



SOLID WALL INSULATION - ARRANGE-IT-YOURSELF OPTIONS

You can save up to 35% of your heating costs by wall insulation. There are several ways of insulating a solid or stone wall. Some similar methods can also be used for timber framed walls in older properties. This is best done when and if you plan to re-decorate.

Ventilation

Ventilation into a building happens in two ways: at molecular level through the materials in an invisible manner, and by air movement. Traditional buildings work on a little bit of both routes. It is very rare for moisture to travel freely in an old house the way it did originally, as occupants invariably do things to their home. However a balance is needed and many buildings are too draughty. An air gap on the inside face of a wall (behind the lath and plaster or plasterboard) provides additional insulation, but only if not excessively ventilated. Dr Alan Owen from RGU measured the airspeed in the air space behind his plasterboard as 2.5 m/s before he filled this space with breathable insulation. So modification (but not closing off) of this air space can give the key to improving the thermal performance of these walls.

1. If lath and plaster walls

Internal insulation can be done using **Proctor's Spacetherm** which is a fibrous matting impregnated with silica aerogel. This is extremely effective and the best product available in terms of thermal performance. It has a thermal conductivity of $0.013 \text{ W/m}^2 \text{ K}$ which is over 3 times better than fibreglass. There is a range of insulation thicknesses available. The cost varies by thickness and ranges from £31.59 - £160.89 per m^2 + VAT.

With lath and plaster you would have a small amount of space, typically 25 mm between the outside wall and the lath. If your house is well ventilated you could remove the lath and plaster and insulate behind this and re-place with lath and plaster (possible but expensive). Historic Scotland are currently trialing Proctors Spacetherm Blanket, held to a lath and plaster wall with a mesh onto the existing plaster. They are awaiting the results. Spacetherm is covered by BRE certification and registered as an energy saving measure by Ofgem.

Details from www.proctorgroup.com Tel 01250 872 261. Spacetherm is made in Blairgowrie.

- 2. If there is a gap between the plasterboard and the outside wall.** Historic Scotland have blown or poured/blown material in regardless of gap size and got reasonable results.

2.1 Silverpor

Dr Alan Owen, director of CUSP at R.G.U. who spoke at a BERI talk in February, has very successfully used Silverpor to insulate behind the plasterboard in his house and in other inaccessible spaces. He managed to get access via his loft space etc. He has saved £1,500 - £2,000 in fuel costs annually since insulating, with no detrimental effects after 6 years. The product paid for itself in under 5 years. Roger Curtis head of research at Historic Scotland is pinning his hopes on him and his wall....

Silverpor is a hydrophobic insulating aggregate made from coated expanded perlite. It comes under the general product name of Silverperl. It is water-repellent and non-flammable. It is loose-pour and seeks out and completely fills the area it is poured into. It is produced and tested to BS EN 14216-1:2004 Thermal Insulating Products for Building. Silverpor has a thermal conductivity of $0.045 \text{ W/m}^2 \text{ K}$. Dr Owen has applied to the B.R.E. with a view to having this product accredited for how he has used it.

The nearest supplier is Sheffield Insulation at Bridge of Don, Aberdeen e mail aberdeen@sheffins.co.uk tel 01224 825825. This would need to be especially ordered as they don't usually keep it in stock. Silvapor is supplied in plastic sacks containing 100 litres when packed (approximately 3.5 ft³). 27 x 100L bags when palletised. It costs £27 per bag + VAT with the price increasing in August. For larger quantities the price per bag could be negotiated.

Silvaperl is a division of William Sinclair Horticulture Ltd. Website www.Silvaperl.co.uk tel 01427 610160 e mail silvaperl@william-sinclair.co.uk

2.2 Warmcell

Warmcell can probably also be used in the same way and Historic Scotland is doing trials with this. This is cellulose made in Wales from recycled newspapers. It has a thermal conductivity of 0.04 W/m² K which is the same as fibreglass. Warmcel has BBA accreditation for roofs. Information from tel 01685 845200 and website www.excellfibre.com Their DIY product is called Warmcell 100 and is distributed by Rob Street at tel 01920 821069. The company that produces this product are adamant that it is suitable only for roofs so using this on a DIY basis for walls would be at your own risk. However BCA have done this for Historic Scotland, so it will work with existing equipment.

2.3 Actis Triso Super 10

Actis Triso Super 10 is a thin material with exceptionally good insulating qualities for roofs. It works best if used to insulate the entire envelope of the house; i.e roof and walls together. It was not specifically designed for walls alone, but it nevertheless works well and is much cheaper than Spacetherm. This is a very thin product which has the insulating effect of 190 mm of fibreglass.

This insulation is installed between the wall and the plasterboard. As the insulation is quite thin, there would be no need to have electric sockets, skirting boards etc re-done. In order for this to work best it needs to be installed perfectly with no gaps between the sheets or at corners etc.

Triso costs £240 + VAT per 24m² roll. Installation cost depends on the amount of joinery work required. Information at www.insulation-actis.com/home and click on UK. Available from Sheffield Insulation. Historic Scotland are not keen on this product and claim it can be risky (if not fitted properly) but some local builders have had very impressive results with this.

2.3 **Proctors Spacetherm** can be used. See details in **1.0** above and refer to manufacturer's information

3. Insulated plasterboard

Insulated plasterboard Kingspan Kooltherm K17 & K18 are phenolic foam which have a very good thermal conductivity at 0.021 W/m²K. These can be fitted on top of existing plasterboard or directly onto the wall, but only if the wall is currently uninsulated. If you are prepared to remove any existing plasterboard (and if there is space behind this) K 18/17 can be fitted in the space behind.

Kooltherm K 18 can be fitted on top of existing plasterboard, fixed onto a minimum 25mm treated timber batten, fixed by long screws going through to the batten that the plasterboard is fixed to. This is required to prevent any potential moisture ingress into the construction.

K 17 can be glued on with dabs. This is best for if there is plaster straight onto the wall, rather than plasterboard.

For illustrative purposes, for a 50 cm thick granite wall insulated using battens as above with Kingspan K18 , a thickness of 72.5mm Kooltherm K18 including 12.5mm plasterboard achieves a U-value of 0.27W/m²K, the 82.5mm Kooltherm K18 achieves 0.24W/m²K and the thickest Kooltherm K18 manufactured (80mm + 12.5 mm) 92.5mm achieves 0.22W/m²K.

The lower the U value the better. A U value of 0.25 is equivalent to a newbuild wall in 2008 and new regulations can require a wall U value of 0.19 The cost of K17 and K18 depends on thickness, varying from £37.41 - £71.11 + VAT per 2.4 m x 1.2 m sheet. Kingspan's website is at www.kingspaninsulation.co.uk Their main local supplier is Sheffield Insulation

Foil backed insulation boards create a low-e air space which improves the U-value, but you cannot use foil-backed for plaster and dab applications because the material would not stick on.

4. For timber frame walls and all stone wall types

The cheap(er) and cheerful option is **Sempatap Thermal**. It goes on like wallpaper. It is thin enough that you don't have to re-do skirting boards. The biggest advantage is this is easy to fit but as it's very thin its insulating qualities are equivalent to only about 7 mm of fibreglass which isn't great but is a lot better than nothing. It is good for taking the chill off rooms. It can also be painted or wallpapered over. The insulation effect of one layer is only the equivalent of 7 mm of fibreglass, but more than one layer (overlapping) can be used. The cost is £169.20 for a 12.5 m x 1m roll. More details from e mail info@mgcltd.co.uk and leaflets in BERI office.

5. If your home is next to an unheated stairwell or corridor wall insulation could be applied from the corridor side.

6. If you have an adjoining shed or garage it could be easy to add insulation to the external wall of your home from the shed/garage side. Rigid and lightweight insulation boards such as Kingspan TW 55 or TP 10 would be suitable. It can be placed directly against the shed/garage wall. 100 mm of this product has the effectiveness of 190 mm fibreglass and costs about £13.34 + VAT per m² from Sheffield Insulation or B & Q.

V.A.T.

The V.A.T. rate for energy saving products including insulation is 5 %. However this is applicable ONLY if the product is supplied and fitted by a V.A.T. registered contractor. For D.I.Y. jobs and non V.A.T. registered tradesmen, it's 20 % and there is no way round this. The relevant information is V.A.T. notice 708/6 energy saving materials on the HMRC website.

Samples of materials and further information on wall insulation

Samples of insulation materials are available from BERI office at Town Hall at our drop in sessions and from our stall at Banchory farmers market from September. Also refer to BERI Stone wall insulation (Insulation company) factsheet.

“Energy Efficiency and Traditional Buildings – Historic Scotland’s work “ To find this google “Historic Scotland technical research” This document also refers to a web link from a conference on Energy Efficiency and Sustainability in Traditional Buildings at www.historic-scotland.gov.uk/energyefficiencyintraditionalbuildings.htm

“Energy Heritage – a guide to improving energy efficiency in traditional and historic homes “ downloadable from website at <http://www.changeworks.org.uk/householders/technical-guides-for-energy-improvements/475/>

“ Energy Saving Trust guide CE 184 Practical refurbishment of solid – walled houses“ (2006 edition)
downloadable from <http://www.energysavingtrust.org.uk/business/content/view/full/70495>

Disclaimer BERI is not responsible for the outcome of any insulation done and you are advised to study the installation instructions from the manufacturers.

This factsheet will be updated when new information and products become available. Make sure you have the latest versions of all BERI factsheets.

Banchory Energy Reduction Initiative (B.E.R.I.) is a local community organisation funded by the Scottish government’s Climate Challenge Fund until March 2012 and run by volunteers and part time staff. Online information at www.banchory.org see link to community projects. For more information tel 077 697 125 20 e mail beri.banchory@hotmail.co.uk Drop in advice sessions at Banchory Town Hall Mondays and Fridays 10.30 – 12.30



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