it functions by physical rather than chemical means its use has no toxicological implications. The dust was tested over an extended period in a 'moth hotel' - an expensive process that created a frustrating delay to the launch of the product but one

that proved the dust to be highly effective.

Having found this solution, Christine's problems were still by no means over - a method of applying the insecticide that didn't interrupt the highly automated manufacturing process had to be devised. Because the insecticide is highly electrostatic and atmosphere in the wool cleaning process is damp, conventional bulk-handling equipment could not be used. Working together with engineer Mike Davis and a specialist engineering company, a new piece of equipment was created that utilises a compressed air system, thus enabling thorough impregnation of the wool by the dust. This process itself is patent-pending, and could be used to apply the dust to any fibre.

Utilising this combination of advanced materials and novel manufacturing technologies, Second Nature is able to produce one month's supply of Thermafleece in just one day – and expects this to rise rapidly with growing demand. This efficiency and the natural materials used means that wool insulation has the best possible balance of energy - the manufacturing process expends only 14% of the embodied energy used to make glass-fibre insulation. This means that wool insulation pays back its manufacturing energy costs seven times faster. It is also more fire resistant than cellulose and plastics, as wool tends to melt away from a source of ignition and self-extinguish.

At last, to market

It's all very well having a wonderful new environmentally-friendly product, but you still have to tell people about it. Christine has appointed a specialist building products PR consultancy to help promote Thermafleece and this has attracted the attention of international news agency Reuters, BBC Radio, local, regional and national newspapers, leading building and construction publications and a host of other media.

A technical expert, David Bell, has

been enlisted to provide more detailed information to environmentally-conscious architects, designers and end-users about the product and to provide help and advice on installation issues and meeting the requirements of building regulations.

Second Nature Ltd and Thermafleece have come a long way since Christine's initial idea – the product was finally launched just before Christmas 2000, and has already gained major orders from both public and private sectors. For many of us the idea might have remained a daydream – but thanks to Christine's refusal to give up you can now buy the real thing.

Postscript

Doing something positive to help the environment and the British economy, at the same time producing a commercially viable product has been Christine's goal since she first started this project. Starting any new business is a challenging task, and one involving manufacturing a new product, doubly so – but with determination and a great deal of hard work Christine has proved that the problems can be overcome. To the woollen industry and hill farming sector, blighted by long term decline and the recent tragedy of foot

and mouth disease, Thermafleece offers a small sign of hope for the future - an innovative, ecologically sound, commercially viable and totally British wool product.

Thermafleece also has remarkable characteristics in its own right – it compares favourably with all other fibrous insulation materials, requiring no protective clothing during installation, does not irritate the skin, eyes or respiratory tract and meets all current safety standards. It is totally recyclable for use in other environmentally friendly ways at the end of its useful life, which is predicted to be in excess of 50 years.

Thermafleece has not been developed as a cheap alternative to other insulation materials such as glass fibre as it costs significantly more. Specifiers and builders who have shown interest in the product see added value in its ecologically sound nature and in the extra benefits wool brings to a building's environmental performance including summer cooling, winter warming and condensation control.

Thermafleece conforms to all BS Standards required, and can be ordered via the internet, post, telephone or fax.

www.secondnatureuk.com

Tel: 01768 486285 Fax: 01768 486825

Second Nature sheep's wool insulation

Technical data and performance characteristics

Natural wool insulation has a very strong appeal for several reasons: the environmental, technical and performance characteristics easily outdo those of cheaper, artificial insulation; and the importance of sustainable development is something that we have all become much more aware of.

The low thermal conductivity of Thermafleece (0.038W/m.K) compares favourably with that of other fibrous insulants. A range of three thicknesses is available (50mm, 75mm, 100mm), enabling any overall insulation depth to be achieved by combining different thicknesses.

Thermafleece is treated with a fireproofing agent to improve its intrinsic resistance, and complies with BS 5803-4 (Spread of Fire), achieving results of zero for ignitability, spread of flame and heat evolved.

Thickness (tolerance+ / - 5mm)

Thermal Resistance

(mm)	(m ² °K / W)
50	1.29
75	1.94
100	2.58
150	3.87
200	5.16
250	6.45

(Thicknesses above 100mm are made up of multiples of either or both 75mm and 100mm batts)

Performance/testing - international standards

Energy consumption in manufacture: 14.6 MJ/jg or 136 MJ/m³

Thermal conductivity:

0.038W/m.k ISO 8302

Water absorption (@ 100% RH): 40%

Mould resistance: 0 NORM B6010

Moth / beetle proofing:

Based on ISO 3998

Ignition point: 560° C

Spread of fire: BS5803-4

Second Nature UK Ltd can provide technical advice on how to incorporate Thermafleece into different forms of constructions, for both refurbishment and new build projects. They offer:

- A telephone help-line
- Computer U-value and condensation risk analysis calculations
- Site visits by technical staff
- Copies of the relevant reports and samples
- Help and advice on meeting the requirements of Building Regulations

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