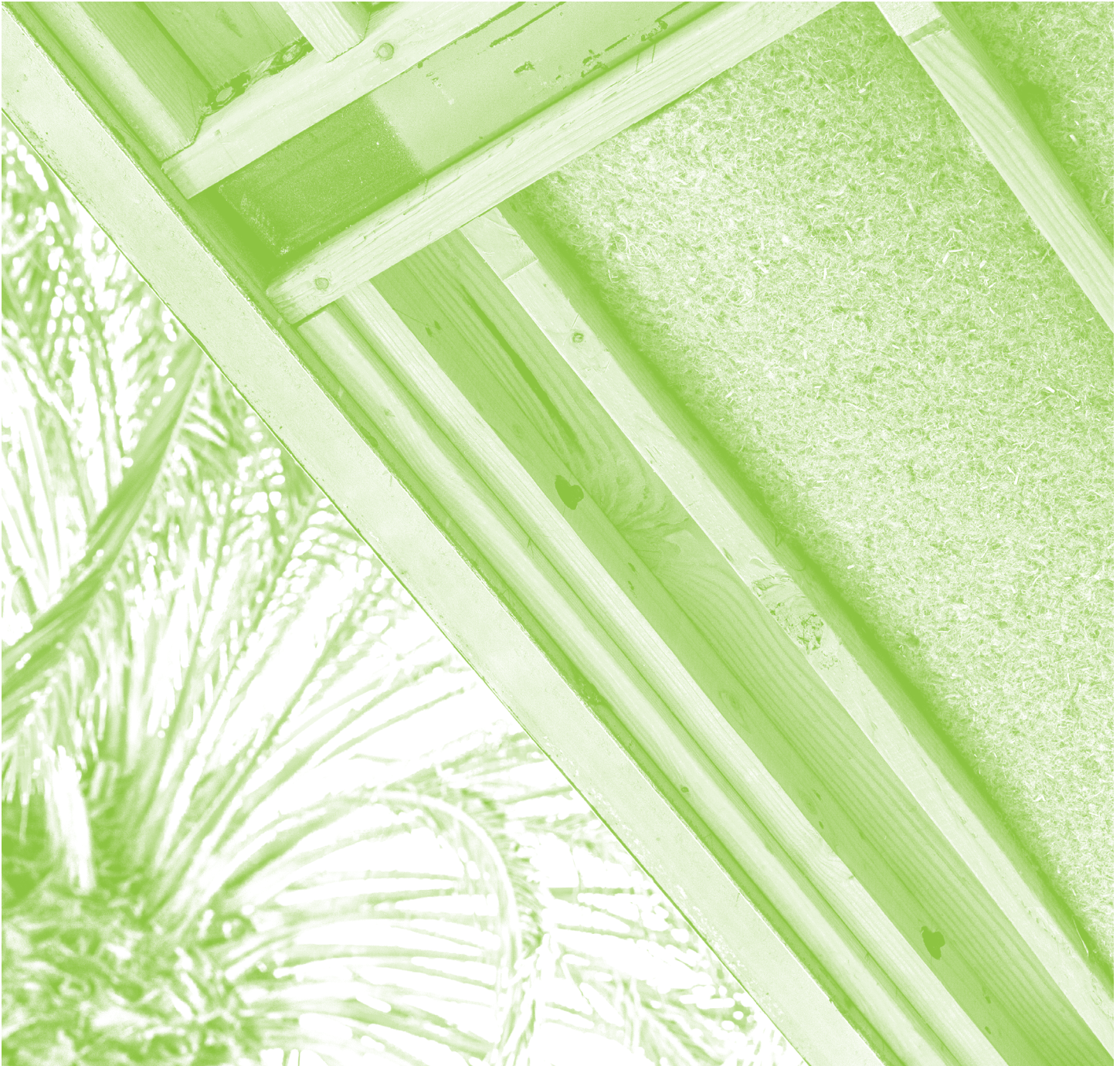


# Product Guide



Product: HempWool1



# Contents



---

|                               |    |
|-------------------------------|----|
| Overview                      | 02 |
| Advantages                    | 03 |
| Installation: Interior Walls  | 05 |
| Installation: Between Rafters | 06 |
| Installation: Roof Trusses    | 08 |
| Tools                         | 09 |

---

# Overview

## 1 Storage

Store insulation panels in their wrapping away from rain and sun.



## 2 Safety

Wear protective clothing to avoid injury when handling cutting tools during installation. HempWool is safe to touch and handle. Always follow OSHA guidelines.



## 3 Cutting

HempWool is factory cut to maintain a friction fit between 16" OC and 24" OC framing dimensions. For off-standard dimensions, cut the insulation panels with an added 1/2" to 3/4" of the width of the studs. This ensures a perfect contact and friction fit between the studs.



## 4 Inspection

Make sure there is no gap between the connecting joint of two panels to avoid any loss or air infiltration.



# Advantages

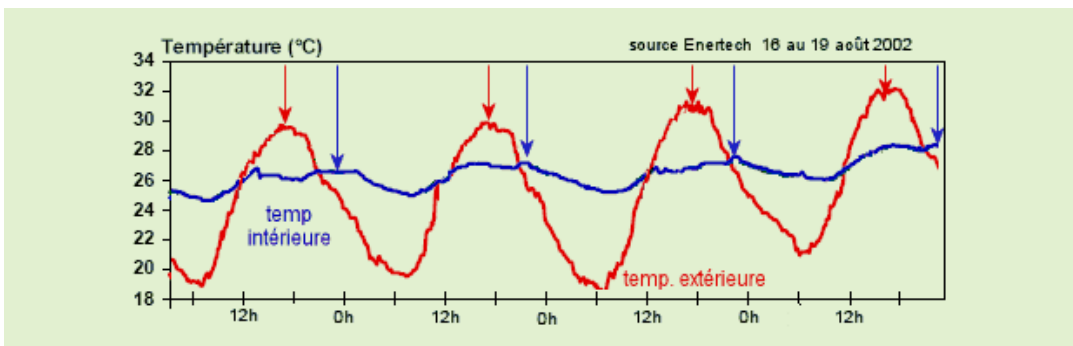
## Humidity Control

Humidity control of HempWool insulation is one of the most advantageous elements of the product, when compared to competitors products. The majority of insulation on the market is not vapor permeable, whereas HempWool is able to absorb up to 20% of its weight in water before losing its insulating values. This results in better moisture management in your structures while avoiding the risk of mold. Products such as fiberglass lose 100% of their insulating factor when in contact with water. RockWool and mineral wool products block any movement of moisture, which can sometimes translate into too much concentration of moisture between the walls, thus allowing mold to grow. HempWool absorbs excess humidity in the air during wet weather and repels it in dry weather to offer unequalled comfort, resulting in a reduction of heating and cooling costs.

## Thermal Inertia & Phase Shift

Thermal inertia is the ability of a material to store heat or cold. The denser a material is (kg / m<sup>3</sup>), the more absorption capacity it will have. HempWool, with an average of 35 kg / m<sup>3</sup>, is considered a dense material, and therefore has a higher inertia than conventional products, such as fiberglass.

Closely related to thermal inertia is the phase shift capacity of a material. Phase shift determines the temperature fluctuations in a building from external temperature fluctuations. HempWool insulation has a significant impact on maintaining a stable indoor temperature, despite temperature fluctuations outside. This results in a reduction of heating costs in cooler seasons and climates, but also air conditioning in warmer weather. See photo below to better visualize the impact of inertia in hot weather.



Example of phase shift in summer with strong inertia.

# Advantages

## Anti-Rodent Materials

Hemp is one of the most resistant insulations against rodents, mites, moths, and termites. Fiberglass, which lacks density, is a perfect nest for rodents. The strong mechanical strength of hemp fiber, and the dimensional stability of the insulation panel, prevents and deters rodents to infiltrate. Moreover, hemp fiber has a high concentration of silica, preventing the development of moths and termites. Whereas moths love sustainable alternatives like Havelock Wool, they will not take to HempWool. In summary, the use of HempWool makes it possible to be better protected against common pests and rodents.

## Produces Two in One

In addition to the various performance factors presented above, HempWool is naturally sound absorbing. This will have the effect of increasing interior acoustic comfort, while also achieving thermal comfort. By achieving both acoustic and thermal comfort with a singular material, the resulting enclosed thermal envelope offers a multitude of benefits.

## Unmatched Ease of Installation

Our insulating HempWool panels are easy and safe to install. Because HempWool is non-abrasive, it can be handled without gloves and with zero risk of irritation. Generally, HempWool installs like mineral wool, but without the itch. Both mechanized and nonmechanized tools, such as insulation knives, can be used to cut HempWool.

## Sustainable Buildings - Zero Carbon

Industrial Hemp contributes to soil regeneration and requires little water, no fertilizer and no pesticides. In addition, during its growth, industrial hemp absorbs approximately 9.8 tons of CO<sub>2</sub> per acre, thus reducing the carbon footprint of HempWool itself, and subsequently, the buildings that use it.

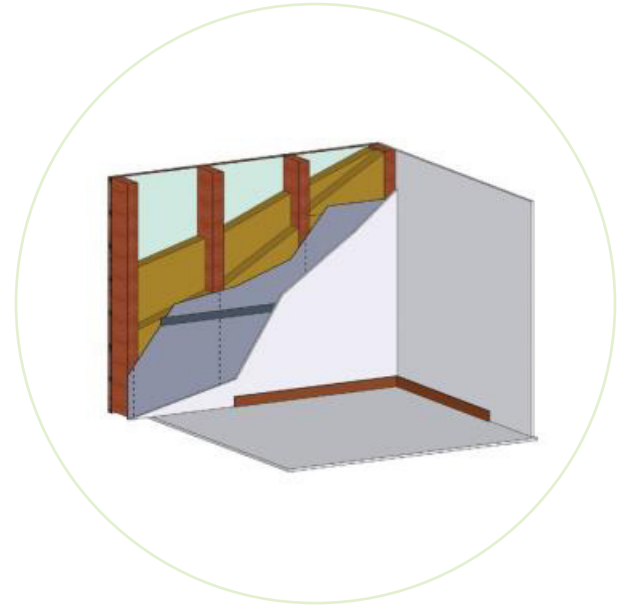
## Beneficial for Health

Made of natural plant based fibers, without VOC's and non-allergenic.

# Installation

## Interior Walls

HempWool Insulation is installed friction-fit between standard framing materials, such as wood studs. For high performance wall assemblies, 2 layers of HempWool can contribute to reduced thermal bridging. In this case, wooden battens can be run perpendicular to the vertical studs, creating an additional cavity to place friction fit HempWool. Alternatively, the additional battens can be run vertically, however this mitigates thermal bridging less so than battens run horizontally.



### Exterior Walls (Wood Framed House)

HempWool Insulation

Vapor Barrier (Recommended in humid climates)

Interior Finish



#### 1 Insulation Cutting

- Cut the insulation with an excess of 1/2" to no more than 3/4" from the actual distance between the two studs. You can cut with an electric saw, manual saw or cutting disc.
- The thickness of the chosen insulation is determined by the desired thermal performance ( $R = 3.7 \text{ m}^2\text{K} / \text{W} \Rightarrow 5.5"$  for a  $\lambda$  of  $0.039 \text{ W} / \text{mK}$ ) as well as the depth of the studs.
- HempWool will perform its best with the use of an interior membrane. It is the responsibility of the purchaser to specify and install a vapor membrane.



#### 2 Installing Insulation Between Joists

- Place the insulation between the studs and slightly compress both sides and let it take advantage of the "spring effect". The insulation will regain its initial shape by marrying perfectly the wooden uprights, thus avoiding thermal bridge risks.
- Adjust the insulation edges to make them perfectly joined.
- Ensure continuity of insulation at junctions between wall, floor, ceiling and crawling space. If necessary, complete with "cut-offs" of insulation produced on the site.

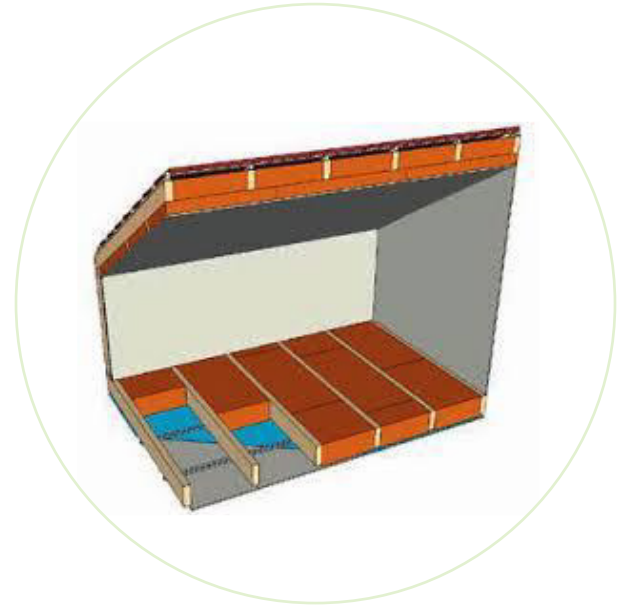


#### 3 Possible Second Layer

- Screw horizontal or vertical battens (2" wide minimum, depth equal to that of the second insulating layer, in either 16" OC or 24" OC spacing).
- Insert the insulation horizontally between the battens by compressing it slightly (spring effect).
- Adjust the insulation strips to make them perfectly joined and ensure continuity of insulation at junctions between wall, floor, ceiling and crawling space.

# Installation Between Rafters

Attics often consist of wooden rafters. Installing HempWool in rafters is very similar to installing it between vertical studs. To begin, simply place a layer between the rafters using the friction fit of HempWool to keep it in place. Based on roof R-Value requirements, you may opt to complete the installation with a second layer of HempWool that is installed perpendicularly with battens, or installed in the same orientation as the first layer.



## Vaulted Ceiling (between rafter insulation)

Insulation

Vapor Barrier (Recommended in humid climates)

Interior Finish



### 1 Prior to Installation

- Follow all architectural design details that are specific to your climate zone. The installation of a water proof membrane on the exterior is required, and a vapor barrier on the inside is recommended.
- Ensure that the surface to be insulated is clean, in good condition, is dry and does not show any leakage.



### 2 Between Rafters

- Place the insulation between the joists and slightly compress both sides and let it take advantage of the "spring effect". The insulation will regain its initial shape by marrying perfectly to the rafter.
- Adjust the insulation panel ends to make them perfectly joined.
- Ensure continuity of insulation at junctions between wall, floor, ceiling etc. If necessary, complete with "cut-offs" of insulation produced on the site.



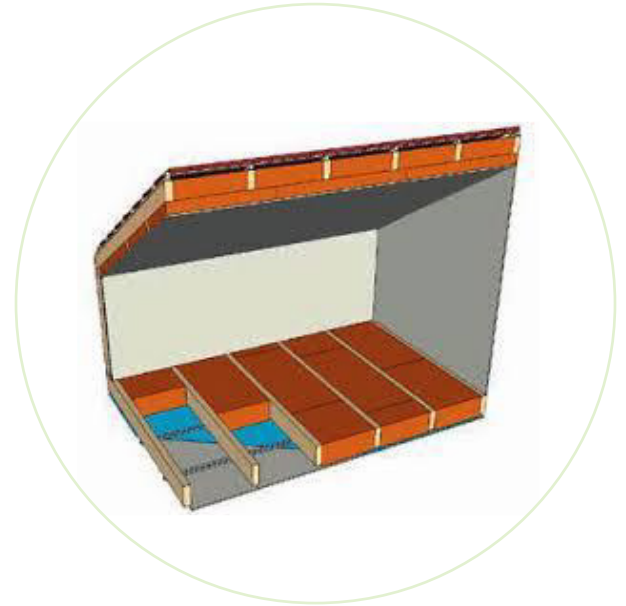
### 3 Possible Second Layer (Cross-Jointed)

- Screw horizontal battens (2.5" wide minimum, depth equal to that of the second insulating layer, 24" spacing on uprights.
- Insert the insulation horizontally between the battens by compressing it slightly for a friction fit.
- Adjust the insulation strips to make them perfectly joined and ensure continuity of insulation at junctions between wall, floor, ceiling, etc.

# Installation

## Between Rafters

### continued



#### **Vaulted Ceiling** (between rafter insulation)

Insulation

Vapor Barrier (Recommended in humid climates)

Interior Finish



#### **4 Vapor Barrier**

- Attach the vapor barrier to the interior side of the building by stapling it to the rafters. We recommend Proclima Intello, however your design professional is responsible for the product specification.
- Follow all manufacturer guidelines for installation.
- HempWool will perform its best with the use of an interior membrane. It is the responsibility of the purchaser to specify and install a vapor membrane.



#### **5 Interior Finish**

- Most all conventional materials, such as drywall, are compatible with HempWool insulation.
- For a healthy, biobased finish approach that compliments the healthy characteristics of HempWool, we suggest Limestrong Mineral Finishes.



# Installation

## Roof Trusses

In unventilated, unconditioned attics formed with roof trusses, HempWool is installed in the same manner as in walls and vaulted ceilings. Simply install the insulation on the ceiling of the conditioned space, or between the truss webs. Complete the insulation with a second crossed layer if necessary for increased R Value.

### Roof (Attic)

#### Insulation

Vapor Barrier (Recommended in humid climates)



#### 1 Prior to Installation

- HempWool will perform its best with the use of an interior membrane. It is the responsibility of the purchaser to specify and install a vapor membrane, as conditions are subject to climate zones and architectural design.
- The undeveloped attic space must be correctly ventilated to avoid moisture condensation.



#### 2 Cutting the Insulation

- The thickness of the insulation depends of the desired thermal performance.
- In the case of an in-between truss web installation, for spacing different then 24" OC or 16" OC, cut the insulation 1/2" to 3/4" wider, to ensure friction fit.



#### 3 Insulation Installation

- Lay the insulation on the floor, taking care not to leave any empty space at the junctions.
- Adjust the insulation strips to make them perfectly contiguous to each other.
- If necessary place a second layer of insulation, parallel, with cross joints above the first layer, to achieve higher R Value.
- Insulation must not obstruct the vents or be in direct contact with heat sources (chimney, spot lighting, etc). Depending on the case, you may use protective covers or create a spacing of at least 6" around chimney ductwork using non-combustible material.

# Tools

## Tips for Cutting HempWool

HempWool is a biobased insulation made primarily of coarse, strong natural fibers. Due to the unique composition of HempWool, it cuts differently than other materials like fiberglass insulation.

The best tool for cutting HempWool quickly and efficiently is a grinder with a metal cutting wheel. Depending on the depth of insulation you are cutting, you can use a variety of cutting disc dimensions. For thicker insulation, we suggest using a 7" cutting disc. If you do not want to use a mechanical grinder, insulation knives for mineral wool will also work.

A table saw with either a metal cutting blade or a Hardie Board blade is recommended for making precise cuts of insulation for widths that are different than standard framing dimensions. To mark HempWool, use a Sharpie or simply imprint the insulation with your finger to leave a reference mark.

A utility knife is suggested for opening the HempWool pallets and bundles. A tape measure is suggested for accurately measuring and cutting hemp insulation.

## Suggested for Installation



Grinder with Metal Cutting Disc



Insulation Knife



Utility Knife (1" Blade)



Tape Measure



Table Saw



Cutting Blade (Hardie Board or Metal Blade)