



NATURAL WOOD FIBRE INSULATION

 **NatuFlex**

 **Black
Mountain**
NATURAL INSULATION

High Performance Natural Insulation

Black Mountain NatuFlex is a high performance plant and wood fibre insulation; a natural solution to insulating traditional, new build and Passive House properties. Its high thermal mass enables it to store heat energy and aids the re-emission of energy back into the building; saving energy and reducing costs.

A combination of natural fibres provides sufficient flexibility to simplify installation whilst maintaining enough rigidity to prevent slumping in vertical walls. In addition to external timber frame walls, NatuFlex is ideally suited for pitched roofs, SIPs panel construction, cold lofts (insulated at joist level) and suspended timber floors. NatuFlex provides a number of significant benefits which include:

- Excellent thermal insulation performance
- Cuts energy costs
- High thermal mass
- Thermal phase shifting - *passive heating*
- Humidity control - *improved indoor air quality*
- High vapour diffusion capability
- Durability and longevity
- Truly sustainable - *locally produced*
- Quick, easy and low cost installation
- Safe handling - *no protective clothing required*

Thermal Mass

Thermal mass is a combination of density and specific heat capacity. Buildings with high thermal mass are able to temporarily store heat and release it when the air temperature declines. NatuFlex will significantly increase the thermal mass of a standard timber frame design or pitched roof where it would have originally been recorded as low.

Whilst concrete and brick have a high density, they have a low specific heat capacity of 0.8 J/(g.K), whereas wood fibres achieve 2.3 J/(g.K) and water is recorded at 4.18 J/(g.K). Specific heat capacity is a result of the atomic molecules vibrating and storing energy.

Second only to ammonia, the hydrogen bond in the water molecule has one of the highest abilities to store energy of all molecular bonding. NatuFlex specific heat capacity is significantly higher than many man-made building materials. Natural insulation materials have some of the highest specific heat capacities of all insulation products due to their unique ability to absorb excess condensation and moisture. In many cases the introduction of moisture would compromise thermal efficiency of insulation materials. By absorbing and storing excess moisture, natural insulation products not only continue to perform well as insulators but they can also significantly improve and increase their thermal mass and storage capacity respectively.

Lower Energy Costs

The high thermal mass of NatuFlex enables buildings to maintain a more comfortable internal environment for occupants. NatuFlex actively absorbs the energy and then releases it back into the building when the internal temperature declines later in the day.

This delayed heat transfer creates a “thermal time lag” in summer months, reducing the requirement for air-conditioning during peak temperatures at midday. In the evening the stored energy is released internally, acting as a passive heat source for the building.

In winter months, the solar gain can be very significant due to the inclination of the sun; a typically south facing window can absorb up to 32kWhr per m²

A five bedroom house designed using NatuFlex, with optimised south facing solar gain, can result in the NatuFlex insulation achieving a stored energy of up to 70KWhr. A significant amount of this energy will be released back into the building as free energy later in the day reducing the heating costs.

On a comparable basis, some lower cost manmade insulations can only achieve up to 10% of this specific heat capacity. Even the more expensive man-made insulations can only achieve up to 20%.

Humidity Regulator

NatuFlex will absorb up to 20% of its weight in moisture without compromising thermal efficiency, an attribute unique to natural insulation products. This process helps to maintain a healthier and more comfortable internal climate throughout the year.

The ability to absorb high levels of moisture is an excellent benefit for many buildings such as traditional properties where condensation is often a major issue. Natural fibres help to ensure that internal moisture levels are reduced to prevent future structural problems including damp and mould growth.

Studies indicate that approximately 50% of British homes have some form of mould problem which can cause harmful toxic reactions in humans. It is well known that mould spore releases can cause asthma sufferers to develop exacerbated respiratory symptoms.

NatuFlex acts as a passive solution to condensation control, improving the internal atmosphere of a building.

Durable Performance

Longevity is an essential consideration when insulating a building. Although thermal performance may be high upon initial application, some man-made insulation materials often begin to deteriorate in efficiency after installation and require regular 'top ups' to retain a sufficient level of energy retention.

The fibres used in NatuFlex are incredibly durable and will span the life of a typical building. This combination of plant and wood fibres is also the reason that NatuFlex can maintain its structure over time and is an excellent solution to vertical applications.

Application

NatuFlex is safe to install without protective clothing and is ideally suited for:

- Passive house construction
- Timber frame walls
- Warm lofts
- Cold lofts
- Suspended timber floors
- SIPs panels

Sustainable Design

Black Mountain NatuFlex offers a number of performance and environmental benefits, which include:

- Wood fibres used in production are taken from recycled wood products.
- CO₂ is permanently locked up during the growth of the fibres.
- Zero waste policy – all natural fibres used in production are recycled.
- 90% less energy used during production in comparison to some man-made insulations.

Fire Standards

Black Mountain NatuFlex achieves a fire performance rating of Euro Class E which ensures that the material is flame retardant. NatuFlex is treated with a non-toxic chemical compound to make it fire safe. This means that the product will not cause or exacerbate a fire.



NatuFlex stores daytime solar gain and releases it at night, reducing the overall energy consumption of the building

NatuFlex insulation matches the following standards for loft, rafter, external and internal wall thermal requirements as follows:

England/Wales	Approved Document L1, L2 - Table 1
Scotland	Technical Standard Table J23
Northern Ireland	Technical Booklet F Table 1.2/1,4

Performance & Technical Standards

Fire	Euro Class E EN 13501-1:2002
Condensation	BS 5250:1989
Thermal Conductivity	0.038 W/mK
Specific Heat Capacity	2300-2800 J/kg ² K
Vapour Permeability	10 MNs/gm
Density	40kg /m ³
ODP*	Zero
GWP*	Zero

ODP - Ozone depletion potential
GWP - Global warming potential

Sizes Available

For the latest pack and pallet quantities, please contact Black Mountain sales@blackmountaininsulation.com.

Thermal Performance

Thickness	Thermal Resistance (R)	U Value
50mm	1.32 m ² k/W	0.76 W/m ² K
75mm	1.97 m ² k/W	0.51 W/m ² K
100mm	2.63 m ² k/W	0.38 W/m ² K
125mm	3.29 m ² k/W	0.30 W/m ² K
150mm	3.95 m ² k/W	0.25 W/m ² K
175mm	4.61 m ² k/W	0.22 W/m ² K
200mm	5.26 m ² k/W	0.19 W/m ² K

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For more information on NatuFlex, please contact our sales team

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