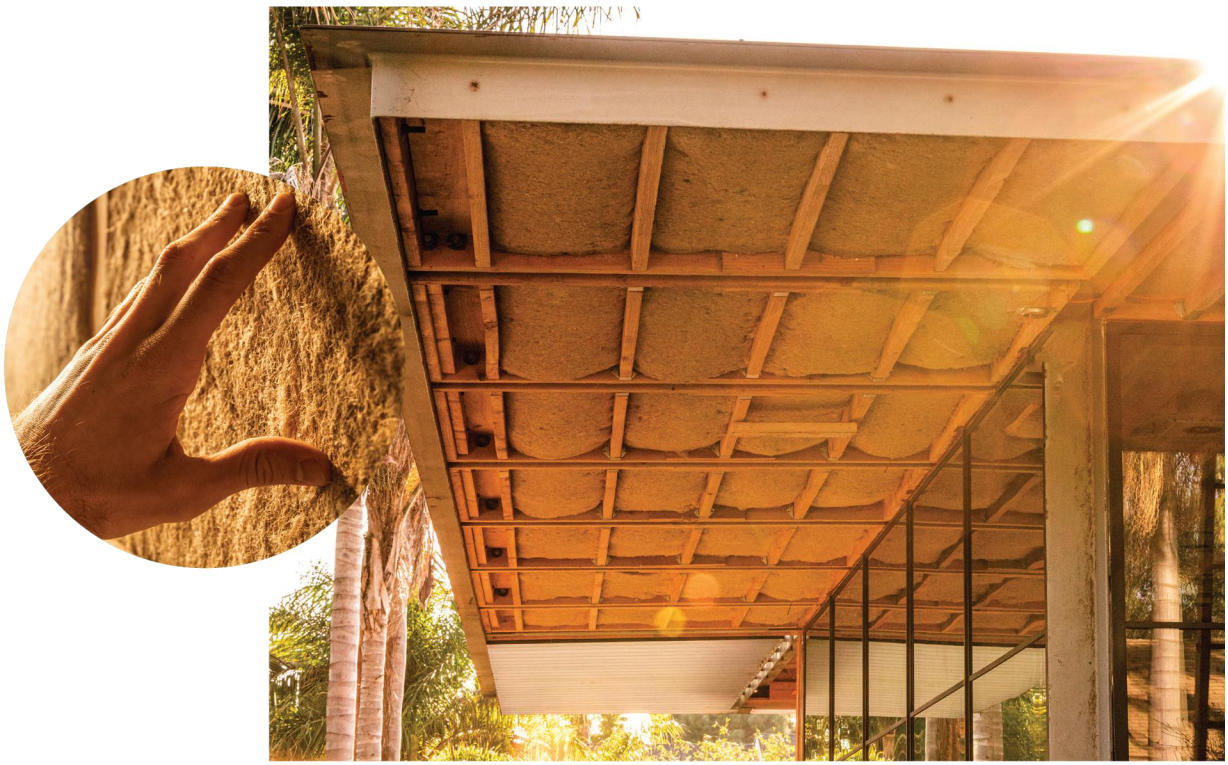
Product Guide

Product: **HempWool**

Contents



Overview

1 Storage

HempWool should be stored in a dry location. In the open, it should be covered with a waterproof tarp. Please ensure that no water or other materials gather on top. It is best to remove the wrapping from the pallets to avoid moisture build up.

2 Safety

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

3 Cutting

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

4 Inspection

Make sure the batts are tightly butt jointed & fill the stud cavity completely. There should be no gaps in the insulation. Also, ensure that the insulation is not overly compressed in any locations.

Advantages

Humidity Control / Moisture Management

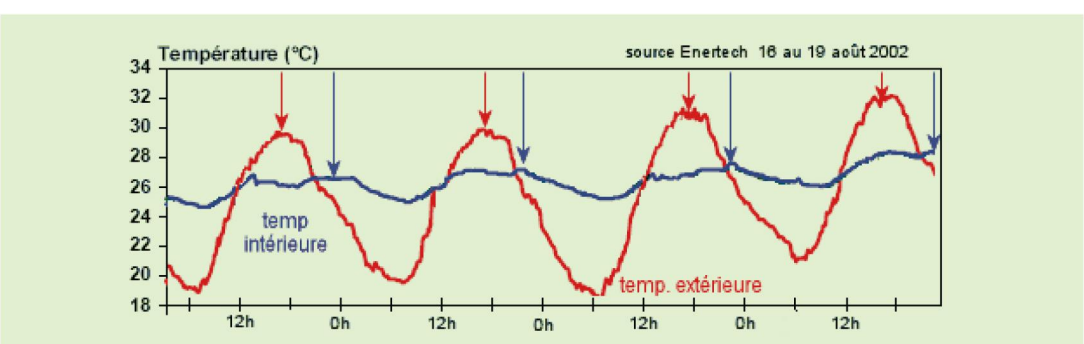
Humidity control of HempWool insulation is one of the most advantageous elements of this material when compared to other insulation products. HempWool is vapor permeable which allows vapor to diffuse through it & increases the drying potential of the building envelope. In addition, HempWool is able to absorb up to 20% of its weight in water before losing its insulating values. This results in better thermal performance in your structures while also minimizing the risk of mold developing from moisture related issues.

Thermal Inertia or Phase Shift

Thermal inertia is the ability of a material to store heat or cold. The more dense a material is (kg / m3) the higher it's absorption capacity. HempWool, with an average TI of 35 kg/ m3 is considered a dense material & therefore has a higher inertia than conventional fiberglass.

Closely related to thermal inertia, is the phase shift capacity of a material. This determines the temperature fluctuations in a build structure, from external temperature fluctuations. HempWool has a significant impact on maintaining a stable indoor temperature, despite external temperature fluctuation. This results in a more comfortable interior environment.

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 insulation against rodents, mites & termites. The strong mechanical strength of hemp fiber & the dimensional stability of the insulation batts, prevent & deters rodents. Moreover, hemp fiber has a high concentration of silica, preventing the development of moths & termites. To summarise, the use of HempWool insulation makes it possible to be better protected against common pests & rodents, preserving the efficiency of the insulation & the structural integrity.

Produces Two in One

HempWool is naturally sound absorbing. It increases interior acoustic comfort, while also achieving thermal comfort. By achieving both factors of comfort with a single material, the resulting enclosed thermal envelope offers a multitude of benefits.

Unmatched Ease of Installation

Our insulating HempWool batts are easy & safe to install. Because HempWool is not abrasive, it can be handled without gloves & with zero risk of irritation. Generally, Hemp Wool installs like mineral wool batts, but without the itch. HempWool is easily cut with both power tools & manual tools, such as wave form blade insulation knives, which can be purchased directly from our website.

Sustainable Buildings - Zero Carbon

Grown in the US, Industrial hemp contributes to soil regeneration & requires less water than other crops, without the use of pesticides. During it's growth, industrial hemp absorbs an estimated 9.8 tonnes of co2 per acre, thus reducing the carbon footprint of HempWool & the structures that use it too.

Beneficial for Health

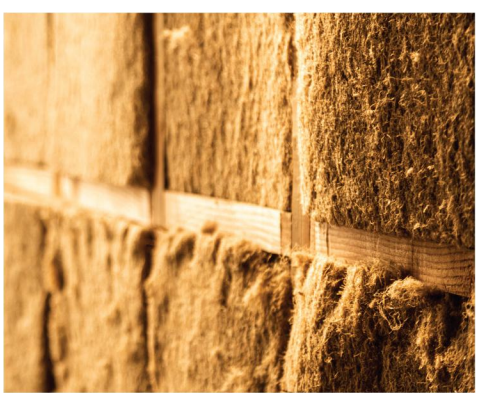
Made of natural plant based fibers, HempWool contains no VOC's & is non-allergenic & has no red list ingredients

Installation
Interior Walls

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

1 Insulation Cutting

- Cut the insulation with an excess of 1⁄2" from the actual distance between the two joists. 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 m2K / W => 145mm for a lambda of 0.039 W / mK) as well as the depth of the joists.
- HempWool will perform its best with the use of an interior membrane. Install membrane in accordance with local codes or project specifications.



2 Installing Insulation Between studs

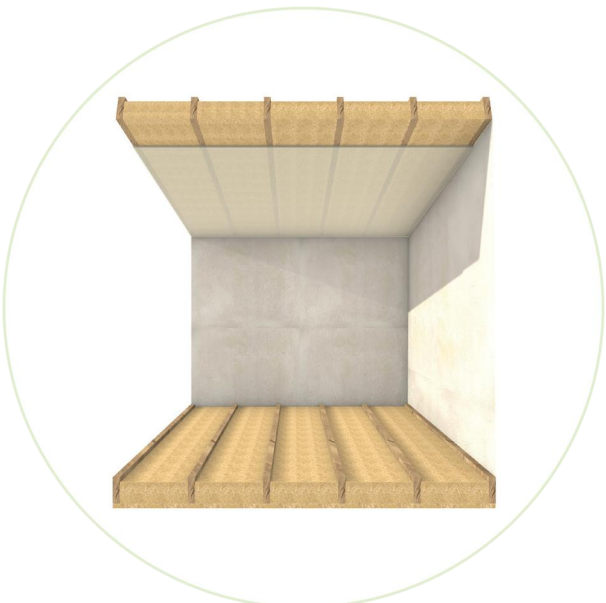
- Place the insulation between the studs & slightly compress both sides & let it take advantage of the "spring effect". The insulation will regain its initial shape & friction fit in the stud cavity.
- Adjust the HempWool batts to make them perfectly joined.
- Ensure continuity of HempWool at junctions between wall, floor, ceiling & crawl space. If necessary, complete with "cuts" of HempWool 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 HempWool horizontally between the wood furring strips by compressing it slightly (spring effect).
- Adjust the HempWool batts to make them perfectly joined & ensure continuity of insulation at junctions between wall, floor, ceiling & crawl space.

Installation
Conditioned Attics

Attics often consist of wood rafters. Installing HempWool in rafters is very similar to installing it between vertical stud walls. To begin, simply place a layer in the rafters using the friction fit technique. The dimensional stability of HempWool will hold 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 wood furring strips.



1 Prior to Installation

- Follow all architectural design details & specifications that are specific to your climate zone & local codes. The installation of a water resistive barrier (WRB) membrane on the exterior side is required. A vapor control barrier membrane on the inside is recommended.
- Ensure that the surface to be insulated is clean, in good condition, is dry & does not show any leaks.

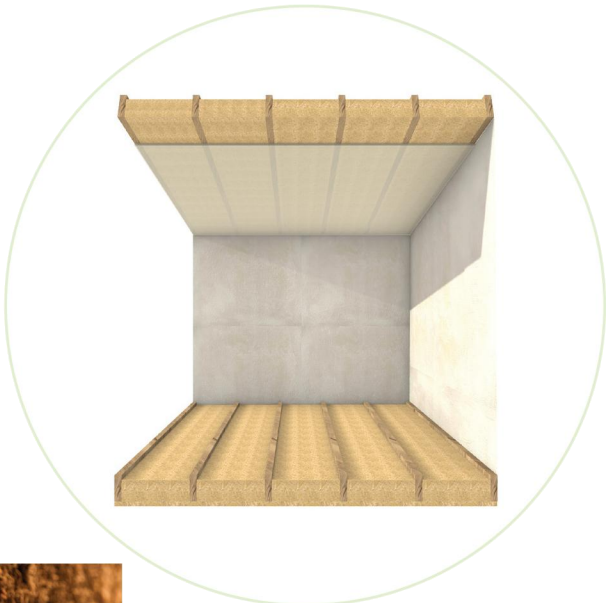
2 Between Rafters

- Place the HempWool between the rafters & slightly compress both sides & to take advantage of the "spring effect". Due to HempWool's dimensional stability & material memory, the HempWool will regain its initial shape & stay suspended through friction.
- Adjust the HempWool batt ends to bring them together & fill the cavity completely with no gaps.
- Ensure continuity of insulation at junctions between wall, floor, ceiling & crawl space. If necessary, complete with "cuts" of HempWool 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.
- Friction fit the insulation horizontally between the HempWool batts
- Adjust the HempWool batts to make them perfectly joined & ensure continuity of insulation at junctions between wall, floor, ceiling, etc.

Installation
Conditioned Attics
continued



Cathedral Ceiling (between rafter insulation)

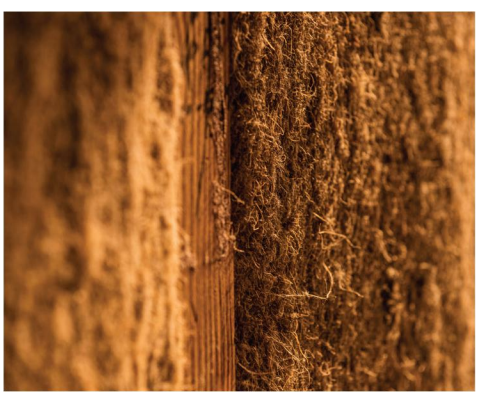
Insulation

Vapor Barrier

Wood Fiber

4 Vapor Barrier

- Mechanically fasten the vapor control membrane to the interior side of the structural elements in accordance with manufacturer's recommendations & guidelines.
- HempWool will perform its best with the use of an interior membrane. It is the responsibility of the purchaser to specify & install a vapor control membrane.



5 Interior Finish

- Most 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 EartHaus Mineral Finishes.

Installation
Unconditioned Attics

In ventilated, unconditioned attics, HempWool can be installed between the attic floor joists . For higher R-values & to minimize thermal bridges, add a second layer on top of & perpendicular to the insulation between the framing members. Add additional layers as necessary to achieve desired R - value.

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 & install a vapor membrane, as conditions are subject to climate zones, local codes, & architectural design.
- “Open Roof” attic spaces must be correctly ventilated to avoid moisture condensation.

2 Cutting the Insulation

- The thickness of the HempWool depends on 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 HempWool on the floor, taking care not to leave any empty space at the junctions.
- Adjust the HempWool to make them perfectly contiguous to each other to form a monolithic layer.
- If necessary place a second layer of HempWool, parallel to the cross joints above the first layer, to achieve higher R Value. Additional layers can be added to achieve desired R-values.
- HempWool 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

Suggested for Installation

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 & 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, manual insulation saws with a wave form blade 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 & bundles. A tape measure is suggested for accurately measuring & cutting hemp insulation.

Grinder with metal cutting disc

Bahfco Profcut insulation saw

Utility Knife (1" Blade)

Measuring Tape

Table Saw

Cutting Blade (Hardie Board/ Metal Blade)