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The Invisible Way of Insulating Your Home

Exclusively available from Bath-based sustainability experts, propertECO, Thermalogix is a unique, low-cost method of improving the insulation qualities of buildings without changing their appearance.

The treatment can be best explained by using the following analogy: Imagine you have been caught in a heavy rain shower with no umbrella. Your clothes are soaked through and very quickly you begin to feel cold. When you get home, your first instinct will be to remove your wet clothes, as you know that they are making you colder.

The reason behind this is that wet materials conduct (or transfer) heat more readily than dry materials. In the case of typical building materials, a completely saturated brick will transfer approximately twice as much heat as an identical dry brick.

By keeping a building's walls drier, it is therefore possible to significantly reduce the heat that is lost through them. Thermalogix has been developed over the last three years to achieve this by creating a high-performance hydrophobic zone in treated properties.

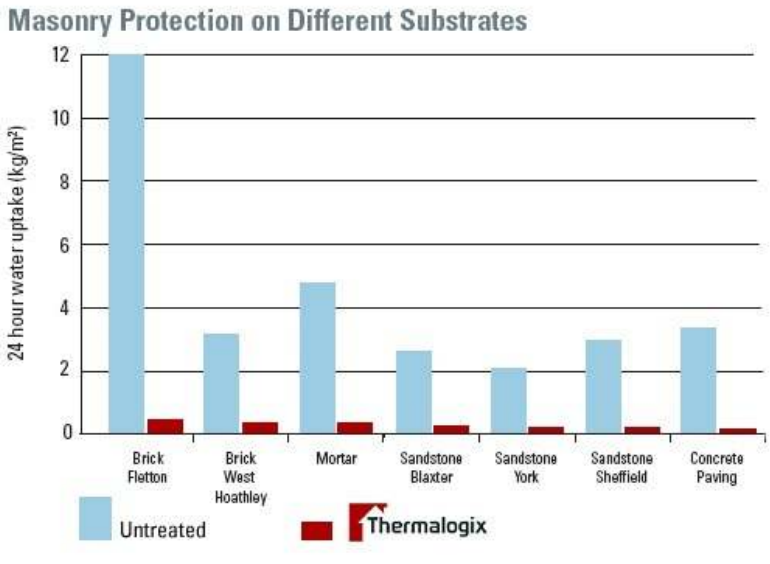
A unique cream formulation of silanes and siloxanes, a single coat of the product is applied externally to masonry using a brush or roller . When applied, the cream is white so that it is easy to see if any areas have been missed. Within 48 hours the product will have penetrated deeply into the walls leaving no visible sign of application on the surface; this means no discolouration, no sheen and no residue.

The advanced formulation of the cream means that the pores of the masonry are lined with the material so that whilst the absorption of moisture is restricted, as the pores themselves are not blocked the property can still 'breathe' and vapours can pass freely through the walls.

The product has been developed primarily as a solution for solid-walled buildings, otherwise known as 'hard to treat buildings', as the alternatives are limited and often undesirable. External cladding systems are expensive and dramatically change the appearance of the building, whilst internal lining systems can take up valuable internal space and require alterations to other fixtures (e.g. door and window frames, kitchen units etc) to accommodate them. Thermalogix can also be used on the external leaf of cavity wall constructions as an extra layer of insulation. The product cannot be used where walls are painted or rendered, as it will be unable to penetrate into the substrate.

Performance

Water uptake laboratory tests have been carried out on a wide range of substrates. The below graph shows the volume of water that each material absorbed in its natural state, compared with the volume absorbed after treatment with Thermalogix.



Experiments in various simulated weather conditions were carried out on a model houses by a leading UK university. In damp weather, the energy needed to maintain a constant internal temperature was between 5% and 9% less in the treated house the untreated house.

SAP analysis has indicated that when driving rain is present, the potential energy saving achieved is 29%.

Cost Effectiveness

Thermalogix has been developed to offer a low-cost solution to those clients who need or want to reduce their carbon emissions but have limited budgets to do so.

The cost of the material is approximately £7/m2 (depending upon surface texture & permeability), or if we are required to provide labour to apply, approximately £14 m2 including material. As the material is deeply penetrating and highly resistant to UV and other forms of degradation, the life expectancy of this single application is 30 years.

The below chart shows the cost effectiveness of Thermalogix in relation to other energy-saving measures.

Measure	Annual CO_2 emission savings from measure (kg/yr)	Annual Fuel savings from measure (£/yr)	£/tonne CO_2saved
Thermalogix	879	74	58
Loft insulation	405	34	53
External wall insulation	1176	99	185
Solar panels	162	11	1,475

The average financial payback period will be approximately 6 years.

Quality Control

Prior to the application of Thermalogix, water uptake testing is carried out at the property to assess the current permeability. This is conducted using a series of Kasten tubes positioned around the property and filled with water. The time taken for a given volume of water to be absorbed is recorded.

One month after Thermalogix has been applied, the tests are repeated and should reveal a much slower (if at all) uptake rate.

Additional Benefits

In addition to saving energy, Thermalogix also contributes to the sustainability of a building by preserving the fabric from deterioration. During the colder months, water that has entered the building's walls will usually freeze and expand, causing the surface to become friable. Thermalogix will halt this process, reducing the need for subsequent repairs and repointing.

It can also limit algae and moss growth.

Carbon Footprint of Application

The carbon footprint of an application of Thermalogix is low, at 0.73 kg CO2 per m2. This compares favourably with the carbon footprint of 100mm thickness of Rockwool insulation (1.05 kg CO2e per m2), and is even less than that of a typical loaf of bread (1.3 kg CO2e)

Taking this into account, the graph below illustrates the potential cumulative carbon savings over an application's 30 year lifespan if differing weather patterns are present (note that this is a simplification only and that wet and dry conditions alone do not determine the carbon usage and subsequent savings of all properties).

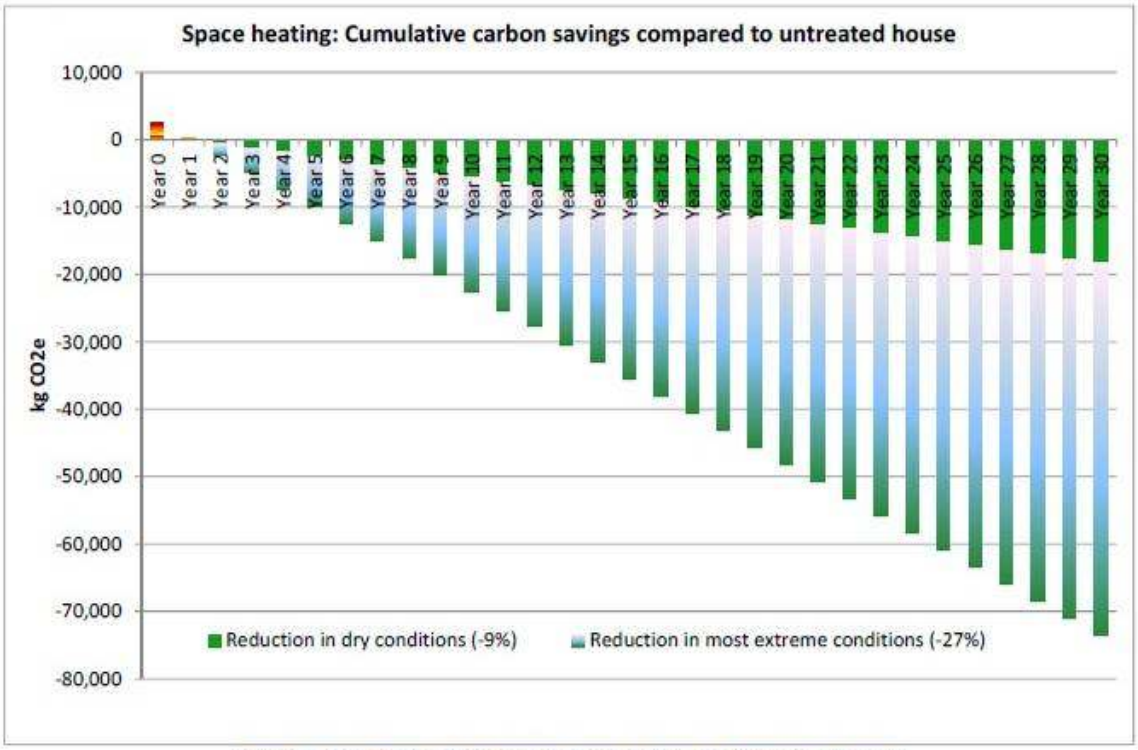


Figure 3. Potential carbon savings from surface treatment over time

Over this time, assuming the average of dry and most extreme weather conditions, the treatment can potentially save between 24,081 and 36,817 kg CO_2e compared to an untreated solid brick house.