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WOODFIBRE INSULATION

Let's Do Exciting Things With Old Buildings

Your guide to using natural woodfibre insulation and how we can help old buildings live on.

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What's So Special About Old Buildings?

Old buildings are treasures waiting to be reimagined, reinvented and reinvigorated.

These structures aren't just bricks and mortar, they are masterpieces of beauty, innovation, and history that stir the soul. Britain boasts some of the most spectacular and cherished buildings in the world, each with its own story to tell.

From charming cottages and Victorian villas to majestic palaces, bustling factories to iconic train stations, and grand national monuments. Many of these buildings continue to thrive, either serving their original purpose or reinvented for modern times. Countless others hold the potential for a brilliant new life.

The challenge for today's architects, designers, contractors, conservation officers, and homeowners is to breathe new life into these timeless structures. The mission? To make them fit for the future, with an eye on sustainability, while ensuring they remain commercially viable and cost-effective.

The past and future unite - let's unlock their full potential.

The Right Materials For The Job

While they might be some of the most beautiful places to live and work, they also pose a challenge: these buildings can be notoriously cold, damp, and energy inefficient. However, there's a hidden secret behind their design!

Solid wall buildings, when properly cared for, can remain dry and damp-free thanks to a natural process called vapour diffusion. Moisture that enters the building can escape in the same way, flowing through breathable or permeable materials.

This is why it's absolutely critical that any work done — whether insulation, plastering, painting, or rendering — preserves this 'breathability.' Enter Lime Green's innovative products, like our Warmshell natural woodfibre insulation system.

While other materials, for example mineral wool are vapour permeable, woodfibre does so much more, as it also wicks water (capillary movement) and buffers and stores it.

Not only does it protect the building, but it ensures that these historic structures stay warm, dry, and as energy efficient as possible — without compromising their timeless beauty.

What Is Woodfibre Insulation And Warmshell?

Woodfibre insulation was born out of a brilliant innovation. Wood processors needed a way to transform their waste products into something valuable. Enter woodfibre insulation, created from waste softwood materials like sawdust and wood chips, which are compressed and transformed into sturdy, eco-friendly boards.

At Lime Green, our woodfibre insulation products are marketed under the name Warmshell, available in various densities and thicknesses to suit your needs. Whether you're insulating walls or roofs, internally or externally, Warmshell has you covered.

For external wall insulation, Warmshell wraps snugly around the exterior of brick, masonry, or timber-framed buildings, making your property not only more energy-efficient but also more comfortable and healthier to live in.

If external insulation isn't an option for your project, no worries! Warmshell is just as easy to apply to internal walls and ceilings, offering an energy-efficient alternative that fits seamlessly into your space.

This powerful system consists of two key components: Woodfibre insulation boards and our tried and tested lime products — plaster for internal use and render for external applications. Together, they create a breathable, healthy, and highly insulating envelope that protects and enhances any building.

And now, with the launch of Warmshell Roof, you can even bring this revolutionary insulation system to your lofts and vaulted ceilings.

Wondering if Warmshell is right for your property?

Warmshell Insulation can be used for nearly any type of property:

- Brick, masonry, solid wood, or timber frame buildings
- Contemporary or traditional designs
- New builds or retrofit installations
- Domestic homes or commercial spaces
- Hyper-insulated eco-homes or even historic landmarks

No matter your project, Warmshell delivers unmatched insulation, comfort, and sustainability!

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What Makes Lime Green Warmshell Unique?

The 8 Compelling Reasons to Choose Lime Green Warmshell!

1. Lime Green Warmshell is the only internal woodfibre insulation system in the UK that has been **DEVELOPED AS A COMPLETE SYSTEM – MEANING ALL THE PRODUCTS HAVE BEEN DESIGNED AND TESTED TO WORK TOGETHER.**

2. **SUPERIOR BREATHABILITY:** Our Warmshell IWI system will allow around 4.5 litres of water to pass per day, almost half the amount a typical family will make from daily living. That's 12x more moisture transfer than insulated plasterboard. It can also harmlessly store 5 litres of water per m2 if needed and releases it as soon as possible when internal or external conditions allow. Both these factors reduce condensation and mould risk, providing a healthier environment.

3. Lime Green internal Warmshell is the only woodfibre insulation system in the UK that **HAS A 25 YEAR WARRANTY**

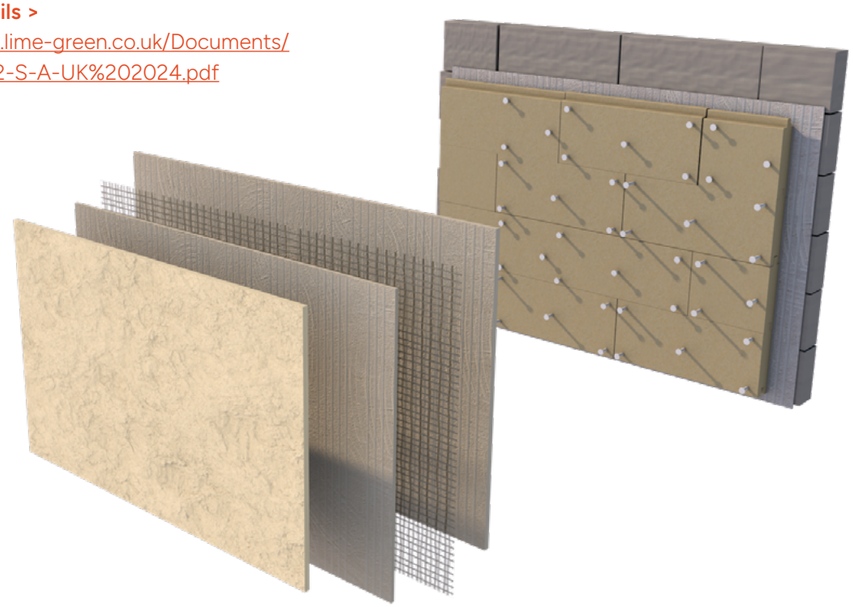
4. Lime Green internal Warmshell is the only woodfibre insulation system in the UK that **HAS BEEN INDEPENDENTLY ASSESSED,TESTED AND VERIFIED BY KIWA.**
   Further details >
   https://www.lime-green.co.uk/Documents/BAW-22-242-S-A-UK%202024.pdf

5. Lime Green Warmshell is the only woodfibre insulation system to have **GAINED AN ENVIRONMENTAL PRODUCT DECLARATION (EPD) FOR ITS PRODUCTS** (currently – Solo Onecoat Lime Plaster used in a Warmshell System scenario and Warmshell Board Adhesive)

6. Lime Green Warmshell **CAN BE FOUND ON THE NBS SOURCE MAKING SPECIFICATION EASY.**

7. **LIME GREEN IS A NAME YOU CAN TRUST.** Our Warmshell woodfibre boards have been used on many hundreds of projects, while accompanying lime plaster and render products have been used on thousands of projects from country cottages to London landmarks since we started the business in 2002.

8. Lime Green are the experts when it comes to the preservation and renovation of older buildings. **WE ARE ALWAYS ON HAND TO OFFER ADVICE ON OUR PRODUCTS, ON PROJECTS AND APPLICATIONS.** Just reach out if you need further information.



Sustainability

Woodfibre insulation isn't just an eco-friendly option - it's a game-changer for anyone looking to build a greener future! As a renewable resource, woodfibre insulation is made from waste products of timber sourced from sustainably managed forests, ensuring that you're not only using a natural material but one that is environmentally responsible from start to finish.

With Warmshell, you're opting for an insulation material that uses significantly less energy, water, and chemicals to produce than traditional options. In fact, woodfibre is *carbon negative,* storing more CO_2 than it takes to make it — a win-win for your home and the environment.

Warmshell Locks Up Carbon:

The Warmshell complete system stores 28 kg of CO_2 per m^2 from day one — reducing emissions as well as energy use.

Why is storing CO_2 important? Carbon capture and storage is a way of reducing carbon dioxide (CO_2) emissions, which could be key to helping to tackle global warming. What's more, by retrofitting buildings rather than knocking down and building new, you keep the carbon in the existing building and you don't use more creating a totally new structure.

With Warmshell, you're not just insulating your property; you're making a statement for a sustainable, eco-conscious future.

And here's something to be proud of: Lime Green is the **only** UK manufacturer to have earned an EPD (Environmental Product Declaration) for its woodfibre insulation system, proving our commitment to sustainability.

But that's just the beginning! Because trees absorb CO_2 during their growth, the carbon remains locked inside the wood, even after processing, which for woodfibre insulation is minimal. Plus woodfibre insulation has a less harmful impact at the end of its life, it being either reprocessed or used as biomass.

But Warmshell woodfibre boards do more than just help the environment — they're the smart choice for your home.

These boards can buffer and store heat and moisture, keeping you warm and cozy in the winter while preventing overheating in the summer. It's a breathable, intelligent solution that adapts to the seasons, providing year-round comfort!

Thermal Performance

Retrofitting as little as 40mm of our Warmshell woodfibre insulation board will reduce the heat loss through your typical solid wall by almost 60%!

You can achieve an awful lot with not a lot of material depth. In fact, the benefits start to diminish the thicker you go. The Alliance of Sustainable Building Products (ASBP) have a great section on their website about finding the sweet spot when it comes to woodfibre insulation.

Further details >
https://asbp.org.uk/asbp-news/finding-the-sweet-spot

We have also produced this table.

		Warmshell Woodfibre Board Thickness				
		No insulation	+ 40mm	+ 60mm	+80mm	+100mm
9" brick wall	U value	1.65	0.68	0.52	0.39	0.32
	% improvement	0%	59%	68%	76%	80%
13.5" brick and a half wall	U value	1.34	0.61	0.48	0.37	0.31
	% improvement	0%	54%	64%	0.72%	77%
500mm limestone wall	U value	1.40	0.63	0.49	0.37	0.31
	% improvement	0%	55%	65%	75%	78%

Acoustic Performance

Woodfibre insulation also has excellent sound absorption properties.

Figures from the World Health Organisation (WHO) and the UK government make for stark reading. A study released by WHO in 2018 indicated that approximately 1 in 5 people, or 100 million citizens, are exposed to unhealthy levels of road traffic noise, and that at least 392,000 healthy years of life are lost to illness, disability or early death each year because of road, rail and air transport-related noise exposure.

Most of these losses were due to chronic annoyance and sleep disturbance, followed by stroke, ischemic heart disease and diabetes.

A study carried out here by the UK Health Security Agency (UKHSA) in 2023 found that 40% of all adults in England were exposed to long-term averaged road-traffic noise levels exceeding 50 decibels (dB).

Heavy traffic can measure 85 decibels. The recommended level for sleep is no more than 53 decibels. And it doesn't necessarily have to be loud to affect us – nuisance noise plays a key part in health outcomes.

Currently, most UK building decarbonisation focuses on creating sustainable and affordable heating solutions and while that's important, it would be a missed opportunity in going for net zero if alleviating the noise issue was overlooked.

So how does woodfibre insulation play a role? The key to reducing noise isn't necessarily thickness of insulation but density and woodfibre insulation boards are more dense than other materials. In fact between 6 and 12 times the density of synthetic counter options.

Lime Green's Warmshell woodfibre boards density of 165kg/m3, tested and certified they could have a significant improvement on the level of sound over lower density rigid foam insulation

Woodfibre is also versatile in the fact that it comes in a number of forms for internal, external and roof applications.

Fire Safety

One of the main fears people have about using woodfibre insulation is the concern around fire.

Warmshell is the only woodfibre system that has been independently fire tested in the UK, and the classification is the highest possible level that can be achieved while using natural insulations like woodfibre. This result is as good as other more traditional options, such as insulated plasterboard.

Details of the combustion, smoke and droplets tests are shown below.

In addition, one of the biggest dangers to life when fires occur are the chemicals released when any material burns, be those items in the building, or the fabric of the structure itself.

Lime Green's woodfibre boards do not use fire retardants in order to achieve high-test results. These fire retardants may give off harmful gases in high temperature fires.

Lime Green's Internal, External and Roof Warmshell were tested onto a wooden substructure and is fire rated as follows:

Reaction to fire Class B-s1,d0

This translates to:

- **B** - Combustible materials – very limited contribution to fire
- **s1** - Little or no smoke
- **d0** - No flaming droplets

Classification according to European Standard EN-13501-1

You can see the fire certificate here>
https://www.lime-green.co.uk/Documents/EN%20Classification%20Report%20-%20REA%20-%20EUI-22-000041.pdf

Installation

Warmshell is a game changer for historic buildings and solid wall properties, offering an exceptional way to minimize heat loss and enhance energy efficiency!

However, it's crucial to understand that when you install insulation, you're altering the inherent physics of the building itself.

Failing to appreciate this can lead to improper installation of the Warmshell, putting the integrity of the building fabric at risk. But fear not! Warmshell is not only effective; it's also incredibly easy to install. There's no need for specialised tools and because it's free from toxic chemicals, you won't need any special PPE either.

Transform your space with Warmshell and enjoy the warmth and comfort of a well-insulated home – safely and effortlessly!

See our installation guides here:

Internal >
https://www.lime-green.co.uk/Documents/Installation%20Guide%20-%20IWI.pdf

External >
https://www.lime-green.co.uk/Documents/warmshellfittingguidecopy.pdf

Roof>
https://www.lime-green.co.uk/Documents/warmshell-roof-design-guide-and-installation-details-v2.pdf

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The Myths About Woodfibre Installation

It will make my house so much smaller

Any type of insulation will add depth to your walls and of course it depends on the size of your room to start with but it's a myth to say your rooms will become much smaller.

You may find you need a relatively thin board to achieve a good level of insulation. A board of just 40mm will reduce the heat loss through your typical solid wall by almost 60%!

Remember also the board is applied directly to the wall, with more modern insulation you would need to use a method that left an air gap and ventilate this which would also add depth – more than 40mm in some cases with the steel frame and board.

It doesn't matter what I use with my woodfibre boards, it's all the same

Not true. Woodfibre doesn't work alone or with the wrong materials. Our plasters and renders are dedicated to being used with woodfibre and create a complete system with substantial benefits.

- Fire protection goes from class E for the boards alone to class B when used with Lime Green plaster or render.
- Weather protection goes from ok for a few weeks unprotected outdoors to a lifespan of many, many decades when Lime Green render is used - protecting the building against wind and rain.
- Impact resistance goes from soft and squishy alone to highly resilient, able to resist balls kicked at it, bikes lent against it and such like.

It will make my walls damp

Warmshell has been developed especially for old buildings. All the products in the system work together and crucially maintain the integrity and breathability of the structure.

It is used in large conservation projects and is recommended by organisations such as SPAB. The Society for the Protection of Ancient Buildings.

It's too expensive

Woodfibre is a more expensive option than some more conventional insulation materials. However, the benefits we think far outweigh the cost when it comes to the environment, the lack of chemicals, the ease of installation and sustainability. Installation is easy and you can save costs here.

Need Further Advice?

Warmshell woodfibre Insulation is a great choice.

We have a number of guides on our website so you can make sure it's the right choice for your project.

Simply log on to **www.lime-green.co.uk** and go to the Warmshell tab in the menu.

There you'll find everything from design guides to project checklists, warranty information and installation guides.

We also have a number of case studies, for example:

Restoring historical fire damaged home>
https://www.lime-green.co.uk/support/case-studies/restoring-historical-fire-damaged-home

Lambeth social housing>
https://www.lime-green.co.uk/support/case-studies/warmshell-lambeth-social-housing

Cannock Mill Co - housing project>
https://www.lime-green.co.uk/support/case-studies/cannock-mill-co-housing-project

Houlston Manor Bungalow>
https://www.lime-green.co.uk/support/case-studies/houlston-manor-bungalow

If you have further questions, you can also contact us

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