



www.lime.org.uk

Tŷ-Mawr

ecological building products
deunyddiau adeiladu ecolegol

wall insulation



Courtesy: Private Sector Housing, Pembrokeshire County Council.

solid

BSI Plus



In the UK, 1 in 4 of our homes has **'solid' walls**, around 45% of the **heat lost** in an **un-insulated** solid walled home is through the walls. In the drive towards **energy efficiency** and **carbon savings**, we are all being encouraged to insulate our homes but solid walled buildings are designed to **'breathe'** and therefore any insulation solution must work in the same way as the building 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 the **nature of these buildings as well as the planet**.

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 designed to enable **moisture** to be readily **exchanged** with the indoor and outdoor environments. Therefore, when insulating materials are introduced, great care needs to be taken to evaluate the **'breathing qualities'** of the chosen material and hence the impact on the building.

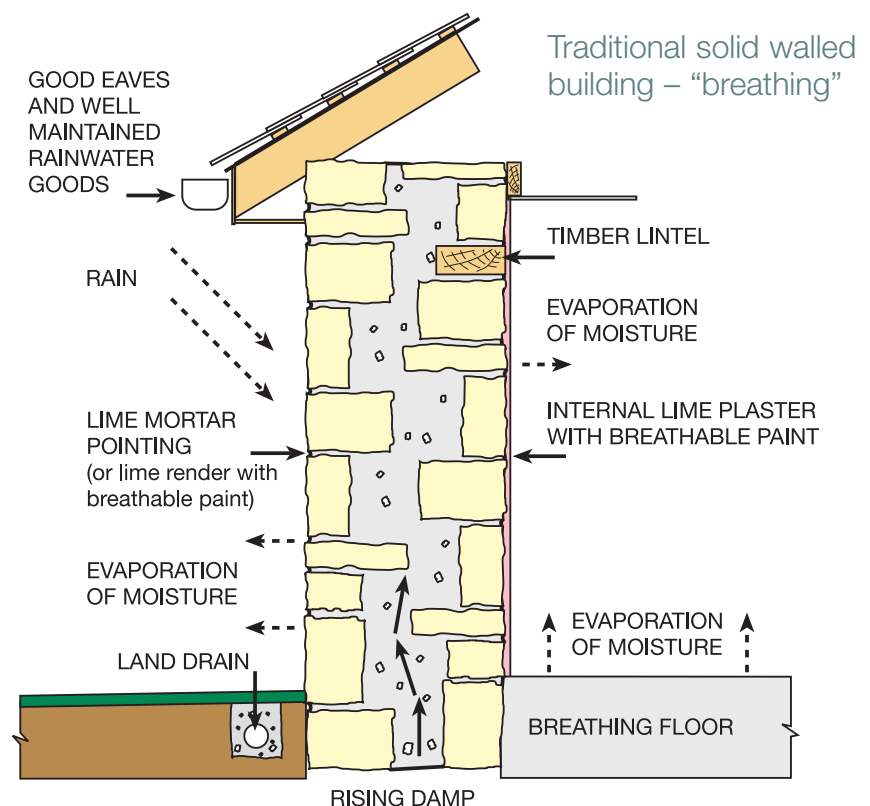
Solid walled buildings are also able to **absorb heat** overtime and then slowly release it (decrement), this ability is referred to as the **thermal mass**, it has a significant effect on the internal environment. It is therefore necessary to consider the impact on this quality as well.

Traditional solid walled construction buildings can be prone to **damp** (moisture in liquid form) and **salts**, it is therefore important to seek the advice from someone experienced with solid walled construction buildings when considering insulating, it is especially important if the building has been empty or had a roof missing or is/has been excessively wet for a long period.

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.



why insulate solid walls?

1. To **save energy** and **improve the internal comfort** – 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.
2. To prevent **cold bridging** which occurs when a material that is a good conductor of heat makes a “bridge” between the warm interior and the cold exterior.

how do I insulate solid walls?

Here, we have presented some of the options we have been developing over the years to help to **insulate** buildings whilst allowing them to **maintain breathability**. There are two methods of insulating solid walls: externally and internally.

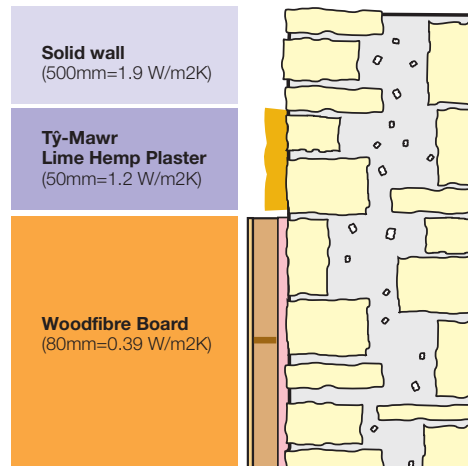
Type of solid wall insulation	Saving per year	CO ₂ saved per year
Internal	Around £380	2 tonnes
External	£400	2.1 tonnes

*Estimated figures based on insulating a gas-heated, semi-detached home with three bedrooms. The Energy Saving Trust

external wall insulation

External wall insulation is installed from the **outside** effectively **wrapping the building**. This type of installation method will change the **physical appearance** of the building (which will usually require planning permission) and will 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 Tŷ-Mawr lime hemp plaster externally with the correct detailing, protection and environment to carbonate but it should have a standard lime render/glaster® top coat. The lime hemp will provide some insulation and is less disruptive than the board system. It will also help to improve weatherproofing and air tightness – see our lime hemp insulating plaster information sheet.



glaster® or standard lime render can be used for top coats. Alternatively, the board system could be timber clad which would require counter battens and the boards would require mechanical fixings.

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, please call for calculations.

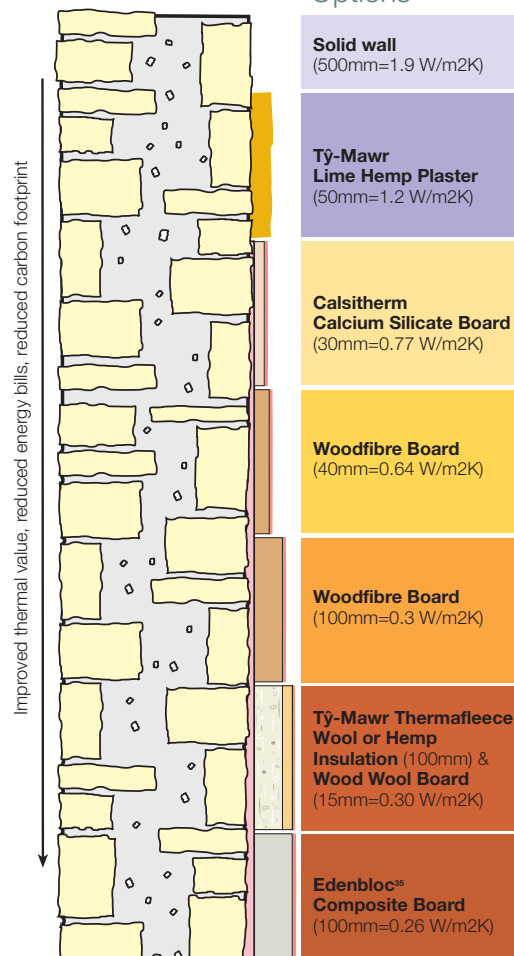
internal wall insulation

Internal wall insulation is applied from the **inside** and necessitates the **removal of all fittings** e.g. radiators, skirting boards, architraves etc. It will disrupt the living space and is therefore often **more involved** than **external wall insulation**.

The **options** shown (right) are graphical representations of some of our solutions, please contact us should you require an actual **calculation** and **condensation risk analysis** 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.

Options



Please note – figures are for illustrative purposes only, please contact us for up-to-date calculations using current values for your application. glaster® or a lime render would provide finish coat.

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 **good energy performance** in an **existing building**, a U-value of around **0.35W/m²K** is recommended. 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.

insulation materials



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 us in Wales. It requires exposure to Carbon Dioxide in the presence of moisture to harden however, it can be applied in **thicker coats** than conventional lime plasters. Like all lime plasters, it is **breathable** but it surpasses other lime products with **increased flexibility** and **durability**. Its **thermal qualities** means that it is predominantly 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).



calsi therm 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 **Calsi therm 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** - visit our website www.lime.org.uk to see an application video.



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**. Different density boards can interlock to optimise their mechanical properties, strength and stability. We stock the Pavatex, Gutex and Homatherm range of products - visit www.lime.org.uk for application guides and technical sheets.



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** which means that it has been thoroughly tested for the purpose of insulating buildings and is produced to continually achieve the values that are stated. Tŷ-Mawr has joined forces with THERMAFLEECE® to produce a wool insulation - Tŷ-Mawr THERMAFLEECE® - which guarantees at least 75% of the wool content is Welsh. 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**.

Combined with our **wood wool boards** and **lime plasters**, this system is a very **popular and extremely effective method of insulating** (readily achieving the

recommended U-value) that works in **harmony with solid wall construction buildings** as well as improving indoor air quality by locking up formaldehyde.



wood wool boards*

These boards have been used in buildings for many decades and have proved to be very popular as a **lime render/plaster carrier** and more latterly 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 in **new timber-frame builds**. They have exceptional **technical qualities** in terms of this application, they are **fully breathable, practically incombustible** and have **excellent acoustic properties**.



edenbloc^{35*}

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! It can usually be applied directly to the wall and fixed with battens offering labour savings.

**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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