# HEMP INSULATION

warmer
safer
smarter

Black Mountain
INSULATION LTD

Hemp locks up to two tonnes of $CO_2$ per tonne of fibre.

Hemp insulation will absorb 20% of its weight in moisture without affecting thermal performance.

## Historic value

Hemp fibre has been used throughout history for durable applications such as, ropes, sails and clothing. Even today, ships still use hemp in sails and rigging around the world due to its strength and natural resistance to mildew and weathering.

The hemp fibre used at Black Mountain is incredibly resilient, with an ability to buffer moisture, regulate thermal performance and retain its structural rigidity - making hemp an ideal natural insulator.

## True sustainability

Hemp fibre is a biodegradable, non-toxic fibre. The organic hemp fibres used at Black Mountain are derived from waste straw left at the end of the hemp seed harvest. Annually, the growth rate and versatility of this agricultural crop means that hemp insulation is truly sustainable and will flourish in diverse conditions.

Hemp needs little water to grow and thus does not require artificial irrigation - an important factor for many areas where water shortages regularly occur.

Hemp is also a natural weed suppressor due to the speed at which the plant grows. It can be grown without the use of herbicides and other chemical pesticides – a condition rare in agriculture today. Hemp is also used as a 'break' crop between other crop rotations thus allowing the soil to regain the nutrients necessary to produce healthy cereal crops.

Black Mountain hemp insulation has a 90% natural fibre content – one of the highest available on the market today. This high natural content enables the product to achieve the maximum natural performance and provide the maximum benefit to the end user.

## Carbon footprint

During its growth stage, hemp will lock away up to two tonnes of $CO_2$ per tonne of fibre harvested, combating the effects of global warming. The $CO_2$ will remain stored in the hemp fibre throughout the life of the product.

Black Mountain use up to 90% less manufacturing energy compared to alternative insulation products. At the end of a building's life, the hemp fibre is biodegradable or it can be incinerated to provide further energy.

Overall the product will lock up more $CO_2$ than was emitted during production – which has a significant *positive* impact on the environment.

## Moisture permeability

Condensation is a fundamental problem facing many architects today. A lack of 'breathability' in building materials can lead to structural damage, e.g. wood rot and health issues as a result of damp and mould.

Hemp can absorb up to 20% of its weight in moisture without any deterioration in its thermal performance, whilst some man-made insulations will deteriorate significantly. Hemp also acts as a 'moisture buffer' by absorbing sudden influxes of condensation and allowing it to evaporate at a more gradual rate.

This ability to regulate moisture makes hemp insulation an ideal product for use in *timber frame* structures as it is able to draw out moisture and keep the frame conditioned.

Black Mountain hemp insulation's superior moisture performance is achieved through our high natural fibre content.

## Thermal performance

The thermal conductivity of hemp insulation is 0.039 W/m°K. Low conductivity levels make hemp an excellent insulator.

Natural insulations also have a higher thermal mass which enables them to not only retain heat but also regulate thermal performance for an optimum indoor environment.

This allows buildings to stay warmer in winter and offers some protection against overheating in the summer – a unique attribute particularly relevant to buildings with *warm lofts*.

## Durability

The greater strength of hemp fibres, together with the high natural fibre content of Black Mountain insulation, means that our product maintains a semi-rigid structure and is more resistant to slumping. These characteristics make Black Mountain hemp insulation an ideal solution for warm lofts and *timber frame walls*.

Some insulations are known to compact over time resulting in a significant loss of performance. Hemp fibres have a natural resilience that enables them to maintain their structure.

The ability of Black Mountain hemp insulation to resist compaction from human disturbance ensures the energy efficiency of the building is retained throughout its life.

## Greener alternative

Black Mountain has the only dedicated natural insulation factory in the UK, which is not only one of the most modern in Europe achieving one of the lowest energy consumption.

Many companies claim their products save the energy consumed in their manufacture – however, this is true for all insulation products. Black Mountain hemp insulation uses very little energy in its manufacture; it is a *carbon negative* product. During its growth stage it will lock up significantly more carbon than is produced in the manufacturing process. Truly sustainable products require minimal energy to manufacture.

Black Mountain hemp insulation is one of the most innovative, technically superior and environmentally sensitive natural insulation products available on the market today.

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## Fire standards

Black Mountain hemp insulation achieves a fire performance rating of Euro Class E which ensures that the material is flame retardant.

All our hemp 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.

## Installation & application

All our insulation products are safe to install without protective clothing and are easy to cut to fit any size or shape. Hemp insulation is resilient yet flexible and ideal for use in confined spaces. This ease of use makes the installation process faster and more efficient.

Black Mountain hemp insulation is ideally suited to timber frame structures and can be applied to:

- Lofts
- Rafters
- Walls
- Inter-floor

Hemp insulation matches the following standards for loft, rafter 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* | 0.039 W/m°K |
| *Density* | 30kg /m³ |
| *ODP** | Zero |
| *GWP** | Zero |

## Sizes available

| | | | |
|---|---|---|---|
| *Form* | Semi-rigid batts | | |
| *Batt Length* | 1.2 mtr | | |
| *Widths* | 380mm/580mm | | |
| *Thicknesses* | 50mm | 75mm | 100mm |
| *Pieces Per Pack* | 12 | 8 | 6 |
| *m² per pack* | 5.47 | 3.65 | 2.74 |

***Bespoke sizes are available on request***

## Thermal performance

| *Thickness* | *Thermal Resistance (R)* | *U Value* |
|---|---|---|
| 50mm | 1.28 m².k/W | 0.78 W/m².K |
| 75mm | 1.92 m².k/W | 0.52 W/m².K |
| 100mm | 2.56 m².k/W | 0.39 W/m².K |
| 150mm | 3.85 m².k/W | 0. 26 W/m².K |
| 200mm | 5.13 m².k/W | 0.20 W/m².K |
| 250mm | 6.41 m².k/W | 0.16 W/m².K |

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ODP – ozone depletion potential
GWP – global warming potential