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. These systems are now all registered with Local Authority Building Control.
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.

<table>
<thead>
<tr>
<th>Type of solid wall insulation</th>
<th>Saving per year</th>
<th>CO₂ saved per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>Around £380</td>
<td>2 tonnes</td>
</tr>
<tr>
<td>External</td>
<td>£400</td>
<td>2.1 tonnes</td>
</tr>
</tbody>
</table>

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

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.

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 ecoCork plaster, 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.

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 0.30W/m²K or lower is recommended (but please refer to current building regulations which are due to be revised). 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.
Thermally upgrading your building has never been so easy. It can be applied to the thermal and acoustic insulation of the traditional lime render that also improves and natural hydraulic lime offering a high energy saving.

The Secil ecoCORK is a lightweight render, formulated with natural cork aggregates and natural hydraulic lime offering a traditional lime render that also improves the thermal and acoustic insulation of the wall to which it is applied.

It can be applied both externally and internally making it ideal for most building types. It is lightweight and easy to apply. Thermally upgrading your building has never been so easy.

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.

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. Natural and renewable (extracted from the cork-oak tree every 9 years), the cork supplied by Secil Argamasas in the Tŷ-Mawr LABC registered Wall Insulation system is a breathable insulating material, free from any chemicals, synthetic resins or carcinogenic materials, which contributes for a healthy environment inside our homes. The cork’s low thermal conductivity offers a high energy efficiency, thus contributing to an environmental and economic saving.

The board is applied using an adhesive mortar ADHERE Vit, which is a dry-bagged mix of Natural Hydraulic Lime and cork aggregates, it ensures secure fixing of the insulation cork panels.

*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

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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