



Loft Insulation



Loft conversions are one of the most common projects taken out by British homeowners. Often it is the only possibility to enlarge the terraced house. Arranging the living space in the attic provides the opportunity for modern living. However, in order to achieve the comfort and energy efficiency, lofts should be properly insulated. Insulating roof, attic or loft will significantly reduce the energy costs. Loft insulation is highly durable and the return on the investment is guaranteed.

In the UK attics in the residential buildings are mostly made of a wooden structure. In such conditions mineral wool is the best insulator. Insulating

the loft is one of the best ways to improve the EPC rating of the building. Without insulation 25% of the heat escapes through the roof of the property. Ac-

cording to the building regulations it is necessary to reach a U-value of 0.16 and the 300mm of wool insulation or less thickness of Celotex or Kingspan.

Selecting the insulation material

Buildings in the UK hold Energy Performance Certificate (EPC) rating system which shows their energy efficiency. The insulating materials have to meet the requirements of current legislation including Part L, BREEAM and the Code of Sustainable Homes.

Heat always flows from warmer to cooler places until there is no temperature difference. Insulation



material slows down the conductive heat flow and to some extent the convective heat flow. The continuity of the insulation layer will eliminate thermal bridging. Heat flows more easily through joists, studs or other building materials. During loft insulating take care at joists of roof and walls where thermal bridging occurs. Insulation of loft should be in the continuity with the insulation of the walls. Rafters should be also insulated. Apart from the floor and rafters insulation, it is recommended to insulate any pipework and cold water tanks up in the loft. To achieve the proper loft insulation it is required to provide the adequate ventilation. There

is also the possibility of adding the external roof insulation material.

While choosing the insulation material it is recommended to select the one with the highest R-value, what means such material has the lowest thermal conductivity- lambda and the highest thickness. Lambda is the measurement of how fast heat flows through the particular type of the material. The lower the lambda the better its thermal performance. It is measured in Watts per metre Kelvin (W/mK). For instance wool and fibre insulation has a thermal conductivity of approximately 0.034 W/mK while insulated panels about 0.008 W/mK. The

resistance of heat flow through a given thickness of the insulation material is measured in R-values. The higher the R-value, the better. The R-value depends on the type of the insulation, its thickness and its density. For multilayered insulation system, all the R-values of each layer are added to calculate the R-value of the whole system. The more insulation material is installed in the building, the higher the R-values and the resistance to heat flow. The total thermal insulation of the cavity wall is calculated by adding the heat resistance of each separate layer.

U-values take into account all three ways for heat flow and measure the heat loss through a given



thickness of the particular insulating material. With U-value the rule is simple- the lower, the better. The best insulating materials have U-value close to zero. According to the Building Regulations, the following construction elements should have the maximum U-value as follows:

Wall- 0.3 W/m²K, roof-0.15 W/m²k, windows 1.6 W/m²k. The insulated 225mm thick solid brick wall will have the U-value of 2.70 W/m²k. To achieve better U-value, there is an option to insulate externally and internally with the 100mm of EPS insulation. In the case of 100mm of Rockwool insulation, same result can be achieved when both internal and external walls are insulated.

Mineral wool

The most common type of loft insulation.

This can be glass wool, rock or mineral wool and it comes in rolls. It traps the air, which provides an insulating barrier. The insulation wool is easy to roll, can be cut to measure and fitted easily into gaps. Rolls of wool are the great value for money. To ensure the efficiency of the insulation, two layers should be installed. Additional layer eliminates the thermal bridges. Wool will compress under any weight pressure like for instance when wooden boards can be laid over all the insulation.

Rigid insulation boards

Boards like Celotex or Kingspan are ideal for insulation of lofts, more expensive than wool but offers double the insulating capacity. For instance, in places where you use 270mm of wool, 135mm of

the insulating board will be efficient. The rigid form of the board allows for easy storage. Usually cut to size with a saw to fit between the joists and drilled to allow room for light fittings.

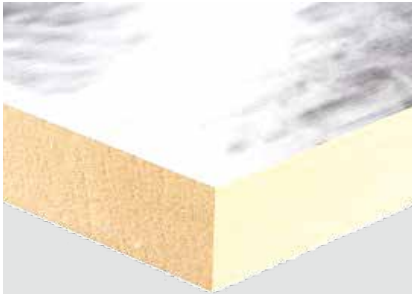
Spray foam insulation

This type of loft insulation is a blown fibre insulation and it has to be installed by a professional. An installer will use specialist equipment to blow insulation material into the gaps.

Apart from the floor and rafters insulation, it is recommended to insulate any pipework and cold water tanks up in the loft. In case of the rafters insulation, it is necessary to ensure there is a gap to the roof membrane to avoid condensation.

Thermal Insulating Materials

There are various types of insulation available and to choose the proper type for a particular building it is necessary to determine where the insulation will be installed and what are the recommended R-values for that specific area. Other aspects relevant to the insulation material choice include ease of installation, indoor air quality, durability, recycled content or embodied energy. The recommendations are to use the thermal insulation that has a little impact on the environment, great thermal properties and has been responsibly sourced.



PIR INSULATION BOARD

Polyisocyanurate was invented in the 1930s and still offers the high performance insulation solution. It is a thermoset plastic rigid thermal insulation. The rigid PIR insulation core is pressed between two high performance layers to create a tough, durable, light weight insulation board.

Applications include built up flat roofs, concrete slab floors, single timber frame wall lining, balconies and terraces, pitched roofs.

- Achieve low Lambda values - great thermal performance
- Lightweight
- Durable
- Resilient to mould and microbial growth
- Non-irritant
- Easy to cut and install

EARTHWOOL DRI THERM CAVITY SLAB

These are semi-rigid or rigid slabs of non-combustible, water repellent, glass mineral wool. They are 455mm wide to suit standard vertical wall tie spacings, ensuring a closed joint with adjacent slabs.

Used for the thermal insulation of masonry cavity external walls and are installed to fully fill the cavity. They are approved for use in buildings

up to 12m high in any exposure zone and multi-storey applications up to 25m in height.

- Odourless, rot proof, non-hygroscopic, do not sustain vermin and will not encourage the growth of fungi, mould or bacteria
- Moisture resistant
- Contains no dye or artificial products



GLASS MINERAL WOOL ROLL

It is made of fibres of glass minded into a material similar to wool what creates the air gaps in its texture and results in thermal insulation properties.

Also available in rolls.

- Wide variety of applications
- Easy to install
- Flexible and lightweight
- High tear strength

- Provides thermal and acoustic performance
- Rot-proof, odourless, non-hygroscopic
- Resilient to the growth of fungi, mould or bacteria
- It is chemically neutral and does not contain impurities

ROCKWOOL PROROX SLAB RWA45

It is a high-quality resin bonded slab, strong and flexible wool board for the thermal insulation. Specialist sizes and thicknesses are available to order. Insulation slabs provide excellent thermal, acoustic and fire insulation. RWA45 is also known as ProRox SL 920 UK. Rockwool Prorox is often used as the acoustic insulation in floor and ceiling voids or stud and party walls.

- Provides thermal, acoustic and fire insulation

- Water repellent
- Easy to install
- Cost effective
- Durable
- Available in dimensions 600mm x 1200mm (1000mm for faced slabs)
- Available in thicknesses 100mm
- Four slabs per pack
- Pack coverage: 2.88m²
- Thermal conductivity: 0.035 W/mK

