

# Tŷ-Mawr

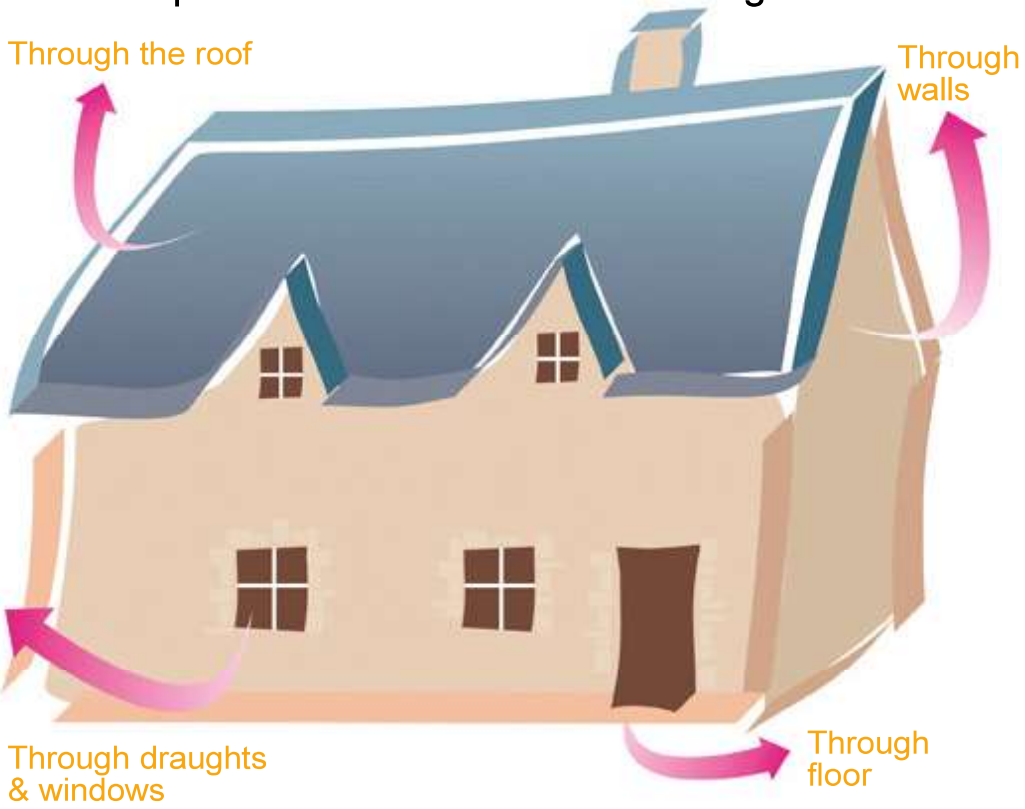
www.lime.org.uk

sustainable building materials for healthier homes...deunyddiau adeiladu cynaliadwy ar gyfr cartrefi iachach



## Retrofit Insulation Systems for Old Buildings

### Areas of potential heat loss in old buildings




registered LABC

Registered Details

bsi. ISO 9001 Quality Management ISO 14001 Environmental Management

In the UK, 1 in 4 of our homes are pre-1919 **'solid' wall** construction. In the drive towards **energy efficiency** and **carbon savings**, we are all being encouraged to insulate our homes but care must be taken with older buildings as they need to **maintain vapour permeability**, i.e. to manage moisture, therefore any insulation solution must also be vapour permeable to **avoid the problems** that we now know are associated with **trapped moisture**. At Tŷ-Mawr, we have developed a number of systems using **environmentally-friendly materials** that both respect and support the **nature of these buildings as well as the planet**. These systems are now all registered with Local Authority Building Control.

Caring for buildings…Caring for the environment…Caring for health…
Gofalu am adeiladau…Gofalu am yr amgylchedd…Gofalu am iechyd…

# solid wall insulation

## how do solid walls work?

Solid walls are simple in their construction and the way they are designed to protect themselves. They rely on moisture being able to move through the wall as both a liquid and as a gas.

The walls of these buildings are protected by an appropriate external finish that is usually determined by aesthetics and/or architectural style as well as the level of protection that a particular elevation requires to be able to resist the build-up of liquid moisture. This can be undecorated pointing, vapour permeable paints, render, slate hanging or cladding. Any moisture that does penetrate the surface must be able to evaporate.

Additional protection can be given by overhanging eaves, good rainwater goods and land drains, they should always be checked and maintained in good working order to keep the building well protected.

Internally, floor coverings, as well as, ceiling and wall plasters have an impact on the internal environment as they will allow moisture vapour to be absorbed and evaporated thus maintaining a 'healthy building'.

The often crude, simple construction of this building type makes them very robust when repaired and maintained with the correct materials.

## how do I know if I have solid walls?

The majority of solid walled buildings in this country are built of **brick** or **stone** and tend to pre-date the 1930s. For brick built buildings, if the wall is more than 25.4cm thick then it probably has a cavity; solid brick walls are usually around 22cm thick; stone walls vary considerably from 10cm to 100cm!

Your house may have extensions from **different periods** and may therefore be constructed with different methods, this will need to be understood **prior to making a choice** about how to upgrade the insulation value of your home/ building.

Traditional solid walled building




## why insulate solid walls?

To **save energy** and **improve the internal comfort level** – heat will always flow from a warm area to a cold one. Therefore, the colder it is outside, the faster heat from your home will escape. **Solid wall insulation** will slow down the rate at which heat escapes, keeping your home warmer for longer. Adding insulation, either internally or externally, reduces what is known as the **U-value** of the walls – the rate at which heat can flow through them, so the lower the U-value, the **more slowly heat is lost** which ultimately will reduce your energy consumption.

## how do I insulate solid walls?

Here, we present our options to **insulate** solid wall buildings whilst allowing them to **maintain vapour permeability,** as requested by Building Regulations (English Part L1B 3.8 & 3.12, Welsh Part L1B Section 12).
There are two methods of insulating solid walls: externally and internally. But before you start, make sure your walls are dry - a dry wall will be 30% more insulating than a wet wall!

**PLEASE NOTE: IF YOUR BUILDING IS STATUTORY LISTED, LISTED BUILDING CONSENT WILL BE REQUIRED FOR ANY ALTERATIONS, INCLUDING INSULATION.**

# external wall insulation

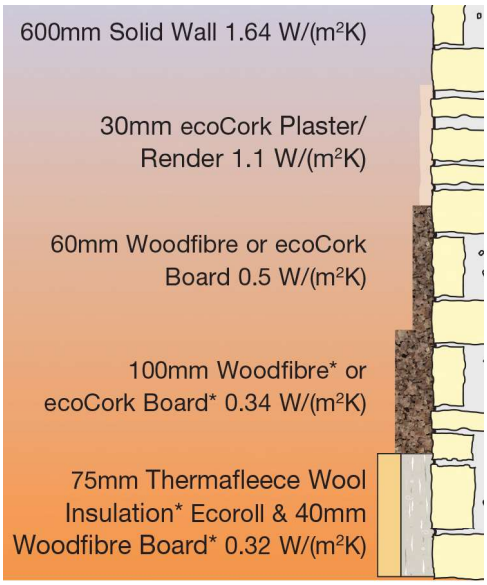
External wall insulation is installed from the **outside** effectively **wrapping the building**. This type of installation method can change the **physical appearance** of the building (which will usually require planning permission) and may necessitate the **removal of rainwater goods** and may require **adaptation of the roof and wall junctions** as well as **window and door openings** as the wall is effectively being made thicker.

It is possible to use the ecoCork plaster externally with the correct detailing, protection and environment to carbonate. The cork provides some insulation and is less disruptive than the board system. It will also help to improve weatherproofing and air tightness.

Please call us for technical sheets or visit www.lime.org.uk for further information and current pricing.

Also applicable to solid brick wall and timber-framed buildings – values will vary.

glaster® or standard lime render can be used for a render finish. Alternatively, the board system could be timber clad.




# internal wall insulation

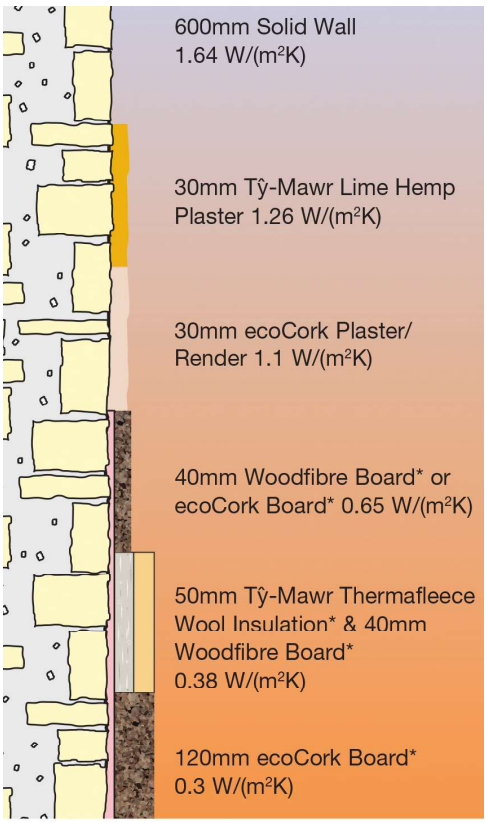
**Internal wall insulation** is applied from the **inside** and may necessitate the **removal of all fittings** e.g. radiators, skirting boards, architraves etc. It can therefore be **more involved** than **external wall insulation**. It must be carried out correctly, even if you are using appropriate materials. Otherwise you can risk increasing the chance interstitial condensation.

The **options** shown (right) are graphical representations of some of our solutions, please contact us should you require an actual **calculation** undertaken for your **specific situation**. Please note your architect should then **consider any problems** of the site and any **detailing** required such as use of a breather membrane.

The boards can carry **various plasters** including our **lime plasters**, **glaster®** and **lime hemp products**, the application guides must be followed for successful results – see www.lime.org.uk or call us for details. Some of the components of these options are described in more detail on the reverse of this leaflet.

**PLEASE NOTE:** when insulating internally, you must protect from driving rain/moisture ingress.

The **U-value** of a wall is a measure of the rate at which **heat passes through** the wall and so is a measure of **how well insulated** the wall is and is expressed in terms of "Watts per meter squared-Kelvin" (W/m²K). **The lower the U-value**, **the better the performance** of the insulation and the less it will cost to heat your home. For **building regulations** in an **existing building**, a U-value of around **0.30W/m²K or lower** is recommended (but please refer to current building regulations). Carrying out a whole house energy survey is useful. Building control often allow less insulation & should follow part L1B & the British Standard 7913 reference solid wall buildings. The **reduction in space**, **aesthetic**, **environmental impact of the material used** and whether or not the **building is listed** will all have some bearing on what you **ultimately choose** or can **practically achieve**, please call our Product Advisers to discuss your requirements.



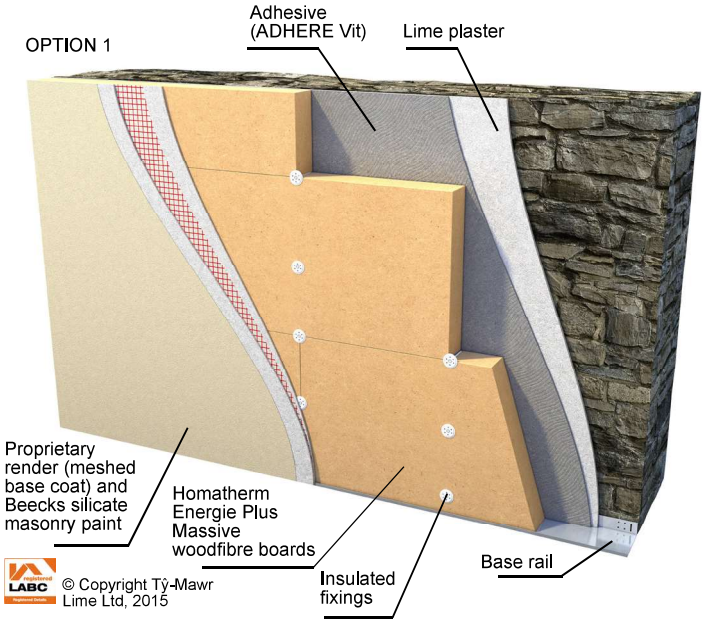

Please note – figures are for illustrative purposes only, please contact us for up-to-date calculations using current values for your application. Finish with glaster®, lime hemp, ecoCork or a traditional lime plaster. *Other ecological boards and insulation materials are available, please call for further information.

# external wall insulation systems

Tŷ-Mawr's external wall insulation systems are part of our range of LABC registered sustainable building solutions. In addition to their thermal and acoustic performance, their vapour permeable properties help them to regulate humidity within the building contributing to a more comfortable and healthy living environment. These systems are ideal for the refurbishment of existing solid external walls as well as cavity walls (care should be taken to ensure the cavity is shut off or filled, seek professional guidance).

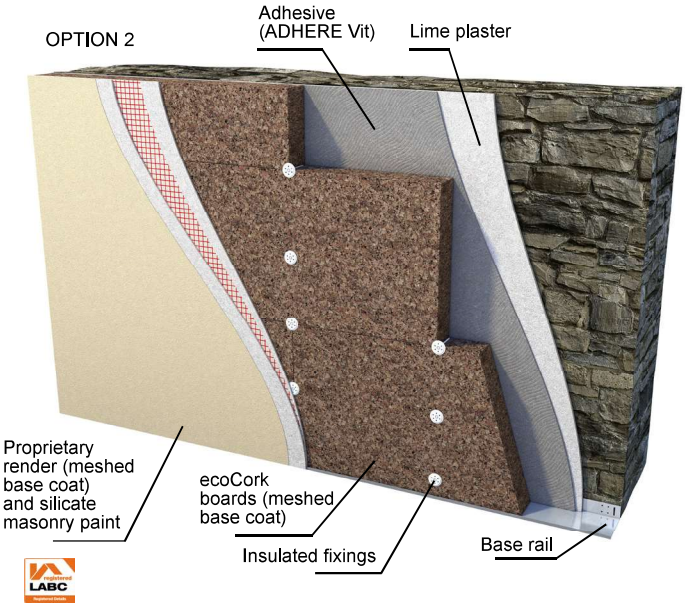
The Tŷ-Mawr registered systems offer a choice of high quality, ecological and sustainable insulation materials, see table below.

OPTION 1



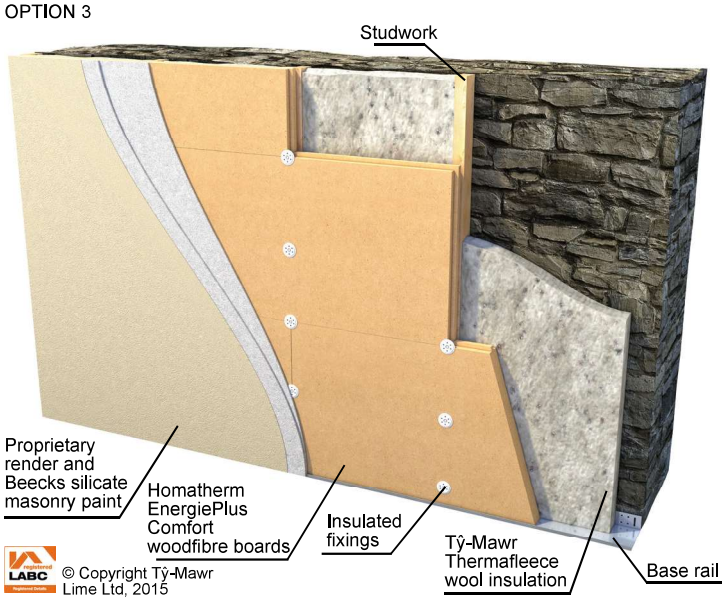

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OPTION 2




| 500-600mm Solid Wall |
|---|
| **Options 1 (woodfibre) / 2 (cork)**<br>**These options meet current building regulations. For different thicknesses/insulation values please contact our technical advisors.** |
| Approx 15mm levelling coat of Hydraulic Lime Plaster* |
| Adhesive coat 10mm combed |
| a) Homatherm woodfibre boards 120mm fixed with insulated fixings at a typical fixing rate of 8 per m2 |
| b) ecoCork boards 120mm adhered to masonry and fixed with insulated fixings at a typical fixing rate of 8 per m2 |
| Board manufacturers proprietary render system following manufacturers instructions or Tŷ-Mawr Hydraulic lime render 1 x 9mm meshed base coat & 1 x 9mm top coat |
| Vapour permeable paint finish - Silicate masonry paint, Tŷ-Mawr limewash, Biosphere |
| *as specified by Tŷ-Mawr Ltd. Please note different insulation thicknesses are available if there is not a Building Regulations requirement |

OPTION 3




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| 500-600mm Solid Wall |
|---|
| **Option 3 (Sheep's wool & woodfibre)** |
| 75mm of Insulation between studs chosen from Tŷ-Mawr Thermafleece Cosywool/Ultrawool/NatraHemp |
| 60mm Homatherm woodfibre boards and approved washer fixings (typical fixing rate of 8 per m2) |
| Board manufacturers proprietary render system following manufacturers instructions or Tŷ-Mawr Hydraulic lime render 1 x 9mm meshed base coat & 1 x 9mm top coat |
| Vapour permeable paint finish - Silicate masonry paint, Tŷ-Mawr limewash, Biosphere |
| *as specified by Tŷ-Mawr Ltd. Please note different insulation thicknesses are available if there is not a Building Regulations requirement |

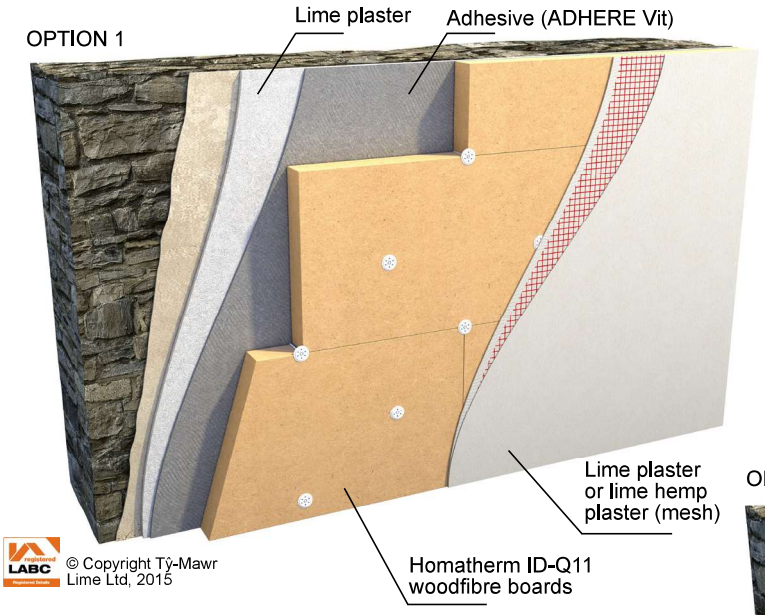
Tables show thicknesses to achieve current building regulations, but please contact us for a specific u-value calculation, condensation risk analysis and quotation for your project. Please note that LABC registered detail only applies where Tŷ-Mawr has designed the build-up (free of charge) and supplied the materials.

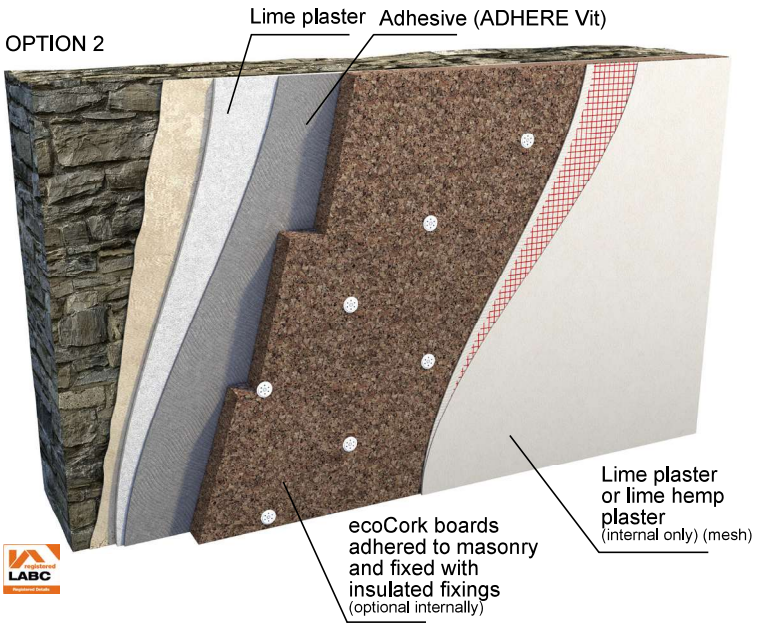
# internal wall insulation systems

Tŷ-Mawr's internal wall insulation systems are also part of our range of LABC registered sustainable building solutions. In addition to their thermal and acoustic performance, their vapour permeable properties help them to regulate humidity within the building contributing to a more comfortable and healthy living environment.

These systems are ideal for the refurbishment of existing solid walls. Where internal space is limited and/or it is not possible to meet current building regulations, lime hemp or ecoCork plaster can be applied directly to the walls to add some thermal insulation and assist with air tightness, please contact us for a product information sheet.

The Tŷ-Mawr registered systems offer a choice of high quality, ecological and sustainable insulation materials, see 4 different options in table below.

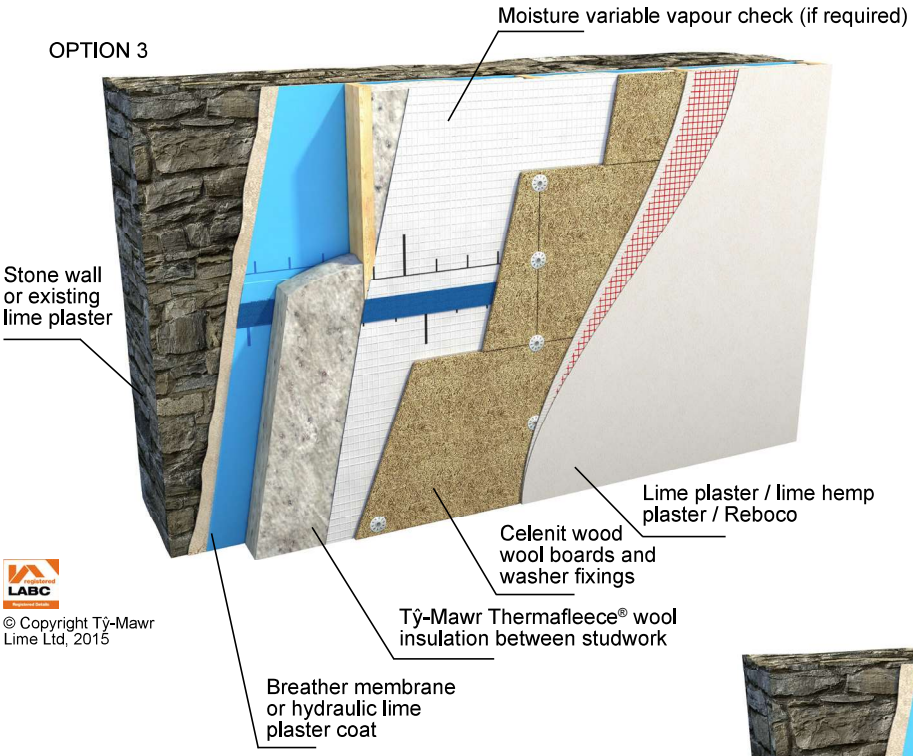


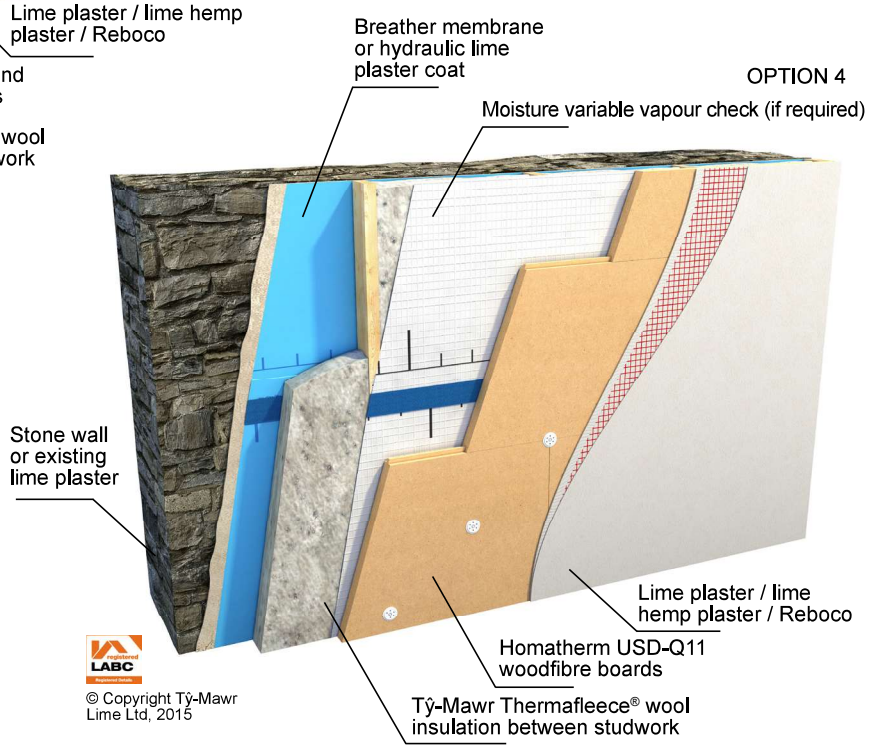




| 500mm Solid Wall (appropriate external protection from driving rain is essential when undertaking internal wall insulation – please contact us for advice) | |
|---|---|
| Minimum 20mm hydraulic lime plaster | |
| **Option 1 (woodfibre)** | **Option 2 (cork)** |
| Adhesive 10mm combed coat | Adhesive 10mm combed coat |
| 120mm Homatherm woodfibre board | 120mm ecoCork board |
| 1 x 6mm Fine Hemp Plaster with mesh* and 1 x 6mm Fine Hemp top coat which can be finished with 1 x 3mm Internal Finish or Superfine Plaster for a finer finish<br>or<br>1 x 10mm REBOCO (meshed) with 1 x 3mm CAL Finishing Plaster<br>*preferred option | |
| Vapour permeable Paint Finish - Internal Silicate Paint, Tŷ-Mawr Limewash, Clay Paint, Ecosphere | |

Table shows thicknesses to achieve current building regulations, but please contact us for a specific u-value calculation, condensation risk analysis and quotation for your project. Please note that LABC registered detail only applies where Tŷ-Mawr has designed the build-up (free of charge) and supplied the materials.

# internal wall insulation systems




| | |
|---|---|
| 500mm Solid Wall (appropriate external protection from driving rain is essential when undertaking internal wall insulation – please contact us for advice) | |
| Breather Membrane | |
| **Option 3 (Sheep's wool & wood wool)** | **Option 4 (Sheep's wool & woodfibre)** |
| 125mm of insulation chosen from below | 100mm of insulation chosen from below |
| Tŷ-Mawr Thermafleece Cosywool/Ultrawool/NatraHemp | |
| Moisture variable vapour check if required | |
| Celenit 15mm Wood Wool board fixed with plastic washers and screws at 8 per m2 | Homatherm Woodfibre board T&G 40mm fixed with plastic washers and screws at 8 per m2 |
| 1 x 6mm Fine Hemp Plaster with mesh* and 1 x 6mm Fine Hemp top coat which can be finished with 1 x 3mm Internal Finish or Superfine Plaster for a finer finish<br>or<br>1 x 10mm REBOCO (meshed) with 1 x 3mm CAL Finishing Plaster<br>*preferred option | |
| Vapour permeable Paint Finish - Internal Silicate Paint, Tŷ -Mawr Limewash, Clay Paint, Ecosphere | |

Table shows thicknesses to achieve current building regulations, but please contact us for a specific u-value calculation, condensation risk analysis and quotation for your project. Please note that LABC registered detail only applies where Tŷ-Mawr has designed the build-up (free of charge) and supplied the materials.

# warm roof system

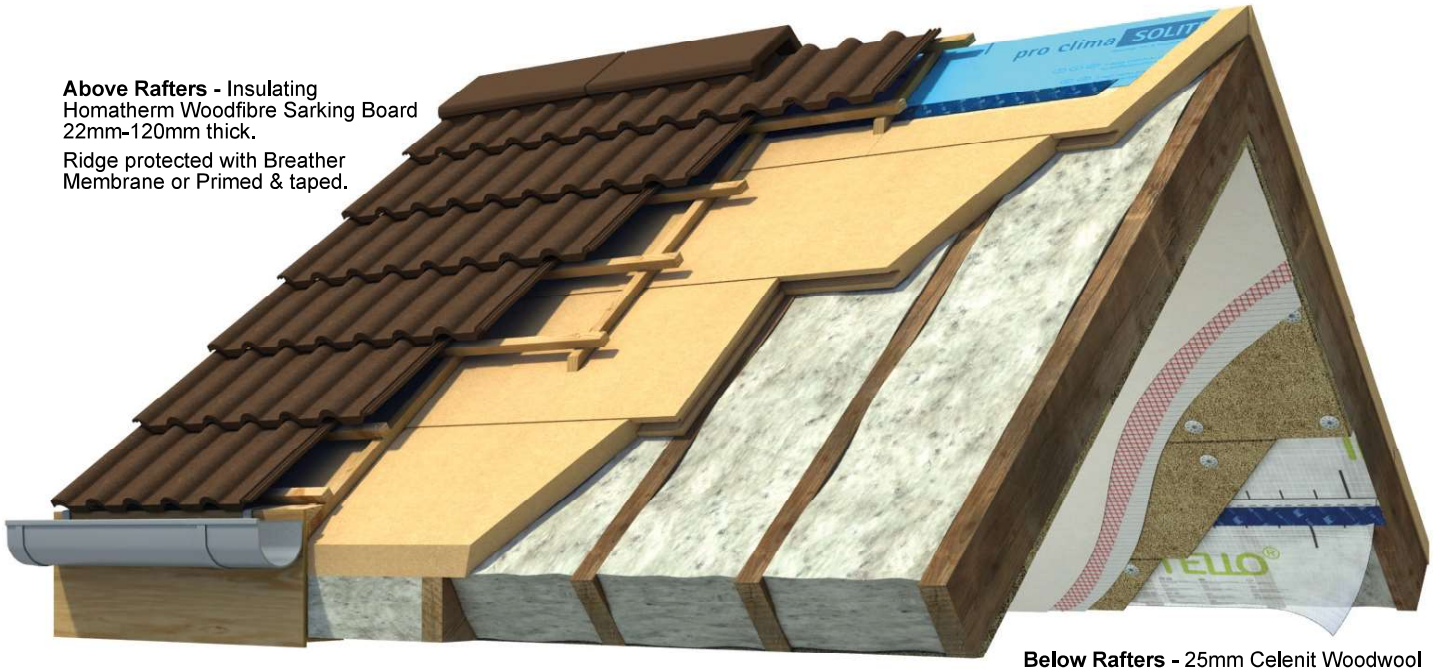
Tŷ-Mawr's warm roof system has a superb thermal and acoustic performance and its vapour permeability also helps to regulate humidity within the building contributing to a more comfortable and healthy living environment.

This system is an ideal solution for refurbishment of existing roofs but can also be used as a sustainable warm roof design in ecological new builds.

The Tŷ-Mawr registered system offers a choice of high quality, ecological and sustainable insulation materials.

The system comprises: water resistant, interlocking woodfibre board over rafters and natural fibre insulation between rafters. Further woodfibre boards can be fitted below rafters before plastering if required or, alternatively, Celenit woodwool board can be installed as the lime plaster carrier.

For roofs with bats, the use of breathable roofing membranes is not allowed.




**Above Rafters -** Insulating Homatherm Woodfibre Sarking Board 22mm-120mm thick.

Ridge protected with Breather Membrane or Primed & taped.

**Between Rafters -** Fully fill with Flexible Insulation (see table for options)

**Below Rafters -** 25mm Celenit Woodwool or Tongue & Groove Homatherm Woodfibre 40mm-100mm. Finished with two coat lime plaster (meshed) and vapour permeable paint.

## Benefits

- LABC (Local Authority Building Control) registered detail; recognised in all 376 local authority areas in the UK this will help to streamline the planning process with building control.
- Excellent sound insulation
- Low thermal conductivity which keeps the building warm in winter reducing energy consumption, lowering the carbon footprint of the building and reducing the running costs.
- High volumetric heat capacity giving excellent protection from summer heat (stopping overheating of attic rooms).
- Air and wind tight reducing energy consumption and hence running costs.
- Vapour permeable design creates a construction that helps to regulate humidity within the building giving a pleasant, healthy living environment.
- Certification of components.
- Technical support and design guidance from the Tŷ-Mawr Technical Team.
- Good for the environment - constructed with low carbon materials from sustainable, renewable resources.
- Easy to install, no on-going maintenance.

<table>
<tr><th></th><th>Option 1</th><th>Option 2</th><th>Option 3*</th></tr>
<tr><td>Above Rafters</td><td>35mm Insulating Homatherm Woodfibre Sarking Board</td><td>60mm Insulating Homatherm Woodfibre Sarking Board</td><td>Proclima Solitex plus fully taped windtight membrane</td></tr>
<tr><td>Fully fill between Rafters</td><td colspan="3">200mm of Insulation chosen from below:<br>Tŷ-Mawr Thermafleece® Cosywool/Ultrawool, NatraHemp</td></tr>
<tr><td rowspan="4">Below Rafters</td><td colspan="3">Intello Plus fully taped (if air tightness required)</td></tr>
<tr><td colspan="2">Celenit 25mm Wood Wool board and approved washer fixings at 8 per m2</td><td>Insulating Homatherm Woodfibre 60mm T&G boards and approved washer fixings at 8 per m2</td></tr>
<tr><td colspan="3">1 x 6mm Fine Hemp Plaster with mesh* and 1 x 6mm Fine Hemp top coat which can be finished with 1 x 3mm Internal Finish or Superfine Plaster for a finer finish<br>or<br>1 x 10mm REBOCO (meshed) with 1 x 3mm CAL Finishing Plaster *preferred option</td></tr>
<tr><td colspan="3">Vapour permeable Paint Finish - Internal Silicate Paint, Tŷ-Mawr Limewash, Clay Paint, Ecosphere</td></tr>
</table>

Please note different insulation thicknesses are available if there is not a Building Regulations requirement - please contact us.
*Option 3 is advisable if you cannot raise the height of the roof.

# sub**lime**® insulated floor system

Tŷ-Mawr's sub**lime**® is an insulated limecrete flooring system, originally designed for solid wall construction buildings (including stone, brick, timber-frame and cob) as an alternative to concrete.

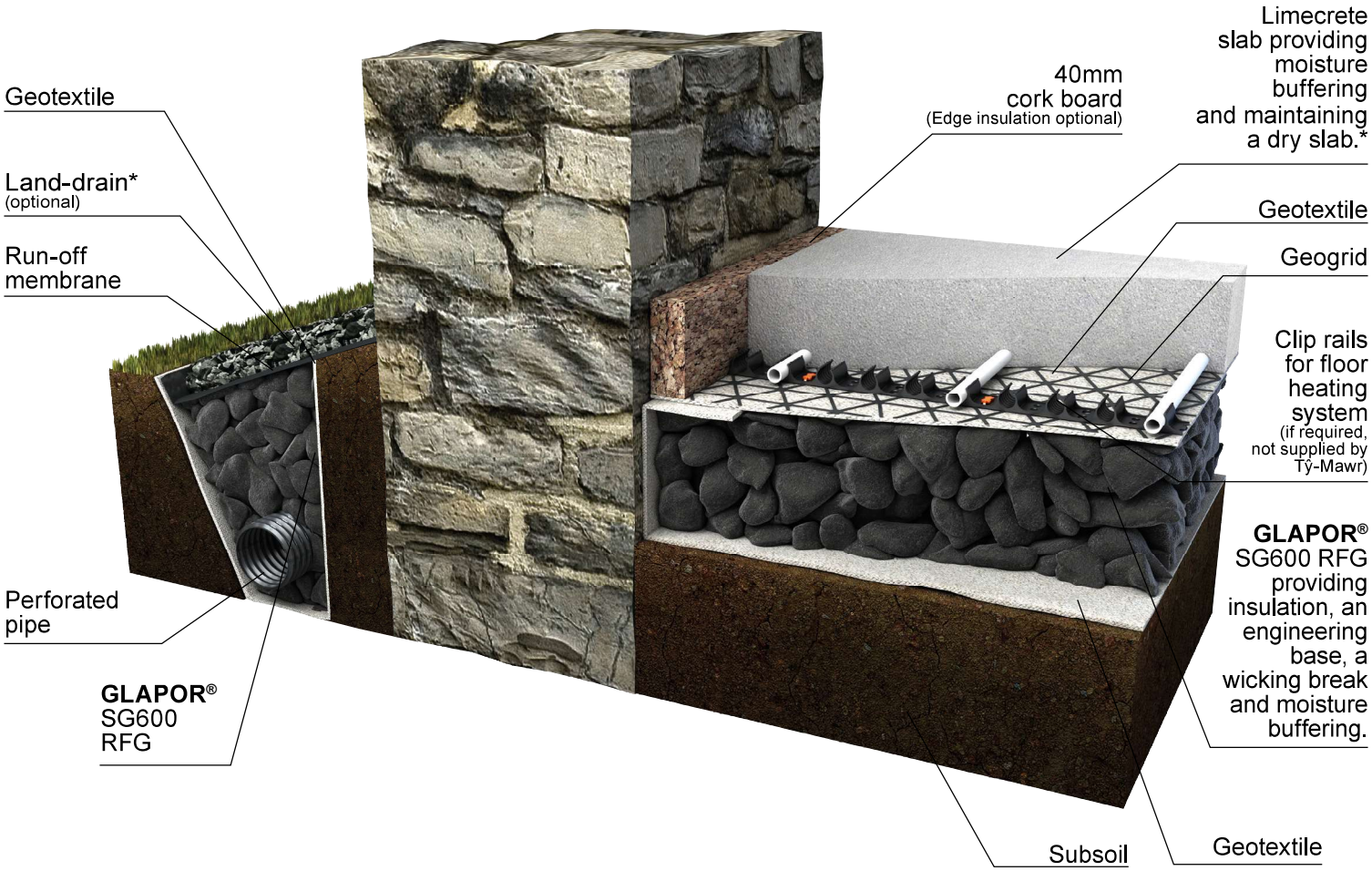
The sub**lime**® insulated flooring system is the most popular product in our range of LABC (Local Authority Building Control) registered insulation systems and now carries LABSS (Local Authority Building Standards Scotland) giving countrywide coverage across every local authority area.

It is comprised of two primary layers – the Glapor® SG600 Recycled Foamed Glass (RFG) Insulating Gravel and the Limecrete Slab. The Glapor® SG600 RFG Gravel provides the structural base which is the insulation layer, provides a wicking break and is moisture buffering.

The Limecrete Slab is a blend of natural hydraulic lime and recycled aggregates which provides the main load-bearing element of the floor as well as providing thermal mass.

Customer confidence and satisfaction in our systems is of primary importance to us which is why we invest heavily in product testing, certification and product support. Our experienced team, design the floor to meet the needs of your specific building, ensuring that you get the best performance for your building for years to come as well as meeting building regulations when required.

To speak to us about your project, call us on 01874 611350 or visit our website www.lime.org.uk to use our newly launched on-line calculation service to get a free calculation and quotation.




Please call to discuss if a radon barrier is required.

The external land drain is your first defence against moisture flowing towards the building. An internal land drain is optional and will only be required if there has been evidence of moisture in the past that might require management.

*The limecrete slab can be finished with any floor covering, although vapour permeable options are preferred.

sub**lime**®
insulated**limecrete**floor

registered LABC Registered Details

LABSS Registered Details

# sublime® insulated floor system

## Properties

- An ability to buffer moisture vapour : ideal for use within existing solid wall properties.
- A lightweight, low impact construction : ideally suited to sensitive sites such as churches over archaeology
- Good environmental credentials along with it's simplicity and ease of installation : an appropriate choice for new builds and extensions!
- Can be designed for use with or without underfloor heating
- The GLAPOR® SG600 gravel used in this flooring system is made from 100% recycled glass and is the most structurally and thermally superior product we have ever supplied for floor applications.
- Improved energy efficiency and response times of under floor heating systems: as the insulation material is directly beneath the heat source the heat drift associated with other systems is significantly reduced.
- Reduced material quantities and therefore reduced delivery costs.
- LABC & LABSS Registered detail: (Updated April 2016) Recognised in all local authority areas in England, Scotland and Wales, the registered detail will help to streamline and simplify the planning application and building control process for your project.
- Winner of the Wales Regional LABC Building Excellence Award 2013 'Best Technical Innovation'.
- Can be recycled at the end of its useful life which is important with the increasing concern about the level of construction waste going to landfill - in the UK this is currently 70-80 million tonnes per year!
- Access to a team with 20 years of experience with Limecrete floors including free heat loss calculations, assistance with quantity calculations, quotes, illustrated installation guides and how-to installation videos.
- NEW - LIMECRETE DIRECT - The UK's first nationwide ready-mixed limecrete service. Contact us for more information.



CGI of the tomb of Richard III at Leicester Cathedral laid in Tŷ-Mawr Sublime® floor. Courtesy: van Heyningen & Haward Architects.



Courtesy: Limecrete Company, www.limecrete.co.uk

## Compressive and Flexural Strength

| Age | Compressive Strength (N/mm2) | Flexural Strength (N/mm2) | Density |
|---|---|---|---|
| 28 | 4.2 | - | 2140 |
| 56 | 6.1 | 3.8 | 2020 |
| 90 | 7.2 | 4.7 | 1990 |

Extracted from research carried out by the University of Glamorgan

Our research has suggested that the considerations applicable to cementitious concretes with regard to expansion joints are not applicable to lime based concretes. Hydraulic Lime generates little heat during the initial chemical hydraulic set and limecrete has a good flexural strength to compressive strength ratio. These properties mean that huge savings can be made in terms of the labour and equipment usually required to fabricate dowelled and induced contraction joints in cement concrete ground bearing slab. For further information contact limecrete@lime.org.uk

# components



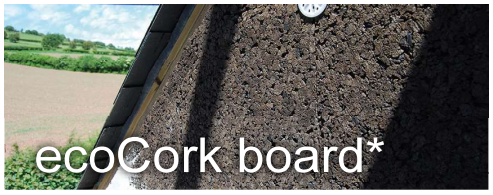

Tŷ-Mawr's Lime Hemp Plaster is a blend of lime (binder) and British hemp plant fibres/shiv and fine aggregate, to make a plaster which is suitable for old buildings as well as ecological new builds.




The Secil ecoCORK is a lightweight render, which can be applied both externally and internally making it ideal for most building types. It is lightweight and easy to apply.




A key component of Ty-Mawr Lime Ltd's award-winning Sublime® floor insulation system, the GLAPOR® SG600 Recycled Foamed Glass (RFG) is a superior loosefill insulating aggregate ideal for use in our LABC accredited limecrete flooring system.




ecoCORK boards provide excellent thermal and acoustic performance which makes them highly suitable for external as well as internal wall and ceiling applications. The use of 100% natural expanded cork boards on a building ensures maximum thermal insulation and a significant acoustic protection, simultaneously preserving the environment.




These boards are very popular as a lime render/plaster carrier and as part of the build up for use with our wool insulation and lime plasters and have exceptional technical qualities are fully vapour permeable, practically incombustible and have excellent acoustic properties.




Tŷ-Mawr has joined forces with THERMAFLEECE® to produce a wool insulation made exclusively from Welsh sheep's wool. It is an excellent choice for those wanting to build/renovate sustainably, minimising road miles whilst contributing to supporting our rural economies and ways of life.




Manufactured using an innovative dry process, Homatherm woodfibre boards are an efficient solution to upgrading the thermal performance of walls (as well as floors and roofs), and have excellent technical qualities for thermal and acoustic insulation, thermal storage capacity, vapour permeability and moisture control.





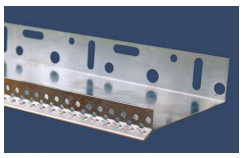

Washer and Cap



Washer fixing



Frameseals for sealing window/ door junctions



Base rail



Insulated Masonry Fixing



Geotextile



Breather Membrane



Moisture Variable Vapour Check




Multi Purpose Adhesive



Air-sealing Tape



Render Mesh



Geogrid

*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

# quick reference guide

## External Wall Insulation Systems

| 500-600mm Solid Wall |
|---|
| **Options 1 (woodfibre) / 2 (cork)**<br>**These options meet current building regulations. For different thicknesses/ insulation values please contact our technical advisors.** |
| Approx 15mm levelling coat of Hydraulic Lime Plaster* |
| Adhesive coat 10mm combed |
| a) Homatherm woodfibre boards 120mm fixed with insulated fixings at a typical fixing rate of 8 per m2 |
| b) ecoCork boards 120mm adhered to masonry and fixed with insulated fixings at a typical fixing rate of 8 per m2 |
| Board manufacturers proprietary render system following manufacturers instructions or Tŷ-Mawr Hydraulic lime render 1 x 9mm meshed base coat & 1 x 9mm top coat |
| Vapour permeable paint finish - Silicate masonry paint, Tŷ-Mawr limewash, Biosphere |
| *as specified by Tŷ-Mawr Ltd. Please note different insulation thicknesses are available if there is not a Building Regulations requirement |

| 500-600mm Solid Wall |
|---|
| **Option 3 (Sheep's wool & woodfibre)** |
| 75mm of Insulation between studs chosen from Tŷ-Mawr Thermafleece Cosywool/Ultrawool/NatraHemp* |
| 60mm Homatherm woodfibre boards and approved washer fixings (typical fixing rate of 8 per m2) |
| Board manufacturers proprietary render system following manufacturers instructions or Tŷ-Mawr Hydraulic lime render 1 x 9mm meshed base coat & 1 x 9mm top coat |
| Vapour permeable paint finish - Silicate masonry paint, Tŷ-Mawr limewash, Biosphere |
| *as specified by Tŷ-Mawr Ltd. Please note different insulation thicknesses are available if there is not a Building Regulations requirement |

## Internal Wall Insulation Systems

| 500mm Solid Wall (appropriate external protection from driving rain is essential when undertaking internal wall insulation – please contact us for advice) | |
|---|---|
| Minimum 20mm hydraulic lime plaster | |
| **Option 1 (woodfibre)** | **Option 2 (cork)** |
| Adhesive 10mm combed coat | Adhesive 10mm combed coat |
| 120mm Homatherm woodfibre board | 120mm ecoCork board |
| 1 x 6mm Fine Hemp Plaster with mesh* and 1 x 6mm Fine Hemp top coat which can be finished with 1 x 3mm Internal Finish or Superfine Plaster for a finer finish or 1 x 10mm REBOCO (meshed) with 1 x 3mm CAL Finishing Plaster *preferred option | |
| Vapour permeable Paint Finish - Internal Silicate Paint, Tŷ-Mawr Limewash, Clay Paint, Ecosphere | |

| 500mm Solid Wall (appropriate external protection from driving rain is essential when undertaking internal wall insulation – please contact us for advice) | |
|---|---|
| Breather Membrane | |
| **Option 3 (Sheep's wool & wood wool)** | **Option 4 (Sheep's wool & woodfibre)** |
| 125mm of insulation chosen from below | 100mm of insulation chosen from below |
| Tŷ-Mawr Thermafleece Cosywool/Ultrawool/NatraHemp | |
| Moisture variable vapour check if required | |
| Celenit 15mm Wood Wool board fixed with plastic washers and screws at 8 per m2 | Homatherm Woodfibre board T&G 40mm fixed with plastic washers and screws at 8 per m2 |
| 1 x 6mm Fine Hemp Plaster with mesh* and 1 x 6mm Fine Hemp top coat which can be finished with 1 x 3mm Internal Finish or Superfine Plaster for a finer finish or 1 x 10mm REBOCO (meshed) with 1 x 3mm CAL Finishing Plaster *preferred option | |
| Vapour permeable Paint Finish - Internal Silicate Paint, Tŷ -Mawr Limewash, Clay Paint, Ecosphere | |

Contact us for u-value calculations, condensation risk analysis and quotations. Please note that LABC registered detail only applies where Tŷ-Mawr has designed the build-up (free of charge) and supplied the materials.

## Warm Roof System

| | Option 1 | Option 2 | Option 3* |
|---|---|---|---|
| Above Rafters | 35mm Insulating Homatherm Woodfibre Sarking Board | 60mm Insulating Homatherm® Woodfibre Sarking Board | Proclima Solitex plus fully taped windtight membrane |
| Fully fill between Rafters | 200mm of Insulation chosen from below: Tŷ-Mawr Thermafleece® Cosywool/Ultrawool, NatraHemp | | |
| Below Rafters | Intello Plus fully taped (if air tightness required) | | |
| | Celenit 25mm Wood Wool board and approved washer fixings at 8 per m2 | | Insulating Homatherm Woodfibre 60mm T&G boards and approved washer fixings at 8 per m2 |
| | 1 x 6mm Fine Hemp Plaster with mesh* and 1 x 6mm Fine Hemp top coat which can be finished with 1 x 3mm Internal Finish or Superfine Plaster for a finer finish or 1 x 10mm REBOCO (meshed) with 1 x 3mm CAL Finishing Plaster *preferred option | | |
| | Vapour permeable Paint Finish - Internal Silicate Paint, Tŷ-Mawr Limewash, Clay Paint, Ecosphere | | |

Please note different insulation thicknesses are available if there is not a Building Regulations requirement - please contact us.
*Option 3 is advisable if you cannot raise the height of the roof.

# quick reference guide

## BUILDING REGULATIONS.

### ENGLISH - PART L1B 3.7, 3.8, 3.9 & 3.12

**Historic and traditional buildings which may have an exemption**

**3.7** As mentioned in paragraph 3.6a, the following classes of buildings have an exemption from the ***energy efficiency requirements*** where compliance would unacceptably alter the character or appearance of the buildings.

a. listed buildings;
b. buildings in conservation areas; and
c. scheduled ancient monuments.

**Historic and traditional buildings where special considerations may apply**

**3.8** There are three further classes of buildings where special considerations in making reasonable provision for the conservation of fuel or power may apply:

a. buildings which are of architectural and historical interest and which are referred to as a material consideration in a local authority's development plan or local development framework;
b. buildings which are of architectural and historical interest within national parks, areas of outstanding natural beauty, registered historic parks and gardens, registered battlefields, the curtilages of scheduled ancient monuments, and world heritage sites;
c. buildings of traditional construction with permeable fabric that both absorbs and readily allow the evaporation of moisture.

**3.9** When undertaking work on or in connection with a building that falls within one of the classes listed above, the aim should be to improve energy efficiency as far as is reasonably practicable. The work should not prejudice the character of the host building or increase the risk of long-term deterioration of the building fabric or fittings.

**3.12** Particular issues relating to work in historic buildings that warrant sympathetic treatment and where advice from others could therefore be beneficial include:

a. restoring the historic character of a building that has been subject to previous inappropriate alteration, e.g. replacement windows, doors and rooflights;
b. rebuilding a former historic building (e.g. following a fire or filling a gap site in a terrace);
c. making provisions enabling the fabric of historic buildings to 'breathe' to control moisture and potential long-term decay problems.

**3.13** In assessing reasonable provision for energy efficiency improvements for historic buildings of the sort described in paragraphs 3.7 and 3.8, it is important that the ***BCB*** takes into account the advice of the local authority's conservation officer. The views of the conservation officer are particularly important where building work requires planning permission and/or listed building consent.

### WALES - 12.2.1 & L1B 12.2.6

**12.2 Historic and traditional buildings where special considerations apply**

**12.2.1.** In addition, special considerations apply to works to the following three classes of non-exempt existing buildings:

a. of architectural and historic interest and are referred to as a material consideration in a local authority's development plan or local development framework; or
b. of architectural and historic interest and are within national parks, areas of outstanding natural beauty, registered historic parks and gardens, registered battlefields, the curtilages of scheduled ancient monuments, and world heritage sites; or
c. or traditional construction with permeable fabric that both absorbs and readily allows the evaporation of moisture.

**Dwellings of architectural or historical interest**

a. restoring the historic character of a building that has been subject to a previous inappropriate alteration, for example, replacement windows and doors; or
b. rebuilding a former historic building, for example, following a fire or infilling a gap site in a terrace; or
c. enabling the fabric of historic buildings to 'breathe' to control moisture and potential long-term deterioration.

**12.2.6** When assessing dwellings of historic and architectural interest where special consideration may apply, it is important that the Building Control Body takes into account the advice of the local authority's conservation officer, particularly where the work requires planning permission and/or listed building consent.

## BRITISH STANDARD 7913 - GUIDE TO THE CONSERVATION OF HISTORIC BUILDINGS

The standard includes information such as walls can be 30% less energy efficient if damp and good repair provides greater energy efficiency. (Section 5.3.1)
Impervious materials can be harmful including cement pointing and rendering and most types of impervious solid wall insulation and the Standard states that removal should be considered.
Section 5.3.1 states ‘some energy efficient measures can have an adverse effect on sustainability’.
Section 7.4 on materials emphasises that ‘the removal of historic fabric and patina should be avoided as far as possible to retain authenticity’.
Section 0.1 highlights that British Standards that are applicable to newer buildings might be inappropriate.

## USEFUL RESOURCES AND FURTHER INFORMATION

**Society for the Protection of Ancient Buildings (SPAB)** www.spab.org.uk
**Sustainable Traditional Buildings Alliance (STBA)** www.stbauk.org
**Building Regulations Part L1B** Conservation of fuel and power in existing dwellings
**British Standard 7913** Guide to the conservation of historic buildings
**Anthony Gwynne, Building Control guidance document for upgrading traditional buildings using lime and modern applications,** Forest of Dean District Council



version 03/2017

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