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Tŷ-Mawr

ecological building products
deunyddiau adeiladu ecolegol



energy efficiency at Tŷ-Mawr



Caring for buildings...Caring for the environment...Caring for health...

Gofalu am adeiladau...Gofalu am yr amgylchedd...Gofalu am iechyd...

Tŷ-Mawr history

Tŷ-Mawr stands on the southern shore of Llangorse Lake. The current buildings are substantial but are merely part of a larger manor house, much of which was demolished in the 1870's. It has a colourful history e.g the original house features on a map drawn in 1584 as part of a dispute between the Lord of the Manor and the Keeper of the Queen's Jewels (a lady in waiting to Queen Elizabeth I) regarding the taking of eels from the lake!

In 1993, Nigel and Joyce Gervis purchased Tŷ-Mawr. As well as becoming the couple's family home (and a life-time's restoration project), this listed property also proved to be the inspiration for their business Tŷ-Mawr Lime Ltd, which they established in 1995.

Materials

Originally, the primary focus was the manufacture of lime-based building materials for the conservation of old and historic buildings. Lime mortars, plasters and paints have subsequently been supplied to some of the most prestigious conservation, restoration and, more laterally new construction projects in Wales, the borders and indeed all over the UK.

Skills

What soon became apparent to Joyce and Nigel was that, just as UK lime production had diminished to almost nothing in the past fifty years, so had the skills and knowledge base required to use such products. They therefore established an education arm and in 1996 began offering courses in the use of traditional building materials. These courses have proved to be extremely popular and now attract 600 or so delegates per annum.

Tailor-made courses have also been designed and run for a wide range of organisations including Local Authorities, British Waterways, the Canals Trust, the National Trust, Wales and Townscape

Heritage Initiatives. They have also hosted the prestigious Summer School for the Prince's Foundation for the Built Environment with participants from all over the world and delivered a complete training package for the Royal Botanic Gardens in Jordan on the use of lime and local, sustainable materials in innovative new builds.

Supporting the environment

Concern for the environment, particularly with regards to minimising the impact of buildings on the environment, quickly became an important focus for Nigel and Joyce. It remains one of Tŷ-Mawr Lime Ltd's core business principles today.

This philosophy is at the heart of the company's development of a unique range of environmentally-friendly building materials compatible with 'breathing building' principles. The range includes paints and finishes, building boards including woodfibre boards, wood wool boards, reed mats and reed boards, as well as insulation products made from Welsh sheep's wool and another from British hemp.



Nigel and Joyce Gervis receiving "Supplier of the Year Award" at the Royal Welsh Agricultural Show

This dedication to the environment has earned Tŷ-Mawr several awards, particularly for their work in developing 'greener' alternatives to mainstream building products. Examples of this are glaster® - a lime plaster made with recycled glass instead of sand; lime hemp plaster, which uses hemp fibres instead of sand, and Limecrete, an environmentally-friendly alternative to concrete. In 2009, Nigel and Joyce were thrilled to be named

as one of 52 sustainable development champions on the first Welsh Green List - a list recognising the commitment and contribution of individuals in Wales to the environment!



Precious, finite resources!

Old buildings are precious, finite resources, the couples' concern for their care has led them to develop a number of systems and products that help others caring for these buildings to improve their energy efficiency whilst ensuring that they continue to manage moisture in the way they were designed. Many modern insulation materials are being used inappropriately in old buildings, they may have excellent thermal credentials but they potentially trap moisture possibly causing problems of mould growth, condensation and even degradation of the timbers and fabric of the building. The business has become one of the UK market leaders in developing natural insulation systems for use in old buildings for walls, floors and roofs some of which are highlighted in this leaflet.

Back to Tŷ-Mawr

Tŷ-Mawr itself has become an exemplar - as well as demonstrating an approach to repair using Tŷ-Mawr products and systems, various technologies have been incorporated such as solar thermal, rain-water harvesting, Pilkington-K glass, heat recovery from the manufacturing yard and biomass heating. This has helped reduce Tŷ-Mawr's own carbon dioxide emissions by up to 40 tonnes per annum.



Summer School 2010, The Prince's Foundation for the Built Environment

energy efficiency measures at Tŷ-Mawr

Building and buildings are one of the greatest polluters on the planet accounting for some 40%-50% of the UK CO₂ emissions. At Tŷ-Mawr, Nigel and Joyce have demonstrated that it is possible to improve the energy efficiency and reduce the impact of our buildings on the environment through the materials we choose, to the way we use them, from the energy sources we choose, to the technology used to convert them for use in our homes/buildings.

This leaflet provides an overview of just some of the energy efficiency measures undertaken at Tŷ-Mawr. Further information can be found on www.lime.org.uk

Solar Thermal Panel built into the stone tile roof for hot water - shower and toilet block

Cold roof with Ty-Mawr Thermafleece sheep's wool insulation on ceiling

Heat recovery from manufacturing yard (back-up heat source)

Warm roof

Ty-Mawr THERMAFLEECE® Sheep's Wool Insulation/hemp insulation

Counter Batten

Woodfibre Sarking Board

Woodfibre Board or Ty-Mawr Wood Wool Board

Eaves Ventilation 25mm

glaster® plaster (with glassfibre mesh)

Loft insulation - 250mm Ty-Mawr Thermafleece (Welsh sheep's wool insulation)

Pilkington K glass for natural light

New toilet block - timber frame

Lime hemp plaster on internal walls of Training Centre

Biomass log boiler - supplying main heating

Ty-Mawr Thermafleece - 200mm sheep's wool between floors (under floorboards)

Newly made traditional sash windows with blinds

Replacement ceilings - 25mm wood wool board & 15mm medium lime hemp plaster

Insulated Limecrete Floor with underfloor heating

Edge Insulation

Flagstones

Ty-Mawr Bedding Mortar

The glaster® Screed

The Limecrete Slab

Breather Membrane

The Insulating Layer/Hardcore

Levelled & Compacted Ground

Not to scale

Counter battens ready for weather boarding

Racking board (if required)

Services void

Ty-Mawr wood wool board

Ty-Mawr THERMAFLEECE® sheep's wool insulation/hemp insulation

Lime plaster, hemp lime plaster or glaster® plaster

Woodfibre Board

Lime render or glaster® render

Breather membrane

Ty-Mawr wood wool board

EXTERNAL

INTERNAL

heat recovery and log boiler

Heating systems consume on average 10 to 20 times more energy than anything else in our homes. Tŷ-Mawr is currently heated by a gasifying log boiler and the waste heat captured from the manufacturing process from the diesel generator and the lime slaking plant. All heating sources are collected in a large hot water tank (4000 litres) called an accumulator. The tank holds its heat for about a week and will heat the buildings for a day.

Burning wood releases CO₂ that trees have absorbed during their lifetime, so it's a carbon neutral process. Burning biomass typically replaces much more carbon intensive sources of energy, such as oil and gas. The log boiler at Tŷ-Mawr saves approximately 16 tonnes of CO₂ a year. The boiler is very efficient converting more than 90% of the wood into heat (compared to 8% for an open fire). Using wood from the site as the fuel source gives an annual saving of £3,500 - £4,000, compared to their former oil boiler. (Although this does not include their own labour.) Innovative software has been implemented on the accumulator to monitor the energy produced more closely. Our thanks to Glasu for their support with the heat recovery project.

Specialist Manufacturer and Distributor of Traditional and Ecological Building Materials and Paints

energy efficiency components of the Tŷ-Mawr restoration



lime hemp plaster

Tŷ-Mawr Lime Hemp Plaster is made from a **high calcium lime** with **renewable hemp fibres** and a **pozzolan** to aid the set. It is entirely made from **British raw materials** and is manufactured by Tŷ-Mawr in Wales. Like all lime plasters, it is **vapour permeable** but it surpasses other lime products with **increased flexibility** and **durability**. It also has **thermal qualities** and can therefore be used as an **insulating plaster** and although it will not achieve the same value as the other materials on this page, it has the benefits of providing an excellent means of achieving **air tightness** (important factor for energy efficiency in old buildings) and it **does not** usually require any **physical** and hence **visual adaption of the building** (which means that it is often the only solution for many old and listed buildings).



calsitherm boards*

This board is **newly available** in the UK. It is made from calcium silicate, a micro porous mineral building material with **effective insulating properties**, its high **capillary action** ensures **humidity regulation** and the nature of the material means that mould cannot form on its surface.

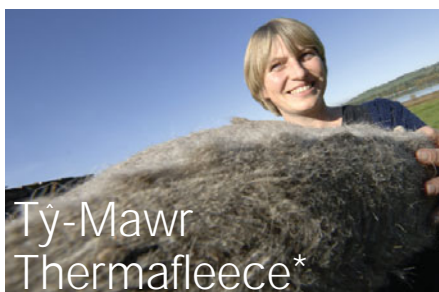
Unlike most other insulation boards on the market, the **Calsitherm Climate Board** can be directly applied on to most **existing internal plasters** without the need for **stud work** to carry the board. It is therefore a useful option in our range of internal wall insulation systems giving **ease, speed and simplicity of actual application**.



woodfibre boards*

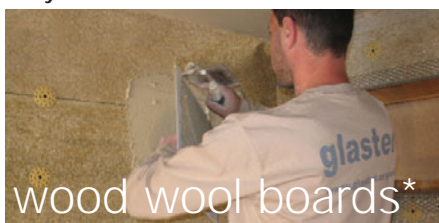
Woodfibre boards are a **well understood, well developed, efficient solution** to upgrading the thermal performance of walls (as well as floors and roofs).

They are produced by compressing wood fibres into a variety of different formats for different applications (some are now glue-free). They have **excellent technical qualities** for **thermal and acoustic insulation**, **thermal storage capacity**, **vapour permeability** and **moisture control**.



Tŷ-Mawr Thermafleece*

Sheep's wool is a **natural fibre insulation** from a fully renewable resource, (ie sheep!) It is made in the UK entirely from **British sheep's wool** and has a **BBA certificate**, Tŷ-Mawr THERMAFLEECE® is predominantly made from Welsh wool. It is therefore an excellent choice for those wanting to **build/renovate sustainably**, **minimising road miles** whilst contributing to **supporting our rural economies and ways of life**.



wood wool boards*

These boards have been used in buildings for many decades and are very popular as a **lime render/plaster carrier**. They are widely used as part of the **build up** for use with our **wool insulation** and **lime plasters** both for **upgrading the insulation value of solid walls** as well as **new timber-frame builds**. They have exceptional **technical qualities** in terms of this application, they are **vapour permeable, practically incombustible** and have **excellent acoustic properties**.



edenbloc³⁵*

This newly launched product is a **natural, low density, rigid insulation** that is **manufactured in the UK**. As well as giving **good energy efficiencies**, it also **locks up carbon dioxide** and so has an **excellent carbon footprint**. It also has the **best thermal conductivity of the natural products** and the ability to **eliminate cold bridging factors** which means that it can improve insulation performance by as much as **30% compared to other natural insulations**. It has 60% recycled content, mainly **waste wool** from the carpet industry, bound with a **natural bio polymer**, because it contains **no synthetics** it can be **composted** at the end of its useful life!



Tŷ-Mawr limecrete flooring system

Our limecrete floor system is a lightweight, breathable and insulated floor system. These properties enable it to satisfy Part C of the current building regulation (with regard to controlling ingress of water) and Part L (with regard to controlling thermal loss). It is extensively used in old and listed buildings and if designed and supplied by Tŷ-Mawr Lime, carries LABC (Local Authority Building Control) systems-type approval. Due to its 'green' credentials it is also widely used in environmentally-friendly new builds as an alternative to concrete.

**these products are all available in different thicknesses which will achieve different levels of performance.*

For other insulation products, plasters and associated fixings, please see www.lime.org.uk



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For further information on any product or system in this leaflet or to keep up with developments at Tŷ-Mawr, please visit our website www.lime.org.uk and register for regular updates!

Disclaimer - every effort has been made to ensure the accuracy of the information and diagrams in this leaflet, however Tŷ-Mawr can not be held responsible for any direct or indirect loss or damage caused by any inaccuracies. Please call us to check information before ordering.

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