



TECHNICAL DOCUMENTATION

# THE HEMPCRETE SOLUTIONS GUIDE FOR SUSTAINABLE RENOVATION AND CONSTRUCTION



  
RELY ON OUR TECHNICAL EXPERTISE  
AND KNOW-HOW



# EDITORIAL

At Saint-Astier®, we have drawn our inspiration from the strength and depth of our values for almost 30 years, continuing to renovate and build with a long-term, sustainable mindset.

“Sustainable” means building for the long run, using materials that respect the environment. Our philosophy is based on a simple conviction: **natural hydraulic lime, combined with plant-based resources such as hemp, straw, flax, rapeseed or cork, is fundamental to well-controlled construction and renovation.** There is always a wide range of locally available bio-resources. This is why we favour using materials as close as possible to their production areas, out of respect for resources and with a commitment to material sobriety.

“Sustainable” also means choosing high-quality solutions that will ensure the longevity of buildings over time, and allow them to be passed on to future generations.

« **EVERY PROJECT IS AN OPPORTUNITY FOR US TO LEARN AND TO REDUCE OUR IMPACT AS MUCH AS POSSIBLE...** »

To help shape tomorrow's construction model, we work closely with professionals across both the building sector and the agricultural sector. We support emerging supply chains, share our knowledge and expertise daily, both in France and internationally. Our aim is to create a strong link between these two essential sectors, those who build and those who cultivate, so that their perspectives can be aligned in a fast-changing world, opening new opportunities and developing new sustainable solutions.

**Our technical solutions reflect a fully integrated and global approach. They are designed to deliver optimal summer and winter comfort by combining thermal efficiency, mechanical performance and interior comfort, while also enhancing the value of agricultural production and the work of all actors in eco-construction.**

We therefore continuously improve and develop new solutions to meet tomorrow's environmental challenges.

**Our work also contributes to local development, promoting the expertise of industrial SMEs and building companies, while striving to reduce transport distances, and therefore our greenhouse-gas emissions, as far as possible.**

THE ECO-BUILD TEAM

# KNOWING THE WORLD

## OF HEMP CONSTRUCTION IS GOOD, MASTERING IT IS EVEN BETTER!

In the construction industry, professional guidelines are technical documents created by experts to outline best practices for designing and building specific systems. They help ensure quality, safety, and reliability across projects. These guidelines are developed before official standards and play a crucial role in testing, validating, and structuring new techniques before they become formalized within national or international standards.

For many years, our solutions have been used on numerous projects carried out by building professionals. The experience we have gained over time, combined with our involvement in developing the regulatory framework, has enabled us to optimise, master and secure the work. **Our solutions comply with the Professional Guidelines for Hemp Construction.**

Our teams dedicated to eco-builds, together with our Technical Sales Managers and Specifiers, several of whom are also certified "Construire en Chanvre" (Building with Hemp) trainers, are on hand to share their expertise and support you throughout your projects (see details page 9).




### WHAT IS A BIO-SOURCED MATERIAL?

Bio-sourced materials come from biomass of plant or animal origin. Their use in the construction sector is encouraged by the government to help accelerate the ecological transition at national level. This support is largely due to the ability of plants to capture CO<sub>2</sub> as they grow, and to the possibility of sourcing these materials locally.

*Example:* WOOD FLAX Hemp Rapeseed Straw WOOL

## WHY CHOOSE HEMPCRETE SOLUTIONS?

 **Lightweight and insulating**

 **Vapour-permeable**, meaning they allow hygrometric transfer between the original substrates and the hemp solution (renovation)

 **Summer and winter comfort**

 **Long-term storage of biogenic carbon**


 **Compliant with construction regulations**

 **Reduced energy demand for the construction.**

 **Excellent thermal and acoustic insulation**

 **Resistant to earthquakes**

 **Resistant to rodents and insects**

 **DISCOVER OUR FAQ VIDEO TO LEARN EVERYTHING ABOUT HEMPCRETE ECO-DESIGN!**



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# CHALLENGES AND DECARBONISATION OF THE SECTOR

## SITUATION

### THE CHALLENGES FACING THE CONSTRUCTION SECTOR

The building sector is confronted with the limits of global resources and with impacts directly linked to climate change.

- The built environment is the number-one consumer of energy (heating, cooling, equipment, lighting, etc.). It is also among the highest emitters of greenhouse gases (GHGs).
- The construction phase of a building has a major environmental impact. This is the phase during which most CO<sub>2</sub> emissions and resource consumption occur.
- The building sector also sits at the crossroads of several wider societal challenges, such as energy poverty, climate-change adaptation and the development of renewable energy. It represents a major source of jobs and economic value (economic activity and the long-term value of buildings).
- The national low-carbon strategy is built around two main pillars to meet the 2050 carbon-neutrality target.

47%

Share of France's energy consumption in 2022 attributable to building use. The number-one sector in terms of energy consumption.

Source: Energy balance

65 TO 85%

According to ADEME (French Agency for Ecological Transition), the construction phase alone accounts for 65% to 85% of the GHG emissions generated by a building over its entire life cycle.

Source: ADEME (French Agency for Ecological Transition)

80 TIMES

more materials are required to build a new multi-unit residential building than to renovate an equivalent one.

Source: ADEME (French Agency for Ecological Transition)

### DECARBONISING THE BUILDING SECTOR:

The building sector is responsible for around 25% of greenhouse-gas emissions in France, largely due to the use of highly carbon-intensive materials (cement, steel) and to the energy consumed during building operation. Decarbonisation relies on several key levers:



#### — Reducing the carbon footprint of materials:

With increasingly strict regulations, the sector must lower its environmental impact while still meeting comfort and safety requirements.



#### — Improving energy efficiency:

Developing passive buildings or even positive-energy buildings.



#### — Reuse and recycling:

Encouraging the reuse of materials and promoting a circular approach to construction.

The hemp sector is becoming more structured across Europe creating major opportunities, both in agricultural production and material processing. The virtuous cycle of hemp is emerging as one of the most relevant responses to today's challenges; combining hemp with natural hydraulic lime, a material with countless benefits, offers yet another powerful solution.

## HEMP, A MAJOR ASSET FOR THE CIRCULAR ECONOMY IN OUR REGIONS



Source: Rapport Filière Chanvre Construction (Hemp Construction Sector Report)



© Agnès Claris

# OUR CONCRETE ACTIONS

## WITHIN THE HEMP SECTOR

TO ADDRESS THE SECTOR'S CURRENT AND FUTURE CHALLENGES, IT IS ESSENTIAL THAT EVERYONE IS ABLE TO REFLECT AND TAKE ACTION AT THEIR OWN LEVEL. AT SAINT-ASTIER®, OUR COMMITMENT IS EXPRESSED IN SEVERAL WAYS.



## IN PRACTICAL TERMS, THIS MEANS:



### INNOVATION / RESEARCH

#### Research & development:

- Active commitment to R&D on bio-sourced materials
- Investment in innovative projects
- Collaboration with academic and industrial partners

#### Strategic partnerships:

- Development of numerous local, regional and European partnerships
- Support for the development of the Earth-building supply chain

#### Our key partners:

- MISAPOR®
- ISOHEMP



### TECHNICAL SUPPORT FOR LOCAL DEVELOPMENT NETWORKS

The emergence of new supply chains sometimes requires us to provide both technical and financial support, and to engage with regulatory bodies to help integrate new practices and promote the use of these materials.



### PROFESSIONAL TRAINING

This is a key lever for regional development and for expanding the use of lime and hemp among applicators, clients, design offices, and trainers in professional training centres such as CFAs (Apprentice Training Centre). Through our own professional training centre, QUALIOP1-certified under "Training Actions", we provide certifying and qualifying courses focused on the use of lime and hemp.



# HEMP CONSTRUCTION

## AND REGULATIONS

Regulations have been evolving for several years to support and secure the development of this fast-growing supply chain. Hempcrete concretes used in vertical walls are governed by the Professional Guidelines for Hemp Construction, in France.

### OFFICIAL VALIDATION AND RECOGNITION IN FRANCE

- These guidelines have two levels of official approval:
- Acceptance by the AQC (Construction Quality Agency)
  - Validation by the C2P (Product Safety Commission)



The latest version was published in July 2024, reflecting the ongoing momentum behind this regulatory framework.

### OBJECTIVES AND BENEFITS

These professional guidelines establish a structured regulatory framework that enables the various stakeholders in the sector (contractors, clients, design teams, project owners, etc.) to substantiate their work to insurers and technical inspectors, in France.

### OUR COMMITMENT

Saint-Astier® plays an active role in drafting and updating this regulatory framework, thereby contributing to the sector's professional development.

**The Saint-Astier® products listed below, when used together with ISOCANNA® hemp shiv, may be used to produce hempcrete for vertical wall applications:**

- **New/old substrates (e.g. stone):**  
choose BATICHANVRE® Plus lime
- **For improved thermal performance:**  
choose BATICHANVRE® ISOL' Plus lime



### THESE PROFESSIONAL GUIDELINES REQUIRE:

- The use of a **certified hemp shiv\***.
- Validation **of** hempcrete aggregate pairing  
Validated binder + hemp aggregate pairings are those that meet the minimum performance thresholds defined in the Professional Guidelines for the intended application.
- Certified **training** for companies installing hemp-based solutions
- Compliance **with installation** requirements

\*To be suitable for use in construction, hemp shiv (hemp aggregate) must comply with the Specification of the Professional Guidelines for Hemp Construction in order to guarantee a consistent product. This is the case with our ISOCANNA® hemp shiv.



**In France, Saint-Astier® has validated its lime binders in combination with building-grade certified hemp, sourced from leading hemp processors to ensure the most local supply possible.**



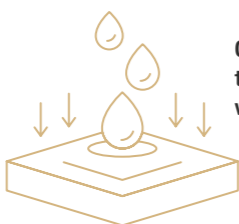
# HEMP

## A HIGH-PERFORMANCE NATURAL INSULATION MATERIAL, CERTIFIED FOR BUILDING USE

Hemp is a hardy annual plant that requires very few resources to grow and helps to remediate soils. Domesticated by humans as early as the Neolithic period, it was traditionally used for food and for producing fibres (textiles and rope). Hemp is an environmentally responsible crop: it requires no irrigation, no pesticides, and very few farm inputs.

Cultivated for centuries for its strong fibres, it has, over the past 30 years, found a new role in eco-construction. This concerns hemp shiv, the woody core (the central part of the stem), which was historically considered a by-product. It is mainly composed of cellulose and lignin, just like wood.

### ITS ADVANTAGES?



Can absorb up to three times its own weight in water.



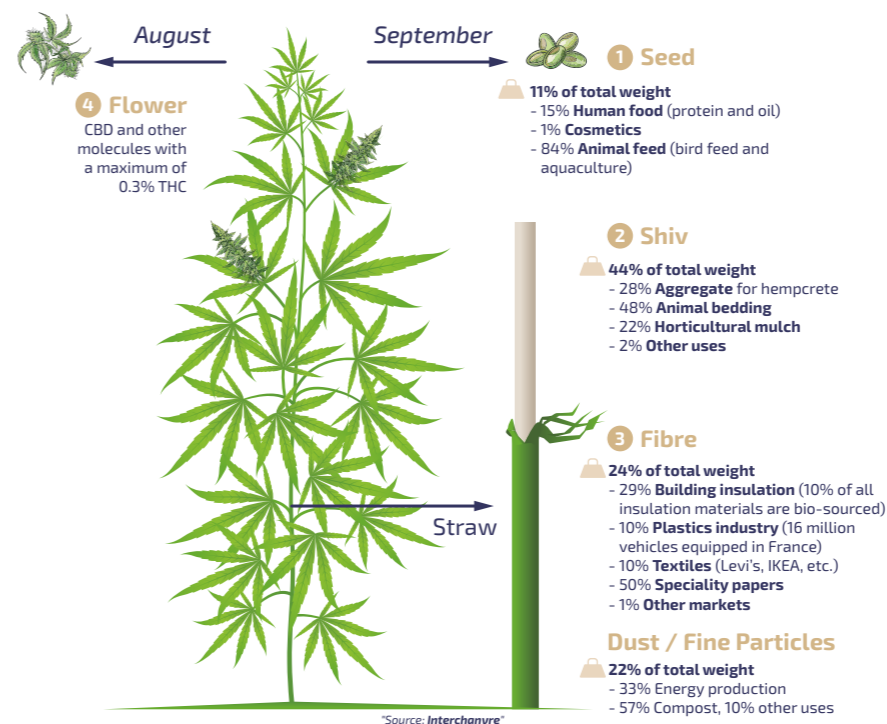
A lightweight aggregate: average bulk density between 90-120 kg/m<sup>3</sup>



1 hectare of cultivated hemp = 15 tonnes of CO<sub>2</sub> captured! (equivalent to the carbon stored by 1 hectare of mature forest)



## HOW DOES AN AGRICULTURAL BY-PRODUCT BECOME A CONSTRUCTION MATERIAL?

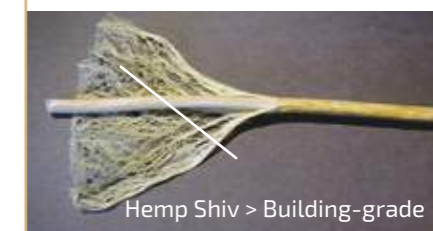


### HARVESTING THE STEMS, FOLLOWED BY THE FIBRE-SEPARATION STAGE (DECORTICATION)

**Hemp shiv**  
> The fragmented inner part of the hemp stem

**Aggregate certification**  
> The "Building-grade hemp" label guarantees:

- Consistency
- Bulk density
- Particle size
- Dust content
- Moisture content
- Colour
- Origin



The hemp sector is now central to the development of bio-sourced construction materials.



At Saint-Astier®, we supply a hemp shiv marketed as ISOCANNA®, compliant with the "Building-grade Hemp" specification set out in the Professional Guidelines for Hemp Construction.



The French association « Construire en Chanvre » (Building with Hemp), of which Saint-Astier® is an active member, is responsible for formalising the Professional Guidelines that underpin the insurability of hemp-based techniques and their standardisation. It accredits professionals, laboratories, companies and processors.



# CARBON FOOTPRINT OF HEMPCRETE SOLUTIONS

## LASTING CO<sub>2</sub> STORAGE

Our innovative binders, formulated predominantly with natural hydraulic lime (NHL), have a carbon footprint 40% lower at manufacture than the previous generation of BATICHANVRE® products.

After installation on site, these binders continue their carbonation process, gradually absorbing atmospheric CO<sub>2</sub> over time. This mechanism, combined with the biogenic carbon sequestration achieved by hemp during its growth phase, ensures durable CO<sub>2</sub> storage throughout the material's entire life cycle. **In other words, the CO<sub>2</sub> captured exceeds the emissions generated, for as long as the building element remains in place (excluding end-of-life processing).**



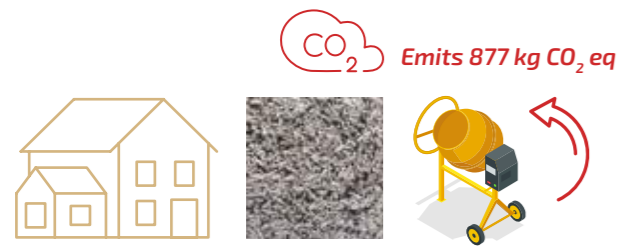
### CASE STUDY:

Insulating 100 m<sup>2</sup> with BATICHANVRE® ISOL PLUS hempcrete at 30 cm thickness

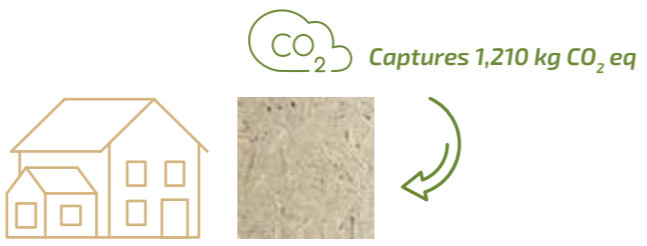
## STEP 1 MANUFACTURING



## STEP 2 INSTALLATION OF 100 M<sup>2</sup> HEMPCRETE ON SITE



## STEP 3 SERVICE LIFE OF THE HEMPCRETE AND CARBONATION OF THE LIME



During its hardening process, lime gradually reabsorbs CO<sub>2</sub> through carbonation.

## TOTAL BALANCE (excluding end of life\*)

Durable storage of 1,503 kg CO<sub>2</sub> eq



Our HEMPCRETE solutions have EPD (Environmental Product Declarations) calculated for 1 m<sup>2</sup> of installed hempcrete at 30 cm thickness, based on a 100-year service life. These declarations are available online in the French INIES Database.

## ÉQUIVALENT / SAVINGS

1,503 kg CO<sub>2</sub> eq =



A 7,000 km trip in a conventional petrol car



A Paris–Los Angeles flight

Source: <https://agirpourlatransition.ademe.fr/>

# HEMP AND LIME SOLUTIONS

## APPLICATION GUIDE



\*We are currently working with all market stakeholders to develop recycling and recovery channels for hempcrete, paving the way for a significant improvement in this environmental performance.





# THE ECO-BUILD RANGE

**A COMPLETE, INNOVATIVE AND HIGH-PERFORMANCE RANGE TO MEET ALL YOUR PROJECT NEEDS.**

Our eco-build range has been redesigned and expanded to address all on-site requirements and the current challenges of the construction sector.

This range includes limes specifically developed for mixing with "Building-grade Hemp" certified shiv, as well as ready-to-use solutions for masonry and/or rendering on bio-sourced blocks or hempcrete substrates.

## LIME FOR HEMPCRETE AND RENDERS



**BATICHANVRE® PLUS 25 KG**  
The original  
\* EPD data: 33.8 kg CO<sub>2</sub> eq / m<sup>2</sup> for 30 cm thickness over a 100-year lifespan.

**BATICHANVRE® ISOL PLUS 18 KG**  
The most insulating  
\* EPD data: 28 kg CO<sub>2</sub> eq / 1m<sup>2</sup> for 30 cm thickness over a 100-year lifespan.

**TRADÉCO® 25 KG**  
Lime for interior hemp renders

YOUR CHOICE

## HEMP



**ISOCANNA® - 20 KG**  
French hemp shiv certified "Building-grade Hemp"  
Also available in a "FINE" version for interior plasters - 20 kg

## THE MORTAR FOR ASSEMBLING BIO-SOURCED BLOCKS



**MBBS® - 25 KG**  
Laying bio-sourced blocks (hemp, flax, rapeseed) ready-to-use

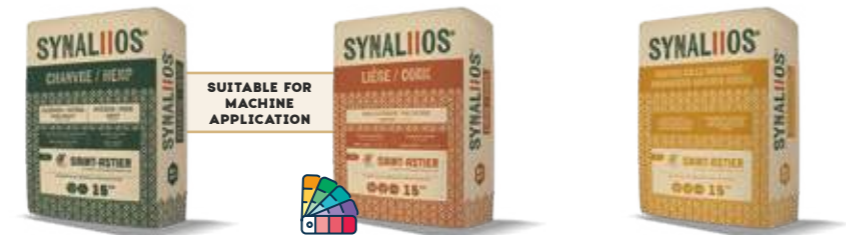
## THE READY-TO-USE RENDER FOR HEMPCRETE AND HEMP BLOCKS



**KALAMUA® - 25 KG**  
Ready-to-use finishing render for bio-sourced substrates  
6 colours available

## NEW READY-TO-USE RANGE, CEMENT-FREE / SAND-FREE

## SYNALIOS®




**SYNALIOS® HEMP 15 KG**  
Hemp-based  
Base coat for EXTERIOR use  
Finish coat for INTERIOR use  
Suitable for machine application

**SYNALIOS® CORK 15 KG**  
Cork-based finishing render - INT/EXT  
4 colours available

**SYNALIOS® MONTAGE 15 KG**  
Hemp-based laying mortar for bio-sourced blocks

## WHAT SETS IT APART?

-  **Extensive field experience:** we have gathered nearly 30 years of hands-on feedback on these solutions. Our teams have in-depth expertise in hemp-construction techniques.
-  **A technical team,** active on site to advise and support you throughout your projects, across the world.
-  **Product innovation:** development of bespoke solutions made predominantly with Natural Hydraulic Lime (NHL), our core expertise for the past 110 years.
-  **A dedicated "Eco-build" Technical Department,** made up of technicians, engineers, and PhDs, acting as a vital link between the field and the R&D Department. Our team also collaborates with universities, research laboratories, industry bodies, associations, and standards organisations.
-  **Low-carbon solutions,** assessed using full life-cycle analysis (LCA) and documented through our individual EPD declarations, based on data collected under real site conditions.
-  **Patented formulations** demonstrating the innovative nature of our solutions.
-  **Our professional training centre,** QUALIOP1-certified, offering courses tailored to bio-sourced solutions and delivered by expert trainers accredited by the Association Construire en Chanvre (Building with Hemp) at Saint-Astier®, France and on sites as well.

 **Over 400 professionals trained each year**



# WHAT WORK

## CAN I CARRY OUT WITH THE ECO-BUILD RANGE?

The eco-build range brings together solutions based on Natural Hydraulic Lime, designed for durable rendering, insulation, and masonry work. **Each product has been developed for a specific application, ensuring effective support throughout the delivery of your projects.**



### LAYING HEMP BLOCKS



**SYNALIOS® MONTAGE - 15 KG**  
Hemp-based

**MBBS®**  
25 KG



### INSULATING

*I produce what is known as hempcrete to provide thermal and acoustic comfort (floors/walls/roofing).*



**BATICHANVRE® PLUS - 25 KG**

**BATICHANVRE® ISOL PLUS - 18 KG**

**ISOCANNA® HEMP**  
20 KG



### APPLYING RENDERS AND IMPROVING THERMAL PERFORMANCE

*I protect the hempcrete with renders, or I apply a render to my walls while adding an extra layer of thermal insulation.*



**SYNALIOS® HEMP\* - 15 KG**  
Hemp-based base coat  
Interior / Exterior

**SYNALIOS® CORK\* - 15 KG**  
Finishing render  
Exterior  
4 colour shades available



**TRADÉCO®**  
25 KG  
Interior

**ISOCANNA® - 20 KG OR ISOCANNA® FINE - 20 KG**  
Interior

READY-TO-USE

OR

TRADITIONAL MIX ON-SITE



### PROTECTING

Interior and Exterior



**KALAMUA®**  
25 KG

**NHL 2**  
25 KG

READY-TO-USE

OR

TRADITIONAL MIX ON-SITE  
WITH LIME + LOCAL SAND

The application methods described in this documentation complement the **professional guidelines** and their current good-practice manual. These must always be followed to ensure the durability of the works.

\* Please consult the product data sheets before starting work.



Courtyard façade - Paris  
Hempcrete insulation and KALAMUA® finish  
Project completed in 2024



## BECAUSE LIME IS IN OUR DNA...

All eco-build solutions are formulated with our Natural Hydraulic Lime, our core expertise.

Our products are manufactured at our site in the Dordogne, from limestone extraction through to the finished material. This is a genuine source of pride for our teams and a mark of trust for users and specifiers in the construction sector.

When combined with local sand, these solutions produce matt, traditional and attractive finishes for both interior and exterior applications. They remain highly vapour-permeable, allowing the underlying substrate to "breathe".



**NHL 2**  
25 KG



# WALLS

## COMMON BASIS FOR ALL TYPES OF HEMPCRETE: INTERNAL CLADDING

### MIX COMPOSITION



For machine spraying, reduce the water dosage (consult the product data sheet for the binder chosen). For all other machines, please contact our team.

### TECHNICAL CHARACTERISTICS AND PERFORMANCE

CHARACTERISTICS AND PERFORMANCE	Dry density Kg/m <sup>3</sup>	Compressive strength Rc at 90 days	Thermal conductivity λ in W/m.K <sup>(1)</sup>	Thermal resistance R for 30 cm <sup>(2)</sup>	Thermal transmittance U-value in W/m <sup>2</sup> .K	Water vapour diffusion resistance factor μ	Reaction to fire
<b>BATICHANVRE® PLUS + ISOCANNA®</b>	<b>350 to 400</b>	<b>&gt; 0.7 MPa</b>	<b>0.069</b>	<b>4.3</b>	<b>0.23</b>	<b>4.5 to 10</b>	<b>B-s1,d0</b>
<b>BATICHANVRE® ISOL PLUS + ISOCANNA®</b>	<b>300 to 350</b>	<b>&gt; 0.4 MPa</b>	<b>0.064</b>	<b>4.7</b>	<b>0.21</b>	<b>4 to 8</b>	<b>B-s1,d0</b>

(1) Tests carried out in accordance with Standard NF EN 12667 by CODEM (Cofrac-accredited measurement).  
(2) These results depend on how the hempcrete is placed (compaction). The best performance is obtained with moderate compaction and after full drying.

Hempcrete insulation improves the thermal and acoustic performance of the walls to which it is applied. By installing this internal lining on existing walls, you benefit from the following advantages:



**Thermal insulation:** increases the wall's thermal resistance and provides an excellent complementary layer of insulation. **Significant phase shift and damping capacity.**



**Enhanced thermal mass:** improved summer and winter comfort thanks to better regulation of the surface temperature of treated walls.



**Hygrothermal regulation:** moisture management and high vapour permeability.



**Acoustic insulation:** reduction of sound intensity through absorption.



**Capillary continuity** between the existing wall and the hempcrete insulation, eliminating the dew point risk.



### PREPARING HEMPCRETE

**In a PLANETARY MIXER:** Introduce the hemp into the mixer and moisten it by spraying until the colour changes (it becomes darker). Add the BATICHANVRE® lime and gradually add the water to obtain a homogeneous mix (mixing time: 5 to 10 minutes).



**In a DRUM MIXER:**  
1/ Add the water and the selected BATICHANVRE® lime.  
2/ Mix for 3 to 5 minutes. The resulting lime slurry must be uniform and free of lumps.

3/ Add the decompressed hemp and mix at slow speed until a homogeneous blend is obtained (consistency of "clumped crumbs").  
**NOTE: Do not leave the hempcrete turning in the drum mixer.**

**In both preparation methods, ensure a homogeneous mix so as to obtain an aerated hempcrete in which the hemp particles are evenly coated with the binder, without forming clumps.**



**With a SPRAYING MACHINE:** as with a drum mixer, a lime slurry must be prepared by mixing all the water with the selected BATICHANVRE® lime (except for continuous-mixing machines). The hemp is propelled by the associated carding/blowing unit. Mixing takes place either in the spray gun or at the outlet, depending on the model.

**NOTE:** water dosage must be adjusted for sprayed application. If spraying is stopped for more than 30 minutes, the pipes must be cleaned.

### CASTING HEMPCRETE



#### MANUAL INSTALLATION USING FORMWORK

- The formwork panels must be fixed either to the structural frame or to the supporting wall, respecting the required total thickness of cast hempcrete.
- The substrates must be pre-moistened and left to drain off.
- Apply a stipple coat (see page 24).
- The hemp mortar is poured in successive layers of no more than 20 cm. Apply light compaction against the formwork and around timber elements. The hempcrete should remain between the formwork panels for at least 20 minutes.
- Where required, upper areas or locations with difficult access may be filled manually using single-sided formwork.
- Fill the first height of formwork, then fix the second height, which is filled to 20 cm; at this stage the first height of formwork can be removed.

#### SPECIFIC CASE: INFILLING TIMBER-FRAME PANELS:

To ensure the finish coat is flush with the timber frame, a recess of 18 to 25 mm must be allowed after removing the formwork, either by:

- > lightly compacting the hempcrete, or
- > scraping the surface within 24 hours maximum.

#### MECHANICAL SPRAY APPLICATION

- Apply the hempcrete starting from the bottom of the wall, working across the full width, until the required thickness is achieved. It is essential to ensure proper encapsulation of any structural elements.
- For machine settings, refer to the manufacturer's instructions.

**At the end of application, level the hempcrete with a notched straightedge to obtain a regular, flat, and rough surface.**



**NOTE:** Application temperature must be between 5°C and 30°C.  
**IMPORTANT:** Provide sufficient ventilation in the building to prevent any risk of condensation.





## DRYING TIME

- Allow approximately 1 week per 2 cm of thickness in ventilated rooms.
- The scratch coat for the finish render can be applied immediately after spraying the hempcrete, providing temporary water protection while allowing drying to continue.
- For the application of the finish coat: wait until the surface of the hempcrete shows a uniform lightening of colour due to drying. Drying is checked by looking for the presence or absence of liquid water traces on the surface. If liquid water is still visible, wait before applying the finish.

**In all cases, allow a minimum of 21 days of drying before applying exterior or interior coatings**

## COMMENTS

- These works require protection from water (run-off, splashing).
- Completed elements must not be in permanent contact with liquid water.
- A peripheral joint between the timber frame and the hempcrete must be installed to prevent possible water ingress.
- For exterior infilling between timber-frame, precautions must be taken to allow for possible timber movement. **Refer to the professional guidelines.**



## SPECIFIC DETAILS: COVERING

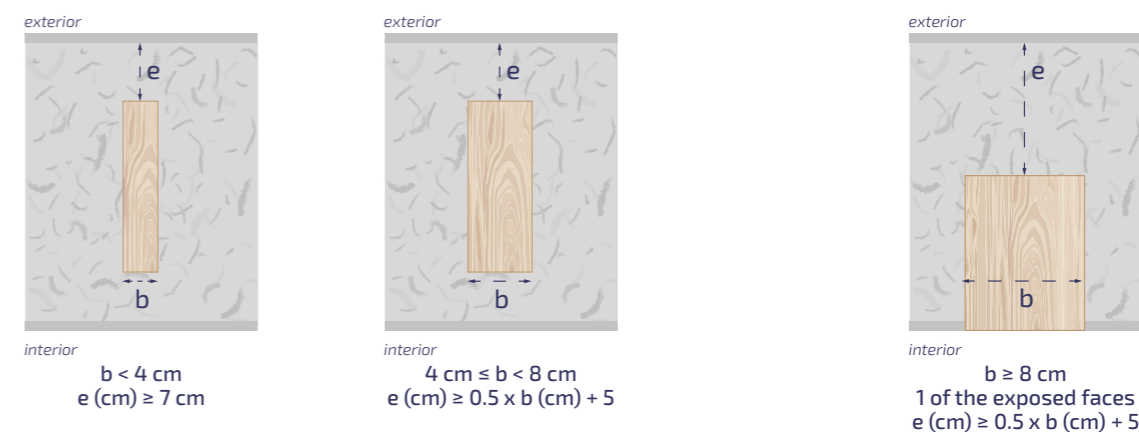
The insulating hempcrete wall must always be constructed in accordance with the **Professional Guidelines and the Best Practice Guides for Hemp Construction published by the Association Construire en Chanvre.**

— **Timber-frame:** Install a batten or lath fixed at a minimum of 6 cm from the exterior face. The treated surfaces must not exceed 60 cm in width. For widths between 30 and 60 cm, install noggings spaced at 50 cm. Height is limited to one storey, i.e. 2.5 to 3 m. The timber frame must be fully covered on the interior by the hempcrete (see covering thickness table). A recess of 18 to 25 mm must be left on the exterior side for applying the render.

— **Cast walls:** The structural frame must be built in accordance with the Professional Guidelines for Hemp Construction issued by the Association Construire en Chanvre. The frame must be embedded within the hempcrete with a minimum cover (see table below). The installation of the hempcrete and adherence to the prescribed mix ratios must provide sufficient strength to support the application of a render, which must be carried out in accordance with the Finishes section (pages 24–25).

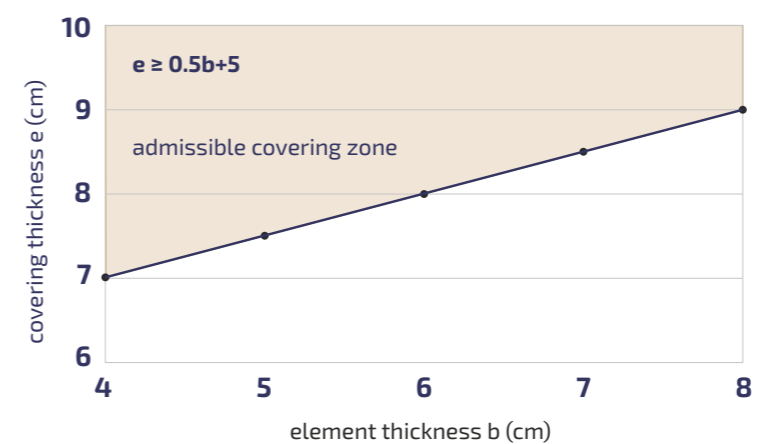
**NOTE:** We do not recommend creating exposed timber framing on both faces of the wall (and it is strictly prohibited if one face is external). For interior applications, if an exposed timber frame is required for aesthetic or spatial reasons, the project manager must take all necessary precautions to ensure the stability of the assembly (installation of mesh, laths, grooves, etc.).

## DIAGRAMS OF COVERING THICKNESSES



## TABLE OF COVER THICKNESSES

Calculation of cover thickness in cm:  $e \geq 0.5 \times b + 5$



Minimum cover thickness (e) according to the thickness (b) of the timber element.  
Source: Professional Guidelines – Construire en Chanvre, July 2024, p. 21





# SPECIFIC POINTS FOR INTERIOR WALL SHUTTERING

## ACCEPTABLE SUBSTRATES

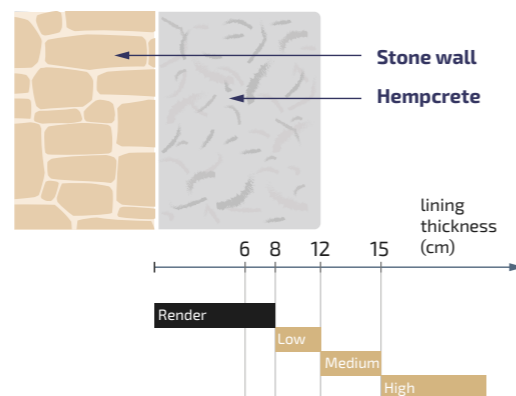
### All new or existing substrates.

- Existing cement-rendered substrates, interior or exterior, must be fully stripped back to expose the original wall.
- Painted substrates or those covered with a plastic coating must be taken back to bare material.
- For masonry laid with coarse gypsum plaster, once the existing renders have been removed, the lining may be carried out using the BATICHANVRE® or TRADÉCO® solution.
- All gypsum-based renders must be systematically removed.

## TYPE OF INTERNAL LINING

### Three types of internal wall lining are possible:

- Thin lining, between 8 and 12 cm thick.
- Medium-thickness lining, from 12 to 15 cm.
- Thick lining, greater than 15 cm.



## APPLICATION OF THE STIPPLE COAT

The stipple coat is mandatory on the substrate before applying the Saint-Astier® hempcrete internal lining.



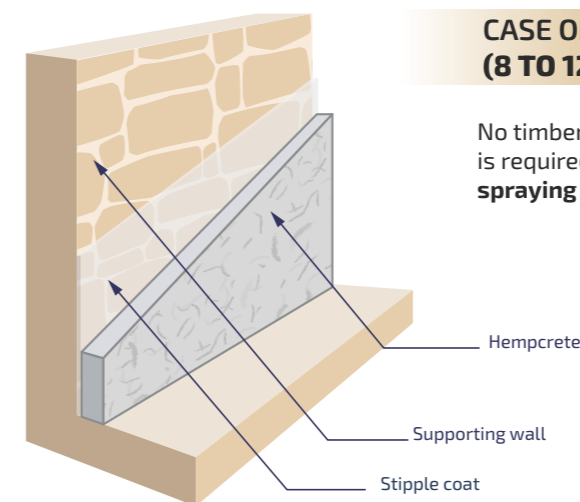
OR



+



50 to 70 litres of 0/4 mm sand

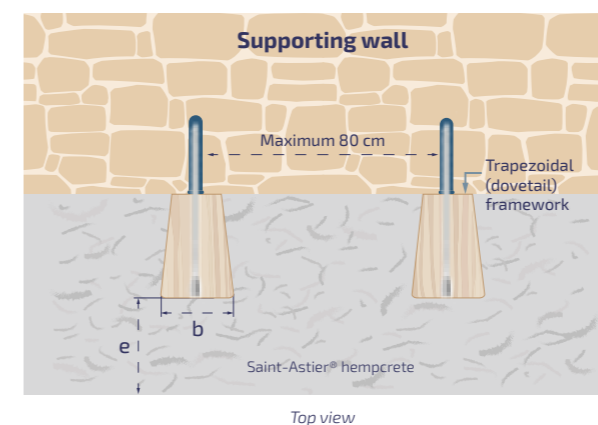


## CASE OF THIN INTERNAL LININGS (8 TO 12 CM)

No timber framework is required. **Mechanical spraying ONLY.**

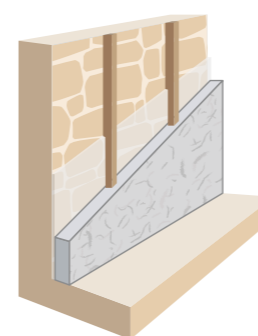
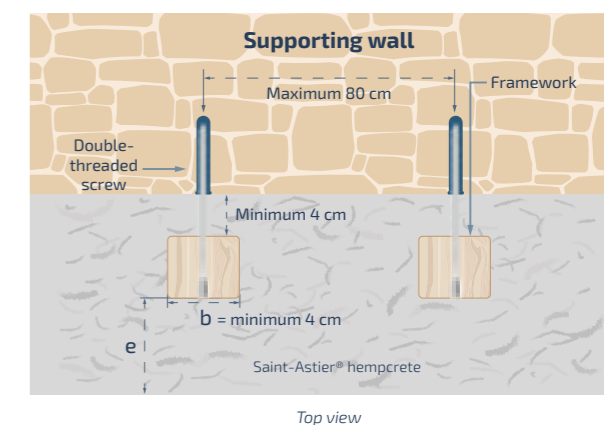
## CASE OF MEDIUM-THICKNESS INTERNAL LININGS (12 TO 15 CM)

This configuration requires the installation of a reinforcing framework mechanically fixed to the existing or new supporting wall. The framework must have a trapezoidal (dovetail) shape, which ensures proper retention of the Saint-Astier® hempcrete lining.

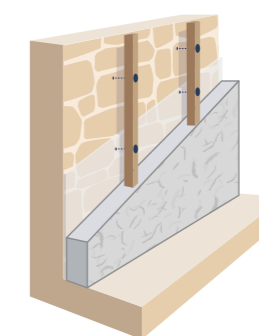


## CASE OF THICK INTERNAL LININGS (OVER 15 CM)

This configuration also requires a reinforcing framework secured to the supporting wall. It must be offset from the wall, leaving a minimum clearance of 4 cm. This framework ensures adequate support for the hempcrete lining and must be sized according to the thickness of the hempcrete applied.



For these linings, other types of framework are possible, provided they ensure proper support of the hempcrete against its substrate. The encasing thicknesses given in the table on page 21 must also be respected.



For these linings, the framework must be dimensioned according to both the thickness of the hempcrete and the ceiling height. Other framework solutions may be used, provided they comply with the provisions shown in the table on page 21.



# EXTERIOR AND INTERIOR FINISHES ON HEMPCRETE

WHETHER INDOORS OR OUTDOORS, HEMPCRETE MUST BE COVERED WITH A FINISH.

## STIPPLE COAT

On cast or sprayed hempcrete, a **stipple coat of approximately 5 mm must be applied using the same binder used to produce the hempcrete** (the stipple coat is recommended for site-mixed mortars, but is not required with KALAMUA®). This stipple coat may be applied 24 to 48 hours after placing the hempcrete to provide protection (necessary in rainy weather conditions).

— The stipple coat may be applied when ambient temperature is between 5°C and 30°C.

### MIX RATIOS



**NOTE:** For interior use, the stipple coat is not required except in the case of overly smooth cast surfaces and/or excessive height (more than 3 m). It is also possible to leave the hempcrete exposed where there is no external stress (friction, impacts, etc.).

## APPLICATION OF A TRADITIONAL BASE COAT

The hempcrete must be dust-free and moistened, without saturating it, and the stipple coat (if present) must be surface-dry before applying the final render. The stipple coat should then show a uniform, light colour.

### SITE-MIXED MORTAR



- A glass-fibre mesh must be embedded within the base coat.
- The base coat must have a thickness of 10 to 15 mm.
- Drying time: at least 14 days before applying the finish.

## APPLICATION OF THE FINISH

### SITE-MIXED FORMULATION

#### TROWELLED / SPONGED FINISH

— A trowelled finish may be applied using the following products. The final thickness of this coat must be between 5 and 7 mm.

— **Using NHL 2 dosed at:**  
1 bag of NHL 2 + 120 litres of sand.



#### SCRATCHED FINISH

— A scratched finish may be applied using NHL 2 lime. The final thickness of this layer must be between 5 and 9 mm after scratching.

— **Using NHL 2 dosed at:**  
1 bag of NHL 2 + 100 litres of sand



### READY-TO-USE

#### SCRATCHED FINISH or SPONGED FINISH

— Apply in two passes, each 8 to 12 mm thick, fresh on fresh, with the first pass reinforced with mesh (see our Technical Application Guide – DTMO for correct product use, in our website).



**KALAMUA®**  
6 AVAILABLE COLOURS: please refer to our dedicated colour chart

**NOTE:** Other finishes are possible; please contact us for details.



**NOTE:** INTERIOR use only, a hemp render can be applied indoors, leaving the hemp visible.

### HEMP RENDERS

- hygrothermal hemp render is possible, provided an intermediate coat is applied beforehand (e.g. BATICHANVRE® PLUS + sand as a stipple coat).
- It is possible to use TRADÉCO® lime combined with our ISOCANNA® hemp shiv (standard or fine grade) or SYNALIOS® Hemp: see the chapter "Hygrothermal Renders", p. 26.



# HYGROTHERMAL RENDER SOLUTION

## FOR INTERIOR AND EXTERIOR USE.

Hemp renders must not exceed a thickness of 8 cm.

### SITE PREPARATION

- When applying onto hempcrete or other bio-sourced substrates (contact us for specific cases), an intermediate coat must be provided by applying a BATICHANVRE® PLUS + sand stipple coat to limit the risk of cracking.
- The substrate must be sound, clean, and dry. Existing renders must be fully removed and the substrate cleaned.
- The substrate must be pre-moistened and then receive a stipple coat prepared as follows: **Mix ratio: 1 part TRADÉCO® to 2 parts 0/4 mm sand.**  
This solution is also compatible with masonry laid using coarse gypsum plaster.
- The stipple coat should be approximately 5 mm thick.

### PREPARING THE HYGROTHERMAL RENDER

Regardless of the render type or finish to be applied, the mix must be prepared as follows:

- 1 Place all the water into the drum mixer, then add the binder.
- 2 Mix for a few minutes to produce a homogeneous lime slurry.
- 3 Add the decompressed hemp and continue mixing until the mortar has a uniform consistency and colour (5 to 10 minutes).
- 4 The resulting mix must be rich and smooth.
- 5 ISOCANNA® Fine may only be used for interior hemp renders, with a thickness of 1.5 to 3 cm maximum. Hygrothermal renders made with ISOCANNA® (standard, not fine) must have a minimum thickness of 3.5 cm.



ALSO AVAILABLE as a ready-to-use solution with SYNALIIOS® (see next page)

### HYGROTHERMAL RENDER MIX RATIOS (traditional solutions)

#### With or without an additional finish

Interior



\*Fire-reaction rating and thermal conductivity coefficient available > please contact us.

NOTE: Also possible using NHL 2 instead of TRADÉCO®, without an additional finish.

Interior / Exterior



\*Fire-reaction rating and thermal conductivity coefficient available > please contact us.

### TYPES OF ADDITIONAL INTERIOR FINISHES

After a drying period of 60 to 90 days, an additional finish may be applied over the hygrothermal render:

- A BADILITH® limewash.
- A SEMI-THICK RENDER: this semi-thick render can be applied using TRADÉCO®, NHL 2, DÉCORCHAUX®.

TROWELLED FINISH: THICKNESS 5 TO 7 MM MAXIMUM		SCRATCHED FINISH: THICKNESS 7 TO 8 MM MAXIMUM	
NHL 2	1 + 12 buckets of sand	NHL 2	1 + 10 buckets of sand
DÉCORCHAUX® - CL 90	1 + 12 buckets of sand		
		TRADÉCO® - HL 3,5	1 + 11 buckets of sand

### TYPES OF ADDITIONAL EXTERIOR FINISHES

— KALAMUA® applied in two passes, fresh on fresh:

**First pass:** reinforced with mesh. **Second pass:** scratched finish or sponged finish. The total thickness must not exceed 20 mm.

### GENERAL REMARKS

- The walls must never be exposed to capillary rising damp. If this occurs, appropriate remedial treatment must be carried out before applying the render.
- The finished hemp render must always remain dry. Recommended thickness: 3 to 8 cm maximum.
- Interior applications: the rooms must be ventilated to promote drying of the hemp render.
- If the premises cannot be ventilated, or if they are occupied, a dehumidifier must be installed to evacuate excess moisture from the render more quickly.
- Exterior applications: the hemp render must be applied at least 20 cm above finished ground level.
- Interior and exterior: the rendered areas must not exceed 25 m<sup>2</sup>. The final thickness for this render must be 5 to 7 mm for a trowelled finish and 7 to 8 mm for the scratched finish.

### CHARACTERISTICS AND PERFORMANCE

Compressive strength R <sub>c</sub> at 90 days	Thermal conductivity λ in W.m <sup>-1</sup> .K <sup>-1</sup> (1)	Water vapour resistance factor μ	Reaction to fire
> 1 MPa	0.12 to 0.15	4.5 to 10	A2-s1,d0

The best results are obtained with TRADÉCO® lime.

(1) Tests carried out in accordance with Standard NF EN 12667 by LMDC (a university laboratory functioning similarly to the Building Research Establishment).



ALL-IN-ONE SPRAYABLE SOLUTION

# Range SYNALIOS®

PERFORMANCE, INNOVATION, SAVINGS.

## A REVOLUTION IN THE WORLD OF ECO-MATERIALS

— The arrival of SYNALIOS® marks a decisive turning point in the sustainable-building market. This revolutionary range fits seamlessly into our eco-build offering, with ready-to-use mortars of an entirely new design: formulated predominantly with Natural Hydraulic Lime (NHL) and bio-sourced materials such as hemp or cork, SYNALIOS® solutions contain no silica sand and no cement, and offer genuine on-site comfort thanks to their reduced weight and low consumption.

## A FORWARD-LOOKING, RESPONSIBLE VISION

— A simple conviction: building should no longer be linked to excessive resource use, and must instead embrace consumption that is measured and aligned with current and future climate challenges. Faced with the depletion of natural resources, SYNALIOS® provides a concrete alternative that preserves raw materials while maintaining the expected technical performance.

— The key advantage? No change in the habits of applicators: these innovative renders are used exactly like traditional products, making the transition towards more responsible construction smooth and intuitive.



### WHAT DOES SYNALIOS MEAN?

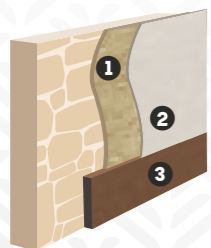
— This name carries our philosophy:

**SYNELIS** (from the Greek "synergos"): synergy, because nothing stands alone

**HELIOS**: the sun, a source of life and energy

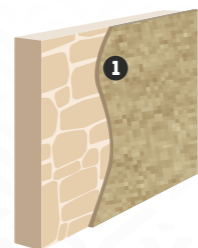
This meeting symbolises the alliance between what the Earth provides and the energy of the sun, between science and nature, between strength and durability.

We love it because:



> **EXTERIOR:**  
It reduces thermal bridging.

- 1 SYNALIOS® hemp
- 2 SYNALIOS® cork finishing render
- 3 Cork board



> **INTERIOR:** It naturally regulates indoor humidity and contributes to the home's thermal comfort.

- 1 SYNALIOS® hemp  
Possible finishing coat with SYNALIOS® cork

APPLICATION: Please refer to product data sheet

NEW

## SYNALIOS®, WHO IS IT FOR?

- For craftspeople who want to work differently and faster
- For architects who want to rethink their approach
- For anyone wishing to build sustainably whilst minimising their environmental impact

For any questions, contact our technical team via our website: [www.saint-astier.co.uk](http://www.saint-astier.co.uk) (link available at the bottom of the homepage).

## RENDERS & MORTARS MADE FROM ECO-BUILDS, READY TO USE:



**SYNALIOS® HEMP**  
15 KG  
Hemp-based base coat

Cover large interior surfaces in reduced time (8 cm thickness in a single day!)

CONSUMPTION: 6 kg/cm<sup>2</sup>



**SYNALIOS® CORK**  
15 KG  
Cork-based finish

4 colour shades available



**SYNALIOS® MONTAGE**  
15 KG  
Hemp-based

## WHAT SETS THEM APART?

- 3 COMPLEMENTARY, COHERENT SOLUTIONS
- CEMENT-FREE AND SILICA-SAND-FREE
- EXCELLENT ADDITIONAL INSULATION:  $\lambda = 0.15W/(m.K)$
- EASY TO APPLY
- COMPATIBLE WITH STANDARD SPRAYING MACHINES
- SUITABLE FOR GYPSUM SUBSTRATES
- IT NATURALLY REGULATES INDOOR HUMIDITY AND CONTRIBUTES TO THE HOME'S THERMAL COMFORT

Please consult the product data sheets on our website, along with associated technical documents: Cofrac certificate (thermal conductivity  $\lambda$ ), EPD, project references, etc.

# ROOF SOLUTION

## SITE PREPARATION

— If the exposed underside of the roof is sensitive to moisture, or if this face must remain visible and free from staining, a moisture-protection layer is required.

## MOISTURE-PROTECTION LAYER

— Before installing the hempcrete, spread a dry hemp mix between the joists in a layer 2 to 3 cm thick.

### MIX RATIO:


**BATICHANVRE® PLUS**  
 One 25 kg BAG

OR


**BATICHANVRE® ISOL PLUS**  
 One 18 kg BAG

+


**CHANVRE ISOCANNA®**  
 One 20 kg BAG

## MIX RATIO FOR HEMPCRETE


**BATICHANVRE® PLUS**  
 One 25 kg BAG

OR


**BATICHANVRE® ISOL PLUS**  
 One 18 kg BAG

+



**CHANVRE ISOCANNA®**  
 One 20 kg BAG

+





40 to 50 litres of water

## PREPARING HEMPCRETE

 — In a **PLANETARY MIXER**: Introduce the hemp into the mixer and moisten it by spraying until the colour changes (it becomes darker).

Add the **BATICHANVRE® PLUS** or **BATICHANVRE® ISOL PLUS** binder and gradually add the water to obtain a homogeneous mix (mixing time: 5 to 10 minutes).

 — In a **DRUM MIXER**: Add the water and **BATICHANVRE® PLUS** or **BATICHANVRE® ISOL PLUS** and mix for 3 to 5 minutes (the resulting slurry must be homogeneous and free of lumps). Then add the decompressed hemp and continue mixing until a uniform blend is obtained, adding water if necessary. Because the binder dosage is low, it may be easier, depending on the size of the mixer drum, to halve the quantities of each component.

 — In a **SPRAY MACHINE specifically for hemp spraying**: for roofing applications, hempcrete can also be applied using a projection machine. Please contact us if required.

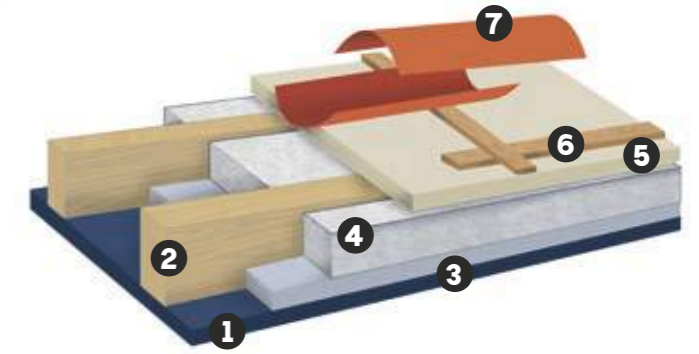
## INSTALLATION OF HEMPCRETE

— The hempcrete must be placed manually or sprayed in a single operation between the joists, working from the bottom towards the roof, onto the lower face serving as lost formwork (whether or not it has moisture protection, see chapter 2, moisture-protection layer). For manual installation, apply very light compaction.

— A mandatory 2-cm air gap must be maintained between the hempcrete and the upper side of the rafters to ensure correct ventilation of the assembly. A lime slurry may be applied once the hempcrete has begun to set (mix: 1 part binder + 1 part water).

— A breathable underlay (rain barrier) must then be installed to prevent accidental wetting of the hempcrete by rain.

— Application temperature: between 5°C and 30°C.



- 1 Underside
- 2 Joist
- 3 Counter-battening / battens
- 4 Moisture-protection layer
- 5 Hempcrete
- 6 Breathable underlay (rain barrier)
- 7 Roof covering

**NOTE:** When applying hempcrete to a roof by spraying, the moisture-protection layer must be adapted accordingly.

## CHARACTERISTICS AND PERFORMANCE OF HEMPCRETE

CHARACTERISTICS AND PERFORMANCE	Dry density Kg/m <sup>3</sup>	Compressive strength Rc at 90 days	Thermal conductivity λ in W.m <sup>-1</sup> .K <sup>-1</sup> (1)	Thermal transmittance U-value in W/m <sup>2</sup> .K	Thermal resistance R for 40 cm(2)	Reaction to fire
<b>BATICHANVRE® PLUS + ISOCANNA®</b>	220 to 250	> 0.05 MPa	0.052	0.13	7.7	B-s1,d0
<b>BATICHANVRE® ISOL PLUS + ISOCANNA®</b>	190 to 220	> 0.05 MPa	0.049	0.12	8.15	B-s1,d0

(1) Tests carried out in accordance with Standard NF EN 12667 by LMDC (a university laboratory functioning similarly to the Building Research Establishment).  
 (2) These results depend on how the hempcrete is placed (compaction). The best performance is obtained with moderate compaction and after full drying.

## THERMAL RESISTANCE

ROOFING-GRADE CONCRETE	30 cm	40 cm	50 cm
<b>BATICHANVRE® PLUS</b> λ = 0.052	5.76	7.69	9.61
<b>BATICHANVRE® ISOL PLUS</b> λ = 0.049	6.12	8.16	10.2

## U-VALUE

ROOFING-GRADE CONCRETE	30 cm	40 cm	50 cm
<b>BATICHANVRE® PLUS</b> λ = 0.052	0.17	0.13	0.10
<b>BATICHANVRE® ISOL PLUS</b> λ = 0.049	0.16	0.12	0.10



View of the roof formwork before filling.



Roof filling.



Hempcrete roof insulation.



# FLOOR SOLUTION

(EXCLUDING INSTALLATION DIRECTLY ON SOLID GROUND FLOORS)

## SITE PREPARATION

The hempcrete must be applied over a load-bearing intermediate floor. In the case of a timber floor, spread approximately 2 cm of pure hemp, lightly dusted with lime, to create the moisture-protection layer. It may also be applied over moisture-resistant particle board panels, without any plastic film, insulation boards, or impermeable materials in between.

A first layer of 5 cm must be cast using only 30 litres of water per batch. This is followed by an additional 5 to 10 cm applied at the recommended dosage below.

**Minimum thickness on intermediate floors: 10 cm.**

**IMPORTANT: Do not place a waterproof film over a timber floor.**

**NOTE:** The mechanical stability of the assembly is provided by the supporting structure, not by the hempcrete itself. Consequently, the hempcrete screed cannot be considered a slab within the meaning of NF DTU 13.3 (slabs).

## MIX COMPOSITION



Hempcrete may be applied when the ambient temperature is between 5°C and 30°C.

## MIX PREPARATION

**In a PLANETARY MIXER:** Introduce the hemp into the mixer and moisten it by spraying until the colour changes (it becomes darker). Add the selected BATICHANVRE® by sprinkling it in, and gradually add the water to obtain a homogeneous mix (mixing time: 5 to 10 minutes).

**In a DRUM MIXER:**  
 1/ Add the water and the selected BATICHANVRE lime.  
 2/ Mix for 3 to 5 minutes. The resulting lime slurry must be uniform and free of lumps.  
 3/ Add the decompressed hemp and mix at a slow speed until a homogeneous blend is obtained (consistency of "clumped crumbs").

**NOTE:** Do not leave the hempcrete turning in the drum mixer.

In both preparation methods, ensure a homogeneous mix so as to obtain an aerated hempcrete in which the hemp particles are evenly coated with the binder, without forming clumps.

**In a SUITABLE SPRAY MACHINE:** The hempcrete can also be applied using a spray machine. Please contact us if required.

**NOTE:** If spraying is stopped for more than 30 minutes, the hoses must be cleaned.

## CASTING HEMPCRETE

The hempcrete must be placed (levelled with a rake or straightedge) and must not be compacted, but light trowelling should be carried out to achieve a good level finish while preserving the material's thermal and acoustic insulation properties. Flatness tolerances: maximum 10 mm deviation under a 2-m straightedge.

## CURING HEMPCRETE

Curing may begin immediately after application by placing a polyethylene sheet (polythene film) over the surface. This must be removed no later than 48 hours after placement.  
 Curing should be provided depending on climatic conditions.

**IMPORTANT: Adequate ventilation of the premises is essential to prevent condensation. Where ventilation is not possible, a dehumidifier must be used.**

## CHARACTERISTICS AND PERFORMANCE OF HEMPCRETE

The hempcrete must have a **minimum thickness of 10 cm** on an intermediate floor.

CHARACTERISTICS AND PERFORMANCE	Dry density Kg/m <sup>3</sup>	Compressive strength Rc at 90 days	Thermal conductivity λ in W.m <sup>-1</sup> .K <sup>-1(1)</sup>	Thermal transmittance U-value in W/m <sup>2</sup> .K	Thermal resistance R for 15 cm <sup>(2)</sup>	Reaction to fire
BATICHANVRE® PLUS + ISOCANNA®	350 to 400	> 0.7 MPa	0.069	0.45	2.2	B <sub>fl</sub> -s1
BATICHANVRE® ISOL PLUS + ISOCANNA®	300 to 350	> 0.4 MPa	0.064	0.43	2.3	B <sub>fl</sub> -s1

(1) Tests carried out in accordance with Standard NF EN 12667 by LMDC (a university laboratory functioning similarly to the Building Research Establishment).  
 (2) These results depend on how the hempcrete is placed (compaction). The best performance is obtained with moderate compaction and after full drying.

## THERMAL RESISTANCE

HEMP CONCRETE FOR FLOORS	10 cm thick	15 cm	20 cm	25 cm
BATICHANVRE® PLUS λ* = 0.069	1.45	2.17	2.89	3.62
BATICHANVRE® ISOL PLUS λ* = 0.064	1.56	2.34	3.12	3.90

## U-VALUE

HEMP CONCRETE FOR FLOORS	10 cm thick	15 cm	20 cm	25 cm
BATICHANVRE® PLUS λ* = 0.069	0,69	0,46	0,35	0,28
BATICHANVRE® ISOL PLUS λ* = 0.064	0,64	0,43	0,32	0,26

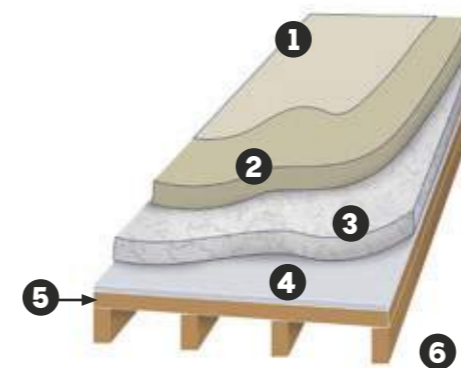
## FINISHES COMPATIBLE WITH HEMPCRETE

After the hempcrete has fully dried (minimum 1 week for every 2 cm of thickness), it may be covered with one of the following:

- Terracotta or natural-stone tiles, laid in a bedded installation on a fresh lime screed (minimum 5 cm thick), using a slurry coat or dusting method. You may also use our KHOLAO® Chape ready-to-use screed solution.
- Floating parquet flooring installed over a lime screed with a thin intermediate underlay.
- Solid timber flooring, nailed onto joists positioned in or on the hempcrete.
- Adhered tiles on a lime screed, or a resilient floor covering laid on a screed. You may also use our KHOLAO® Colle ready-to-use tile adhesive solution.

## RESILIENT FLOOR COVERING

On an intermediate floor



- Resilient floor covering
- Load-distribution lime screed Saint-Astier® Natural Hydraulic Lime screed or KHOLAO® CHAPE (screed)
- Hempcrete
- Moisture-protection layer (if required) or ISOCANNA® aggregate
- Intermediate floor
- Beam or joist

## FLOATING PARQUET

View of intermediate floor



- Floating parquet
- Load-distribution screed
- Hempcrete
- Moisture-protection layer (if required) or ISOCANNA® aggregate
- Intermediate floor
- Beam or joist



# LAYING OF BIO-SOURCED BLOCKS

Bio-sourced blocks are a modern and efficient solution, combining the ecological benefits of hempcrete with the constructive simplicity of a masonry block. Their composition blends plant-based aggregates such as hemp or flax with a mineral binder (lime), giving them both low density and strong performance. Several types of blocks are available on the market. **Our ready-to-use masonry mortars are compatible with the vast majority of blocks available today. Please feel free to contact our team for further information.**



**SYNALIIOS® MONTAGE (MASONRY MORTAR)** ensures material consistency between the block and the masonry mortar.

- ITS** +
- Hemp-based
  - Ensures material consistency between the blocks and the masonry mortar
  - Reduces thermal bridging and limits render-ghosting at block joints.



**MBBS®** is a mineral bedding mortar compatible with these blocks, while offering higher strength.

- ITS** +
- Replaces traditional mortar
  - Easy and fast to apply
  - Allows thin-joint application
  - Faster drying

## MIX RATIOS



- Mix in a **DRUM MIXER** or **PLANETARY MIXER** for **3 to 5 minutes**
- **PREPARE the substrate:** remove dust and lightly moisten the blocks.
- **APPLICATION:** apply a thin coat (3–5 mm) using a notched trowel.
- **SPECIFIC RECOMMENDATIONS:**
  - Work at temperatures between +5°C and +30°C.
  - Protect from rain and direct sunlight.
  - Do not excessively wet the blocks (light moistening only if needed).
  - Do not exceed the recommended thin-joint thickness (3–5 mm).
  - Respect drying times before applying the render.

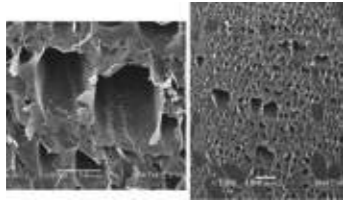


**SCIENTIFIC ENDORSEMENT**

# HEMPCRETE: FAR MORE THAN JUST INSULATION, A COMPLETE SOLUTION

## THE EXCEPTIONAL TECHNICAL PROPERTIES OF HEMPCRETE

— Hempcrete is an innovative material with remarkable properties, distinct from conventional construction materials. Its unique performance stems from the specific porous structure of the hemp shiv and the wide granulometric diversity of its pores, as revealed by Scanning Electron Microscopy (SEM) analyses:



### EXCEPTIONAL HYDROSCOPIC BEHAVIOUR

— This heterogeneous porosity gives the aggregate outstanding moisture-handling performance, both for liquid water and water vapour: **hemp shiv can absorb up to four times its own mass in water, of which nearly 80% is absorbed in just a few minutes.**

### THERMAL REGULATION THROUGH PHASE CHANGE

— The diversity of pore sizes produces a remarkable physical phenomenon: the water contained within the hemp shiv is capable of changing phase under varying temperature and pressure conditions.

— Major technical consequence: This mechanism induces a natural thermal-regulation effect within hempcrete, effectively dampening fluctuations in outdoor temperature and ensuring optimal interior thermal stability.

— **This intrinsic property positions hempcrete as a leading technical solution for passive climate control in buildings.**

## WHY USE A SPECIFIC BINDER?

**To produce hempcrete, it is essential to preserve all the qualities of the hemp shiv. A dedicated binder must therefore be used, offering the following properties:**

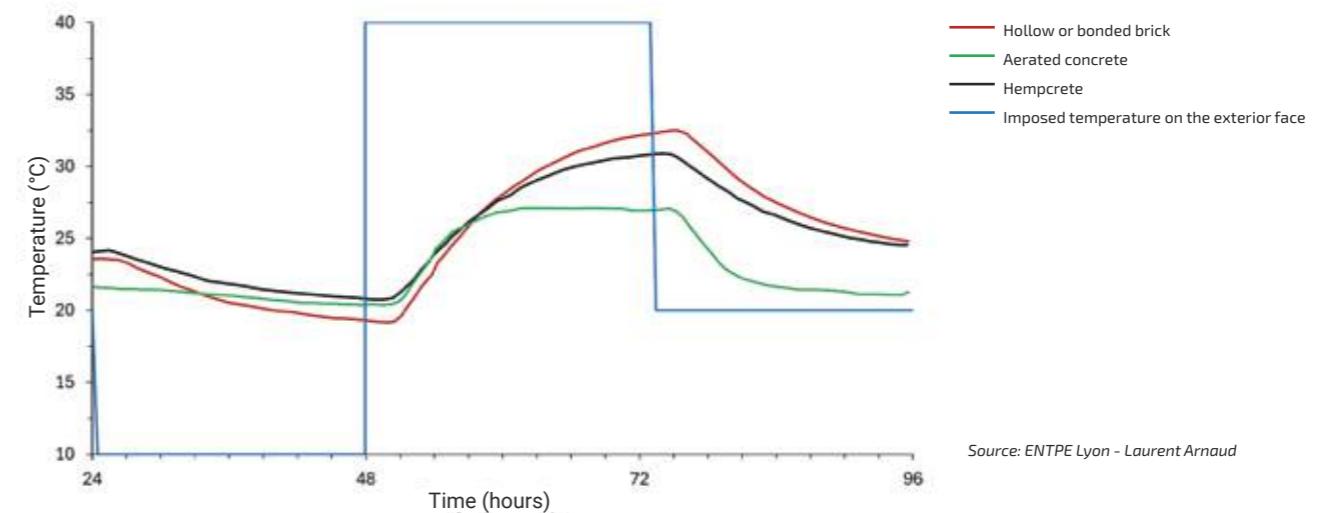
- High vapour permeability, allowing moisture exchange with the external environment.
- An undisturbed hydraulic set, unaffected by the presence of hemicellulose or by competition between the binder's setting reaction and the hemp shiv's water-absorption capacity. Poor control of the setting process can lead to powdering at the core of the hempcrete, resulting in a loss of mechanical performance. Such binder degradation also significantly affects liquid-water transfer within the hempcrete, one of its key characteristics.

**The binder's properties are crucial for unlocking the full potential of the hemp shiv. This is why our binders are the result of extensive research and are protected by several patents.**

When the binder and hemp shiv come together to form a high-quality mortar, hempcrete offers not only the expected mechanical performance, but also unmatched moisture-regulation capacity compared with other materials:

- As an illustration, the tests on page 37 compare three materials subjected to variations in outdoor temperature (orange curve). The green curve (hempcrete), black curve (aerated concrete), and red curve (single-wall brick) show the temperature recorded at the core of each material.
- To ensure a fair comparison, the wall thickness for each material was calculated to provide the same thermal resistance.

## ILLUSTRATION OF THE HYGROTHERMAL TRANSFER BEHAVIOUR OF HEMPCRETE:

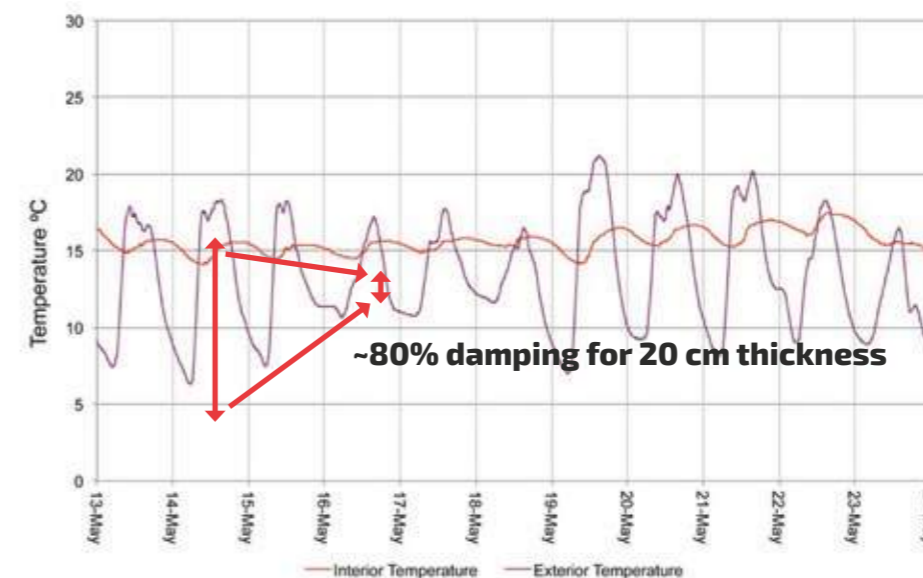


All insulation materials initially show a rise in temperature, but hempcrete quickly reaches a temperature plateau, while the other materials continue to heat up and transmit this heat to the interior of the building. This behaviour of hemp-based composites is explained by the water held within the capillaries of the plant fibres: when the air temperature within the hempcrete rises, the liquid water in the capillaries evaporates, absorbing heat and therefore limiting the rise in temperature inside the building, thus contributing directly to summer comfort. Example: just

like when you moisten the back of your hand and blow on it, you feel a cooling sensation due to the evaporation of the water.

**Whether the external temperature rises or falls, hempcrete strongly attenuates these variations.** This was demonstrated by the University of Bath in an unheated hempcrete test room subjected to outdoor temperature fluctuations (see graph below).

## THERMAL DAMPING

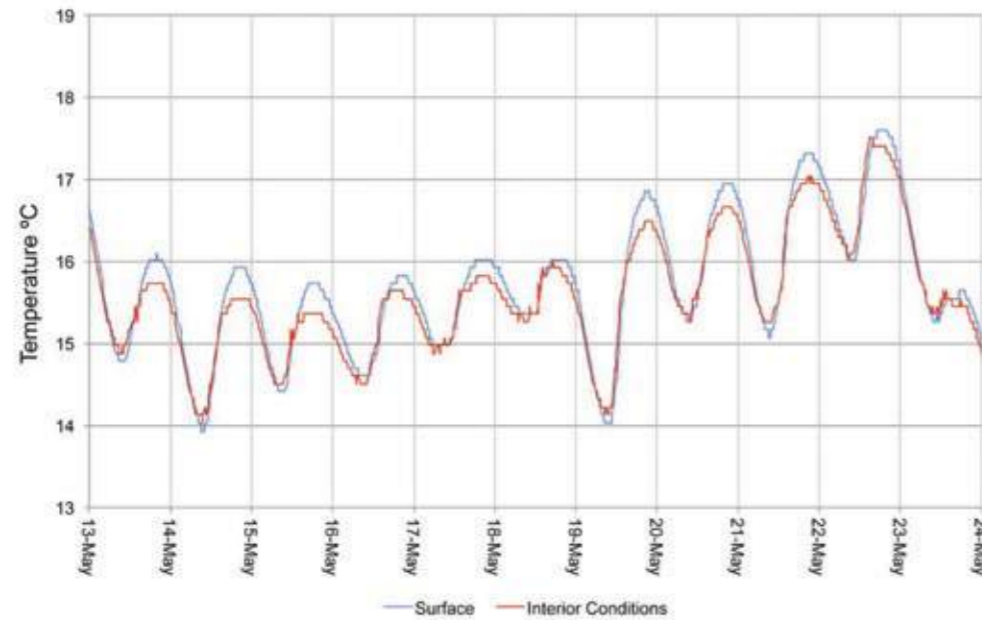


External temperature variations (purple curve) are attenuated by 80% indoors (red curve). Thus, with only 20 cm of wall thickness and despite external temperature fluctuations, the variations observed inside the building remain very small.



## THERMAL COMFORT

The surface temperature of the wall closely follows the indoor temperature.

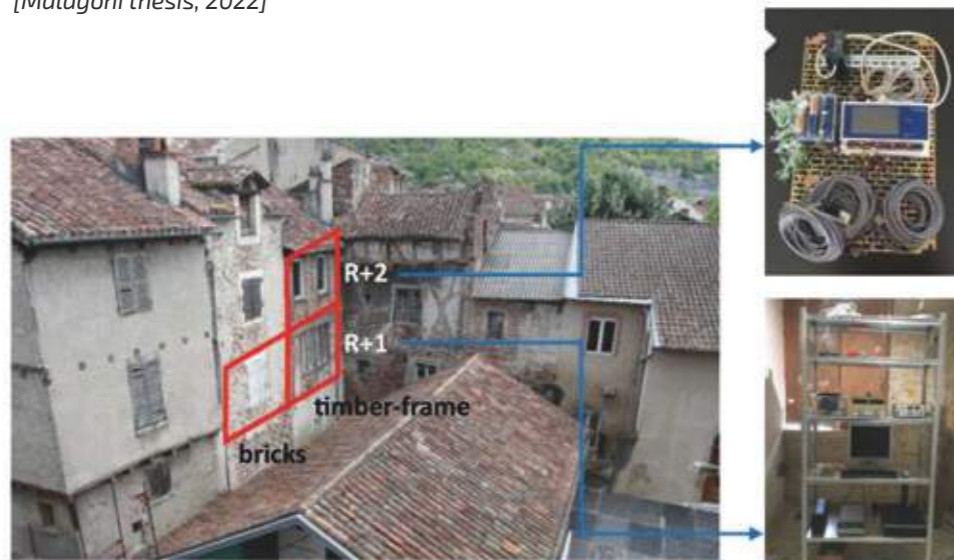


— This property of hempcrete walls is highly appreciated for the level of comfort it provides in dwellings when outdoor temperatures are extreme. The perception of cold or heat changes significantly when the surface of the walls is tempered. This reduces the need for heating in winter and can eliminate the need for air-conditioning in summer.

## CASE STUDY: RENOVATION OF A BRICK HOUSE IN THE CITY CENTRE OF CAHORS (46) AND INTERIOR HEMPCRETE INSULATION

### BEFORE RENOVATION

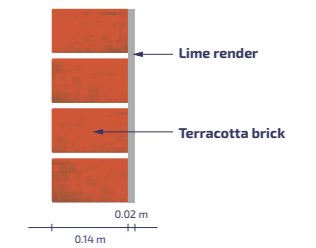
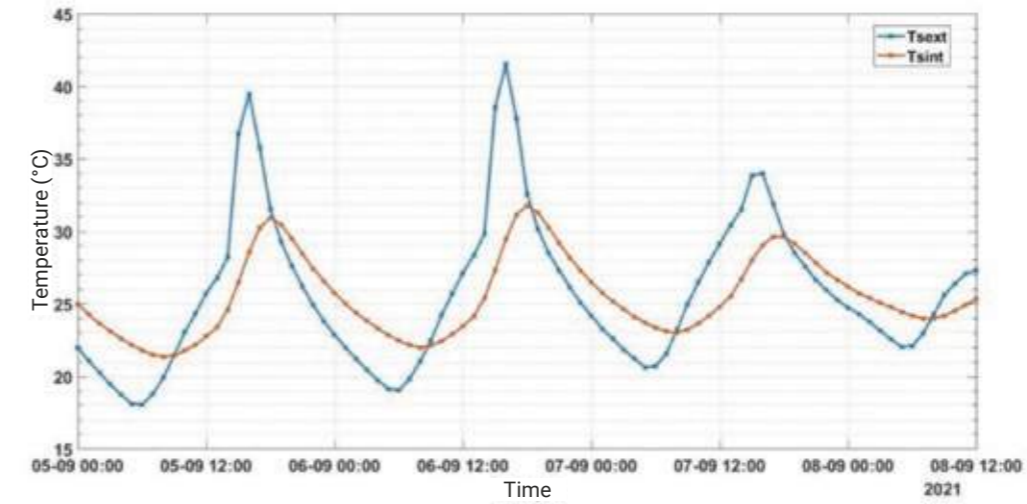
West façade of the buildings under study and the data-acquisition stations used on each floor. [Malagoni thesis, 2022]



## TEMPERATURE PROFILES: EXTERNAL (BLUE) AND INTERNAL (ORANGE)

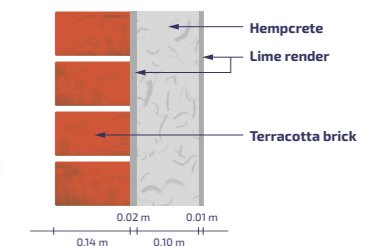
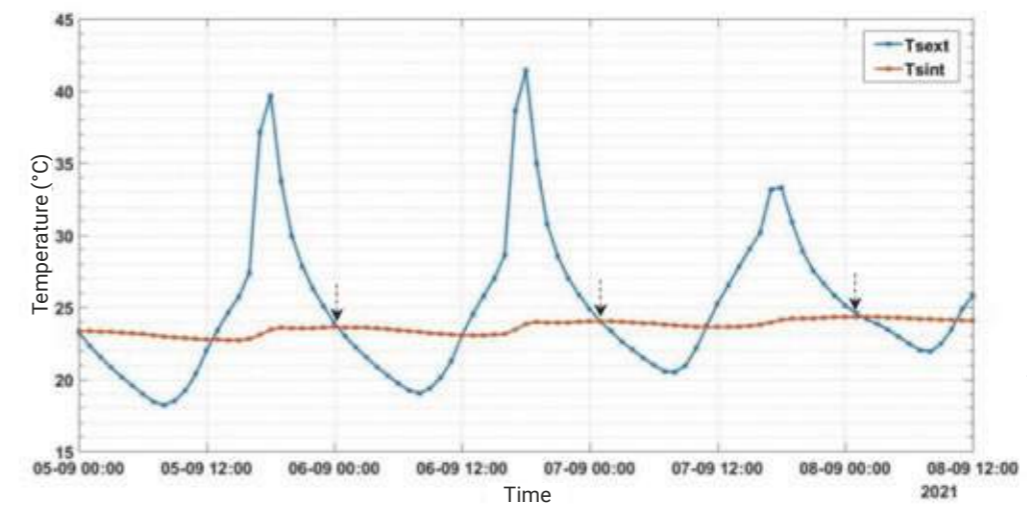
### BEFORE RENOVATION

Evolution of surface temperatures for the exposed timber-frame wall on the second floor (R+2) [Malagoni thesis, 2022]



### AFTER RENOVATION

It is also this phase-change effect that explains why the surface temperature of a hempcrete wall closely follows the indoor temperature.



— These curves show the evolution of external (blue) and internal (orange) temperatures over three consecutive late-summer days (5–8 September).

Outdoor temperatures were extremely high: 40°C, 42°C, 33°C.

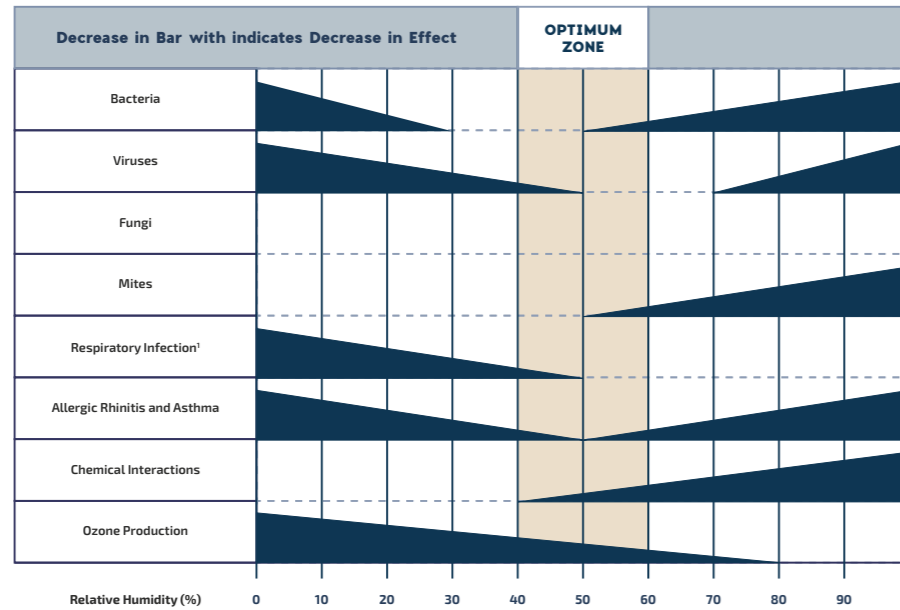
— Before hempcrete insulation, the indoor temperature followed the outdoor fluctuations, reaching 31°C, 32°C, and 30°C, respectively. Night-time outdoor temperatures dropped to 18°C, 19°C, and 21°C over the three monitoring days. The brick wall provided a small degree of thermal mass, slightly reducing the interior peaks.

— After hempcrete insulation, the interior peaks were completely damped. The indoor temperature stabilised at around 24°C, providing significant comfort for the occupants despite the very high outside temperatures.



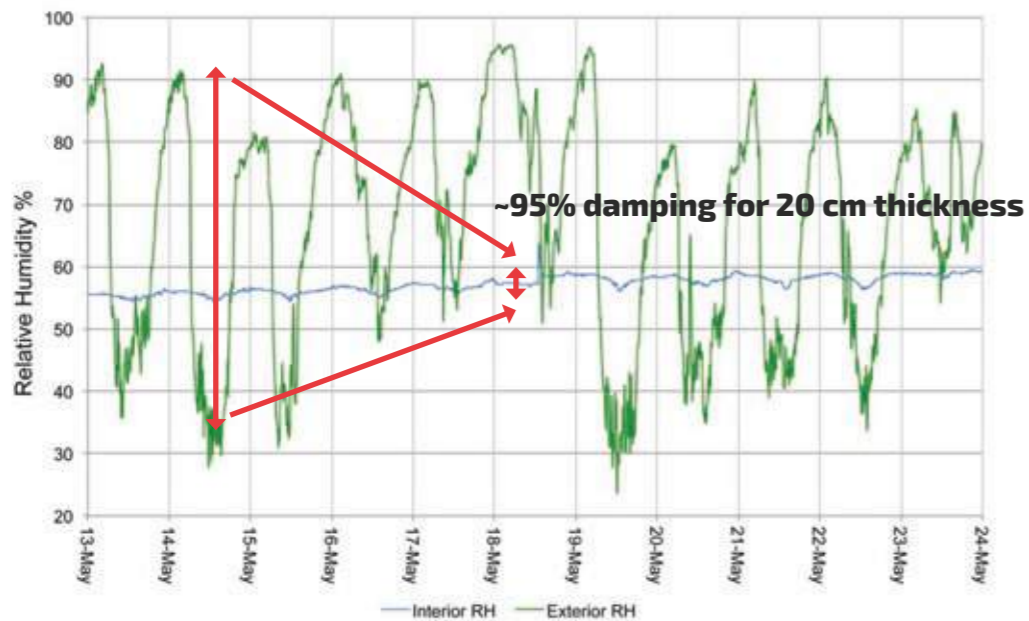
**Another key comfort factor is humidity regulation inside the home.**

The graph opposite shows that the optimal comfort zone in dwellings lies between 50% and 60% relative humidity.



**HUMIDITY REGULATION**

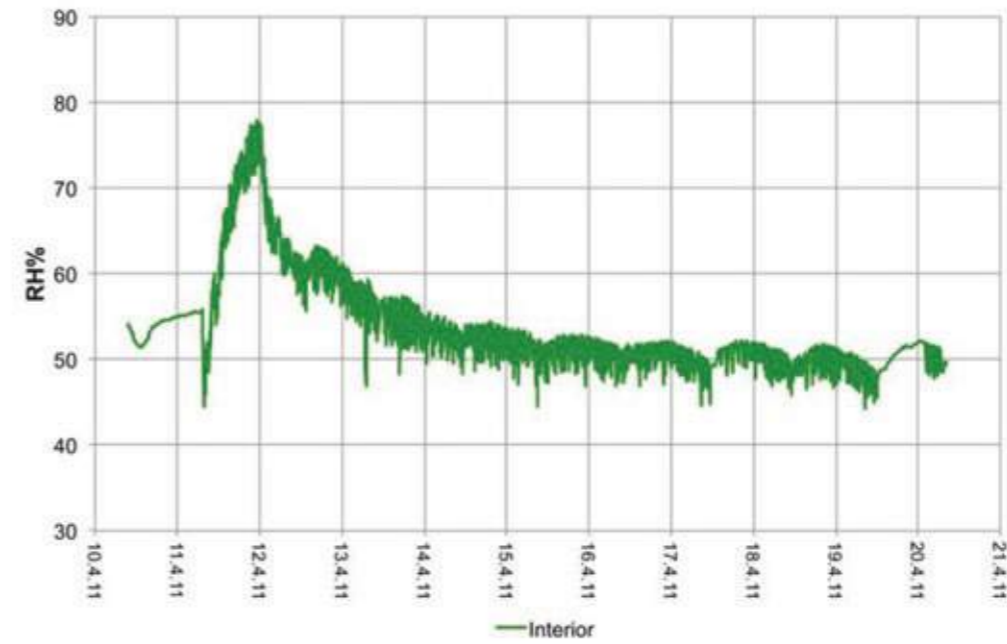
As shown in the diagram below, the humidity level inside the dwelling, even without ventilation, remains between 50% and 60% relative humidity.



This property is beneficial in all seasons, but it is particularly valuable in winter, when indoor heating naturally causes humidity levels to drop. With hempcrete, the indoor relative humidity remains at an optimal level, between 50% and 60%.

Conversely, in a dwelling built with inert materials (such as brick or polystyrene), indoor humidity can fall to as low as 10% during the heating season, creating discomfort for occupants.

Likewise, in the case of a sudden moisture load (for example, a shower in a bathroom), the following graph shows that even without ventilation, humidity quickly returns below 60%.



**IMPORTANT NOTE:**

To benefit from these properties, the binder used in hempcrete must be highly vapour-permeable. It is also crucial that exterior and interior renders do not obstruct vapour diffusion.

**FIRE BEHAVIOUR**

Properties relating to reaction to fire and fire resistance.



**Reaction to fire:**

- Hempcrete render = **A2-s1, d0**
- Hempcrete = **B-s1, d0**

A2 = non-combustible or very limited combustibility  
 B = limited combustibility  
 s1 = low smoke production  
 d0 = no flaming droplets or debris

**Fire resistance:**

Hempcrete is classified as **EI 240**.  
 Integrity + Insulation = **240 minutes**

**LEPIR II Test - carried out at CERIB (October 2020):**

Hempcrete façade, 30 cm thick, over two storeys  
 Timber frame fully embedded in the hempcrete and exterior finish in lime/sand render

**Test performed to assess fire spread between storeys**

>>> **Complies with the applicable regulations concerning non-propagation of fire through façades for a duration of 60 minutes.**



## THERMAL RESISTANCE TABLES FOR HEMPCRETE AND RENDERS BY THICKNESS

### HEMPCRETE FLOOR SOLUTION FOR INTERMEDIATE FLOORS

THICKNESS (cm)	10	15	20	25	30
<b>BATICHANVRE® PLUS</b> $\lambda^* = 0.069$	<b>1.45</b>	<b>2.17</b>	<b>2.90</b>	<b>3.62</b>	<b>4.35</b>
<b>BATICHANVRE® ISOL' PLUS</b> $\lambda^* = 0.064$	<b>1.56</b>	<b>2.34</b>	<b>3.13</b>	<b>3.91</b>	<b>4.69</b>

### HEMPCRETE IN WALLS (INTERNAL LINING AND NEW BUILD)

THICKNESS (cm)	8	10	15	20	25	30	35
<b>BATICHANVRE® PLUS</b> $\lambda = 0.069$	<b>1.16</b>	<b>1.45</b>	<b>2.17</b>	<b>2.90</b>	<b>3.62</b>	<b>4.35</b>	<b>5.07</b>
<b>BATICHANVRE® ISOL' PLUS</b> $\lambda = 0.064$	<b>1.25</b>	<b>1.56</b>	<b>2.34</b>	<b>3.13</b>	<b>3.91</b>	<b>4.69</b>	<b>5.47</b>

### HEMPCRETE ROOFING SOLUTION

THICKNESS (cm)	30	35	40	45	50	55	60
<b>BATICHANVRE® PLUS</b> $\lambda = 0.052$	<b>5.77</b>	<b>6.73</b>	<b>7.69</b>	<b>8.65</b>	<b>9.62</b>	<b>10.58</b>	<b>11.54</b>
<b>BATICHANVRE® ISOL' PLUS</b> $\lambda = 0.049$	<b>6.12</b>	<b>7.14</b>	<b>8.16</b>	<b>9.18</b>	<b>10.20</b>	<b>11.22</b>	<b>12.24</b>

### HYGROTHERMAL RENDERS

THICKNESS (cm)	3	4	5	6	7	8
<b>TRADÉCO®</b> $\lambda = 0.12$	<b>0.25</b>	<b>0.33</b>	<b>0.42</b>	<b>0.50</b>	<b>0.58</b>	<b>0.67</b>
<b>SYNALIOS® HEMP</b> $\lambda = 0.15$	<b>0.20</b>	<b>0.27</b>	<b>0.33</b>	<b>0.40</b>	<b>0.47</b>	<b>0.53</b>



**TRAINING  
IN HEMPCRETE  
SOLUTIONS**



# TRAINING IN HEMPCRETE SOLUTIONS

In response to the growing use of bio-sourced materials and the building sector's new environmental requirements, Saint-Astier® has developed a comprehensive training offer to support all professionals working in the hempcrete sector. Our certified training courses, delivered in our **QUALIOPI-accredited centre under the "training actions" category**.

## APPLICATOR TRAINING: *Mastering On-Site Application*



### TRAINING OBJECTIVES

This practical, intensive three-day course is designed for craftspeople, site workers and team leaders wishing to acquire or enhance their application techniques for hempcretes and renders.

#### Detailed programme

##### Theory module:

- Properties and behaviour of hempcrete materials.
- Professional Rules for Hemp Construction
- Preparation of substrates and mixes
- Weather conditions and recommended precautions

##### Practical module:

- Spraying techniques and manual application methods
- Adjustment and use of spraying machines
- Application of multi-layer renders
- Special finishes and surface textures
- Quality control and diagnosis of defects



### TRAINING ADVANTAGES

- **Knowledge of machines** for projecting hempcrete and mechanical spraying methods.
- **Training on a technical platform** reproducing real site conditions
- **Professional-grade equipment** provided (spraying machines and specialised tools)
- **Issuance of a certificate** recognised by insurers and regulatory bodies
- **Post-training support** with telephone assistance



## TRAINING FOR DESIGNERS AND PROJECT MANAGERS

*Designing and specifying with confidence*

### TRAINING OBJECTIVES

Designed for architects, consulting engineers, cost consultants and project managers, this two-module course (2x2 days) provides the full technical and regulatory foundations required to integrate hempcrete solutions safely and confidently into your projects.

#### Full programme

##### Technical fundamentals:

- Physical and mechanical properties of hempcretes
- Thermal and hygrothermal calculations
- Compatibility with other materials
- Thermal bridges and critical junctions

##### Design and specification:

- Bioclimatic design methodology
- Thickness design according to use
- Writing technical specifications and related documents
- Selecting appropriate construction systems

##### Regulatory and standards framework:

- Current Professional Rules
- Insurability and liability
- Labels and certifications
- Feedback and pathologies avoided

##### Practical case studies:

- Analysis of completed projects
- New-build versus heritage renovation
- Costing and budget estimation
- Coordination with specialised contractors



### TRAINING HIGHLIGHTS

- **Site visits to exemplary buildings** to understand real-world applications
- **Calculation tools** and charts provided
- **Professional network:** connection with qualified applicators
- **Regulatory monitoring:** privileged access to changes in standards



## PRACTICAL INFORMATION

### OUR QUALITY COMMITMENT

- **QUALIOPI-certified training centre:** a guarantee of quality and eligibility for professional funding.
- **Expert trainers:** our team of six specialists are ready to share their passion, knowledge and hands-on site experience with you.
- **Active learning approach:** 60% practical sessions, 40% theory.
- **Discover our company its unique know-how.**



*We look forward to welcoming you in the heart of the Périgord Blanc region (Dordogne), 15 km from Périgueux, in the département where 100% of our production is carried out, right here in the town whose name we proudly bear.*

### ON-DEMAND

- **Duration:**  
Applicator training: 3 days  
Designers & project managers training: 2 x 2 days
- **Location:** Saint-Astier Training Centre (Dordogne, France)

### CERTIFICATION AND RECOGNITION

Our training courses issue a **skills certificate** recognised by:

- Construction insurance bodies
- Technical inspection offices
- The network of specialist specifiers

### INFORMATION AND REGISTRATION:

Tel.: +33 (0)5 53 54 11 25  
Email: [formation@saint-astier.com](mailto:formation@saint-astier.com)  
[www.saint-astier.com/formations](http://www.saint-astier.com/formations)





Gymnasium / Blamont (54)  
40 cm cast hempcrete - Interior: TRADÉCO® lime + ISOCANNA® hemp-lime render -  
Exterior: KALAMUA® render, shade 070



Gymnasium / Blamont (54)  
View of hempcrete and KALAMUA® 070

Orthodox Monastery of Terrasson (24)  
Extension built in timber frame and hempcrete - Finishes: Chaux  
colorée® and KALAMUA®



Detached house / Saint-Chamond (42)  
ISOHEMP® hemp blocks + hempcrete  
+ KALAMUA® white finish (020)



Inner courtyard - Rue de Courson - Paris  
Hempcrete and KALAMUA®



Foyer for Young Workers / Siorac-de-Ribérac (24)  
Hempcrete with a NHL 2 and local-sand render  
Architects: Dauphin Architecture





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