



Kalzip low U-value roof system

Achieving 0.10 W/m²/K

Kalzip's low U-value roof system provides a cost effective and technically sound solution for roof U-values as low as 0.10 W/m²/K.

The system has been developed in anticipation of changes to Part L of the Building Regulations in 2010 and beyond. These new regulations will lead to ever-tightening design limits on thermal performance.

Maintaining all the qualities and benefits of a Kalzip standing seam roofing system this hybrid configuration combines rigid insulation boards with glass mineral fibre layers.

It is the symbiosis of the two insulation types that gives the system its high performance and uniqueness in achieving extremely low U-values, allowing a significantly greater overall thermal resistance to be achieved compared to that of any one single layer of insulation of the same total thickness.

product review



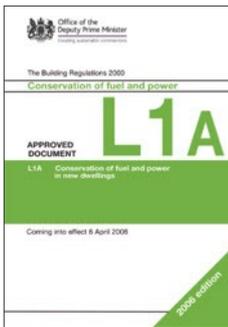
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System

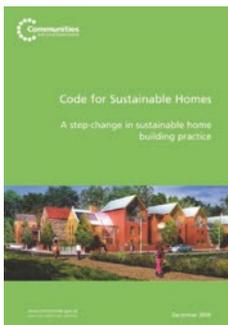


Energy legislation

Changes in legislation and challenging government targets are having a huge impact on how a building's fabric is constructed.



Part L1A Regulations Energy/Carbon Reduction Levels



Code for Sustainable Homes (Dec 2006) Rating Levels

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The realities of climate change and the drive for sustainable construction are accelerating the way forward for all new buildings and structures to become net zero carbon rated by 2019.

Critical to the successful implementation of a carbon free future is the need to reduce both CO₂ emissions and energy consumption levels. The UK government estimates that buildings account for approximately 50% of CO₂ emissions.

Reducing heat loss by improving U-values is, therefore, a fundamental consideration for reducing the carbon footprint of buildings.

The Code for Sustainable Homes

The Code represents current best practice for the construction of residential dwellings. The Code is closely linked to the Building Regulations, which are the minimum building standards required by law. Higher standards of the Code will be reflected in future revisions to the Building Regulations, giving developers a clear framework within which to anticipate changes.

It is generally accepted that a similar code will be extended to non-dwellings, driving the way forward to achieving zero carbon buildings by 2019.

Step change approach to sustainable construction

	2002	2006	2007	2008	2009	2010	2013	2016
Part L1A Regulations Energy/Carbon Reduction Levels	Base start point	-23% (April 2006)				-25% (cumulative -48%)	-44% (cumulative -92%)	Zero Carbon Home
Code for Sustainable Homes (Dec 2006) Rating Levels Homes			Level 3 (April 2007)			Level 4 (zero emissions from heating, hot water, ventilation & lighting)	Level 5	Level 6 (zero energy emissions)
			<small>(includes: energy, CO₂, and potable water consumption, materials, water run-off, site waste, lighting and white goods.)</small>					
Public Sector			Mandatory			Mandatory	Mandatory	Mandatory
Private Sector			Voluntary			Mandatory	Mandatory	Mandatory

Note:

Code level 3 (25% reduction) is the current standard required for all new public dwellings and a standard requirement of Part L in 2010. 'The Code' entry level will then become Level 4 (44% reduction). It is anticipated that this step change approach will continue to the 2019 target.

The Code measures the sustainability of a home against nine design categories, rating the entire dwelling as a complete package. The design category covering building fabric is energy and CO₂ emissions.

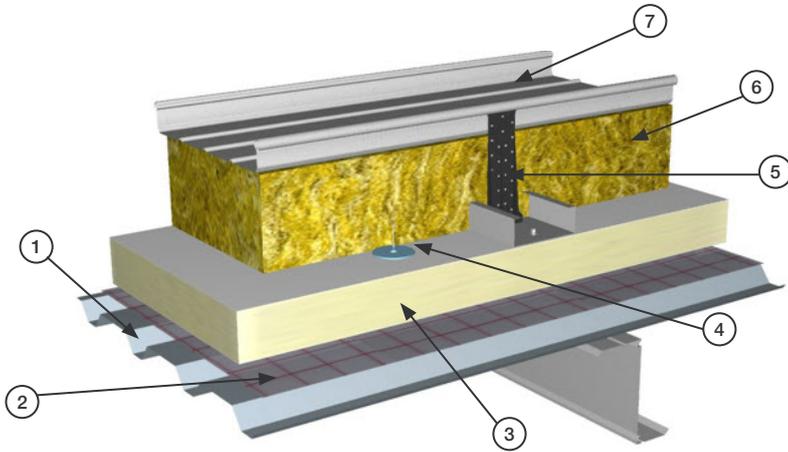
Studies on typical residential apartments have shown that U-values down to 0.10 W/m²/K can be required to achieve a Code Level 3 rating without the need for additional low and zero carbon technologies.

Kalzip low U-value roof system

The low U-value system is primarily based on a standard Kalzip standing seam roof build and as such is subject to the same basic set of criteria and properties for materials, finishes, geometries, accessories and components as outlined in the Kalzip systems brochure.

System configurations

The Kalzip low U-value system is available with four types of roof lining



Standard liner tray over purlins

1. Inverted liner sheet over purlins
2. Vapour control layer
3. Kalzip Insulation 23 (2400 mm x 1200 mm boards)
4. SFS Iso-Tak fastener system
5. E clips fixed to inverted channel
6. Kalzip Insulation Plus range
7. Kalzip top sheet

Liner roof system

The Kalzip low U-value liner roof system consists of a conventional trapezoidal steel liner sheet laid with the wide flange side facing upward.

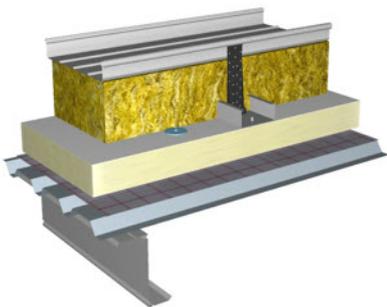
The wide flange up provides a greater bearing surface to support the inner layer of Kalzip Insulation 23.

This is a fire retardant polyisocyanurate (PIR) rigid foam board available in a range of thicknesses.

A second layer of mineral fibre quilt insulation is laid on top of this creating a hybrid or "duo" system shown above.

Using this combination of rigid board and mineral fibre insulation materials allows a significantly greater overall thermal resistance to be achieved compared to that of any one single layer of insulation of the same total thickness.

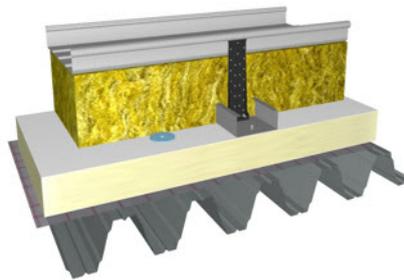
Liner-deck spanning between purlins



Liner-deck roof system

The liner-deck roof system is a variation of the standard liner roof system. A higher structural grade of steel is used to allow the clip rails to be positioned away from purlins.

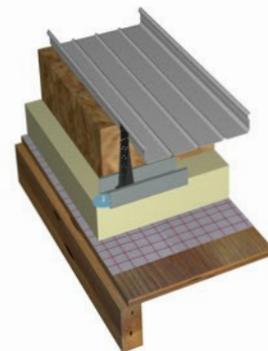
Structural metal deck spanning between rafters



Structural deck roof system

The structural deck roof system is a variation of the standard liner roof system. A higher structural grade of steel is used to allow the clip rails to be positioned away from purlins.

Timber decking



Timber deck roof system

Timber (or SIPS) decking provides a popular sustainable solution for supporting roof constructions. Please contact our technical services department for fastener pull out values.

Sustainable options

Information on the use of the low U-value system with renewable (Kalzip AluPlusSolar) and green roof (Kalzip Nature Roof) technologies is available from the Kalzip technical department.

Curving parameters

Where Kalzip Insulation 23 board is fixed to a curved liner, there are a number of possibilities to accommodate solutions for flat roofs and curved roofs down to a 1.5° radius.

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Kalzip Insulation 23

Kalzip Insulation 23 is a standard component for use in the Kalzip low U-value roof system. It is a high performance rigid polyisocyanurate (PIR) insulation board, introduced to give a second layer of insulation with low thermal conductivity.

Kalzip Insulation 23 is faced on both sides with a low-emissivity which is highly resistant to the transmission of water vapour in accordance with BS 4370-2: 1993.

Kalzip glass quilt insulation

At the heart of Kalzip's insulation products is a full range of Kalzip Insulation Plus materials which are high performance glass quilts offering extremely efficient thermal performance. Products are fully compliant with the harmonised European Standard BS EN 13162 : 2001, are non-hygroscopic, non combustible to BS 476:Part 4, Class 0 and in accordance with BSI Quality Assurance Standard BE EN ISO 9002.

Environmental performance

Kalzip insulation products conserve energy and therefore assist in reducing demand for fuels for the heating and air-conditioning of buildings. As a result they reduce the emission of the major greenhouse gas – CO₂.

The core of the PIR based formulation and all Kalzip insulation products are CFC/HCFC free with zero Ozone Depletion Potential (ODP) and a Global Warming Potential (GWP) of less than five.

Durability and recycling

When correctly applied Kalzip Insulation 23 has an indefinite life fully supporting the sustainable credentials of standard Kalzip standing seam systems.

Kalzip insulation products can be reused or recycled at the end of the building's life. Further details on the procedure for recycling are available on request.

Kalzip Insulation 23 - physical properties

Material	Aluminium foil-faced polyisocyanurate foam board
Dimensions (mm)	2400 x 1200
Thickness (mm)	25, 30*, 40, 50, 60, 70, 75*, 80, 90, 95, 100, 110, 120, 130, 140
Density (kg/m ³)	32
Thermal conductivity (W/m/K)	0.023
Tensile strength (kPa)	60
Compressive strength (kPa)	150
Specific heat capacity	1400
Vapour resistance (MNs/g)	> 100 MNs/g

*Non standard product

Technical performance

Please refer to the Kalzip technical department for further information on low U-value system performance including acoustics, fire and thermal efficiency.

NBS specifications are also available on request.

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