

lime|green

Contents

Lime Green Company Profile	3
About the Warmshell Insulation System	4
Warmshell Uses	5
Warmshell - Tried and Tested approved	7
Warmshell: Case History	8
Warmshell System FAQ's	9
Lime Green's Lime Lab	11



Left to Right: Brett Wood from the BBA, Phillip Dunn MP, Simon Ayres: MD at Lime Green, James Ayres: Technical Director at Lime Green

Lime Green Company Profile

Founded in 2002, Lime Green Products is the leading supplier of high quality lime-based products for use in building renovation, conservation and development work. Our wide customer base includes home owners, builders merchants, contractors and architects.

Forward thinking and innovative, we're committed to offering construction materials from sustainable sources that minimize environmental impact and contribute to healthier buildings.

We hold the BBA international accreditation for our UK-manufactured " Warmshell" External Wall Insulation System using woodfibre board and lime-based render, qualifying it for the Government's Green Deal.

With an expected life span of at least 30 years "Warmshell Exterior" is the only external wall insulation system using breathable lime render to have passed the ETAG 004 and to hold a BBA certificate.

We are interested in talking to suitable building or insulation companies who want to join our network of approved installers. If interested please come to Stand S2082.



Exterior wall section showing the layout of Warmshell.



Warmshell Exterior for new build or retrofitting to existing hard to heat buildings.

About the Warmshell Insulation System

Warmshell is a versatile insulation system used to create highly energy-efficient new build properties or transform cold, damp houses into warm, comfortable homes.

Highly adaptable, Warmshell can be used on a wide range of properties with solid brick walls, as well as super-insulated buildings and historic properties.

On new build properties Warmshell insulation virtually eliminates thermal bridging by providing no opportunity for cold air to migrate inward through timber, brickwork or steel used in the exterior wall.

Fitted internally or externally, Warmshell is so energy efficient that walls are not only warmer, but are also more airtight and have better acoustics than standard properties. So a wall as thin as 260mm meets Building Regulations standards (0.18 U Value) without the need for additional waste-water heat recovery systems or triple glazing to be installed as part of the build.

Warmshell is also much better than standard insulation at limiting solar gain, giving consistency of internal temperature throughout the year.

Warmshell consists of just five key components, making the construction process straightforward, with limited training required by contractors. Available as eco-friendly wood fibre board, you can choose which insulation thickness to use to suit your budget and specification.

Fully accredited by the British Board of Agrément (BBA), the independent international authority that approves products for use in the construction industry, you can be sure that Warmshell will meet and continue to perform to its stated specification.

Made in the UK, Warmshell has been developed exclusively by Lime Green, one of the UK's leading manufacturers of environmentally friendly and energy efficient mortars, plasters and renders.

warm|shell



Warmshell Uses

Warmshell can be used on a wide range of detached or properties with solid brick walls, as well as super-insulated buildings and historic properties.

Warmshell Timber Frame

The Warmshell Timber Frame is specifically designed for timber frame buildings, either new or existing. Unlike standard methods of insulating timber frames where insulation infills between timbers, Warmshell adds an additional layer to the outside of the structure so that the property is completely encased.

To give the look required, Warmshell Timber Frame is completed with one of Lime Green's self-coloured renders in a texture to suit. And as a lime-based render is used to finish, it won't shrink or crack over time so the outside of the property remains pristine.

Warmshell Exterior

Warmshell Exterior is fitted to the outside of a property, using an appropriate thickness of wood fibre insulation to achieve the thermal efficiency required. With Warmshell Exterior, the internal floor area stays the same, with no disruptive works need inside, or redecoration afterwards.

Once the insulation is in place, Warmshell Exterior, is also finished with one of Lime Green's self-coloured and textured renders to give exactly the look – contemporary, rustic or traditional – that's required.

Warmshell Interior

Warmshell Interior is the most practical solution when fitting insulation to the outside of property isn't an option, perhaps because of poor access or that the look of the building can't be changed because of conservation area designation. With Warmshell Interior there is no need for scaffolding, to negotiate access with neighbours, to think about external finishes, or get planning permission, because everything's done inside the property.

Fitting Warmshell Interior is a simple four-step process.

- Furniture and furnishings are moved so as to access exterior walls (internal walls aren't affected)
- The Warmshell insulation boards are secured to the wall surface (the existing plaster can be left in place).



warm|shell

- Insulation is cut to size and fixed into position (cables for sockets and light switches may need to be extended through the insulation, though this isn't always necessary).
- The insulation is plastered with one-coat lime plaster – Lime Green Solo.

Because Warmshell uses natural lime plasters and woodfibre boards the system continues to allow the wall to breathe, creating a healthy and comfortable environment inside.

The logo for Warmshell, featuring the word "warm|shell" in a white serif font on a red rectangular background. The vertical bar in the logo is a thin white line.

warm|shell

Warmshell: Tested and Proven

Warmshell is unique in that it is the only external wall insulation system using breathable lime render both to have passed ETAG 004 European Technical Approval and to hold a BBA certificate.

The ETAG 004 guideline governs the performance of External Thermal Insulation systems, and means that Warmshell has been assessed not only for its structural and mechanical stability and capacity to meet hygiene, health, safety and environmental requirements, but also energy efficiency and heat retention, sound reduction qualities and long-term durability.

Warmshell is also fully accredited by the British Board of Agrément (BBA), the independent international authority that approves products for use in the construction industry.

To obtain this accreditation, the Warmshell system has gone through a rigorous programme of laboratory testing, on-site evaluations, quality management checks and production inspections to confirm that it will meet and continue to perform to its stated

specification.

Through testing at specialist facilities, Warmshell has been exposed to extreme and accelerated cycles of heating, freezing, thawing, wetting and drying, at high levels of humidity and temperatures ranging between 20°C and 70°C, over repeated and extended periods.

BBA accreditation is widely recognised throughout the construction industry as a symbol of quality and assurance, which means that it is accepted by specifiers, building control, local authorities and insurers.

Regular monitoring by the BBA will ensure that Warmshell continues to meet its own high performance standards.

The Warmshell System has also been extensively tested for its reaction to fire and been found to produce no flaming droplets or smoke when tested in accordance with relevant European standards. Assessments by fire consultants Exova mean that Warmshell can be used on buildings up to 18m in

height.

To find out more about the BBA and its accreditation process at www.bbacerts.co.uk.

Our BBA Certificate can be downloaded via this link:
<https://dl.dropboxusercontent.com/u/12047917/WARMSHELL%20EWI%20Certificate%20Ref.5173ps1i1.pdf>

Notes about the benefits of BBA Certification can be downloaded here:
<https://dl.dropboxusercontent.com/u/12047917/WARMSHELL%20EWI%20Certificate%20Ref.5173ps1i1.pdf>



Warmshell in Action: A Case History

Background

Contrary to what might be expected, almost all methods of internal building insulation have been developed from theoretical paper exercises, lab tests and computer simulations, but with no real world verification.

This issue was brought to prominence by conservation charity SPAB (Society for the Protection of Ancient Buildings) who had become increasingly aware that standard methods of building using plastic membranes and sealed plasters, were not only very unsatisfactory, but had in some cases led to catastrophic failures when retrofitted to historic structures. This was despite computer software predicting no problems.

To investigate what was actually happening, using in-situ sensors SPAB monitored the walls of a number of buildings before and after insulation work was carried out on them.

One of these properties was a typical 19th Century solid brick walled building in Abbey Foregate in

Shrewsbury, still being monitored so as to better understand how the physics of insulating actually work, an on-going and real world analysis that's unique in the UK.

Project Detail

Abbey Foregate was insulated internally using Steico Therm woodfibre boards that were then plastered with Lime Green Solo. No vapour barrier or membrane was installed. Throughout the depth of the plaster, insulation and brickwork sensors check relative humidity, temperature and the dew point. Internal temperature, humidity and air quality are also logged, as well as the data from an external weather station.

All this information has been recorded at five-minute intervals over the last 4 years, before being sent to specialist consultancy Archimetrics, for analysis and interpretation.

The results have been revelatory.

In reality, the breathable plaster and insulation have behaved completely differently to computer

predictions mandated by building regulations with the walls never suffering from condensation, as predicted, but rather have become steadily drier.

However, external weather – from wind-driven rain to sun on the façade – have been shown to have far greater impact than previously thought.

Crucially, the data shows that the insulation and plaster not only keep the structure dry and safe, but also provide a comfortable internal climate for those inside.

The logo for 'warm|shell' is displayed in white text on a red rectangular background. The word 'warm' is followed by a vertical bar and then 'shell'.

Warmshell: FAQs

What makes Warmshell so special?

A unique combination of wood fibre board (WFB) insulation and specialist render. Warmshell's WFB is much more effective than traditional mineral wool insulation at limiting solar gain, which means that temperatures inside the home remain far more constant, while the renders contain recycled glass beads that trap air to make walls even warmer. Also, when used externally Warmshell completely encases a property ensuring there are no gaps through which warm air can escape, or 'thermal bridges' across which cold from the outside can travel through walls.

Why do you call Warmshell a system?

Because it comes complete with all components – insulation, fixings, reinforcement, profiles and render – and uses a standardised installation process to create a highly energy efficient building.

In properties that suffer from condensation, won't Warmshell just trap moisture inside?

No. Far from it. Warmshell is a 'breathable system' that's made from natural materials, so it actually prevents the unpleasant build-up of damaging condensation and damp by allowing moisture to

pass through the wood fibre board insulation so that it can evaporate. What's more, Warmshell's wood fibre boards absorb excess moisture from the air – as much as 60 times more than standard mineral wool insulation, which makes homes not only much warmer, but healthier.

Many insulation products use materials and processes that aren't environmentally sound.

What about Warmshell?

Warmshell's insulation boards are made with softwood from sustainably managed sources. Chipped and mixed with water, the wood's own cellulose and lignin bind the board together without the need for chemicals or adhesives. And because of the recycled glass beads we use to trap air in our render, not only does it keep walls warmer, but it's up to 50% lighter than other renders, making it more energy efficient to transport. So, unlike some other insulation and cladding systems, Warmshell is 'genuinely green', allowing existing cold walls to be upgraded quickly and cost-effectively, with immediate benefit to the environment. And as the materials used in Warmshell are all natural, any waste at the end of a project can be disposed of harmlessly.

What surface finishes are available with Warmshell?

With Warmshell there are many different self-coloured renders and several textures available to achieve exactly the look that's wanted, that's contemporary, rustic or traditional.

Is Warmshell cost-effective?

Yes. Whichever Warmshell system is chosen energy savings are achieved from Day One. Lime Green's Warmshell Saver System is specifically designed for anyone who wants a warm, comfortable home, but is working to a tighter budget. Using innovative expanded polystyrene (EPS) boards that incorporate graphite, the Warmshell Saver System achieves high level insulation performance, at a lower installation cost.

The logo for Warmshell, featuring the word "warm" in a lowercase sans-serif font, followed by a vertical bar, and then the word "shell" in a lowercase sans-serif font. The logo is set against a solid orange rectangular background.

Are grants available for installing Warmshell?

Warmshell qualifies for the government's 'Green Deal' loans, so there's even more reason to make energy-saving improvements to properties right now.

Can timber frame houses be upgraded using Warmshell?

Absolutely. Warmshell is perfect for new build timber frame and for retro-fitting to existing timber frame properties. In both cases, Warmshell literally encases the entire property, wrapping it completely in an insulative layer that doesn't allow warm air to escape or cold air to get in.

Can Warmshell be used in conservation areas?

Yes. By fitting Warmshell Interior you don't change the external appearance of a property. It is also the ideal solution when access to the exterior of a property isn't possible.

Can anyone install Warmshell?

With good DIY skills Warmshell Interior can be fitted as this mainly involves cutting wood fibre board to size and fixing this to the wall surface using the components we supply. Applying our lime-based plasters to the surface of the boards isn't difficult. For Warmshell Exterior we would suggest that one of our

recommended installers is used.

How do you become a Warmshell system installer?

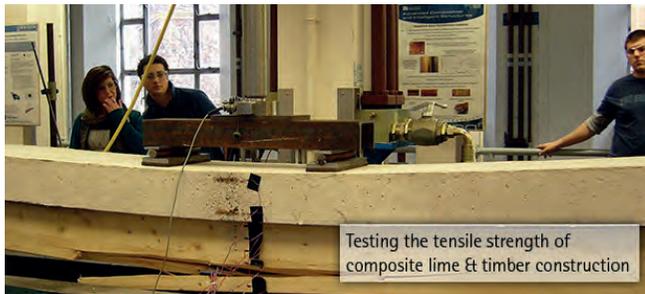
We are always looking to certify installers who can demonstrate their competence and professionalism, so just contact Lime Green.

How do you find a Warmshell installer?

Contact Lime Green for our approved installer lists.

The logo for Warmshell, featuring the word "warm" in white lowercase letters and "shell" in white lowercase letters, separated by a vertical white line. The text is set against a solid orange rectangular background.

warm|shell



Lime Green's Lime Lab

Lime Green is continually creating new products, improving existing ones and looking for even better ways of using lime products in green building at its own dedicated research and development department – Lime Lab.

It's here that Lime Green analyses and refines the formulations of lime products, plaster materials and insulation materials so they best meet the needs of self-builders, trade specialists, architects and specifiers.

It's this attention to detail that has helped Lime Green become a leading innovator in the marketplace, and enabled the company to develop products such as its Ultra range of lime renders and lime plasters which incorporates insulating glass beads.

Through such research, Lime Green has also been able to uniquely develop lime grouts, lime mortars, lime renders and lime plasters that maintain and complement the original integrity of historic and ancient buildings.

It was at Lime Lab that the Warmshell Insulation System was developed and the Interior system tested with in situ real world monitoring.

Lime Green Products Ltd
Coates Kilns
Stretton Road
Much Wenlock
Shropshire
TF13 6DG

sales@lime-green.co.uk

www.lime-green.co.uk

lime|green